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Authors: A.V. Brushlinsky, L.B. Itelson, N.S. Leites, V.S. Mukhina, A.V. Petrovsky (Head of the Group), E.B. Pirogova, G.S. Sereda, M.G. Yaroshevsky, P.I. Zinchenko, T.P. Zinchenko, V.P. Zinchenko

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Part One

INTRODUCTION

Chapter 1

THE SUBJECT-MATTER OF PSYCHOLOGY

I.1.1. Concept of Psychology

Every concrete branch of science is distinguished from every other by the specificity of its subject-matter. Thus geology and geodesy, both concerned with the Earth, differ from one another in that the former studies its composition, structure and history, whereas the latter focuses on its size and shape. The specific features of the phenomena investigated by psychology are much more difficult to define. Understanding of these phenomena depends to a large extent on the world view of the people engaged in psychological studies.

The difficulty consists first of all in that the processes explored by psychology have long since been distinguished by the mind and separated from other manifestations of life as *special phenomena*. Indeed, it is quite obvious that my *perception* of a typewriter is something very special and different from the typewriter itself, the real object on the table in front of me; my *wish* to go skiing is something different from a real skiing trip; my *recollection* of the New Year's eve party is not the same as what really occurred on the eve of the New Year, etc. People gradually learnt to distinguish between different categories of what came to be known as mental phenomena (mind's functions, characteristics, processes, states, and so on). Their specificity in people's eyes consisted in that they belonged to man's inner world as distinct from the environment. They were included under the head of mental or psychic life (from the Greek "psyche"—the soul or the mind) in contrast with real events and facts. Such phenomena were classed as "perceptions", "memory", "thinking", "will", "senses", etc. making up what is called the *mind*, the *psyche*, *man's inner world*, etc.

Though people observing their fellowmen in everyday life were concerned with different behavioural patterns (actions, deeds, labour operations, etc.), the needs of practical intercourse demanded that they should *distinguish hidden mental processes behind external behaviour*. An action was always interpreted in terms of intentions and motives guiding a man's behaviour, whereas his response to one or another event was believed to be indicative of his personal traits. Thus people acquired psychological knowledge of one another long before mental processes, properties and states became an object of scientific analysis. This knowledge was recorded and passed down from generation to generation in language, folklore and works of art. It was epitomised, for instance, in such sayings and proverbs as "Better to see once than to hear ten times" noting advantages of visual over auditory perceptions, "Habit is second nature" stressing the importance of deep-rooted habits, etc.

Man's knowledge of life, too, gives him a certain idea of the psyche: for instance, he learns from experience that rereading a text helps retain it in memory.

Psychological information drawn from personal and social experience constitutes *prescientific psychological knowledge*. It may be rather broad in scope helping to a certain extent understand the behaviour of the surrounding people and providing a correct reflection of reality within certain limits. On the whole, however, such knowledge lacks system, depth, conclusiveness and for that reason cannot provide a solid foundation for pedagogical, medical, organisational and other humanistic activities that should be based on *scientific*, i.e., objective and authentic knowledge of the human mind making it possible to prognosticate an individual's behaviour under expected conditions.

What is then the subject-matter of scientific study in psychology? It is, first and foremost, the *concrete facts of man's mental life* lending themselves to both *qualitative* and *quantitative* description. Thus, studying man's perception of the surrounding objects, psychology established one crucial fact: the image of an object remains relatively constant under changing conditions of perception. For instance, the page with these printed lines will be seen as white in the bright sunshine, in semi-dark-

ness and in electric light, though the physical properties of the rays reflected from the paper under so different conditions of light intensity will be very different. We are faced here with a qualitative characteristic of a psychological fact. A quantitative characteristic can be exemplified by an individual's reaction time, that is the minimum time between a stimulus and a response (if several subjects in an experiment are offered to push a button right after a flash of light, the reaction time of one individual may be 200 milliseconds, and of another, 150 milliseconds, i.e., much shorter). Individual differences in the response time observed in an experiment are psychological factors established in a scientific investigation. They provide criteria for quantitative rating of some mental characteristics of the subjects.

However, scientific psychology cannot confine itself to the description of a psychological fact, however interesting it may be. Scientific cognition calls for transition from a *description* of phenomena to their *explanation*, i.e., to the underlying laws of these phenomena. Therefore psychology shifts the focus of attention on *psychological laws* which, together with psychological facts, become the subject-matter of this discipline. The emergence of certain psychological facts is contingent on the existence of the corresponding conditions, i.e., is a *law-governed process*. Thus the above fact of relative constancy of perception is governed by a lawlike regularity, constancy being characteristic not only of colour perception, but also of the perception of the size and shape of objects. Special studies have shown that constancy of perception is not an inborn quality in man, it develops gradually in accordance with definite laws. If perceptions lacked this essential characteristic, a man would not be able to adapt himself to the environment: the slightest change of his position in relation to the surrounding objects would distort their mental images and bring about a radical change in the picture of the visible world.

Knowledge of laws is not yet sufficient to disclose the specific mechanisms whereby they manifest themselves. Therefore, alongside the exploration of psychological facts and laws, psychology is concerned with the investigation of *mechanisms of mental activity*.

For instance, the relative constancy of the perception of an object's size despite the increasing distance between the subject and the object depends, among other things, on the interaction between the processes set off by retina stimulation, on the one hand, and the excitation resulting from the tension of the convergence and divergence muscles, on the other hand. Though the projection of an object on the sensitive cells of the retina diminishes as the distance between the object and the eye increases, the corresponding change in the tension of the eye muscles during divergence of the lines of vision informs the brain that the object has moved away and not become smaller.

Since mechanisms of mental activity are of necessity correlated with specific anatomo-physiological apparatus performing one or another mental process, psychological investigation into the nature and operation of these mechanisms is bound up with the results obtained by physiology, biophysics, biochemistry, cybernetics and other sciences.

So, *psychology as a science studies facts, lawlike regularities and mechanisms of the mind.*

It stands to reason that the above definition, like the traditional definition of psychology as a science which treats of mental processes, states, qualities and so on needs extensive elaboration. The mere indication that mental phenomena are specific, that they form an individual's inner world cannot disclose the essence of the mind and its specificity. Before attempting to answer what is meant by the mind, we must outline, if only in short, the genesis of the notions of mental phenomena.

A Brief Historical Survey. From ancient times the realities of social life have impressed upon man the necessity to differentiate mental qualities of the surrounding people and to take them into account in his actions. Initially these qualities were ascribed to the activity of the soul. The notion "soul" was born of the *animistic* views of primitive people. The primitive man did not clearly distinguish between the soul and the body. His notions derived from prescientific, spontaneously materialist interpretation of the phenomena of life and consciousness, such as sleep, death, faint, etc. Being unable to account for such phenomena in terms of cause-effect relationships,

the primitive man mistook their appearance, the immediate givenness, for essence. Thus it appeared that dreams were impressions of the soul leaving the body in sleep and wondering in the world. The primitive man did not view death as the end of life, he regarded it as a kind of sleep when the soul stayed away from the body for some reason or other. He believed the soul to be a man's double whose needs, habits and conditions of life were the same as those of living people. The souls of dead people formed communities similar to those of living men, with similar pursuits and social structures. The living men and the souls of the dead were interdependent, their bonds being essentially material, economic.

The notions of this dependence of an individual man and a community as a whole on the soul reflected the defencelessness of the savage in the face of nature and gave rise to the worship of the soul, the initial form of religion.

At a later stage, the development of society accompanied by the differentiation of the functions of planning and execution, physical labour and the "spiritual forces of production", the emergence of classes and the improvement of man's capacity for abstract thinking provided the foundation for the idea of the *immaterial nature of the soul*. New social needs gave rise to new philosophical schools which treated of the basic questions of human existence and man's attitude to the world as a whole. These schools proceeded from the already existing categories and notions reinterpreting them in accordance with the new ideological demands. Highly illustrative of this new trend are the texts of the Vedas which made their appearance in India in the second millennium B.C. and developed later in the Upanishad treatises concerned with the nature of man and the universe (c. 1000 B.C.). The problem of the soul was discussed there primarily from the ethical standpoint in the context of the rules for righteous behaviour, self-improvement and attainment of happiness. According to Yoga, the free soul is connected with the physical body and with the so-called fine body (senses, reason, empirical Ego, intellect). At the same time the earlier animistic, mythological notions began to give way to attempts at interpreting the soul in terms of natural philosophy. The Ionian natural philos-

ophers¹—*Thales* (7th-6th centuries B.C.), *Anaximenes* (5th century B.C.), and *Heraclitus* (6th-5th centuries B.C.) treated the soul of men and animals as a life-giving form of the element constituting the primary substance of the world (water, air, fire). Consistent pursuit of this idea led them to *hylozoism*—the doctrine of universal animism of matter which was a peculiar form of materialism. Carrying on the materialist tradition, the ancient atomists² *Democritus* (5th-4th centuries B.C.), *Epicurus* (4th-3rd centuries B.C.) and *Lucretius* (1st century B.C.) conceived the soul as a material body-animating organ controlled by spirit or reason, also a material principle, guiding the entire life process. Since both the spirit and the soul represent a bodily organ, they are corporeal and consist, according to the atomists, of fine spherical, and therefore the most mobile, atoms. Naïve as it was, this theory was an important advance on the contemporary philosophy as it contended that the properties of a living organism, from the lowest bodily functions to mental phenomena and reason itself are nothing else than properties of matter.

Hence, the first major steps on the road of the scientific cognition of the mind are inseparably connected with the recognition of its subordination to the laws of the physical world, with the discovery of the dependence of its manifestations on the anatomy and physiology of a living organism. However, the data available to the materialist philosophers of those times did not provide any clue to the mysteries of the capacity for abstract logical thinking inherent in man, the origin of ethical imperatives, man's ability to make a choice and control his body by an effort of will, etc.

All these properties of specifically human behaviour could not be deduced from the movement of atoms, blending of "juices" or accounted for by the visible structure of the brain. The lack of positive knowledge created prerequisites for the development of idealistic views of the mind put forward by ideologists of the slave-

¹ the Ionian school arose and flourished in Ionia, a region on the West Coast of Asia Minor colonised by the Greek (6th-4th centuries B.C.).

² Atomism, the theory of the discrete structure of matter, posed as a materialist teaching throughout the history of natural science and philosophy.

owning society. The most prominent of them was *Plato* (428/427-347 B.C.) He introduced the notion of the three faculties (or parts) of the human soul—the rational, the forceful, and the concupiscent which resided respectively in the head, chest, and stomach. According to Plato, the influence of each of these faculties was different in different individuals, and their social status depended on which of them prevailed. Thus the labourers were distinguished by the domination of the desirous part of their soul and doomed, therefore, to be perpetually in the service of the aristocrats or philosophers who were governed by the rational part of their soul. This scheme clearly brought out the class substrate of Plato's views. A profound influence on subsequent philosophical thought was exercised by Plato's theory of ideas as eternal and immutable entities abiding in the transcendent invisible world of absolute truth. The rational part of the soul was in communion with this eternal world of ideas before the soul moved to a mortal body. Upon incarnation as a man, the soul began to recollect the ideas it had contemplated in the other world. The more vivid the recollections, the truer the knowledge it shared in.

Plato was the progenitor of *dualism* in psychology, i.e., the doctrine regarding material and spiritual substances, body and mind as two independent and antagonistic first principles. Plato's dualism was largely overcome by his pupil *Aristotle* (384-322 B.C.) who reunited psychological thought with natural studies and restored its close links with biology and medicine. Aristotle's work "On the Soul" testified to the fact that psychology by that time had already acquired the status of an independent branch of science. It owed its achievements to the observation, description and analysis of concrete manifestations of life in both man and the animals. Aristotle championed the experimental, objective methods of inquiry into mental activities.

Before Aristotle both the materialists treating soul as a variety of matter and the idealists seeing in it an incorporeal entity believed in a separate existence of body and soul. *Aristotle was the first thinker in the history of philosophy who put forward the idea of the inseparability of soul and living body.* The soul did not consist of separate parts, but revealed itself in different capacities

or functions: nutritive, sensitive, motive and rational. The first function was characteristic of plants, the second and the third, of animals, and the fourth, of man. The teaching of the vegetative, animal and rational soul brought in the principle of development: a higher faculty derived from the lower one as its foundation. Man represented a combination of the earlier and later stages of the development of life and mind. The primary cognitive activity was sensation which was described by Aristotle as a power of receiving form without matter, as wax received the shape of a signet-ring without its material. Sensations left an imprint in the form of perceptions. Aristotle discovered that perceptions could exist as a memory image or a reminiscence of those sensible objects which had originally acted on the organs of sense. He also showed that such images were combined on the principles of similarity, contiguity and contrast, thereby indicating three main categories of *associations* of mental phenomena. Proceeding from the assumption that innate abilities could only be realized by an organism through its own activity, Aristotle advanced the *theory that character was moulded in practical activity*: a man became virtuous and temperate by practicing virtue and temperance.

The teachings of Heraclitus, Democritus, Plato and Aristotle laid the foundation for subsequent development of psychological thought. Gradually the notion of soul originally applied to all manifestations of life (including vegetative, purely biological processes) was narrowed down to what is now known as the psyche or mind. This latter category came under a more close scrutiny and a notion of *consciousness* began to evolve out of it. Man realized that he was capable not only of having perceptions and thoughts, but also of being *their originator*; he understood that it was not only within his powers to perform voluntary actions, but also to *initiate them*.

Progress in the experimental study of the organism's anatomy and functions, as well as the needs of developing society set off a process of specification and differentiation of the once undivided and integral notion of soul. In the 3rd century B.C. Alexandrian physicians *Herophilus* and *Erasistratus* discovered nerves by distinguishing them from ligaments and tendons. They systematically

studied the dependence of mental functions (sensations and movements) on the irritation of the brain and found out that only definite organs (nerves, the brain) and not the body as a whole are inseparably connected with the mind. The soul as the formative principle of any manifestation of life and the soul as the formative principle of sensations and movements (inseparable from nerves) proved to be two different entities.

In the 2nd century B.C. Roman physician *Galen* generalising the achievements of physiology and medicine expanded the knowledge of the physiological foundation of mental phenomena and came closer to the notion of consciousness. He demarcated the movements involving attention, memory, reflection, from those performed by man, for instance, in sleep. Both kinds of movements are regulated by the soul, but in the first instance some additional factors come into play. The nascent notion of consciousness was seized upon by idealist philosophy which, hand in hand with religion and mysticism, was flowering in the atmosphere of social unrest, civil war and slaves' revolution that shook the Roman Empire. First *Plotinus* (3rd century A.D.), then *Augustus* (4th-5th centuries A.D.) imparted a purely idealistic shade to the notion of consciousness. They contended that all knowledge resided in the soul which had an ability to turn to itself and rediscover with utmost clarity and authenticity its own activity and its invisible products. The soul's knowledge of itself was the inner experience entirely different from the experience provided by external sense organs. Later on this viewpoint came to be known as *introspectionism*.

The dominant ideology of religion fostered hostile attitude to the real world and asserted the need for self-contemplation and reunion with the Almighty. The progress of psychology barred from empirical knowledge was halted. It could only be resumed under new socio-historical conditions. These conditions were created by the growth of productive forces and development of new social relations. Progressive psychological teachings began to emerge already in the depths of feudal society; the self-awareness of the personality extricating itself from feudal chains consolidated in the fierce struggle against the clerico-theological conception of soul. In those times,

when the students of a university wanted to appraise a professor at the very first lecture, they shouted to him: "Tell us about the soul!"

The bonfires of the Inquisition were powerless to stifle the thought set at liberty by new social forces. The bourgeois revolution, that broke out first in the Netherlands, then in Great Britain marked the beginning of a new epoch. The needs of society effected a radical change in the very mode of thinking: science turned away from scholasticism toward empirical studies and mechanistic explanation of nature, including man himself.

The 17th century opened a new period in the development of biological and psychological knowledge. The notions of body and soul underwent a crucial transformation. The body came to be conceived of as a machine built on the same principles as technical structures and, like the latter, needing no soul to regulate it. This idea was effectively bolstered by the discovery of the reflectory nature of behaviour made by *Descartes* (1596-1650). The great French thinker postulated that just as the cardiac muscle was controlled by the internal mechanism of blood circulation so all other muscles at all levels of behaviour were actuated by their own mechanism and moved like the clockwork hands.

That was how the notion of *reflex* as a regular response of the organism to external stimulus came into being. Descartes contended that a muscle was capable of responding to external irritants of its own accord, without any intervention on the part of the soul by virtue of the specific organisation of the nervous system. Indeed, he argued, it did not occur to us to account for the movement of the clockwork or for the reflection of a light beam from a surface by the activity of the soul. In his view, animals were also peculiar mechanisms and the processes in nerves were reflected from the brain to muscles very much in the manner of a light beam.

This truly revolutionary conception became the compass of the objective cognition of neuromuscular activity. Proceeding from his notion "nervous machine" as a model of the living organism, Descartes made an attempt to account for most of the mental phenomena which had hitherto been ascribed to the soul. Basing himself on his reflectory scheme, he explained the origin

of sensations, associations and passions, yet he proved unable to extend it to all mental phenomena. Alongside reflex, Descartes postulated the existence of soul as a separate entity independent of the body.

Descartes's dualism was rejected by other great thinkers of the 17th century—some of them arguing from the materialist, others, from the idealist viewpoint. Thus English materialist Hobbes (1588-1679) unequivocally ousted the soul from his doctrine and declared *mechanical motion* to be the only reality wherefore its laws were also the laws of psychology. For the first time in history psychology stopped being the science of soul and focused on mental phenomena conceived as shadows of bodily processes. The world's unity, however, was bought at a high price—by denying reality to the mind and turning it into mere appearance. This conception which came to be known as *epiphenomenalism* was undoubtedly progressive for its time, as it was directed against the prevalent belief in immaterial spiritual entities or forces.

Like Hobbes, Dutch materialist philosopher *Spinoza* (1632-1677) was an ardent champion of the idea of the unity of the world, but he considered consciousness to be no less real than matter extended in space. In one of the theorems of his chief work "Ethics" he affirmed that the order and connection of ideas were identical with the order and connection of things. Both bodies and their ideas were integrated in one and the same iron order of nature. Here Spinoza, like Hobbes (and also Descartes in his teaching of reflex) advocated one of the basic principles of scientific psychology—the *principle of determinism* according to which all phenomena came out of the operation of material causes and laws. He averred that the laws governing human feelings, thoughts, actions were as necessary and accurate as geometrical axioms. It is not fortuitous that his "Ethics" was modelled on Euclid's geometry in which propositions followed one another in inexorable succession. The achievements of mechanics, optics and geometry gave a powerful impetus to psychological thought.

Mathematics, particularly the discovery of integral and differential calculus, exercised a strong influence on the teaching of *Leibnitz* (1646-1716), an outstanding German philosopher, who was the first in the history of

science to put forward the idea of unconscious mind. In his eyes, the plurality of mental phenomena made an integral, and not an arithmetic sum. Proceeding from the idea that things shade into one another by infinitely small gradations, Leibnitz differentiated between unconscious *perception* and conscious *apperception* mediated by attention and memory. Being an idealist, Leibnitz considered the universe as a host of souls or "monads" (indivisibles). However, he enriched psychology with a number of new ideas and notions, first and foremost, the ideas of the active nature and continuous development of the mind, of the complex relationship between the conscious and the unconscious.

Theoretical science and practical life in the 17th century were dominated by *rationalism* which proclaimed reason as the only instrument of true knowledge. Profound economic changes in the advanced countries, the industrial revolution, the tendency towards practical application of scientific knowledge in the 18th century brought into the foreground *empiricism* and *sensualism*—the doctrine of the primacy of experience and sensuous knowledge over "pure" reason rejecting any innate ideas and principles. This doctrine found its resolute proponent in the person of English philosopher and pedagogue *John Locke* (1632-1704) who is considered the father of *empirical psychology*. The postulate that all knowledge comes from experience was of crucial importance to psychology as it emphasised the need for studying concrete mental phenomena and the ways of transition from elementary phenomena to complex ones. Experience, according to Locke, has two sources: the activity of the sense organs (external experience) and the activity of the mind reflecting its own operation (internal experience). A man is born without any ideas. His soul is a blank tablet (*tabula rasa*) which is filled with ideas by experience. Experience consists of simple and complex ideas which come either from sensation or from reflection (internal perception). In the latter case the mind is closed on itself and reflects on its own operations. Locke's notion of reflection (which should not be confused with the notion of reflex) was based on the assumption that man's cognition of psychological facts (in contrast to physical facts) was essentially intraspective. That was

the old dualistic postulate. Consciousness and the external world were counterposed on the grounds that they could only be cognised by essentially different methods.

The dual character of Locke's teaching about the inner and outer experience accounts for the fact that it gave an impetus to the development of both materialist and idealist doctrines. The English, French and Russian materialists with *Hartley* (1705-1757), *Diderot* (1713-1784) and *Radishchev* (1749-1802) at the head, proceeding from the notion of external experience deduced the inner content of man from his relationship with the surrounding world. By contrast, the idealists headed by *Berkeley* declared this content to be primary, independent of any external influence. Now, how do individual ideas become integrated into a single whole, the complex mental life of an individual? Locke's teaching paved the way for the conviction that the *association of ideas* was the main law of psychology. After Locke *associationism* became the dominant trend in psychological thought. The struggle between materialism and idealism within this trend centered upon the concept of the mind and reflected the mutually exclusive explanations of the nature of mental phenomena.

One of the most prominent expounders of the materialist trend in 18th-century associative psychology was *David Hartley*. Basing himself on the physical principles of Newton, as well as on the achievements of physiology and medicine (Hartley was a practicing physician), he combined the notion of reflex with the notion of association. He maintained that all mental phenomena derived from external effects on the nervous system which carried them from sense organs through the brain to the muscles. These effects are impressed as sensations and their traces, as ideas. As a result of frequent repetition of contiguous sensations one sensation proves sufficient to restore the whole chain of traces left in the nervous system by other sensations (formerly connected with the first one). When a new irritant, the word, is cut into this chain, will and thought come into play. The word begins to substitute for and call forth by association those actions which could formerly be initiated only by direct effects on the senses. Hartley's teaching was distinguished by a high degree of consistency. It was based on the principle

of determinism. The law of association which was considered as universal for human nature as the law of gravitation for the outer world was resorted to for explanation of every phenomenon of mental life.

Associative psychology was considered a theory that opened up a possibility for moulding individuals with preset qualities and controlling their behaviour by acting appropriately on their nervous system. The nervous system itself was conceived of as absolutely free from any predispositions and innate qualities.

This theory was opposed by another trend in the psychological thought of the 18th century—the *psychology of abilities* (in Germany its leader was *Christian Wolff*, in England—*Thomas Reid*). The adherents of the psychology of abilities contended that the soul is endowed with certain innate powers, first and foremost, the power of presentation which manifests itself as knowledge and desire. They did not offer any causal explanation of these forces. The latter were posited as something primary and ultimate. This turned ability into a fictitious notion which was but a semblance of scientific explanation.

The 18th century was marked by new important achievements in the investigation of the nervous system (*Haller, Prochaska*) which paved the way for the idea that the operation of the mind should be regarded as one of the vital functions of an organism rather than interpreted in terms of mechanical motion. It was a prerequisite for the *doctrine of the mind as a function of the brain*. This doctrine was put forward by the French materialists of the 18th century who maintained that the process of thinking was initiated by the impressions coming from without and terminated in the expression of thought in a word or gesture, the unknown intermediate nervous processes taking place in the brain. Hence, the general scheme of the process of thinking was reminiscent of the reflex mechanism. However, the term “reflex” was only applied by the French materialists to an unconscious motor act, a simple response to an external stimulus. In his reply to the Convention’s inquiry about muscular convulsions of those beheaded, French materialist philosopher and physician Cabanis replied that the blade of the guillotine caused no suffering to the victims as their movements were purely reflectory.

The view that the organism’s movements fell in two categories—voluntary (conscious) and involuntary (unconscious, reflectory) became common knowledge in the early 19th century. Its tenability was vouched for by spectacular achievements of physiology resulting in the discovery (by Englishman *Charles Bell* and Frenchman *François Magendie*) of distinctions between sensory and motor nerves. The stimulation of spinal cord nerve roots produced different results. A muscular reaction was only observed in case of front root irritation. As regards the rear roots, they were recognised as the seat of sensory function. A theory was evolved that the stimulation of the end of a sensory nerve sets off an impulse transmitted from this nerve via the nervous centre in the spinal cord and along the motor nerve to the muscle. This route came to be known as the *reflex arch*. The philosophical hypothesis of reflex turned into an experimentally confirmed fact. However, the mechanism of reflex arch could only be invoked in explanation of the simplest forms of motor reactions. The experiments of biologist *Pflüger* in the 1850s showed that the notion of reflex could not be referred to for explanation of the behaviour of animals capable of active adaptation to environmental conditions, let alone the conduct of man. Numerous facts called in question the reflectory character of behaviour in general. At the same time the notion of reflex contained a valuable idea that the activity of an organism is determined by material influence on the material organ. Rejecting this idea was tantamount to retrogressing to the old notion of the soul as the body’s mover. Psychology found itself on the horns of a dilemma: if it adhered to the theory of reflex, it was unable, as observation showed, to account for the activity of living beings; on the other hand, if it gave up this theory, it also had to relinquish its hope for a causal explanation of such activity.

The way out of this impasse was found in the late 19th century by the Russian scientist *Ivan Sechenov* (1829-1905).

Reflectory Character of the Mind. In his article “*Reflexes of the Brain*” (1863) Sechenov came out with the thesis that all actions of conscious and unconscious life are reflectory by their origin.

Thus an act of consciousness (a psychic phenomenon)

was declared not a property of the soul as an incorporeal entity, but a reflex-like process in terms of structure and operation. A mental phenomenon cannot be reduced to what is given a subject contemplating his sensations, ideas and experiences. Like the reflex, it includes the effect of the external irritant and the motor response to it. Earlier theories confined the subject matter of psychology to what stood out in our consciousness as images, notions and thoughts. According to Sechenov, they were nothing else than fragments of integral mental processes representing a specific form of interaction ("life encounters") of the organism and the environment. The opinion that mental processes start and end in consciousness was regarded by Sechenov to be a gross error.

Sechenov held that it was wrong to separate the brain link of the reflex from its natural beginning (the stimulus of the sense organ) and end (the response). Emerging in a single reflexive act and being its product, a mental phenomenon simultaneously poses as a factor forestalling its result (the action, the movement).

What is then the role of mental processes? They perform the function of a *signal* or *regulator* which correlates the action with changing environmental conditions ensuring the expediency (adaptability). *The mind is thus conceived of as a regulator of the response—not by itself, of course, but as a property, a function of the corresponding brain sections which receive, store and process information on the outer world.* The reflexive act thus includes man's knowledge, notions of the surrounding world, that is all the wealth of individual experience. Mental phenomena are the brain's reactions to external (the environment) and internal (the state of the organism as a physiological system) stimuli. *Mental phenomena are permanent regulators of activity arising in response to external influences (irritants) which are effective now (sensations, perceptions) or which were effective in past experience (memory), generalising these influences, enabling the mind to foresee their results (thinking, imagination), strengthening or weakening, intensifying or inhibiting the activity depending on external influences (feelings and will) and underlying differences in the behavioural patterns of different individuals (temperament, character, and so on).*

Sechenov put forward the idea of the reflexive nature of the mind and mental regulation of activity. These crucial theoretical propositions were experimentally confirmed and concretised by the Soviet physiologist *Ivan Pavlov* (1849-1936) who discovered the laws of the regulation by the brain of the interaction between animals (and man) with the environment. The sum total of Pavlov's views on these laws came to be known as the *teaching of two signalling systems*.

The image of an object (visual, auditory, olfactory, etc.) serves for the animal as a signal of some unconditional irritant thereby causing a *conditioned reflex-like* change in its behaviour.

A conditioned reflex is caused by the convergence in time of the action of some conditioned irritant (for instance, a blinking electric lamp) with the action of an unconditional irritant (for instance, feeding) which sets up a temporary nervous link in the animal's brain between two centres (visual and digestive) so that two kinds of animal activity, visual and digestive, become integrated. The blinking of the lamp turns into a feeding signal and the animal begins to salivate.

The behaviour of animals is governed by what Pavlov called the "first signals" or *signals of the first signalling system*. Animal mental activity does not rise above the level of the first signalling system. In man, the signals of the first signalling system (concrete images, presentations) also play an important part regulating and guiding his behaviour. Thus the red traffic light is a *signal irritant* for a driver inducing him to perform a number of motor acts in order to apply the brakes and bring the car to a halt. Significantly, it is not signalling irritants as such (e.g. the red, yellow and green traffic lights) but their *image signals* in the brain that automatically control the driver's behaviour.

In contrast to animals which have only the first signalling system, man is also endowed with the *second signalling system* which is his specific feature and exclusive advantage. The signals of the second signalling system are words ("secondary signals") which can be pronounced, heard or read. Words can substitute for the signals of the first signalling system, the image signals. Replacing and representing them in a generalised form, a word can

call forth the same actions that are provoked by the primary signals. Hence, the word is "the signal of signals". It is necessary to distinguish between signal irritants (a sound of speech, a text of a written message) and signals representing these verbal irritants in the brain in the form of the meaning of a word which, on being comprehended by a person, controls his behaviour and ensures his orientation in the surrounding world. If a word is not understood and remains meaningless, it can only act upon a person as a signal of the first signalling system or even leave the person completely indifferent.

In view of the above we have reason to conceive of the mind as a *subjective image of the objective world, as a reflection of reality in the brain.*

Such a conception of the substance of the mind is in accord with the *theory of reflection* developed by Lenin. According to Lenin, our sensations, our consciousness are nothing but an *image* of the outer world. *The Leninist theory of reflection is the epistemological foundation of scientific psychology.* It gives a philosophically correct understanding of the substance of the mind as a process of reflection which is a property of the brain. It is opposed to both idealistic and mechanistic views of mental phenomena. Idealism separates the mind from matter and turns the former into a closed inner world independent of the environment, whereas mechanicism does not see any qualitative difference between the mind and matter reducing the former to nervous processes. Epistemology, that is a theory of knowledge, a teaching of the sources, forms and methods of cognition and of the ways of attaining the truth, studies the mind from the viewpoint of the relationship between the subject and the object concerning itself with such problems as the truth of man's knowledge of the world, the adequacy of reflection, and others.

Being also concerned with the mind, psychology has its own concrete tasks of scientific investigation, its own subject-matter. It explores the process of the transformation of external influences into the subject's internal, mental states in which the external objects are represented. It investigates the mechanisms of this transformation which control the activity of the subject, that is the programming and the regulation of his response to environmental influences.

The mind is characterised by *activeness* manifesting itself in *motivation*, constant *search* for the best solution and *choice* of possible behaviour. A mental reflection is not a lifeless, mirror image of the surrounding world, but a crucial aspect of an individual's activity.

The active regulation of behaviour is impossible without a functional *feedback* apparatus. The notion of feedback is widely used in modern psychology, physiology and cybernetics. In psychology and physiology it implies that each response is evaluated by the brain from the viewpoint of the task being solved, i.e., presupposes the existence of a single cyclic system in which not a fraction of the response controlled from the centre can be completed without the immediate dispatch of information on the results of the action in the reverse direction, i.e., from the periphery to the centre. The feedback apparatus makes it possible to compare the result of the action with the image that *precedes, anticipates* this result as a peculiar model of reality.

The mind enables a human being to evolve a programme of consecutive actions and carry out, before its execution, a series of internal mental operations (involved, for instance, in selecting the best way for its implementation).

Having developed in the process of biological evolution as a special behaviour control apparatus, man's mind undergoes a qualitative transformation. Under the effect of laws of social life people become personalities, each bearing the hallmark of concrete historical conditions that moulded it. As a result, *the behaviour of an individual acquires features characteristic of him as a personality.*

We may now concretise the definition of the subject-matter of psychology that has been offered earlier: *psychology is a science about facts, laws and mechanisms of the mind as an image of reality evolving in the brain and enabling the individual to control his behaviour and activity determined by personal traits.*

1.1.2. The Brain and the Mind

The mind is a function of the brain. The mental activity of an organism is effected through the agency of a multitude of special bodily devices. One group of

such devices serves as receivers of external influences, a second group transforms them into signals, constructs a plan of behaviour and controls its execution, a third group imparts the necessary energy and impetuosity to the behaviour, a fourth group actuates the muscles, etc. This complex activity performed by an organism, permits its active orientation in a specific situation and enables it to solve vital tasks.

During the course of the long evolution of the organic world, from amoeba to man, the physiological mechanisms of behaviour became more and more complex and differentiated gaining in flexibility and adaptability to environmental conditions.

The Organisation of the Nervous System and the Mind.

A unicellular organism, such as the amoeba, has no specialised organs either for sensing food, or for searching or digesting it. One and the same cell should combine in itself all the three functions, wherefore the amoeba's vital capabilities, i.e., its capacity for obtaining food and avoiding destruction are extremely limited. By contrast, owing to the specialisation of organs, higher representatives of the animal world exhibit a very fast and accurate response to both kinds of situation. This specialisation reveals itself in the *emergence of cells whose sole function is to receive signals*. Such cells make the so-called *receptors*, sensitive to certain kinds of external stimulation. Other cells form *effectors*—muscles or glands which respond to motor impulses. However, specialisation tends to separate organs and functions, whereas life calls for their constant communication, for the coordination of movements with the flows of signals from the surrounding objects and from the organism itself. This integration is achieved through the “master control desk”—the *central nervous system* acting as an integral whole.

The general design of the nervous system in all the vertebrates is identical. Its elementary building blocks are *nervous cells* or *neurons* whose main function is to conduct excitation. The neuron consists of the *cell body*, *dendrites* or ramifying fibres conveying impulses toward this body and an *axon* conducting impulses away from the cell body to other neurons. The point of contact between the axon and dendrites or the cell body of other neurons is called a *synapse*. It is not an anatomical, but a

functional connection allowing nervous impulses to pass from one neuron to another. The synapse is believed to play the key role in the mechanism responsible for the establishment of new links in the nervous system. It is presumed that the establishment of such links is accompanied by certain changes (chemical or structural) in the synapses which transmit impulses in a definite direction. The synapse is believed to be a kind of barrier offering resistance to excitation. Some barriers are easily surmountable, others are more difficult to overcome, and sometimes there may be several alternative paths for a nervous impulse.

Some neurons allow impulses to pass from receptors to the central nervous system, others, from the central nervous system to effectors, yet the overwhelming majority of neurons maintain communication between different points of the central nervous system consisting of two main departments, the *brain* and the *spinal cord*.

The upper part of the brain is represented by two cerebral hemispheres covered with a six-layer mass of neurons (about 10 billion) known as the *cortex*. The cortex is the most important (but not the sole) organ of mental activity. In the back of the head below the cerebral hemispheres is located the *cerebellum* or “little brain”, whose functions are not yet completely clear. It is known, however, that it plays a major part in the coordination of muscular movements. Adjacent to the cerebral hemispheres is the *cerebral trunk* whose upper portion, the *thalamus*, is a “relay station” for all nervous impulses running from the spinal cord to the hemispheres. Its lower portion, the *hypothalamus*, contains nervous centres important in the regulation of water metabolism, hunger and other visceral functions.

The structure of all the above indicated parts of the central nervous system is extremely complex. They are studied and described by *anatomy* and *histology*.

Contemporary science regards the *spinal cord* and the *cerebral trunk* predominantly as *seats of innate forms of reflectory activity (unconditioned reflexes)*, whereas the *cortex of the cerebral hemispheres* is the *organ of acquired forms of behaviour controlled by the mind*.

Every kind of sensitive surface (skin, eye retina, etc.) and every organ of locomotion has its own representa-

tion in the brain. The specialisation, characteristic not only of receptors and effectors, but also of those cerebral cells which form the projection of peripheral events is known in every minute detail owing to the high level of modern neurosurgery and cortex electrostimulation technique (such stimulation is achieved with the help of very thin electrodes).

Scores of experiments of this kind have been staged on animals. As regards men, there is no question, of course, of making any surgical experiments on the brain of healthy individuals. It is only in some operations necessitated by patients' conditions that neurosurgeons have had a chance to explore the human brain with the help of electrodes. Since the brain has no painful points, the patient does not suffer from any discomfort during such exploration. At the same time, a patient retaining his consciousness may inform the doctor about his experience during stimulation. This technique has made it possible to establish that the stimulation of certain parts of the brain causes muscular contraction, whereas the stimulation of other parts evokes visual, auditory and tactile sensations. It was found out that the "terminals" of sensory and motor nerves are arranged in a definite order and that not all parts of the organism are equally represented in the brain.

A large part of the cortex of man's cerebral hemispheres is occupied by cells connected with the activity of the hands, particularly the thumbs which are counterposed in man to all other fingers, as well as by cells connected with the functions of the muscles of the organs of speech—the lips and the tongue. Thus the cortex of man's cerebral hemispheres represents predominantly those motor organs which perform the main function in labour and in communication.

The general laws of the operation of the cerebral hemispheres were discovered by Ivan Pavlov. In his famous experiments he developed conditioned responses in dogs to various signals which produced the same physiological reaction (for instance, salivation) as the direct effect of the corresponding unconditioned irritant (for instance, the sight of food). It would not be correct, though, to limit Pavlov's teaching to this simple scheme. Under natural (not laboratory) conditions an animal

cannot afford to wait for food to get into its mouth: it sets out in search of food, performs various actions, checks their efficacy and actively seeks orientation in the environment.

Present-day investigations show that the general regularities of the higher nervous activity also manifest themselves in the active behaviour of birds and animals.

For instance, if a pigeon is placed in an experimental cage with a button which, after being pecked, can open a feed box with grain, the pigeon will learn in a while to accomplish this task. The button becomes a conditioned irritant and the reaction of the beak to the signal becomes as compulsory as the reaction of the salivary gland to a bell ring or to a light in Pavlov's experiments with a hungry dog.

In recent years the study of the physiological mechanisms of mental activity has gained a new dimension owing to progress in the investigation of the functions of the cerebral trunk by direct stimulation of the nervous tissue through microelectrodes implanted under the skull cap. It was found out, in particular, that a number of sections of the cerebral trunk serve as a source of energy for the higher sections of the brain.

Alongside the electrical stimulation of the cerebral trunk the researchers use the technique of recording biological currents which arise in the trunk spontaneously, without any intervention on the part of the experimentalist. Experiments showed that the electrical activity of the brain is not uniform. The character of the records of biological currents is indicative of changes in the subject's mental state. *The waves evolving in the brain are electromagnetic oscillations of different frequencies.* The lowest frequencies correspond to a state of repose when a person is relaxed and sitting with his eyes closed. Once he receives an assignment, for instance, to do a sum, the curve of his biological currents immediately changes and exhibits signs of much higher frequencies.

The discovery of brain electrical currents which can be recorded with the help of amplifiers in the form of an *electroencephalogram* was of great importance for physiologists, physicians and psychologists. Electroencephalography permits observing changes in the activity of the

brain and correlating these changes with mental processes. Though the record of biological currents testifies only to general biophysical and *biochemical activity* of the brain and says nothing of the content of its work, these investigations are very important. There is no doubt that they will provide in future a lot of new and highly important information on the brain and the mind. It is not accidental, therefore, that researchers carefully study the biological currents of the brain in different circumstances and, in particular, under specific conditions of space flight. The record of biological currents of a cosmonaut's brain reflects changes in his central nervous system indicating a state of sleep or wakefulness and registering different levels of activeness of his consciousness.

The brain mechanisms of mental processes in man have much in common with the mechanisms of the animal psyche. The general principles of the structure and operation of the nervous system are identical in all mammals. Therefore the study of the animal brain is exceedingly important for both physiology and psychology. However, one should never lose sight of the fundamental distinctions between the mental activity of man and that of animals—these distinctions are not only *quantitative* (this is obvious enough), but also *qualitative*¹. They developed in a natural way in the process of labour, a powerful material factor transforming all structures and functions of the human organism, including the organ of mental phenomena, the brain. Its qualitative distinctions from the animal brain clearly manifest themselves when we study the mechanisms of the higher cognitive processes, particularly the process of thinking. These processes are not localised in definite sections of the brain like the processes of sensation and perception. In case of injury to the occipital section of the cortex the man will inevitably lose visual sensations. By contrast, the functions of the injured brain sections involved in the higher cognitive processes may be taken over by a different brain section. The nervous tissue whose activity constitutes the basis of intellectual and speech acts is characterised by a high degree of *plasticity* and *interchangeability*.

¹ For more detail see Chapter 3.

Particularly important in man's psychic life is the role of the *frontal lobes* occupying 30 per cent of the surface of the brain cortex. An injury to the frontal lobes resulting from a disease, trauma, etc. affects not the elementary, but the higher forms of behaviour. For instance, patients with injured frontal lobes retain eyesight, the capacity for speech and writing; however, when asked to solve an arithmetic problem, they do not even try to analyse its conditions. In drawing up a plan for the solution of the problem they fail to take into account the ultimate question. They do not compare the answer with the initial data, do not notice their errors, etc. Numerous clinical facts show that injury to the frontal lobes of the brain entails, alongside intellectual deterioration, a number of personality disorders and character shifts. Thus patients who were notable for tact and even temper become unrestrained, irascible and rude.

It has been established that there exists a certain division of mental functions between the left and right hemispheres. Both hemispheres are capable of receiving and processing information in the form of images and words, yet their performance reveals a marked difference in the functions they accomplish: the brain is notable for a *functional asymmetry*. Thus the left hemisphere is concerned with reading, counting and, in general, manipulation of signs (words, symbols, figures, etc.). The left hemisphere enables logical constructs without which consistent analytical thinking is impossible. Impaired activity of the left hemisphere leads, as a rule, to speech disorders (aphasias), prevents the possibility of normal communication and, in case of extensive injury to the nervous tissue, results in a serious deterioration of the thinking ability. The right hemisphere manipulates image information, ensures man's orientation in space, perception of music, emotional attitude to objects being perceived and comprehended. Both hemispheres are functionally interconnected. Functional asymmetry is characteristic of man only. It evolves in the process of communication and may develop into a relative prevalence of the left or right hemisphere influencing the person's individual psychological characteristics.

The brain is a complex system of organs whose physiological activity is the substratum of the psyche of the

higher animals and man. The content of the psyche is determined by the outer world with which a living being interacts. The outer world for the human brain is not merely a biological medium (as is the case with the animal's brain), but a world of phenomena and objects created by people in the course of their social history. The roots of the mental development of every individual from his first steps in life lie deep in the history of man's culture. **The Mind-Brain Problem.** The problem of the relationship between mental and neurophysiological processes involves considerable difficulties. However, its analysis may be instrumental in elucidating some essential characteristics of the mind vis-à-vis the brain. If mental activity were lacking specificity, psychology would not be entitled to the status of an independent science and would have to be identified with the physiology of the nervous system.

Though mental activity is contingent upon and results from neurophysiological processes, the specificity of the mind is hard to define as the brain processes are in fact not represented in mental phenomena even in the "masked" form. Mental processes reflect the characteristics of *external objects* (their shape, size, interaction), and *not of internal*, physiological process whereby this specificity of the mind, i.e., the *reflection, representation of the outer world in the conditions of a bodily system is realised and brought out.*

The main difficulty in the investigation of mental phenomena was the elusiveness of neurophysiological processes which were not represented in the content and structure of the mind. For this reason mental phenomena appeared "incorporeal", ethereal, devoid of any substratum which gave the idealists cause to affirm the existence of an immaterial soul and construct various theories in support of this view. On the other hand, for this very reason the desire to adhere to the materialist principles in the investigation of mental phenomena sometimes led the researchers to the other extreme, the identification of the mental with the physiological, resulting in attempts to eliminate psychology in favour of physiology. The untenability of such attempts is demonstrated by the reflex theory of mental phenomena which demonstrates the real, active, regulating role of the mind in the act of reflection.

I.1.3. Concept of Consciousness

The mind as a reflection of reality in man's brain is represented by different levels.

The higher level of the mind inherent in man is *consciousness*¹. *Consciousness is the supreme integrating form of the mind which evolved under definite socio-historical conditions of man's labour activity in the process of constant linguistic communication with other people.* Consciousness in this sense is in fact nothing else than the awareness of being.

What is the *structure* of consciousness, its most important psychological characteristics?

Its first characteristic is implied in the word "*consciousness*" itself which is synonymous with awareness or *knowledge* of the surrounding world. The structure of consciousness, therefore, includes the most important cognitive processes whereby man constantly enriches his knowledge. Among these processes we can distinguish *sensations, perceptions, memory, imagination* and *thinking*. *Sensations* and *perceptions* directly reflecting the effect of irritants on the brain form in consciousness the sensuous picture of the world as it appears to the individual at a given moment. *Memory* enables man to restore in consciousness the images of the past, *imagination* allows him to construct image models of objectives which are not attainable at the moment. *Thinking* makes it possible to solve problems by drawing on the knowledge accumulated by the individual. An impairment or disorder of any of the above indicated mental cognitive processes, let alone their complete disintegration, inevitably results in the impairment of consciousness.

The second characteristic of consciousness is a clear *distinction between the subject and the object*, i.e., between what belongs to man's Self and to not-Self. Man who was the first living being in the history of the organic world to stand out from it and counterpose himself to the surrounding objects continues retaining in his consciousness this counterposition and discrimination. He is the only living being capable of *self-cognising*, i.e., of

¹ The emergence and genesis of consciousness is described in detail in Chapter 3.

making his Ego the object of exploration. Man consciously evaluates his own actions and his own Self as a whole. The separation of Self from not-Self—an experience which every individual undergoes in childhood—is an important stage in the formation of man's *self-consciousness*.

The third characteristic of consciousness is the assurance of *man's goal-directed activity*. One of the functions of consciousness is the formation of aims of activity, including the evolvment and weighing of motives, the making of volitional decisions, the exercise of control over the actions oriented towards certain objectives, the introduction of necessary corrections, etc. Every kind of mental deviation resulting from a disease or from some other cause and hampering goal-oriented activity (disturbing its directionality and coordination of actions) is regarded as a disorder of consciousness.

Finally, the fourth characteristic of consciousness is a definite *attitude* to the environment. Man's consciousness necessarily includes the world of *emotions* reflecting complex objective, primarily social, relations. The emotional appraisals of interpersonal relations constitute a value aspect of his consciousness. Here, like in many other cases, pathology helps clarify the characteristic features of normal consciousness. In some mental diseases the impairment of consciousness is characterised by disorders in the sphere of emotions and relations: the patient hates his mother whom he loved dearly, speaks with malice about his friends and relatives, etc.

All the above indicated specific features of consciousness are shaped and manifested through the agency of *language* which is inseparable from the development of the mind. Indeed, it is only through speech, a language-mediated form of human communication that an individual can accumulate knowledge and enrich himself with the wealth of ideas amassed by mankind and consolidated in language. Language is a peculiar objective system representing man's socio-historical experience or social consciousness. On being internalised by an individual, language becomes in a sense his real consciousness.

The term "consciousness" used in psychology, psychiatry and other disciplines always possesses the basic

characteristics indicated above. The psychiatrists who often have to ascertain whether a patient's consciousness is sound, disturbed or altogether absent understand by consciousness the person's awareness of his whereabouts, time, the environment, his own condition and behaviour. An individual whose consciousness is sound evaluates incoming information on the basis of his previous experience and knowledge, distinguishes himself from the environment, maintains his habitual attitudes to other people and to the situation and, proceeding from all these data, controls his behaviour.

Being a social product, consciousness is inherent only in man. Animals do not possess consciousness.

The lower level of the mind is the *unconscious*, which may be defined as the *totality of mental processes, acts and states which are conditioned by realities the individual is not aware of*. Remaining within the sphere of the mind or psyche (these notions are broader than the notions of consciousness or the conscious¹), the unconscious is a form of mental reflection wherein the subject's orientation to time and to the place of action is incomplete and the verbal control of his behaviour is impaired. As distinct from the conscious mind, the unconscious mind is unable to exercise purpose-oriented control of the individual's actions or to evaluate their results.

The sphere of the unconscious includes mental phenomena arising in sleep (dreams); response reactions evoked by unsensed but effective irritants ("subsensory" or "subceptive" reactions); movements which were conscious in the past, but then became automated and were displaced from the conscious mind due to frequent repetition; certain motives for activity without awareness of the goal, etc. Unconscious phenomena also include certain pathological processes arising in the mind of a sick person: delirium, hallucinations, etc. It would not be correct to equate the unconscious with the animal psyche on the grounds that the unconscious mind is the opposite of the conscious mind. The unconscious is no less characteristic of the human mind than consciousness,

¹ The "conscious" is sometimes used in the narrower sense as "corresponding to norms of social consciousness".

it is also determined by the social conditions of man's existence, but represents only a partial, inadequate reflection of the world in man's brain.

Further consideration of the mind-brain and mind-environment relationships, as well as the analysis of mental regulation, programming and control of human activity calls for a more detailed discussion of the *mind's genesis*. Indeed, the principal regularities of the mind and the fundamental psychological facts can only be brought to light and comprehended under the phylogenetic (historical) approach to the evolution of mental reflection and development of human consciousness.

Chapter 2

MODERN PSYCHOLOGY: STRUCTURE AND METHODS

I.2.1. Marxist-Leninist Philosophy as the Methodological Foundation of Scientific Psychology

Psychology is one of those disciplines which clearly bring out the importance of correct philosophical approach to the study of both general theoretical problems and concrete aspects of personality and interpersonal relations. Specialising at the interface between natural and social sciences and reaching out respectively into the province of natural psychology, psychophysiology, etc., on the one hand, and social psychology, pedagogical psychology, etc., on the other, the science of the mind is highly illustrative of the beneficial influence of the dialectico-materialist teaching on the progress of science.

Listing the fields of knowledge that provide the foundation for Marxist epistemology, Lenin indicates, among others, three psychological disciplines: psychology, the history of the child's mental development, and the history of animals' mental development. Closely related is the fourth discipline in Lenin's list—physiology of the organs of sense. Indeed, the analysis of the history and present-day state of psychological studies corresponding to the departments of knowledge mentioned by Lenin provides conclusive evidence that their advance is only possible on the basis of dialectical materialism.

The 20th century is marked by a break of psychology with idealist and metaphysical philosophy. To be sure, psychology does not fence itself off from any philosophy. Modern scientific psychology rests on *scientific philosophical notions*, the dialectico-materialist conception of the mind as reflection of the objective world by the brain, i.e., as a property of highly organised matter. Philosophy and its component part, the theory of knowledge (or epistemology) study the relationship of the

mind to the surrounding world and regard mental phenomena as reflection of the surrounding world underscoring the primacy of matter and the secondary nature of consciousness. Psychology focuses on the *role of the mind in man's practical activity and development*.

The philosophical works of Marx, Engels, and Lenin have provided methodological guidelines for the development of scientific psychology, and the wealth of ideas they contain is truly inexhaustible. Of course, they do not contain ready-made principles of the psychological theory. In order to extract them and develop into a theoretical basis of psychology, it was necessary not only to study the enormous theoretical heritage of Marxism, but also to assess the main difficulties and problems confronting psychological thought. Turning to Marx's works, the Soviet psychologists started out by focussing on three philosophical ideas which were of crucial importance for the development of the basic principles of psychological investigation and evolution of an adequate concept of consciousness. These ideas are as follows.

1. The essence of consciousness consists in that *man's relation to the environment is mediated in his mind by the ideal reflection of this environment*. This ideal reflection objectified in language stands, as it were, between the immediately given situation and the action which effects a change in this situation or, viewed in a broader perspective, in the surrounding world. Marx's idea about the mediated character of consciousness is a pivotal proposition in the thesaurus of scientific psychology which is opposed to the idealist psychological (introspective) teachings about the immediate givenness of the mind, i.e., about immediate experience given in self-observation as the subject of psychology. Marxism holds that the mind, consciousness lend themselves to objective cognition in a mediated way, through man's activity and its products in which mental phenomena are objectified.

2. *Man's activity*, both practical and theoretical, *plays a definitive part in the formation of the mind* since the objective world created by man conditions the development of his mind. In the process of labour the activity of the subject and the object of this activity, i.e., the product of his labour, are characterised by interdependence and

interpenetration. Indeed, being a result of man's activity, the product of his labour conditions this activity as a mental image of its expected result, as goal and anticipation. Changing the outer world, man changes himself. This brings us to a crucial conclusion: man's essential powers, i.e., human psychology, man's feelings, aspirations and thoughts are conditioned by the products of human activity. Man's needs engendering the necessity of production are themselves born of and develop in production; they are determined by the products of labour created to meet human needs. It is only through the objectively unfolded richness of man's essential being that the richness of subjective *human* sensibility (a musical ear, an eye for beauty of form—in short, *senses* capable of human gratification, senses affirming themselves as essential powers of man) can be either fostered or brought forth. Not only the well-known five senses, but also the so-called mental, practical senses (will, love, etc.) owe their existence to *humanised* nature.

3. *Man's activity* and, consequently, *his psychology are social by nature*. According to Marx, just as *society* produces *man* as a *human being*, so is society itself *produced* by him. Thus the complex problem of the relationship between the natural and the social in personality was set by Marxist philosophy on a firm scientific footing. Accepting the opinion of Adam Smith, the famous English economist of the 18th century, that the diversity of human talents is the consequence rather than the cause of the division of labour, Marx wrote that the initial difference between the porter and the philosopher is less significant than between the mongrel and the borzoi; the gulf between them was fixed by the division of labour. Man's abilities are a gift of nature, but their development depends on the changing, historically conditioned forms of human labour, on the material life of society.

To be sure, the richness of Marx's ideas underlying the theoretical foundation of scientific psychology does not boil down to the above indicated philosophical propositions that stimulate the development of current psychological thought. Marxism as a philosophical teaching opens up unlimited possibilities for the progress of psychological theory and methodology.

Engels's works, too, contain a number of crucial philosophical propositions which are widely used by modern scientific psychology. Of exceptional importance for the understanding of the historical development of man's consciousness and qualitative distinctions between the human and animal psyche were Engels's ideas about the part played by labour in anthropogenesis. Developing further Marx's views on the historical nature of human psychology, Engels devoted special attention to the analysis of needs as a source of man's activity. His ideas about the influence of activity on man's capacity for thinking were highly instrumental in enriching the psychological concept of activity.

Lenin's views provide guidelines for defining the main trends in the development of psychology, its theoretical principles and methods. As far back as 1894 in his work *What the "Friends of the People" Are and How They Fight the Social-Democrats* Lenin gave a profound analysis of the then typical method of constructing various theories and systems based on dogmatic and abstract propositions and convincingly showed that such theories were completely groundless right from the start by virtue of their hopelessly metaphysical nature. Characterising in brief outline a broad field of philosophical-psychological studies laying claim in those times to the exclusive title of scientific psychology, Lenin showed with remarkable insight their basic methodological flaw—disregard of facts, rejection of objective analysis.

Criticising metaphysical psychologists who had spent all their lives making "investigations" into the nature of the soul "without knowing exactly how to explain a single psychological phenomenon, even the simplest", Lenin at the same time came out against positivist, empirical constructs which skirted fundamental scientific issues, and firmly declared for the unity of theory and practice. His criticism of metaphysical psychologists was preceded by a profound and comprehensive analysis of the materialist approach to sociology. Lenin's work gave scientific psychologists a clear idea of the alternative to metaphysics: it was not the blind worship of the fact, not the "creeping" empiricism but a scientific theory, scientific understanding and explanation of facts on the basis of their objective analysis.

Having defined the tasks of scientific psychology in his book *What the "Friends of the People" Are and How They Fight the Social-Democrats*, Lenin later (in *Materialism and Empirio-Criticism* and other works included in his *Philosophical Notebooks*) laid the *foundation of the theory of reflection which became the philosophical bed-rock of dialectical-materialist psychology*. The theory of reflection provided the key to the solution of the most important psychological and epistemological problems, such as the specificity of the mind, the relation of the mind to the brain, the relation of reflection to the reflected, the subjective to the objective, sensation to thought, and many others. Lenin's works in fact expounded a comprehensive theory of man's mental activity as the activity of his brain.

Among the fundamental theoretical propositions that were developed by Lenin and formed the *theoretical basis of scientific, dialectical-materialist psychology* in general and its teaching of cognitive processes in particular, are the following.

First, all human knowledge derives from sensations which, like all human consciousness, are a product of highly organised matter. Lenin wrote that we cannot know any forms of substance or motion except through sensations. Making a stand against agnosticism, he pointed out that sensations reflect objective reality existing outside and independent of the cognising subject. Sensations are the first link in the process of man's cognition of reality.

Second, transition from sensations to thinking in terms of notions representing a higher stage of the reflection of reality is a dialectical leap, a break of continuity. Characterising the movement of notions, their mutual transitions, Lenin stressed that human concepts are not fixed but are eternally in movement, they pass into one another.

Third, creative imagination, fantasy can play an important part in increasing our insight into the nature of things. Lenin wrote that vivid imagination is an extremely valuable quality needed not only by poets; even the differential and integral calculus could not have been discovered without imagination. This approach to fantasy as an extremely valuable asset and a necessary component in

the process of creation orients psychological thought towards a careful analysis of the methods of solving one or another practical problem.

The theory of reflection formulated by Lenin not only opened up broad possibilities for dialectical-materialist interpretations of the findings of numerous studies in the field of sensory cognition (sensations, perceptions, memory), thinking (formation of concepts, analysis and synthesis in thinking), fantasy as components of creative activity—such interpretations figure prominently in Soviet psychologists' works and give an impetus to experimental research into man's cognitive activity—but also provided the basis for further investigation of the theoretical problems of the psychological science. The epistemological concept of the mind as a process of reflection which is a property of the brain becomes a powerful instrument in the fight both against idealism separating the mind from matter and turning it into a closed inner world independent of objective reality, and against mechanicism blind to qualitative distinctions between the mind and matter and identifying the mind with neural processes.

The epistemological approach to the investigation of the mind (the problems of the source and authenticity of man's knowledge of the world, the adequacy of its reflection) prompted by the principles of the Leninist theory of reflection is inseparably linked with concrete scientific studies of mental processes. This concrete psychological approach defining the object of psychological investigation proper realises, in turn, the principles of the Leninist theory of reflection by focussing on the process of transformation of external influences into internal mental states of the subject, on the process of transformation of the reflected into a reflection, the processes of control, programming and regulation of the subject's response to such influences. The notions used by psychology to describe and characterise this specific approach to the process of investigation are formed under a direct influence of the theory of reflection.

Lenin's works provide the foundation for scientific approach to one of the central problems of psychology—the psychology of personality and the laws of its formation in social life. Lenin's concept of personality left no

room for any biologicistic speculations. He resolutely defended the crucial Marxist thesis that man's essence is the sum total of social relations.

The history of psychology clearly shows that the Marxist-Leninist conception of man's essence was a highly effective instrument helping overcome all sorts of vulgar reflexological and idealistic theories in the field of social psychology and the psychology of personality. Indeed, the very possibility of sustaining a coherent Marxist analysis of the reflexological approach to social psychology was contingent upon Lenin's devastating criticism of scholastic and fruitless attempts to apply biological notions in the field of social sciences.

Lenin's works are as topical today as in the early years of this century, and it would not be an exaggeration to say that his ideas have been illuminating the path of psychological thought throughout the Soviet period. They provide a reliable frame of reference for psychologists who turn to them for methodological guidance in the solution of even the most complex problems.

1.2.2. Contemporary Psychology and Its Relationship to Other Sciences

In the 20th century psychology has set itself to develop the scientific principles of investigation into its major problems. At present it can boast of its own subject-matter, its specific tasks and specific methods of research. Its material base is comprised of a ramified network of psychological research centres, laboratories and educational institutions training personnel for research activities, as well as of a number of journals and specialised publishing houses. International psychological congresses are held on a regular basis, psychologists form scientific associations and societies. The role of psychology as a leading science about man is universally recognised. **Psychology and Natural Science.** The evolvment of psychology as an independent branch of knowledge is largely referable to its growing alliance with natural science that started in the late 19th century with the introduction of the experimental method of *Gustav Fechner* (1801-1887), a German physicist and psychologist.

A powerful impetus to psychological thought was given by Ivan Sechenov's book *Reflexes of the Brain* which showed that mental phenomena are as natural as all other functions of the human organism and originate in the reflectory activity of the nervous system. *Sechenov's reflectory theory of mental activity* developed further in *Pavlov's teaching about conditioned reflexes* and in his pupils' works became the *natural scientific foundation of psychological knowledge*. Extensive research into the nature of neurophysiological mechanisms of the brain activity carried out in many countries ever since have provided a wealth of new material in support of the scientific explanation of mental phenomena. Hence, *achievements in the investigation of the complex system of physiological mechanisms of mental activity were a direct result of the close ties between psychology and advanced natural science*.

The evolution theory of the great natural scientist, *Charles Darwin (1809-1882)*, expounded by him in *On The Origin of Species by Means of Natural Selection or the Preservation of Favoured Races in the Struggle for Life (1859)* exercised an enormous influence on the study of the main problems of modern psychology. His theory brought out the role of the mind in the adaptation of living creatures to changing environmental conditions and explained the origination of higher forms of mental activity from lower, more primitive forms. Basing himself on the idea of evolution of all living organisms, Darwin succeeded in accounting for the origin of animal instincts and showed that the same basic factors that determine the structure of the living organism and its individual parts, i.e., natural selection, simultaneously act as the motive force of mental development in phylogenesis.

Darwin's ideas about the evolution of the animal psyche were further developed and elaborated in the works of numerous Soviet researchers, particularly *A. N. Severtsov* and *V. A. Wagner* who focussed on the genesis of various forms of mental activity in animals. Severtsov showed that adaptive evolution in animals which expressed itself in the change of their behavioural patterns and did not affect their morphology proceeded in the main along two divergent paths and reached its peak in two phyla of the animal kingdom. In the phylum of arthro-

pods the progressive evolution took the form of hereditary changes in their behavioural patterns (instincts), and their higher class, the insects, exhibit extremely complex and perfect innate automatisms providing for every detail of the animals' life. However, their complicated and perfect instinctive activities are extremely conservative and inflexible: the arthropod is incapable of adapting its stereotyped response to rapid changes in the environment. In the phylum of chordates the evolution took a different course: its main thrust was not towards the perfection of instinctive activity but rather to the adaptability of the animal through the individual change of its behaviour. The result of this progressive trend was the considerable enhancement of the plasticity of the organism and the appearance of a superstructure of individual behavioural change based on innate adaptability.

As we see, the theory of evolution made it possible to explain both the instinctive forms of activity established genetically, and the acquired behavioural patterns resulting from the formation of complex systems of conditioned reflexes. It helped us penetrate deeper into the nature of the animal and human psyche and afforded convincing evidence that the psyche is not a redundant product (epiphenomenon) of physiological processes as alleged by some anti-dialectical and anti-materialist physiologists and psychologists. Indeed, the doctrine of epiphenomenalism regarding the mind, the complex world of mental phenomena as a by-product of physiological processes playing no part in man's life and activity runs counter to the principles and laws of evolution (natural selection, as is known, eliminates everything that is redundant, inactive, unnecessary to a living creature).

In this context special importance attaches to the investigations of psychologists-clinicians who have developed the basics of medical psychology. Arising at the interface between psychology and medicine, medical psychology uses the achievements of psychological studies in diagnostics, treatment and disease prevention. The very fact that the course of a disease depends on mental factors (apathy, anxiety, suspiciousness, etc.), on the one hand, and that the disease itself tends to bring about specific mental states which may, for instance, reduce the efficacy of treatment, on the other hand, calls

for concerted efforts on the part of the physician and the psychologist. Again, the clinico-psychological investigations of mental disorders resulting from injuries of certain areas of the cortex, such as the temporal lobes, provide new data on the regularities of perceptions and memory. On establishing the nature of psychological disorders of the patient's oral or written speech, the psychologist-clinician localises the lesion in a definite part of the brain hemisphere, thereby helping the neurosurgeon.

Hence, in its development as an independent branch of knowledge modern psychology finds in natural science its ally. Serious psychological studies are contingent on the knowledge of the laws of natural science (general biology, physiology, neurology, the theory of evolution, etc.). A number of departments of psychology, particularly comparative psychology, animal psychology, ethology, medical psychology, pathopsychology, and some others are at the same time branches of natural science and medicine.

Psychology and Scientific and Technological Progress. The 20th century is notable for a tremendous expansion of production, the emergence of new technologies, means of communication, broad use of electronic devices, automatic systems, new types of transport facilities, supersonic jet liners, etc. The sweeping changes make enormous demands on the human mind dealing with modern technology. The so-called psychological factor, i.e., the potentialities of mental cognitive processes, such as perception, memory and thinking, the personal characteristics, such as character traits, temperament and reaction time, acquire ever greater importance in modern industry, transport, and in the services. Under the conditions of psychological stress due to the necessity to make important decisions in face of acute time deficit (which is characteristic of the working conditions of supersonic airline personnel, large power system dispatchers and operators) certain personal qualities ensuring against bad blunders and disruption of activity prove to be extremely important. The absence of such qualities leads to breakdowns and accidents. The in-depth study of mechanisms of emotional stability and psychological reserves from the viewpoint of demands on an individual's activity under specific conditions is an important function of modern psychol-

ogy. Engineering psychology investigating interaction between man and machine (the man-machine problem), like the psychology of labour in general, abuts on a number of technical disciplines, particularly computer technology.

Psychology and Pedagogics. Scientific and technological progress stimulating the development of psychology and helping it overcome abstract metaphysical constructs has been instrumental in bringing out its close ties with pedagogy. To be sure, progressive psychologists and pedagogues have always been aware of their affinity. Outstanding Russian pedagogue *K. D. Ushinsky* (1824-1870) pointed out that of all branches of knowledge psychology was the most important for pedagogics. He stressed that all-round education of a person calls for a thorough study of his psychological make-up.

At present, the links between psychology and pedagogics acquire a new character. The thing is that in the past years research was mainly oriented on the external adaptation of psychology to the needs of the existing pedagogical practices and on the external assimilation by pedagogics of "ready-made" psychological recommendations. Indeed, the role of psychology was not infrequently reduced to the "psychological substantiation" of the already established pedagogical principles and methods, their improvement and elaboration, and the representatives of pedagogics often based themselves on certain "psychological formulae" understood in a dogmatic way (for instance, on the proposition that the junior schoolchild's thinking lacked abstractedness and was exclusively concrete).

Today, the tasks of the all-round development of personality under the conditions of rapid progress of science and technology and considerable achievements in the field of concrete psychological investigations have added a new dimension to the potentialities of psychology and brought about a reassessment of its role in the teaching and upbringing of schoolchildren. Foremost psychologists are now formulating the *tasks* which confront the psychological science and are *directly related to the solution of crucial pedagogical problems*.

The first of these tasks consists in *reorienting psychological investigations from the substantiation of existing*

practices towards search for new guidelines, new forms and methods of teaching and education.

The second task deriving from the first is prompted by the needs of scientific and technological progress. The mass of data which has to be assimilated is ever increasing. It has been established that information becomes rapidly obsolete and needs updating. Hence the teaching which mainly relies on the pupil's memory is no longer fully adequate to contemporary requirements. Priority is now to be given to the *formation of a thinking ability* that would enable the pupil to assimilate the constantly renewed information independently and allow him to keep pace with the rapid progress of science and technology after he has completed his course of studies. The system of education in socialist countries which is undergoing a period of sweeping changes has set psychology a number of urgent tasks, namely: to define general regularities underlying the development of the mind in ontogenesis; to give a psychological description of man's activity and personality at each developmental stage; to investigate the psychological mechanism governing man's interiorisation of social experience systematised in the basics of science, morality and ideology; to show the interrelation of upbringing and man's mental development thereby disclosing the psychological principles governing the moulding of human personality in the process of teaching and education; to study the relationship between developmental and personality traits; to identify the psychological reasons for age-related mental deviations from the normal course of development and work out appropriate diagnosing procedures.

Addressing itself to these and related problems, contemporary psychology works in close cooperation with pedagogics. A number of special branches of psychology (pedagogic psychology and developmental psychology in the first place) interact with specialised branches of scientific pedagogics, theory and methodology of education, didactics, special methods of teaching various subjects (mathematics, history, geography, etc.)

The computerisation of teaching processes which is gaining momentum in Soviet schools poses before the teachers the problem of the schoolchildren's psychological readiness to adopt the new technology and empha-

sises the need for developing the corresponding habits and skills to permit them mastering the "second literacy".

Psychology and Other Branches of Knowledge. As can be seen from the above, contemporary psychology specialises at the interface of a number of scientific disciplines. It occupies an intermediate position between philosophical, natural and social sciences. Its close affinity to these sciences, even the presence of certain fields which they explore jointly in no way detracts from its independence. Psychology preserves *its object of investigation, its theoretical principles and its methods of studying* this object in all its fields. As regards the complexity of psychological problems which intrigue not only psychology, but also contiguous sciences, it is referable to the fact that the psychologists have always focused on *man*, the principal character of world progress. All sciences and branches of knowledge can only be meaningful if they serve man, enlighten him, are engendered by him, arise and develop as human history and practice. Subsequent development of psychology can only be conceived of as the maximum possible expansion of its links with contiguous sciences on the basis of its independence.

1.2.3. Principles and Structure of Contemporary Psychology

As has already been pointed out, the understanding of mental phenomena and the general approach to mind problems are contingent on the investigators' world view and, in the final analysis, on their stand in the class struggle.

Contemporary psychology is the arena of clash between the reactionary views on the substance and nature of mental life professed by some psychologists and the progressive conceptions of the subject-matter and tasks of psychology championed by the scientists of the socialist countries and some psychologists in Western Europe and the USA, such as French psychologists *Henry Wallon*, *Georges Politzer*, *Henri Piéron*, Swiss psychologist *Jean Piaget*, and American psychologist *Jerome Bruner*.

The main trends which now occupy the centre of the psychological stage in capitalist countries came into exist-

ence in the early 20th century and have undergone certain changes in the course of their historical development over the past fifty or seventy years. The most influential of them are undoubtedly behaviourism and psychoanalysis.

Behaviourism had its inception in the USA and is credited to the pioneer works of *Edward Thorndike*, *James Watson* and other researchers who observed the life of animals. Behaviourism rejects consciousness as a subject of research and reduces the mind to various forms of behaviour. It holds that psychology should only concern itself with the regularities of the relationship between behaviour and the environment. The goal of psychological investigation, according to behaviourists, is the prediction of reaction R to stimulus S (a remark, a shot, a picture, etc.) affecting the organs of sense, or the identification of the stimulus by the known reaction. Orthodox behaviourism postulates the formula $S \rightarrow R$. Behaviourist psychology is consistently mechanistic, regarding man, like the animal, as a passive mechanism, a kind of machine, responding to external influences irrespective of whether the organism is endowed with mind or not.

Fixating the relationship between stimulus and reaction ($S \rightarrow R$), i.e., between what occurs at the brain's "input" and "output", behaviourism declared the field between the "input" and the "output" inaccessible to scientific analysis (the "black box") since it does not lend itself to direct observation. The behaviourists conducted their experiments mainly on animals (predominantly white mice), and extended their findings to human beings disregarding in fact the activeness of personality. No less mechanistic was their understanding of the process of teaching. In studying animal responses (e.g., by the labyrinth method), the behaviourists came to the conclusion that the problem could only be solved by the trial and error method interpreted as a process of "blind" selection of random movements until one of them proves successful. This conclusion was applied to the behaviour of man which was denied any qualitative distinctions from that of animals.

Another influential trend of Western psychology in the 20th century is *psychoanalysis* known also as Freudianism (after the Austrian psychiatrist and psychologist *Sigmund Freud*).

From the viewpoint of Freudianism, man is essentially an asocial being. His behaviour is governed by two principles: the "principle of pleasure" implying mainly the manifestation of sexual urge (libido) and the "principle of reality" resulting from the demands of society to suppress sexual instincts as shameful and forbidden. As a result of the conflict between the principle of pleasure and the principle of reality the "ungratified instincts" are displaced into the sphere of the unconscious whence they control the person's behaviour. Like the behaviourists, the Freudians depreciate the role of mind considering it to be negligible. Basing themselves on the idea of perpetual controversy between the unconscious psychic forces and the social environment basically hostile to the individual, the psychoanalysts contended that the individual is doomed to live under the stress of an internal conflict being torn between the demands of society with its bans which are experienced by him subjectively as conscience, shame, fear, etc. ("censorship of consciousness") on the one hand, and the imperatives of his unconscious urges, on the other. To relieve this unbearable stress, the individual activates the mechanisms of psychological defence channeling his sexual energy onto the socially acceptable tracks. The unconscious guides of an adult's behaviour are fully controlled by the impulses which were formed in early childhood and remain practically unchanged throughout his life, being but slightly masked in view of the need to conform to the "censorship" of consciousness.

Freud has put into the limelight the problems of unconscious motivation, psychological defence, the effect of early traumatic experiences on adult behaviour, and others, but he gave them an utterly wrong interpretation proceeding from the idea of the primacy of the unconscious to consciousness and subordination of the individual's behaviour to sexual urges. He conceived the psychology of personality in terms of biological notions and went even so far as to declare it essentially asocial. Freud has turned his psychological principles into the general theory of man, society and culture and won great influence in the Western world.

Today, behaviourism and Freudianism in their initial "classical" form have given way to various "subsidiary"

trends (neo-behaviourism, neo-Freudianism, etc.) in which the distinguishing features of the original doctrines are somewhat watered down. The most odious traits of mechanicism and idealism in them are carefully and skillfully masked. However, despite the cosmetic change these trends have preserved their main ideological orientations. The barrenness of biologicistic and idealistic conceptions in psychology accounts for the fact that many psychologists in capitalist countries have been showing increasing interest in the dialectico-materialist interpretation of mental activity and, in particular, in the achievements of Soviet psychology.

The Structure of Contemporary Psychology. Contemporary psychology is a widely ramified system of scientific disciplines notable for different degrees of maturity and diverse fields of practical application.

How can we classify these numerous branches of psychology? One of the possible principles of such a classification is the principle of interconnection between mental development and activity. Proceeding from this principle, we may take any of the following three criteria: (1) concrete activity; (2) development; (3) relation of man (as the subject of development and activity) to society (as the medium of his activity and development).

Proceeding from the first criterion, we may distinguish a number of branches of psychology investigating the psychological problems in specific fields of human activity.

The psychology of labour studies the psychological aspects of man's labour and industrial engineering. Falling within its province is the investigation of the individual's professional traits, the regularities of the development of his work habits, the study of the effects of the industrial premises, design and arrangement of instruments and machine tools, signalling facilities, etc. on the worker. The psychology of labour is comprised of a number of departments which, being relatively independent, are closely connected with one another. They include: *engineering psychology* mainly concerned with the activity of the operator in automatic control systems and tackling the problems of the distribution and coordination of functions in the man-machine environment; *aviation psychology* investigating the psychological regularities of man's activity in training and practical flights;

space psychology studying the psychological aspects of man's activity in zero-gravity and space disorientation conditions, in peculiar states brought about by mental stress and excessive overload of the organism, etc.

Pedagogic psychology focuses on psychological regularities of teaching and upbringing. It investigates the process of thought formation in students, examines the problems of control over the development of methods and habits of intellectual activity, investigates the psychological factors influencing the efficacy of the process of teaching, studies the relations between the teacher and schoolchildren and between the schoolchildren in the collective, explores the psychological distinctions between individual pupils, the psychological aspects of the teaching and upbringing of mentally deviant children, the specifics of teaching adults, etc. The departments or branches of pedagogic psychology include: the *psychology of teaching* (the psychological basics of didactics, specific methods, programmed teaching, formation of mental actions, etc.); the *psychology of upbringing* (the psychological basis of upbringing, the psychology of pupil collective, the psychological principles of reformatory pedagogics); the *psychology of the teacher*, the *psychology of teaching and upbringing anomalous children*.

Medical psychology studies the psychological aspects of the doctor's activity and the patient's behaviour. It is divided into *neuropsychology* investigating the correlation between mental phenomena and physiological brain structures; *psychopharmacology* concerned with the effects of medical substances on man's mind; *psychotherapy* studying and using psychoactive drugs in therapeutic practice; *psychoprophylaxis* and *psychohygiene* concerned with measures aimed at ensuring people's mental health.

Juridical psychology studies the psychological aspects of legal relationships. It comprises *forensic psychology* investigating the psychological peculiarities of the behaviour of participants in the criminal trial (the psychology of oral testimony, the peculiarities of the defendant's behaviour, psychological requirements to interrogation, etc.); *criminal psychology* addressing itself to psychological problems of criminal behaviour and the formation of the criminal's personality, the motives for the crime,

etc.; *correctional psychology* investigating the psychology of the inmate contingent at corrective-labour colonies, the psychological problems of reformation through conviction and compulsion, etc.

Military psychology studies the psychological aspects of man's behaviour in combat, of the relationship between the superiors and the subordinates, the methods of psychological propaganda and counterpropaganda, the psychological problems related to the control of combat materiel, etc.

The *psychology of sport* examines the psychological aspects of the athlete's personality and activity, studies the conditions and methods of his psychological training, investigates the psychological parameters of his readiness for a contest, and also concerns itself with various psychological aspects of the organisation of contests.

Trade psychology examines the psychological effects of advertising, the individual and the age-related peculiarities of demand, the psychological aspects of vogue and client servicing, etc.

Recent years have been marked by growing interest in the problems of the *psychology of scientific creativity* (character traits of the creative personality, the factors stimulating creativity, the role of intuition in scientific discoveries, etc.). This branch includes *heuristics*, a peculiar discipline concerned not only with the investigation into the laws of creative (heuristic) activity, but also with the development of methods to control the heuristic processes.

Mention should also be made of the *psychology of artistic creativity* (in the field of literature and art) and of *aesthetic perception*. This latter field remains largely unexplored, though its importance is universally recognised.

If we base our classification on the *psychological aspects of development*, we shall have a number of divisions of psychology notable for the realisation of the principle of development.

Developmental psychology studying the ontogenesis of various mental processes and psychological qualities of the developing personality falls into *child psychology*, *teenage psychology*, *youth psychology*, *adult psychology* and *old-age psychology*. Developmental psychology in-

vestigates the age specifics of mental processes and assimilation of knowledge, the age aspects of the personality's development, etc. The *problem of teaching vis-à-vis mental development* which is one of the key issues of developmental psychology is a priority subject for a large group of psychologists seeking to establish reliable criteria of mental development and to optimise the process of training and education.

The *psychology of anomalous development* or *special psychology* includes *pathopsychology* investigating various deviations in the process of mental development, and disintegration of the mind as a result of various forms of brain pathology; *oligophrenopsychology* studying the pathology of mental development referable to innate brain defects; *surdopsychology* investigating the child's mental development under the conditions of partial or complete inability to hear; *typhlopsychology* studying the mental development of partially or completely blind children.

Comparative psychology studies the phylogenetic forms of mental life. It is concerned with the comparison of the animal and human psyche and studies the nature and causes of the existing similarities and differences in the behaviour of animals and men. *Animal psychology* which is one of the departments of comparative psychology studies the psyche of animals belonging to different divisions of the animal kingdom (species, genera, families), the principal forms and mechanisms of behaviour. The classical objects of comparative psychology (spiders, ants, bees, birds, dogs, horses and monkeys) have of late been supplemented with cetacians (dolphins). The hereditary mechanisms of behaviour of animals make an object of special study in a comparatively new branch of biology and psychology known as *ethology*.

The classification of the branches of psychology from the viewpoint of the *psychological aspects of relationship between the personality and society* gives us yet another group of psychological disciplines coming under the head of *social psychology*.

Social psychology deals with mental phenomena arising in various organised and non-organised social groups. At present it concentrates on three groups of related phenomena.

Socio-psychological phenomena in large groups (in the macroenvironment). Here we have the problems of the mass media (radio, television, the press, etc.), the mechanisms of the mass media and their effects on various social groups, the laws governing the spread of fashions, rumours, tastes, rituals, prejudices, public sentiments, the problems related to the psychology of classes, nations, the psychological aspects of religion.

Socio-psychological phenomena in the so-called small groups (in the microenvironment). This field includes the problems of psychological compatibility in closed groups, interpersonal relations in groups, the group atmosphere, the positions of the leader and the followers in a group, types of groups (associations, corporations, collectives), the relation between formal and informal groups, the qualitative limits of small groups, the degrees and causes of group cohesion, the perception of one individual by another in a group, group values, and many others. Taking, for instance, the family as a small group, we shall meet here with such important problems as the dynamics of relations between the parents and the children, the problem of the preservation of the seniors' authority, etc.

Socio-psychological manifestations of personality (social psychology of personality). Man's personality is an object of social psychology which correlates the personality with social expectations in large and small groups, studies its attitudes to the group influence and its assimilation of group values, investigates the dependence of self-appraisal on the personality's appraisal of the group to which it belongs, etc. The problems dealt with by the social psychology of personality are related to the personality's orientation, self-appraisal, self-respect, stability and suggestibility, collectivism and individualism, personality's sets and attitudes, their dynamics and prospects.

To be sure, the above three groups of sociopsychological problems are neither mutually exclusive, nor just contiguous. They are interrelated and make a single whole which derives from the unity of personality and society, from the sum total of relations constituting the substance of the personality.

As can be seen from the above, contemporary psychology is characterised by the process of *differentiation*

accounting for a considerable diversity and essential distinctions of its departments. Different branches of psychology gravitate towards different contiguous sciences, such as sociology, technology, zoology, medicine, etc. which, naturally, have little in common, though they preserve the common object of investigation—facts, regularities and mechanisms of the mind. The differentiation of psychology goes hand in hand with the opposite process of *integration* which, on the one hand, brings psychology in contact with adjacent branches (through engineering psychology with technology, through pedagogic psychology with pedagogics, etc.) and, on the other hand, reveals a possibility of hitherto separate departments of psychology itself merging into one another. Thus the theory which is gaining ground in Soviet psychology and which contends that the personality is moulded in labour activity not indirectly, but through the labour collective, provides a basis for a process of convergence of social psychology and the psychology of labour.

The Concept of General Psychology. Unlike pedagogic, juridical, medical, military, comparative and other branches of the psychological science, *general psychology*, as the term implies, is concerned with the more general laws and theoretical principles governing psychological phenomena, as well as with the basic scientific notions and research methods adopted in psychological studies. These general principles, methods, laws and notions can only be brought out and described if we abstract ourselves from the concrete investigations conducted within the aforementioned specialised field of psychological knowledge. General psychology is sometimes termed *theoretical and experimental psychology*. Its tasks comprise the investigation of the methodology and history of psychology, the theory and methods of research into the most general regularities characteristic of the genesis of mental phenomena. General psychology studies cognitive and practical activity; the general laws of sensations, perceptions, memory, imagination, thinking and mental self-regulation; psychological traits of the personality; character and temperament, prevalent motives of behaviour, and so on. *The findings of general psychological investigations provide the basis for the development of all branches and departments of psychological knowledge.*

This book is a *course of general psychology*. Hence, it deals with the general theoretical principles and basic methods of psychological research and expounds the fundamental notions of psychology as a science with special emphasis on the regularities it explores.

For didactical purposes the key notions of psychology are included under three main categories: *mental processes, mental states and mental properties or traits of the personality*.

Mental processes usually include *cognitive phenomena: sensations and perceptions* as reflection of objects (irritants) directly acting on the organs of sense; *memory* as the reproducible reflection of reality; *imagination and thinking* as generalised and transformed (in man's consciousness) reflections of properties of reality which are inaccessible to direct cognition; *volitional processes* (origination of needs, motives or inducements to a definite kind of activity, decision-making and executing); *emotional processes* (the origination of feelings and their dynamics depending on the satisfaction of needs, etc.). Mental states comprise *manifestations of feelings* (mood, affects), *attention* (concentration or absent-mindedness), *will* (confidence or diffidence), *thinking* (doubt), etc. The mental properties or traits of the personality include the *qualities of a person's mind, thinking, stable features of his volitional sphere consolidated in his character, temperament, abilities; habitual and recurrent inducements to act in a definite way, temper* (irritability or sentimentality), etc.

Of course, the division of all mental processes into the three categories indicated above is purely conventional. The notion "mental process" implies the *fluid, dynamic character of the phenomenon* in interest. By contrast, the term "mental state" characterises the psychological fact as *relatively static and constant*, whereas the term "mental property" or "trait" emphasises the *stability of a given characteristic of the personality, its permanent and recurrent nature*. One and the same mental phenomenon, e.g., an affect, a violent outbreak of emotion can be described with equally good reason as a mental process (since it expresses the dynamics of the affective state, its stage-like character), as a mental state (since it characterises mental activity during a certain period of

time), and as a manifestation of a personality trait (since it reveals such a quality of a person as irascibility, lack of restraint).

The key to the solution of the main issues of general psychology is the *principle of the development of personality in object-oriented activity and communication*. This principle proposed earlier for disclosing the structure of the entire system of contemporary psychology also provides the basis for the exposition of general psychology. It places into the foreground the personality as a *subject of communication and activity*, focuses on his/her cognitive, emotional and volitional spheres and discloses his/her principal psychological qualities (temperament, character, abilities).

I.2.4. Research Methods in Contemporary Psychology

The methods of psychological investigation show dependence on the basic theoretical principles implemented by psychology and on the specific tasks it is concerned with.

The theoretical foundation of Marxist psychology is dialectical and historical materialism, therefore the basic approach to psychological investigation is determined by the requirements of the *dialectical method*. The dialectical method presupposes the examination of an object in its direct and indirect relations with other objects and, first and foremost, the establishment of essential links between phenomena and laws, the analysis of a subject in its development, the analysis of contradictions, unity and struggle of opposites, the transformation of quantitative into qualitative changes. The methods used in psychology should be examined from the historical perspective. They are no less liable to historical change than the subject-matter of psychological knowledge. The specificity of the subject-matter of psychology could not but impress on the researchers the need for specific methods of psychological inquiry.

Objective Character of Scientific Psychological Methods. The sole method that idealist psychology was able to offer in order to get an insight into man's "soul" was the method of self-observation (or introspection, i.e., inner vision).

The choice of self-observation as the only instrument of research into mental phenomena was in fact the natural consequence of the notion "soul" (mind, consciousness) as a closed inner world, a specific spiritual substance (first cause) which is not connected with the outer world and therefore accessible only to comprehension through inner vision. Self-observation as a subjective method is counterposed to the methods used by other social and natural sciences. The idealist psychologists contended that mental phenomena could only be cognised through self-observation.

But the belief in self-observation as the only method of psychology is just as illusory as the belief in the immaterial soul which allegedly constitutes the subject-matter of psychology and lies outside the province of the laws of nature. The data obtained exclusively through self-observation are not scientifically valid even if observation is conducted by specially trained psychologists. Even less valid are the attempts to interpret the mind of a little child or an animal on the basis of data obtained through self-observation by an educated adult. Such attempts, however, were made by the most consistent introspective psychologists who sought in real earnest to put themselves, as it were, into the animal's shoes, i.e., to model the conditions under which their own expressive movements would be on the whole of the same kind and then to reproduce the animal's consciousness in accordance with the properties of their human consciousness.

The unfoundedness of the method of introspection becomes quite obvious in the light of the dialectical-materialist conception of the mind which leaves no room for subjectivity in investigation and opens the way to objective methods in psychology basically identical to the methods used in other natural and social sciences.

The objective method in psychological investigation is based on the principle of the unity of consciousness and activity adopted in scientific psychology.

The objective study of the mind includes inquiry into the objective conditions of the emergence and manifestation of mental phenomena. Hence, the objective principle of investigation is not a method of direct apprehension of mental phenomena by introspective contemplation, but a way of their mediated cognition (i.e., investiga-

tion through analysis of their objective manifestations in activity). Studying man's activity and taking account of the conditions under which it proceeds, we may form sound judgements on the mental processes in interest. Significantly, the objective investigation by the researcher of his own mental processes is conducted by essentially the same mediated methods as his assessment of mental processes of another individual (we assess the efficacy of the process of memorising irrespective of whether we are interested in our own or somebody else's memory).

Equally illusory is the belief that we get to know individual psychological features (traits of character, abilities, intellectual qualities, etc.) through introspection.

Numerous investigations show that correct assessment of one's personality is provided not by the individual himself, but by the people who surround him and have known him for a long time. Thus on the evidence of juvenile psychological studies the youth learns first to assess objectively individual psychological traits of his friends and relations, and only after that projects, as it were, his empirical psychological knowledge on himself and arrives at a more or less correct estimation of his own features and qualities.

Facts confirm that psychology expands its knowledge not through self-observation, but through the implementation of objective methods.

The illusory character of the possibilities of introspection is also brought out by the concept of mental reflective activity, its essence and specificity. Indeed, attempting to "look into one's own soul", i.e., to apprehend one's own mental processes, their links, relations, mechanisms, one in fact "looks outward" and sees nothing else than the objective world reflected in the brain and not the brain itself with its mental properties. Thus the method of introspection proves to be as false as the idealist psychologists' notion of soul.

The denial of self-observation as a *specific direct method of exploration* of the mind should not be confounded with the denial of self-observation in general. The latter retains its validity as a *verbal account* of what an individual sees, hears, feels, experiences, wishes, etc. Such a verbal account is indicative of the individual's mental states and taken into consideration as any other

external evidence thereof. It should be stressed, however, that in this case we deal *not with a method, but with an object of investigation*. We can also *assess our actions through peculiar self-observation*, i.e., consider and analyse them in essentially the same way as other people investigating these actions. Yet this kind of self-observation cannot be identified with introspection, since it is a mediated, but not direct method of investigation. It differs from conventional observation only by a lesser degree of authenticity in view of the possible subjectivity of the interpretation of its results. Finally, we should not confuse introspection with *reflection* (thinking about and going through one's own mental states and qualities) which also has a mediated character and consists in the processing of a verbal account, analysis of one's own actions, drawing corresponding inferences, comparing one's own opinion of oneself with the opinions of other people, etc.

The subjective and objective principles of research in psychology are mutually exclusive. Genuine scientific psychology can only be based on objective methods of investigation and rejects any other methods as incompatible with truly scientific inquiry.

Genetic Principle. Another important requirement of modern psychology to research methods is *historical or genetic approach to the investigation of mental phenomena*. The genetic principle demands that the *mental phenomenon* under study should be viewed *as a process*, and the investigator should seek to reproduce all the stages of its dialectical development in their succession and explore mental facts in their concrete historical environment.

Highly illustrative of the application of the genetic principle to psychological studies are the works by *Lev Vygotsky*. The importance of this principle stands out with special clarity in his investigation into the so-called child's egocentric speech—a peculiar kind of speech of small children which does not serve the purpose of communication and does not change anything in the child's behaviour, being nothing more than an accompaniment of his activity and experiences. The child's egocentric speech is addressed to the child himself. With every passing year this speech becomes more and more obscure to the sur-

rounding people and its proportion in children's speech reactions (egocentric speech ratio) falls to zero towards the beginning of the school age. Some specialists, for instance, prominent Swiss psychologist Jean Piaget maintained that egocentric speech just dies out, disappears at the threshold of the school. Vygotsky took a different view of the phenomenon. Using the genetic principle, he ventured a theory that egocentric speech does not disappear but recedes to the background and turns into *inner speech* which plays an important part in man's behaviour control. This theory provides a key to the understanding of the most important features of inner speech which is very difficult to investigate by experimental methods, but lends itself to a scientific account in genetic terms, i.e., through analysis of the development and change of egocentric speech.

In recent years the genetic principle of investigation has taken root in child psychology giving birth to what is known as the *longitudinal method* or *longitudinal study of the child's personality*. This method is helpful in investigating mental development not by cross cuts (study and comparison of individual age periods), but by prolonged and systematic observation of changes in the child's personality under preset training conditions in the course of many years.

Basic Methods of Psychology. Like all natural and social sciences, psychology uses two methods of investigation supplemented by subsequent analysis of obtained data—the *methods of observation and experiment*. These methods have a number of modifications which, however, do not change their essence. Though these instruments of scientific cognition are taken for granted in every field of knowledge, we deem it necessary to underscore their use in psychological studies, as idealist psychology for reasons stated above used to reduce observation to self-observation (introspection) and denied experiment any significant part in psychological investigation, particularly in research into higher mental processes.

Observation can only become a method of mental research if it is *not confined to the description of external phenomena*, but extends to the *explanation of their psychological character*. The purpose of scientific observation is not merely to register psychological facts, but

mainly to reveal their causes, i.e., to give them a scientific explanation. By contrast, the so-called *everyday observations* which make the foundation of man's worldly experience and represent his gropings for the causes of other people's actions and behaviour are concerned with the registration of individual facts. Everyday observations differ from scientific observation by their random character, spontaneity and lack of system. They seldom take into account all essential conditions related to the emergence and course of a mental process. Yet everyday observations, innumerable and down-to-earth as they are, sometimes provide examples of profound psychological insight and crystallise into proverbs and sayings of considerable interest to a psychologist.

As distinct from everyday observation, scientific psychological observation implies *transition from the description* of observed facts related to behaviour or activity to the *explanation* of their psychological core. This transition assumes the form of a *hypothesis* arising during observation. The verification or refutation of such a hypothesis is a matter of subsequent observations. It is essential that psychological observation be based on a clear *plan* and that the obtained results be registered in a *special journal*.

Observation may take the form of a *psychological analysis of the products of activity*. On the face of it, we are apparently concerned not with activity itself, but only with its product, but in fact the true object of investigation is the mental processes objectified in the results of the activity. Thus in child psychology considerable importance attaches to the study of children's drawings. Under the head of observation we can also include the method of *generalisation of independent characteristics* obtained while observing a personality in different kinds of activity.

The principal method of objective scientific investigation and production of new psychological facts is *experiment*. Having gained ground only about a century ago, it now enjoys general recognition as the main supplier of psychological knowledge and the basis of a number of theories.

Unlike observation, experiment provides for a possibility of active intervention of the investigator into the subject's activity. The investigator creates conditions

under which the psychological fact in interest may be clearly revealed, changed in the direction desired by the experimenter or reproduced repeatedly for all-round examination.

The experimental method can be applied in the form of a *laboratory* or *natural experiment*.

The characteristic feature of the laboratory experiment is not only that it is conducted under the laboratory conditions with the help of special psychological equipment and that the actions of the subject are determined by special instructions, but also that the subject is fully aware of being experimented on (though, as a rule, he does not know the purpose of the experiment and the aim of the investigation). Laboratory experiments are instrumental in bringing out the qualities of attention, perception, memory, etc. At present, the laboratory experiment is frequently designed in such a way as to simulate certain psychological aspects of the activity in which the subject is engaged under habitual conditions (for instance, an experiment can simulate conditions of considerable emotional strain under which the subject, a professional pilot, has to make sensible decisions, perform a set of complex movements calling for a high degree of coordination, respond to instrument indications, etc.).

The natural experiment (proposed for the first time by Russian psychologist A. F. Lazursky in 1910) is intended to relieve the subject of the strain which results from his awareness of being the object of experiment, and to provide the normal, habitual setting for investigation (lesson, talk, play, homework, etc.).

Natural experiment can be exemplified by an inquiry into the memory process, namely, the dependence of recall on the retention set. Of the two groups of schoolchildren familiarised with a lesson and offered to commit it to memory the first group was told by the teacher to be ready for a checkup the next day, and the second group, in a week. The checkup which was carried out in two weeks in both groups revealed the advantage of the long-term memory set.

Special importance attaches to *psychologico-pedagogical experiments* carried out under natural conditions and intended to reveal the cognitive abilities of schoolchildren of different age groups, to investigate concrete ways for moulding the schoolchild's personality, etc.

At present, there are no sharp demarcations between laboratory and natural experiments and their distinctions should not be absolutised.

Psychological Testing. The methods discussed so far are essentially investigatory, i.e., intended to help the psychologist establish important *facts*, discover certain *laws* or *regularities*, or reveal the hidden *mechanism* of mental phenomena. In other words, the object of investigations carried out with the help of these methods coincides with the subject-matter of psychology as a science.

Psychological techniques can be used not only for research, but also for *testing purposes*. In the latter case the aim is not to obtain new data required to deepen scientific knowledge, but to find out to what extent the psychological qualities of the subject correspond to the existing psychological norms and standards. The methods whereby the investigator seeks to ascertain definite psychological traits of the personality are *tests*.

The test is a short-term assignment whose fulfilment is indicative of the subject's capacity to perform certain mental functions. Tests are instrumental in revealing the presence or absence of certain abilities, habits, skills, assessing with a fair degree of accuracy some personality qualities, establishing a subject's fitness for a specific occupation or profession, etc. Psychological tests are used, for instance, to ascertain the degree of a spaceman's psychological readiness for a space flight, assess the subjects' progress in an experimental study group using special training methods, and in many other cases. The diagnostic value of the test largely depends on the scientific level of the experiment and on the authenticity of the psychological fact which was used as the basis of the test. Indeed, the design of a test may be the result of extensive experimental work or random, inaccurate and superficial observations. Psychological tests without proper scientific substantiation and verification may become a source of grave errors and prove extremely detrimental in pedagogic practice, in the field of vocational selection and when diagnosing mental disorders and temporary retardation of an individual's mental development.

Concrete Methods of Psychological Investigation. The term "method of psychological investigation" can also be used in the sense of *special technique for the solution*

of a concrete scientific psychological problem. Of course, such concrete methods are based on the methodological principles and cognitive processes characteristic not only of the given problem, but also of many others. Yet the specificity of concrete methods is determined first and foremost by the character of the scientific task they have been devised to solve.

The number of specific psychological methods used in modern psychology is very large. What is more, they assume different forms according to specific psychological fields and peculiarities of the problems that have to be investigated.

Despite the wide diversity of concrete methods of psychological investigation, we can single out some common features characteristic of most of them. Take, for instance, the investigation into age-related stability of attention in normal and mentally retarded children (oligophrens).

The investigation typically falls into four stages.

The first stage is *preparation* for investigation. At this stage the psychologists study the materials pertaining to the investigation, collect preliminary information (by *observation* during class hours and labour activity, in everyday life and in the course of purposive talks, sometimes with the help of a *questionnaire* with specially selected questions, by studying the subjects' background and case histories that reveal the conditions preceding the emergence of the facts in interest, etc.).

In one instance psychologists observed the activity of normal and mentally deficient children studying at special schools from the angle of stability of attention (the accomplishment of an assigned task without obvious errors and distraction of attention). The observations were carried out under different conditions and were accompanied by the collection of additional information. As a rule, by the end of the preparatory stage the investigator makes himself familiar with the material related to the study, establishes necessary contacts with the subjects and, which is particularly important, starts forming a hypothesis suitable to explain the psychological facts under investigation. In this particular case the hypothesis which was to be verified and confirmed in the course of subsequent analysis was based on the assumption that the stability of attention in normal and mentally retarded children

was different in terms of quality, rather than quantity.

The second stage, the *experiment proper*, is based on the concrete experimental techniques and, in turn, falls into several consecutive *experimental series*.

In our example the concrete method was the so-called *proofreading*: the subjects were to look through a proof-sheet consisting of a chaotic selection of letters and cross out, line after line, all c's and b's. Every minute after a signal the subjects were to tick off the letter they had reached. It was thus possible to register exactly the number of lines and letters looked up by the subjects during one minute, as well as the number of errors made. That was the first series which showed that the oligophrens, though making more mistakes than the normal children and lagging behind them in the number of lines looked up were not essentially different from their healthy age-mates. In the second series both groups having the same task (to cross out c's and b's) received a meaningful text—a small story. It was found out that the normal group (fifth-form children) made more mistakes than the oligophrens. This apparently paradoxical fact resulted from the difference in the children's attitude to the text: the normal children could not abstain from reading the story and made mistakes because of distractions, whereas the oligophrens were immune from such "temptations". The second, third, fourth and fifth series provided more data.

The third stage of investigation consists in the *quantitative processing of the results*. It involves the mathematical analysis of psychological data, that is the use of various statistical methods and basic propositions of the theory of probability for determining the degree of certainty of the findings which confirm (or disprove) the initial hypothesis.

The fourth stage of investigation consists in the *interpretation of the obtained results* on the basis of the psychological theory and the final confirmation or refutation of the hypothesis.

Thus the use of the given concrete method known as proofreading includes a number of characteristic features of a scientifically reasoned objective psychological investigation. Observation, analysis of the products of activity, talks, case-history study, experiment, mathematic-

al processing of its results, conclusions and their interpretation—all these elements are synthesised during the course of the investigation.

The scientific solution of psychological problems calls for application of appropriate investigation techniques. The versatility and broad use of objective methods of psychological inquiry are an important prerequisite for high standards of research in modern psychology.

Chapter 3

DEVELOPMENT OF THE MIND AND CONSCIOUSNESS

I.3.1. The Mind in Phylogenesis

The Mind as a Product of Evolution. The genesis of the human mind poses one of the most difficult problems that have ever confronted investigators of the laws of nature. The materialist scientists hold that the mind evolved as a result of a long process of the development of matter. Investigating the nature of matter, they focus on the different forms of its motion, since *motion is its mode of existence, its inseparable quality*. There is no such thing as absolutely motionless and immutable matter. All matter in the universe, all animate and inanimate nature is in constant motion, change and development.

All matter, starting from its inanimate, inorganic forms and ending in the highest and most complex product of evolution, the human brain, has one universal property—that of *reflection*, i.e., *response to an external effect*. The forms of reflection correspond to the forms of the existence of matter: reflection manifests itself in the ability to respond to external influence in accordance with the nature of such influence and the form of the existence of matter.

In inanimate nature motion can assume the forms of mechanical, physical or chemical interaction of bodies or substances. Thus a rock washed by the sea offers certain resistance to the effect of water—the waves break against the rock, but the latter, too, is gradually worn out; water surface reflects sun beams; an electrical discharge causes the generation of ozone. The emergence of organic matter brings about a qualitative change in the forms of reflection: living organisms are characterised by a *biological form of reflection*. The evolution of organic matter produces the *mind as a fundamentally new form of reflection*.

The biological form of the motion of matter, that is life, represents a qualitatively new stage in the development of nature. The change from inorganic to organic matter is accounted for by a number of theories. One of them belongs to Soviet biochemist *A. I. Oparin* who maintained that the necessary prerequisite for the emergence of organic matter was the formation of carbon-based organic substances in which the atoms of carbon were linked in various configurations with atoms of nitrogen, oxygen, hydrogen, phosphorus and sulphur. Modern science appears to have amassed much evidence in support of this view.

According to Oparin's theory, the formation of organic substances started approximately two billion years ago owing to the generation of free oxygen in the Earth's atmosphere and the resulting photochemical reactions and photosynthesis. The primordial ocean was very much like a broth of organic combinations which in the course of time synthesised into very complex carbon-based substances with gigantic molecules¹. The molecules which were unstable and easily broke up into component parts depended for their existence on *continual metabolic interchange with the natural environment* outside them, that is on the selective assimilation (absorption) of substances from the environment and dissimilation (excretion) of the products of decomposition of protein. Thus the giant molecules actually turned into *self-reproductive systems* autocatalytically regulating the interchange of substances with their natural medium. From the very outset this metabolic interchange between the molecules of protein called *coacervates* and the environment was an active process. The coacervate drops are believed to have been engaged in a kind of struggle for nourishing substances, and those with a more favourable chemical composition or structure grew faster than others, became

¹ There exists yet another theory credited to French physicist Alfred Kastler, according to which the orderliness of molecular combinations under normal conditions tends to decrease rather than increase. For this reason the emergence of organic compounds on the Earth appears to be extremely unlikely, its probability factor being as low as approximately 10^{-255} . This practically rules out the possibility of the spontaneous generation of life on the Earth due to a chance combination of molecules. The author of this theory, therefore, supports the hypothesis of the extraterrestrial origin of life.

unstable and broke up into smaller components. The cycle then repeated itself. Some drops having slightly different chemical compositions merged. Hence, coacervates possessed a number of qualities characteristic of the structure of living substance.

What were these qualities?

Coacervates selectively absorbed nourishing substances from the outside showing certain *irritability* to the materials needed to sustain their existence and remaining *indifferent* to substances that could not directly participate in their vital activity. This need for metabolism was a result of their *capacity for self-regulation*. Coacervates were capable of dividing and building up molecules of different chemical composition, i.e., of creating differentiated materials that played an important part in the process of natural selection. Besides, in coacervates the *reflection* of external influences *depended* not only on the strength and nature of these influences, but also on the *inner state of the coacervates* (organic formations) themselves.

There are grounds to believe that such organic structures with their rudimentary forms of reflection developed in the course of many geological epochs into the ancestors of contemporary living systems.

Like coacervates, presumably the prototypes of modern living organisms, every kind of organic substance differs from inanimate nature by the manner in which it reflects external influences. Such reflection depends not only on the environmental effects themselves, their intensity and character, but also on the internal condition of the organism. *Every living organism is characterised by selectivity, that is an active attitude towards all external irritants thereby exhibiting a qualitatively new property of animate nature, that of self-regulation.*

As a result of a long evolutionary process, modern organisms have developed numerous forms of reflection ranging from *irritability* to *sensation, perception, memory and thought*, i.e., *different manifestations of mental life.*

Irritability. Tropisms. All living organisms at all stages of the evolution of vegetable and animal systems feature irritability as a specifically biological form of reflection. *Irritability is the capacity of the living organism to respond to biologically meaningful (biotic) stimuli.*

Elementary irritability is already exhibited by the simplest unicellular organisms (Protozoa) which respond to external influences by movement. The environment can exercise a biotic influence changing the property of the protoplasm of the living organism. An irritant acting on the living cell as a self-regulating system elicits an avoidance response. It ceases in a medium which is conducive to the restoration of the chemical composition and structure typical of the given cell protoplasm.

The specific types of movements in response to biotic factors are called tropisms or taxes. These include phototropism or a reaction to light, thermotropism or a reaction to heat, chemotropism or a tendency to seek a definite physiochemical medium, topotropism or response to the effect of a mechanical stimulus, and a number of others. The biological form of reflection is limited to tropisms related to the process of self-regulation.

The animal systems develop a new type of irritability known as *sentience*. According to Soviet psychologist A. N. Leontiev, sentience is genetically nothing else than irritability in relation to that kind of environmental influence which brings the organism into correlation with other influences, i.e., *orients it towards the environment* by performing a signalling function. The transition from irritability to sentience brings about a new mode of existence. Highly organised animals develop sense organs. The qualities of objects, such as smell, shape, colour, which are neutral by themselves (in the sense that they cannot be used to satisfy any organic need) acquire *significance as signals*. Therefore under certain conditions even the simplest animal may start reacting not only to biotic, but also to abiotic, neutral stimuli which may signal in a given situation the appearance of various biological irritants.

As compared to plants, sensitivity to both biotic and abiotic agents enables animal organisms to reflect a far broader range of external influences.

Observation showed that infusoria, normally indifferent to light, can be conditioned to respond to this stimulus. In one experiment Protozoa were placed in a pipe with water. One end of the pipe was heated and the unicellular organisms quickly moved to the warmer section of the pipe as they possess positive thermotropism. Heating was combined with the lighting of the same end of the pipe.

After several exposures to such combined effect the infusoria which do not react to light under normal conditions learnt to gather in the illuminated end even if the temperature in the pipe was not raised.

Hence Protozoa reveal the capacity for *active orientation* in the environment and tend to develop temporary response to a combination of light and warmth.

To be sure, it is but a *tendency* to the formation of temporary relationships as they dissolve right after being formed. Moreover, the extinct forms of reflection are not restored and the animal that has lost them must reorient itself to a search for new conditions corresponding to its biological needs.

Multicellular animals are characterised by a higher level of reflection. The most primitive multicellular organisms include Coelenterata (for instance, hydroids, medusae) which live in water like Protozoa. However, these organisms feature a far more complex structure than the unicellular. The difference lies not so much in the multiplicity of the cells that make up their organisms, as in their *relative heterogeneity*: for instance, the external part of their bodies has stinging cells, whereas the internal surfaces are lined with digestive cells. Multicellular organisms also include cells with very sensitive protoplasm performing the function of excitation conductor. Such *very sensitive (nerve) cells* join together and form a *nervous network* penetrating the animals' entire body. In *Coelenterata* particularly sensitive are tentacles with which the animal seizes its prey.

The behaviour of Coelenterata is partly conditioned by generic memory, that is hereditary links developed in the course of evolution between definite irritants and the corresponding reactions of the organism (mainly in the form of taxes), as well as by temporary relationships evolving during the life span of an individual animal, i.e., conditioned reflexes.

The formation of such relationships can be easily observed in this experiment. If we bring a piece of paper to an actinia, the animal seizes and swallows it. If this procedure is repeated several times, the actinia pushes away the paper without even bringing it to its mouth. This kind of reflexes, however, are short-lived and normally fade away in three or four hours.

In multicellular organisms which are higher than Coelenterata and abide on land the structure of the body is characterised by a greater complexity owing to a change in the mode of existence. They develop *specific organs of reflection* of a definite kind of irritants, that is the *organs of sense*. The *forms of reflection*, too, become *much more complex*. Already worms exhibit a segmented structure of the body and rudiments of sense organs (organs of vision, taction, olfaction and taste). Every segment of a worm contains *concentrations of nerve cells—ganglions*. By their reflective capacity the ganglions of segments (except the head one) are similar. The ganglions located in every segment make it a relatively independent carrier of certain functions performed autonomously. If some segments are irritated, they start contracting, exhibiting chaotic pulsation.

Thus the formation of a large number of nerve ganglions alone does not yet provide the really useful complexity which is necessary for a more adequate reflection of external influences and, consequently, better adaptation to the environment. However, the potentiality for such superior reflection is already there—its seat is the *head ganglion* which consists of nerve cells performing different functions and having different links. In the chain of ganglions the head one represents the leading element. It collects the excitations arising in any part of the animal's body, analyses them, transfers to other cells and directs impulses to the muscular apparatus of the segments. Owing to the head ganglion, worms as creeping and digging animals develop specialised sense organs in the forward part of their body: they are bristles or antennae performing the function of feelers, and the rudiments of eyes.

Instinctive Forms of Behaviour. The behaviour of worms is more complex than that of Coelenterata. They are distinguished by *active search*. For instance, earthworms first seize fallen leaves by their sharp ends and only after that pull them into their hole. A number of investigations showed that the "purposeful" behaviour of worms is a reaction to the chemical substances present in the top of the leaf rather than directly to the leaf form. In worms we find a more clear manifestation of generic memory which reveals itself in innate *unconditioned reflexes*.

Thus the females of some Annelida species exhibit a hereditary capacity for care of their posterity. The Nereis female, after laying eggs inside its habitable tube starts vigorously moving from side to side thereby pumping in fresh water for embryos to breathe. Some species of worms start on a journey at a definite time in search of an individual of the opposite sex.

It should be noted, however, that unconditioned reflexes can only be evoked under strictly definite environmental conditions. Yet the environment is subject to constant change which may prevent the realisation of genetically programmed hereditary reactions.

The reflective abilities of animals with a ganglionic nervous system are not limited to unconditioned reflexes. During the course of their life they develop new forms of response to external influences, more flexible than in-born reactions—*conditioned reflexes*.

Although Coelenterata, as shown earlier, are also capable of developing temporary links (conditioned reflexes), those of worms are of a notably higher level, as they already exhibit a certain degree of plasticity (despite the fact that they also need a large number of combinations of irritants to arise).

An experiment was staged in which worms had to find an exit from a T-shaped labyrinth in order to get to their hole. When the opening was in the right elbow and the worms received an electric shock in the left one, they learned to turn to the right after 120-180 experiments. After that, when the live wires were transposed to the right elbow and the passageway to the hole was changed to the left elbow, the worms changed their response accordingly. Characteristically, the relearning period was two or three times shorter than the original habit-forming period.

As can be seen from the above, already the ganglionic nervous system is a rather complex instrument of response to an infinitely large number of environmental effects. The behaviour of an animal possessing a ganglionic nervous system with the leading ganglion in the head is essentially different from the behaviour of an animal possessing a diffuse, net-shaped nervous system. Worms show the first signs of in-born behavioural patterns (precursors of future instincts) and at the same time exhibit a more plastic form of reflection—conditioned reflexes.

A more complex structure of the ganglionic nervous system opens further possibilities for reflection. Among animals with the ganglionic nervous system we find a higher level of reflection in Arachnida and insects. These animals have variegated sense organs featuring rather complex designs. The evolution of the animal kingdom is accompanied by specialisation of receptors, i.e., development of reactions to a definite irritant. Thus chemoreception in most Arthropoda falls into olfactory and gustatory. The corresponding receptors develop a qualitative difference: gustatory reception requires direct contact with the irritant, whereas olfaction is effective at a certain distance from the source of stimulation. Besides, insects are notable for further development of photoreceptors—complex faceted eyes providing a mosaic image of small objects within short distance (large and remote objects are distinguished by such organs but dimly). There also exist other specific receptors, for instance, those capable of tactual sensibility.

Arthropoda, particularly insects, are characterised by the presence of *instincts*—a complex innate form of response to definite environmental conditions. Instincts acquire a chain character accounting for a series of consecutive adaptive actions.

Thus the females of some species of spiders make a web cocoon for their eggs. The female guards this cocoon and often carries it from one place to another. As soon as little spiders appear, the female does not let them out of sight. As time goes on and the young ones grow, their mother becomes more and more indifferent to them and finally abandons them altogether when they become self-sufficient.

Bees are notable for extremely complex instincts underlying their group behavioural patterns.

As is known, every bee colony has one queen, several scores of male drones and several hundreds of barren worker bees (females with underdeveloped sex organs). The behaviour of worker bees is the most complex of all. In the course of its development every worker bee in the colony changes its functions. First it feeds the larvae, cleans the hive, then guards the hive, procures food and builds cells. The instincts of the digger wasp also comprise a complex chain of actions. Having dug a burrow,

the wasp masks it with a lump of earth each time before flying away. Coming back with a prey, the wasp lays it at the entrance, moves aside the lump, examines the hole and only after that pulls the prey inside.

Such apparent expediency in the behaviour of Arthropoda may seem amazing to the uninitiated. However, it is completely devoid of any conscious purpose being but an automatic reaction to a definite external irritant or combination of definite irritants and is similar in all individuals of a given species. Instinctive behaviour does not change under a different set of conditions and becomes inexpedient if even one essential link in the chain of events alters or drops out.

Russian animal psychologist V. A. Wagner (1849-1934) observed and described the behaviour of a female spider under conditions rendering its instincts quite senseless.

Thus not infrequently the content of cocoons is destroyed by parasites, but the female spider continues guarding and carrying the empty cocoon. It also happens so that the female, having made a cocoon and accomplished a series of egg-laying movements fails to produce any eggs. Despite the fiasco it passes to the next stage—closes up the empty cocoon and starts carrying it about. The expediency of the reactions of bees is also very relative. If we cut off the back side of the honeycomb intended to store honey, the bee, placing a definite quantity of honey into the defective comb closes it up with wax on one side while the honey flows out on the other side.

French investigator *Jean-Henri Fabre* observed stereotyped inexpedient behaviour of a wasp. When a digging wasp brought a paralysed grasshopper to its burrow and, like all wasps, went inside to examine its dwelling, the investigator moved away its prey. On coming out and finding the grasshopper, the wasp drew it to the hole and again dived in to examine it. Fabre moved the grasshopper away from the wasp's hole forty times and each time on finding it the wasp searched the hole anew in order to draw in the victim.

These examples show the limitations of the instinct. *Instinctive actions are geared to strictly definite conditions.* The mechanism of instinctive behaviour is triggered by external conditions which evoke a reflex reaction.

This, in turn, sets off the next reaction, and so on, the entire chain of reflexes representing a hereditary programme. *Instinctive actions lose their expediency as soon as environmental conditions deviate from the standard.* Thus instinctive behavioural patterns in animals are only expedient under permanent conditions.

It should be noted that though definite instincts are common to all individuals of a given species, their manifestations slightly vary from individual to individual. Such relative nonuniformity of the realisation of instincts enables the species to survive in case of an abrupt change in the animal habitat. Observation of instinctive actions of young animals shows that such actions follow a standard course without preliminary training. However, young individuals are slightly less skillful in their performance than older ones. The efficacy of their actions is improved in the process of individual development as the animal's *life experience* helps it to fulfil the inbred programme of behaviour.

Natural scientists have established that insects develop a great number of conditioned links during their lifetime. These links may result from the operation of various receptors. For instance, they may derive from the memory of physical actions based on motor signals, or a visual memory of the colour or shape of objects.

Thus if we move a beehive two meters westward from its original position, the bees returning home with nectar and pollen yield gather in the air in the place where the hive entrance was formerly located. For several minutes they circle around the imaginary entrance and only after that turn to the hive. That means that bees are mainly guided in space by motor signals and resort to vision only in case of failure. Orientation in insects plays an exceptional role. They easily develop conditioned sensitivity which enables them to differentiate the shapes of the flowers they frequent, various degrees of objects luminosity and definite parts of the optical spectrum (for instance, bees easily distinguish between yellow, blue-green, blue and ultraviolet).

Observations have shown that conditioned links in insects are established best of all in respect of irritants which normally set off instinctive programmes of behaviour ("trigger signals").

Very illustrative in this respect is the following series of experiments. The investigator placed several glasses with water or aqueous solution of sugar in boxes with similar round holes. In one instance the box with sugar solution was marked with a triangle, and the box with a glass of water, with a quadrangle. In another instance the box with sugar solution carried a multipetal pattern resembling a flower, and the box with water carried a six-pointed star. It proved much more difficult to teach the bee to distinguish between simple geometrical figures such as triangles and quadrangles than between more complex patterns. These findings, unexpected at first sight, are in fact indicative of the biological significance of complex geometrical forms—they resemble the forms of flowers visited by bees.

Hence, animals with the ganglionic nervous system develop temporary links most easily in respect of those objects whose properties represent biologically significant signals; *conditioned links are only formed within instinctive programmes of behaviour*. The principal form of reflection in animals with the ganglionic nervous system is connected with instinctive behaviour.

Instinctive forms of behaviour can be observed not only in Arthropoda, but also in all higher vertebrates (fishes, amphibia, reptiles and mammals). Some fish species, for instance, exhibit a very complex instinct of protection of posterity.

Thus the mail stickleback makes a hollow in the bottom of a water reservoir, covers the bed with seaweed, builds sidewalls and a roof from larger water-plants and lines them with the slime of his body. After that it drives a female into the cave to spawn and guards the cave till the fry appear.

Most vertebrates are also distinguished by very complex instincts pertaining to the protection of progeny, breeding, procurement of food and defence. Nest building and care of posterity in birds and mammals appear to be remarkably expedient. However, this expediency based on purely external factors is very superficial and a change in the environmental conditions brings about but a very slight restructuring of the animal's behaviour patterns. A small alteration in a definite set of conditions which initiate a series of instinctive actions upsets the

entire elaborate programme—birds may abandon their nestlings, mammals may bite to death their posterity.

The defensive behaviour of animals which is exclusively instinctive is also characterised by extreme rigidity. This is attested to by a multitude of examples. Here is one of them. In North America there lives the skunk—a small animal with dark fur which is practically immune from the attack of all beasts—they identify it at a distance by a white stripe on the back. Nature endowed it with a musk gland which produces an offensive odorous secretion. In case of danger the skunk turns its back on the enemy, holds up its tail and ejects a cloud of fluid which causes even the biggest predators to pass out for several hours. All animals on the American continent avoid the skunk. A decision was made to acclimatise this animal in the Soviet Union. First the cubs were kept in enclosures and in order to enable the attendants to take care of them, all skunks were deprived of the musk glands. On being set free the skunks were allowed to live in woods. However, when dogs began to attack the animals, the latter did not try to run away but just turned their back on the pursuers and fell an easy prey to them. Later the attending personnel found ways to look after the skunks and they were no longer subjected to gland ablation.

Instinctive reactions arise as a response to simple stimuli which set off inherited behaviour patterns. Much interest in this connection attaches to the investigation of ethologists studying the innate forms of animal behaviour. Representatives of this branch of science have shown that *instinctive actions are called forth by very definite signals*.

Thus a frog rushes after an insect if it makes a quick movement in front of it. The reaction to a fast moving irritant is very easy to ascertain. If we suspend a scrap of paper from a thin thread and pull at it before a frog, the latter is sure to jump at it. In mammals instinctive actions are also triggered by a definite irritant and representatives of different species may respond in the same way to different stimuli. It is known, for instance, that a newly born cub and a newly born lamb search for the mother's nipple and, on finding it, begin to make energetic sucking movements. It has been established that the programmes of these actions are set off by different sig-

nals. The cub responds only to *warm fur*. If we substitute a hot-water bottle for the cub's mother, it will not evoke any searching reactions. However, if the cub is offered a piece of warm fur, it starts searching at once. By contrast, a lamb responds to the *covering of the vertex*; when a feeding bottle was thrust into the lamb's mouth, it did not evoke any sucking movements, yet if its vertex was simultaneously covered, the lamb at once began to suck.

Hence, instinctive actions do not reflect a large number of various irritants and therefore limit the vertebrate's capacity for reflection. The vertebrates develop a *tubular nervous system* (with spinal cord and brain) which further improves their ability to respond to environmental changes. The differentiation of their receptors is even more significant than in animals with the ganglion nervous system. The new possibilities opened up by evolution cannot be translated into reality through instinctive behaviour alone.

Forms of Behaviour Acquired by Individual Organisms. Higher animals, particularly mammals, are characterised by the prevalence of new, more flexible forms of behaviour. Individual distinctions in the formation of temporary links within one and the same species become more conspicuous than the variations allowed by an instinct. In certain individuals conditioned links may arise easier than in others. The vertebrates may develop a far greater number of conditioned links than the lower animals. *The higher an animal on the evolutionary ladder, the more complex and flexible its conditioned links.*

Fishes form conditioned links with comparative ease responding to light, colour, shape, sound and gustatory qualities of various objects. However, these links are not very flexible. Thus a hunting reaction quickly developed in the pike to the sight of fry proved very difficult to obliterate. In an experiment the fry was separated from the pike with a transparent glass partition and the predator dashed against it for quite a long period before a new conditioned link was formed. This, in turn, was just as persistent and faded only long after the glass had been removed: for quite a while the pike showed no interest in the small fishes prowling about.

Conditioned links may be fairly rigid and exert but an

insignificant influence on the animal's behaviour in a changing environment.

The next stage in the evolution of reflection in organic matter is the *emergence of more sophisticated forms of plastic individual behaviour based on the independent development of new criteria of behaviour*. To achieve plasticity in individual behaviour the living organism must *analyse* and *synthesise* not just separate properties of the environment (temperature, colour, smell), but entire *objective situations*.

If we sprinkle some grain in front of a hen and set a frame with a screen between them, the hen will attempt to break through the screen. By contrast, in a similar situation birds of a higher level of development (e.g., a crow, a magpie or a raven) will behave differently: after a few unsuccessful attempts to get food through the screen, they would get round the obstacle.

In the first instance the behaviour is based on an instinctive programme, in the second, on an analysis of a given situation. The 2nd type of behaviour is particularly pronounced in mammals: the animal begins to perceive and analyse whole situations adapting itself to changing conditions and adjusting its behaviour. Alongside instinctive behavioural patterns, higher animals exhibit other forms of behaviour which vary from individual to individual—*habits* and *intellectual actions*. By habits are understood animals' actions which are based on conditioned links and performed automatically. Both habits and instincts also exist at lower stages of development, yet pronounced habits are only found in animals which already have the cerebral cortex.

The motor components of animals' habits may include both innate movements reproducing the experience of a species, and conditioned reflexes consolidated through repetition of chance movements. The examples given below illustrate these types of movements.

A trainer can easily teach a hare to beat the drum. It is a specific movement: all hares at a definite time of the year pound in the forest on stumps, fallen tree trunks, etc. Illustrative of the second type of movements are motor reactions exhibited by a chained dog. An experimenter placed in front of a dog a piece of meat which was beyond the dog's reach. The meat was fastened to a

length of rope which the dog could reach with its paw. After a number of unsuccessful scratching movements with the paws resulting from excitement the dog accidentally pulled at the rope and seized the meat. Through repetition the movement became habitual and the dog learned to get the food without any difficulty. Then the meat was moved farther away out of the reach of the dog's forelegs. After a few unsuccessful attempts to get it by the habitual method, the dog turned round and reached the food with its hind leg (Fig. 1).

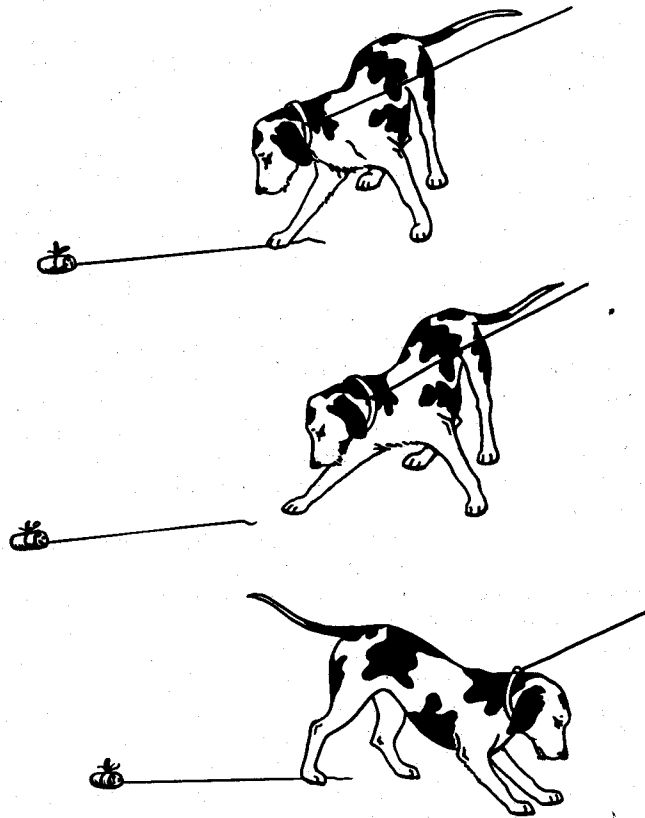


Fig. 1.

This experiment shows that the habits developed by an animal can be applied in a changed situation. In this particular case the conditions of the experiment became more complex and the dog reacted to the change by transferring the habit from the forelegs to the hind legs in order to attain the desired goal.

Hence, habits may be essentially different from one another, approximating to instincts (owing to their automatic character), on the one hand, and to intellectual forms of behaviour, on the other.

Intellectual Behaviour of Animals. *Intellectual behaviour is based on the reflection of complex relations between individual objects.* It can be illustrated by the following experiment.

The instrument used in the experiment consisted of two hollow tubes. The bait (a piece of meat) suspended from a length of twine was lowered into one of them in front of a crow. The bird saw the bait enter the upper tube, pass through the gap between the tubes and again disappear in the lower one. The crow at once ran to the end of the second tube and waited till the bait came out of it (other birds of prey, cats and dogs acted in a similar manner).

This example shows that higher animals are capable of grasping the *relationship* between objects and *anticipating the outcome of a given situation*, i.e., determining the place where the moving object will appear. Such behaviour is already a type of *intellectual behaviour*.

Among higher animals, primates (anthropoid apes) occupy a special place. In contrast to most other mammals, they show interest not only in food as such, but also in apparently neutral objects. What with the excellent vision characteristic of apes, this interest known in psychology as "persistent (or disinterested) curiosity" and "exploratory impulse", greatly expands their scope of perception, increases the ability to accumulate knowledge and sets them far ahead of other animals in terms of possibilities for development of habits and sophisticated forms of behaviour.

The intelligence of apes is characterised not only by the complexity of problems they can solve, but also by the general orientation of their activity. For hours on end apes can labour at an object trying to split it, engage in

various tricks in an attempt to attract a visitor's attention and lure him to their cage, watch creeping insects, etc. These peculiarities in the behaviour of apes are referable to their mode of existence. Under natural conditions an ape has to continually "explore" the environment in quest of food. The wild chimpanzee's diet includes eighty-one "dishes". Half of them are fruit, a quarter, leaves, and the remainder seeds, flowers, stalks and bark. Besides, chimpanzees feed on insects. Their menu is sometimes supplemented with lizards, small rodents and even larger animals. This shows that the highly developed exploratory behaviour of apes, their curiosity towards most diverse objects, has deep biological roots. Apes not only distinguish between shapes and colours of fruit they feed on—they have also developed conditioned reflexes in respect of various gustatory qualities. Seeing food, an ape can faultlessly differentiate edible fruits from inedible and poisonous ones.

The diverse character of food stimulates the development of apes' analysing powers. An ape no longer reacts instinctively to definite types of food or to a definite feeding situation. In order to find the food it needs, an ape has to examine everything around it.

The sophisticated behaviour of apes which is far more complex than the behaviour of other animals is also credited to the remarkable qualities of the primates' fore extremities resembling a human hand. The hand enables the ape to enter into very complex relations with surrounding objects. As a result, apes develop a multitude of temporary links (associations) which are not known to other animals. Apes exhibit various methods of reflection against the background of active exploration-oriented behaviour. Under certain conditions they display instinctive forms of behaviour. Like in other vertebrates, instinctive reactions in apes can be evoked by a simple stimulus. The investigations of American scientists *H. Harlow*, *M. Harlow* and *S. Suomi* have shown that new-born monkeys display real affection for artificial mothers only if the latter possess definite qualities.

The experiment was carried out as follows. New-born macaques were placed in a cage with artificial mothers of approximately the same size as the real mother. One of the kiddies received a mother in the shape of a metal

framework, the other one, a wooden cylinder with fleecy covering. The baby that got the soft mother stayed with it most of the time embracing and clambering on it. Any danger immediately sent it scuttling to its mother for protection. The monkey that got the metal mother was very unhappy. Investigations showed that baby monkeys preferred rag mothers who did not suckle them to wire mothers who did. Rag mothers imparted to babies a feeling of comfort inspiring them with confidence and making them feel safe.

However, the instinctive behaviour of higher adult apes is essentially different from the instincts of lower animals. Higher apes, for instance, chimpanzees are notable for a hereditary form of behaviour—the nest building instinct. Under natural conditions they are daily engaged in the construction of nests on trees from branches. Observations have shown that in building a nest monkeys carry out a *practical analysis* of the material they need.

During the course of investigations the construction activity of apes was compared with the nest building practices in rodents (rats). If the materials available to them differed in hardness, for instance, if they had tree branches and paper, both chimpanzees and rats built nests after the same pattern: they made the framework of the nest from a harder material and used the softer material to line the interior. If both a chimpanzee and a rat were given only soft material, they started building the nest from it. However, if they were offered harder material after the nests had already been built, the qualitative difference in the animals' reaction showed up at once. On receiving a harder material, the chimpanzee at once started rebuilding the nest. It put aside the structure of the soft material with one movement of its hand, took the harder material and constructed the nest base. Only after it was ready, did the animal begin to use the soft material lining within the inner surface of the nest. In a similar situation rats continued building the nest laying the coarse material on top of the soft one.

Hence, though the nest building activity in apes is essentially based on an instinct, they also take into account the environmental conditions.

Individual behaviour patterns developed by apes during the course of their life span are also notable for certain

peculiar features. An investigator who observes the formation of habits in apes and lower animals is sometimes struck by the fact that lower vertebrates can develop habits faster than monkeys. This fact should not by any means be construed as evidence that the former are more advanced than the latter. The thing is that monkeys are capable of perceiving the relations of different objects that surround them and can exert their influence upon them. It is precisely this capacity that not infrequently adversely affects their behaviour. Indeed, "disinterested" curiosity sometimes simply distracts a monkey from the experiment so that it often shows a greater interest in inedible objects than in a bait hidden in a "problem box". Yet when monkeys develop strong conditioned links, their manifestations become no less stereotyped than in other higher animals.

Let us consider, for instance, one of the details in a series of experiments made on chimpanzee Raphael. The experimenter kindled an alcohol burner in front of a fruit placed deep in a box. After numerous attempts to get at the fruit Raphael accidentally struck against the stop-cock on a tank with water arranged above the burner. The water that gushed out extinguished the fire. After several repetitions the action became habitual. In a new situation the tank was arranged at a distance from the burner. After several attempts Raphael coped with this task too: it took some water in the mouth and splashed it out on the fire. In the next experiment the box with bait was arranged on a raft in the middle of a pond. The tank with water was arranged on another raft. In order to put out the fire, Raphael rushed to the neighbouring raft along a rickety footway.

As can be seen from the above, the animal carried a customary behavioural pattern (a habit) into a new situation. Of course, the action appears to be inexpedient (there was water all around the raft), yet biologically it was quite valid. Running along the rickety gangway was not physically difficult for a chimpanzee, therefore the task set in the experiment did not become for it a *problem situation* calling for an intellectual effort. Instincts and habits as a more stereotyped way of reaction protect an animal from overstrain. *It is only in the case of a series of failures that an animal responds to a challenge by*

exerting its highest powers—the intellectual abilities. However, typical situations rarely create problems for animals and, consequently, do not imperatively demand response at a higher, intellectual level. *Intellectual powers of animals usually lie dormant as a potentiality for reasonable behaviour.*

In a series of experiments carried out by Soviet psychologist N. N. Ladygina-Kotz (1889-1963) chimpanzee Paris, when receiving a tube with a bait inside, selected an instrument suitable for insertion into the tube. Paris differentiated between such properties of objects as shape, length, width, density and thickness. If there was no suitable object, Paris tore off side stems from a branch lying nearby, chipped off splinters from a wide board, straightened twisted wire—in short, the monkey engaged in making a tool.

However, the "tool-making" activity of higher apes should not be exaggerated. Experiments are on record when chimpanzees proved unable to join together two sticks to achieve their goal. This is quite understandable: biting round a branch and chipping off splinters are customary actions of apes under natural conditions. Joining sticks together, however, is something they do not practice. The solution of such tasks calls for numerous trials. Sometimes monkeys did prove capable of making one long stick from two short ones, that is of making "tools". Yet they do not preserve the manufactured "tools", do not make them in advance. A "tool" appears during the monkey's direct action and disappears at once, therefore it is only figuratively that we can speak of any analogy between the labour activity of man and the corresponding actions of apes.

Very interesting in this connection were Pavlov's experiments with a box containing a bait. A monkey could see the bait through a triangular opening. The box could be opened if one inserted a stick of triangular cross-section into the hole and pushed a lever inside the box. The experimentalist performed that operation before the monkey's eyes. Lying before the monkey were sticks with most diverse cross-sections—round, square, triangular. At first all the monkeys tried to insert any stick that happened to catch their eye. Then they felt the sticks, sniffed them around, examined and tried to insert them into the

hole one after another. At last, they found the right one.

Thus intellectual actions of monkeys assume the form of concrete practical thinking in the process of orienting manipulation.

A characteristic feature of the behaviour of higher apes is *imitability*.

For instance, a monkey can sweep the floor or moisten a rag, squeeze it out and clean the floor. Most of such imitative actions are very primitive: monkeys usually imitate the action itself and not its result. Therefore, when "sweeping" the floor a monkey usually moves the dust from one place to another without removing it from the floor (this goal, however, can be achieved by some properly trained animals). There is no conclusive evidence for apes' capacity for intellectual imitation.

As can be seen from the above, all the forms of reflection (tropisms, instincts, habits, intellectual actions) cannot be demarcated clearly. There is a single continuous line of development in the animal kingdom: instincts, for instance, become overgrown with habits and habits pass into instincts.

Yet in concrete manifestations the process of development reveals its leap-like character, breaks in continuity: some species of animals are notable for prevalence of instincts, others for associations formed on the basis of personal experience.

Communication and the "Language" of Animals. The relations of "social" animals sometimes reach a high degree of complexity. Already animals with the ganglionic nervous system forming large communities exhibit not only complex instinctive individual behaviour, but also extremely sophisticated instinctive reactions to the "language"¹ of an individual member of the community.

It has been found out, for instance, that a bee returning to its hive with a nectar and pollen yield and performing a definite pattern of movements ("dance") informs in this way the entire bee community of the location of nectariferous flowers. A set of definite movements represents a definite signal. Very complex is the "language" of ants. Motor reactions may denote a call for joint action, a request for food, etc.

¹ By "language" we shall imply any signalling system, any means of transmitting information.

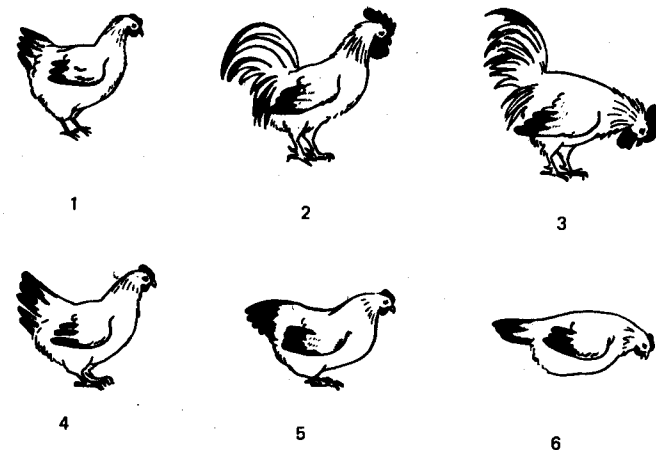


Fig. 2. Domination and submission postures of hens:

1 and 2 — domination posture of hen and cock; 3 — very aggressive posture; 4 — posture expressing readiness to join the herd without aggressive intentions; 5 — submission posture; 6 — inviting posture

The "language" of animals with the ganglionic nervous system consists of postures, acoustic signals, chemical ("olfactory") information, all kinds of tactual contacts.

The behaviour of insects in communities strikes the observer by its general expediency and coordination. Yet this coordinated expediency results from stereotyped reactions of the animals receiving information. Their reactions are completely devoid of any analysis, any processing of information; the signal received by the animal is automatically followed by a response developed in the course of evolution.

Communities of higher animals (birds, mammals) are also characterised by definite forms of relations. Any congregation of animals in a community inevitably results in the emergence of a "language" required for intercourse among its members.

Any community is notable for a biologically rational inequality—stronger animals dominate over weaker ones. The stronger get the better part of the food and are at ease among the members of the community. Weaker animals serving as prey for animals of other species ensure the survival of the best individuals of their species. Weak-

er animals, in turn, possess certain means giving them relative safety inside the community (Fig. 2.). Such means include a peculiar "posture of submission" whereby the animal conquered in a conflict with a stronger individual admits its defeat.

Austrian ethologist *Conrad Lorentz* observed the following situation. A young wolf bursting with energy attacked the leader of the pack. However, old hardened fighter very soon made the young pretender feel the strength of his teeth. The young wolf immediately took the posture of submission—exposed to the heated rival its neck, i.e., the most vulnerable part of its body so carefully guarded by fighting animals. The old wolf's fit of anger immediately died out—the vanquished adversary's signal evoked in the leader an instinct born of the experience of thousands of generations. Postures of submission are known to all animals living in communities. Such postures in apes are very expressive.

Besides the "language" of postures and tactual contacts, there also exists a "language" of auditory signals. Investigators have described complex signalling systems of ravens, dolphins and monkeys. The sounds produced by animals express their emotional state. An analysis of vocal reactions of chimpanzees has shown that every sound produced by a monkey is connected with a definite reflex activity. Several groups of sounds have been distinguished: sounds produced while eating, orienting-defensive and aggressive sounds, sounds connected with the exercise of sexual functions, etc.

Animals of the same community are oriented towards the vocal reactions of one another. Such reactions additionally inform other members of the community of the individuals' condition thereby providing orientation for intercommunal behaviour. Thus the hungry animals rush to the place whence come the appetising grunts of others devouring some food; the healthy and the sated ones respond to their fellow-creatures' playing or orienting sounds signalling them of a possibility to satisfy the need for movement or orientating behaviour; aggressive sounds of fighting apes causes the leader to rush to the scene to restore order in the herd and an alarm signal sends the entire herd into a wild stampede. Yet there is one important deficiency in the animal language—unlike

the language of human beings, *it cannot serve as a means of transmitting experience*. If therefore we presume that some outstanding member of an animal community were to devise ingenuous methods of procuring food, he would not be able to share his "know-how" with other members by "linguistic" means even if this imaginary individual really needed to do so.

I.3.2. Dependence of the Psyche on the Environment and Structure of Organs

The Psyche and the Environment. If the habitat of living organisms were the same everywhere, the Earth would most probably be inhabited by only one species of animals. In reality the environment is exceedingly diverse both in terms of climate and habitat conditions, and this accounts for a broad diversity of organisms. The Earth is inhabited by more than a million of different species of animals. For all the diversity of environmental phenomena on the Earth they are notable for cyclic changes, such as annual cycles, alternation of day and night, changes of temperatures, etc. All living organisms have to adapt to existing conditions.

Self-regulation starting from elementary irritability finds its highest expression in man's creative reason.

The higher the methods of reflection, the more independent a given species of animals from the direct influence of the surrounding medium. The unicellular organism whose reaction to environmental changes is limited to tropisms completely and directly depends on environmental conditions.

Thus a change in the ambient temperature causes a change in the rate of chemical reactions in the organism: with the increase of temperature the reaction velocity increases, and vice versa; a considerable increase or decrease in the ambient temperature proves fatal for a unicellular organism. To be sure, exposure to very low temperatures will kill any living organism, yet the behaviour of higher animals under such extreme conditions is essentially different from that of lower organisms.

It has long been known that an abrupt change of environmental conditions causes the animal to migrate.

Such migrations may vary in adequacy. In the hot and cold seasons of the year steppe turtles and small rodents bury themselves deep in earth where the ambient temperature accords more with the normal conditions of their existence. Their behaviour is guided by instincts. An elephant douches itself with cold water and takes refuge in the dense shade, a monkey also selects and prepares a place where the heat would be easier to endure. Besides instincts, they are also guided by conditioned links—the experience accumulated within their life span.

Thus animal organisms gradually free themselves from direct dependence on the surrounding medium. However, living beings will never become absolutely independent of the environment whatever their level of development. The environment represents the necessary condition for the existence of the living organism, the principal factor determining the life of living creatures or, to put it differently, *the existence of living organisms is determined by environmental conditions.*

The Psyche and the Evolution of the Nervous System. The adequacy of reflection depends primarily on the structure of sense organs and the nervous system. The more accurate the reaction of a receptor to a definite kind of irritants, the more adequate the reaction. Within certain limits the latter is directly related to the former. For instance, the development of the visual receptor was contingent on the organism's adaptation to the reflection of diffused sunlight.

In unicellular and the simplest multicellular Coelenterata one can only observe general reaction to light—phototropism. An earthworm has light sensitive cells located in its epiderm. These cells are capable of distinguishing between light and darkness. The flat mollusc already possesses several groups of light sensitive cells lining, as it were, a small bag immersed in the animal's body. Such a design of the visual organ enables the mollusc not only to register the presence or absence of light, but also to determine the side from which it falls. In insects the faceted design of the eyes enables them to see the shape of small objects. In most vertebrates the eye includes a special refractive lens providing a clear-cut outline of the object.

The development of receptors is geared within certain limits to the development of a definite type of nervous system. The level of development of sense organs and the nervous system invariably determines the level and forms of psychic reflection. At the lower developmental stage, for instance, in Coelenterata, the nervous system represents a nervous net consisting of neurons with interlaced extensions scattered about the animal's body. It is a *net-shaped nervous system.* As has been indicated above, animals with the net-shaped nervous system mainly respond to stimuli by *tropisms.* Their temporal links are formed with difficulties and soon fade out.

At the next evolutionary stage the nervous system undergoes a number of qualitative changes. The nervous cells form not only nets, but also nodes (ganglions). The *nodical* or *ganglionic nervous system* enables the organism to receive and process the greatest possible number of irritations, since sensory neurons are located in close proximity to the irritants thereby improving the analysis of the received signals. In animals with ganglionic nervous system the leading ganglion has a much more complex design than all other nodes of the nervous system. The most primitive ganglionic nervous system is found in worms: their segment ganglions are similar in terms of reflective abilities which rules out the possibility of a more sophisticated reflection. Only the head ganglion which consists of heterogeneous nerve cells (performing different functions and having different links) receives and processes more diverse irritations.

Higher invertebrates—insects—have a more advanced nodical nervous system. In each part of their body ganglions merge into *nerve centres* interconnected with one another through *nerve tracts.* Particularly complex is the head centre. The nervous system of insects communicates with the surrounding medium through the agency of sufficiently sophisticated receptors performing the signalling function. Animals with the ganglionic nervous system reflect external influences with the help of both innate and individually acquired reflexes. At this stage, however, numerous *hereditary reactions* are clearly *predominant.*

The higher type of nervous system is the *tubular* one, consisting of tubular nerve cells (in the chordates) join-

ed together. During the course of evolution the vertebrates develop the spinal chord and the brain—the *central nervous system*. Its development goes hand in hand with the *genesis and improvement of the animals' sense organs*. As the nervous system and the receptors gain in complexity, the *forms of psychic reflection become ever more sophisticated*. Evolution develops new and improves the already existing psychic functions that appeared earlier at a lower stage (*sensation, perception, memory and, finally, thinking*). *The more complex the nervous system, the more sophisticated the psyche*. Special significance in the evolution of vertebrates attaches to the development of the *brain* and progressive differentiation of its local functional centres. These centres become linked to one another through special nerve formations—*association areas*. The higher the animal's organisation, the more sophisticated the areas. The animals possessing the central nervous system are capable of the most adequate reflection of the surrounding world. The bulk of the nervous activity of animals is represented by the *sum total of nodular reflexes*.

Hence, *the evolution of the psyche is expressed in the growing complexity of the forms and functions of the receptors and the signalling activity*.

The development of the body, nervous system and sense organs of animals results in the quantitative and qualitative change of the forms of reflection and leads to the appearance of ever more complex and multisided connections of living organisms with the environment. Psychic functions develop in accordance with the animal's habitat and the peculiarities of its organisation. Thus, the structure of the visual receptor improves the animal's visual orientation in the habitat. The eyes of deep-sea fishes are capable of picking up the faintest light stimuli. Their retina contains the *rods*, highly sensitive elongated elements. The iris and the lens are relatively large. The cornea and the lens of higher land animals do not pass ultraviolet light to the retina. The eyes of animals leading both day and night life also include a special organ adapting the visual receptor to the conditions of the animal's life. Variations in the design of the eye provide a more adequate reflection of irritants under different environmental conditions.

It would be wrong to think, however, that under identical environmental conditions animals tend to develop similar leading receptors. The phylogenetic development of sentience in animals largely depends on what kind of irritants acquire biological significance. In one and the same environment the spider is oriented towards vibration, the frog towards rustle hardly distinguishable by man, the bat, towards ultrasounds, whereas the dog's predominant orientation is towards smells (mainly towards the odours of organic acids, its olfaction being far less keen towards the odours of aromatic substances such as flowers and herbs), etc.

The evolution of the psyche is not rectilinear. Rather, it proceeds along divergent lines. In one and the same habitat are found animals of very different reflection levels; conversely, in different natural abodes dwell various species of animals having similar levels of reflection. It is commonly believed, for instance, that dolphins, elephants and bears occupy equally high positions in this respect.

The habitat is not something immutable. Like all the surrounding world, *it is subject to constant change*, and the animal species abiding in it adapt to the changing conditions. It may happen, though, that changes in the environment drastically affect certain species bringing about corresponding changes in their psychic functions, and exercise but a minor influence of the development of functions of other animals. Thus the radical transformation of living conditions caused a qualitative change in the behaviour of ancient anthropoid apes and resulted, in the final count, in the appearance of man on the Earth.

I.3.3. Emergence of Consciousness in the Process of Labour Activity and Its Social-Historical Nature

Essential Difference Between the Animal and Human Psyche. There is no doubt that the difference between the human mind and the psyche of the highest animal is enormous.

For one thing, the "language" of animals can in no way be compared with man's language. In contrast to

the animal which can only give a signal to its fellow creatures about phenomena occurring in a given concrete situation, a *human being can inform, through the medium of language*, other human beings about the past, present and future and, which is of crucial importance, *pass social experience* to them.

Mankind's history shows that language played the key role in the restructuring of reflective abilities: the reflection of the world by the human brain is the most accurate. Owing to language every separate individual can use the experience accumulated by numerous generations and profit from the knowledge of phenomena he has personally never met with. Besides, language enables the human being to perceive the content of most sense experiences.

The difference in the "language" of animals and man's language underlies the difference in their thinking, as every psychic function develops in interaction with other functions.

Numerous experiments have shown that the thinking of higher animals is of purely practical ("manual", according to Pavlov) character. A monkey is capable of resolving one or another situational task and even of creating an "instrument" only in the process of orienting manipulation. Not a single investigator who has ever studied the animal psyche can boast of revealing in monkeys any signs of abstract thinking. *The animal can only act within the limits of a given, directly perceivable situation*, but is incapable of overstepping its bounds, abstracting itself from its specifics and comprehending a general principle. The animal is a slave of the immediately given situation.

By contrast, *the behaviour of the human being is characterised by a power of complete abstraction* (withdrawal) *from a given concrete situation and anticipating the consequences which may arise in connection with it*. Thus sailors rush to patch even a minor hole in the ship's hull and a flier starts looking for the nearest airfield if he has little fuel left. Human beings are by no means slaves of a given situation, they are capable of anticipating the future.

Hence, *the concrete, practical thinking of animals leaves them at the mercy of their immediate impression*

of the given situation, whereas man's capacity for abstract thinking makes him relatively independent of it. Man is capable of reflecting not only the immediate impacts of the environment but also their future effects. *Man is capable of acting consciously, in accordance with his knowledge of necessity*. This is the first essential distinction of the human mind from the animal psyche.

The second distinction between man and animal consists in his *ability to create and preserve tools*. The animal creates tools in a concrete, tangibly-real situation for its immediate needs. Outside a concrete situation the animal never singles out a tool as such, never preserves it for future possible use. As soon as a tool has fulfilled its function in a given situation, it immediately ceases to exist for the ape as a tool. Thus a monkey which has been using a stick as an instrument to reach a fruit may gnaw it into shreds a few minutes later or calmly watch another monkey do it. *Animals do not live in a world of permanent objects*. An object acquires a definite sense only in a concrete situation, in the process of activity¹. Besides, *the instrumental activity of animals is never performed collectively*—monkeys at best can watch the activity of one of their fellow creatures, but will never act jointly, helping one another.

In contrast to the animal, *the human being makes a tool according to plan worked out beforehand, uses this tool to achieve the desired aim and keeps it*. A human being uses a tool together with other people, borrows the experience of using it from some and passes it on to others.

The third distinguishing feature of man's mind consists in his ability to *assimilate social experience*. Both the animal and man possess the experience accumulated by generations in the form of instinctive reactions to a certain kind of irritant. Both acquire individual experience in various situations they get into within their life space. Yet *social experience can only be appropriated by man*. It determines the behaviour of an individual and *plays the main role in developing man's mind*. A child starts mastering the methods of implementing tools and the tech-

¹ The notion "activity" can only be used in regard to the animal figuratively as "performance of vital functions".

nique of social intercourse the moment he is born. Man's mental functions undergo a qualitative change due to the fact that an individual masters the tools of mankind's cultural progress. He develops the highest human qualities—voluntary memory, voluntary attention and abstract thinking.

The development of senses, like the development of abstract thinking represents a method of the most adequate reflection of reality. Therefore the fourth essential distinction between man and the animal is the *distinction between senses*. To be sure, neither man nor the higher animal remain indifferent to what goes on around them. Objects and phenomena of the surrounding world may evoke in animals and human beings certain kinds of attitude to the external influences—positive or negative emotions. Yet man alone is endowed with a developed capacity for sharing in another individual's grief and joy, only man can take delight in the beauty of nature or experience a feeling of intellectual gratification in the process of cognition.

The basic distinctions between the human and animal psyche are rooted in the conditions of their development. Whereas the progress of the psyche in the animal world was based on the laws of biological evolution, the *genesis of the human mind, human consciousness, is subject to the laws of social-historical development*. Without the assimilation of the experience of human society, without communication with other human beings an individual cannot rise to a level of mature, really human feelings, develop a capacity for voluntary attention, memory and abstract thinking and, consequently, become a personality. This is borne out by authentic stories of human babies brought up among animals.

All Maugli children displayed primitive animal reactions and did not exhibit the abilities whereby man is distinguished from the animal. In contrast to a baby monkey which, on straying away from the herd by an unlucky chance, will behave like a monkey just the same, a *human child will only become a human being if it grows among people*.

Man's psyche emerged as an outgrowth of the long evolution of organic matter. Scientific analysis of the development of the mind gives us grounds for asserting

that there existed *biological prerequisites for the emergence of consciousness*. The ancestor of Man undoubtedly possessed an ability for object-oriented active thinking and was capable of forming numerous associations. The prehuman animal possessing hand-like extremities was capable of creating elementary tools and using them in a concrete situation. We find all this in extant anthropoid apes.

It would be wrong, however, to deduce the mind directly from the evolution of animals: *man is a product of social relations*. The biological prerequisite for social relations was the herd. Man's ancestors lived in herds which provided the best conditions for mutual assistance and protection against numerous enemies.

The crucial factor in the transition from ape to man, from herd to society, was *labour, i.e., the activity based on the joint manufacture and use of tools*.

Labour Activity as the Prerequisite for and Result of the Development of Social Relations. Joint labour stimulated the development of social relations and society, whereas developing social relations stimulated further improvement of labour activity. The emergence of labour as a specific kind of activity resulted from an abrupt change in the life of the prehistoric man. Disastrous deterioration of environmental conditions made it very difficult for him to satisfy his needs: food was no longer in abundance because of the worsening of the climate. Man's ancestors were faced with a dire alternative—either to die out, or to effect a qualitative change in their behaviour. Necessity compelled the ape-like forbears of Homo sapiens to turn to collective pre-labour activity.

The instinctive intercourse of man's forbears inside the herd gradually developed into a communion based on "productive" activity. This change in the relations between members of a community, that is transition to joint activity and exchange of products was instrumental in the transition from herd to society.

The emergence of labour and the formation of society humanised the animal-like ancestors of man.

Labour also stimulated the development of human consciousness—the highest evolutionary form of reflection characterised by the ability to single out the stable

objective properties of object-related activity and, on this basis, to transform the surrounding world.

The manufacture, use and preservation of tools ensured a greater independence of the community from external influences. From generation to generation the ancient people's instruments of labour became ever more sophisticated changing step by step from carefully selected stone splinters with sharp edges to special tools made by joint efforts. Tools were gradually assigned to perform definite operations, such as cracking, cutting, chopping. It is precisely at this stage that a demarcation was drawn between human and animal environments. As has already been pointed out, *the animal lives in a world of chance objects, whereas man creates for himself a world of permanent objects*. The tools made by human beings are material evidence of operations, actions and activity of preceding generations. It is through tools that one generation passes down its experience in the form of operations, actions and activity to another generation.

In labour activity man's attention is focused on the tool being made and, consequently, on his own activity. The activity of an individual human being merges with the activity of the whole community, therefore it is aimed at the satisfaction of social needs. Under such conditions it becomes necessary for an individual to take a critical attitude to his activity. *Man's activity becomes conscious activity*.

At the early stages of social development men's thinking was limited by the low level of their social practice. The higher the level of tool production, the more sophisticated the reflection of the environment. When the manufacture of tools attained a high level of perfection, a single tool-making process was divided into several stages so that each of them could be assigned to different members of the community. This division removed the final goal, the procurement of food, even farther from each individual member. The process in toto could therefore be grasped only by an individual capable of abstract thinking. Hence, the production of sophisticated tools resulting from the social division of labour was a crucial prerequisite for conscious activity.

Acting upon the environment and changing it, man simultaneously changed his own nature. Under the influ-

ence of labour *new functions devolved upon the hand* causing it to attain ever greater dexterity. As a result of the increasing anatomic perfection of the hand the relationship between the arm and the forearm started changing and all the joints, particularly those of the hand began to gain in flexibility and freedom of movement. The hand was developing not only as an *instrument of prehension*, but also as an *organ of cognising the objective reality*. Under the impact of labour the active hand gradually transformed into a specialised organ of active taction, a specifically human faculty of cognition. Such transformation became possible not only because the sensitivity of the palm and fingertips to touch and pressure was much higher than that of other parts of the body (e.g., the back, arm, shin), but also because it was formed in the process of labour and therefore could manipulate various objects. It is precisely for this reason that the hand gives us valuable information on the essential properties of external material objects.

Thus the human hand became capable of performing various functions which were absolutely alien to the extremities of man's ancestors. As Engels justly pointed out, human hand is not only the organ of labour, but also the product of labour.

The development of the hand was interrelated with the development of the entire organism. The specialisation of the hand as the organ of labour helped our hairy ancestors to *change to erect gait*.

The working hands were constantly controlled by *eyes, the organ of vision*. Numerous links arising between the organs of vision and taction in the process of labour and cognition of the outer world alter the effect of the irritant—man's awareness of it deepens and its reflection becomes more adequate.

Particularly important was the influence of the hand on the *development of the brain*. The hand as a developing specialised organ was bound to have a representation in the brain. The formation of this new nervous centre resulted not only in the increase of the brain mass, but also in its more complex structure.

The emergence and development of labour led, on the one hand, to a much fuller satisfaction of man's needs for food, shelter, etc. On the other hand, *social relations*

of people effected a qualitative change in the biological needs themselves and *engendered human needs proper*. What is more, the development of objects of labour created a need for such objects.

Hence, labour was the motive force of the development of human society, the formation of human needs and the genesis of the mind capable not only of reflecting, but also of transforming the world. All these phenomena in the evolution of man led to a radical change in the intercourse of human beings. The necessity to pass the experience from one generation to another, to train fellow-tribesmen in the use of labour methods and to divide separate actions among them created a *need for communication*. The language of instincts was patently inadequate to satisfy it.

Human language representing the *higher forms of communication* emerged together with labour and in the process of labour.

The development of consciousness and new forms of reflection inherent in it alters man himself as a personality.

Part Two

PERSONALITY IN ACTIVITY AND COMMUNICATION

Chapter 4

ACTIVITY

II.4.1. Activeness and Activity

Needs as a Source of Activeness. The universal feature of living beings is activeness whereby they maintain their vital links with the surrounding world. Activeness can be defined as a capacity for independent reaction inherent in the living organism.

Activeness is born of the living being's needs which induce it to act in a definite way. *A need is a state of the organism expressing its dependence on the concrete conditions of its existence and evoking the organism's activeness in respect of these conditions.*

Man's activeness manifests itself in the process of satisfying his needs, and this very process clearly reveals the difference between the activeness of man and the behaviour of animals. The animal is active in its behaviour owing to the fact that its natural organisation (the structure of its body and organs, the fund of instincts) predetermines, as it were, the range of things that may become the objects of its needs and evoke the animal's active desire to possess them. Animals' adaptation to the environment is in fact contingent on the extent to which they can satisfy their needs. For instance, the innate programme of the beaver's behaviour fixates not only the animal's construction needs, but also indicates the vehicles of their satisfaction: tree species suitable for making a dam, their proximity to water, the methods of tree-felling (the beavers undercut the trunk on the side opposite to the water thereby causing the tree to fall across the river), etc.

Hence, *activeness in the animal is elicited by a natural object directly represented in the animal's needs.*

Man's activeness provoked by human needs is of a different character. *Man's needs are formed in the process*

of his upbringing, i.e., assimilation to the world of human culture. A natural object ceases to be a mere catch, i.e., a thing that has only the biological sense of food. Through the agency of labour implements man can modify that object and adapt it to his own needs shaped by a long process of historical development. Therefore the *satisfaction by man of his needs is in fact an active purposive process whereby an individual acquires a given form of activity conditioned by social development.*

Satisfying his needs, man develops and changes them. The needs of a contemporary man are different from those of his ancestors, and the needs of his descendants will again be different. Under communism, every man will work in accordance with his abilities and receive in accordance with his needs. Are we to infer from this that an individual who gets an opportunity to satisfy easily all his needs will thereby develop spontaneously the high qualities of personality and his activeness will be automatically directed towards lofty ideals? Such a conclusion would not be correct. The full satisfaction of man's needs is one of the principal conditions of his all-round development, yet it is not the only condition. Moreover, in the absence of other personality-moulding conditions, particularly labour, the possibility of easy satisfaction of one's needs not infrequently leads to a deterioration of personality. Parasitic needs not controlled by labour may, and sometimes do, become a source of anti-social and even criminal behaviour.

Fostering the *need for labour* is one of the chief requirements of socialist society to the system of education of its members. There is reason to believe that a growing need for labour will be stimulated by the development of production, comprehensive automation of many labour operations, improvement of the conditions of labour, reduction of working hours and the awakening of creative forces which can only be used to advantage in socially useful labour.

Types of Needs. Human needs are both social and personal by nature. Indeed, even in order to satisfy seemingly narrow personal needs (such as the need for food), the individual uses the results of the social division of labour (bread, for one, represents the objectified result of labour efforts of selectionists, agronomists, tractor-drivers, com-

bine operators, grain-elevator workers, millers, bakers, salesmen, etc.). Besides, the individual uses the historically conditioned methods and means of consumption characteristic of a given social environment and requires certain conditions (for instance, a piece of meat should be, first of all, cooked in an acceptable manner. The individual needs a plate, a knife and a fork, he has to observe certain hygienic requirements, etc.). Finally, a lot of human needs represent not so much the individual's narrow requirements as the needs of the society, collective, group to which he/she belongs and in which he/she works—*the needs of a collective acquire the character of the individual's personal needs.*

This can be shown by taking a specific example of a student assigned to make a report at a group meeting. He exercises special care in preparing his report not because the preparation itself is more attractive to him than, say, the reading of an interesting book, but simply because he feels an imperative need to comply with the collective's request.

Needs can be distinguished by *origin* and *object*.

By their origin needs may be *natural* and *cultural*.

Natural needs are indicative of man's activity, his dependence on the conditions required to preserve and sustain his life, as well as the life of his posterity. All people have natural needs for food, drink, human beings of the opposite sex, sleep, protection against cold and excessive heat, etc. If one of the natural needs cannot be satisfied over a lengthy period, the individual is bound to perish or leave no posterity.

Though the natural needs of contemporary people are basically identical with the needs of our animal ancestors and primitive people, their psychological substance is entirely different. It is not only the ways and means of their satisfaction that have altered—far more important is the fact that the needs themselves have undergone an essential change and are no longer experienced by the contemporary man in the same way as by his prehistoric forefathers. *Man's natural needs have a social-historical character.*

Cultural needs are indicative of the dependence of man's activity on the products of human culture; they are rooted wholly in human history. The objects of cul-

tural needs include things which may satisfy some natural need within the framework of one or another established culture (e.g., fork and spoon, sticks for eating), as well as things required for labour and cultural intercourse with other people, for complex and diverse social life. Under different economic and political systems an individual develops different cultural needs depending on his education and assimilation of the adopted customs and forms of behaviour. If an individual's cultural needs are not satisfied, he will not perish (as would be the case with his natural needs), but his human essence will be badly impaired.

Cultural needs differ essentially from one another by their level, that is by the demands of society on an individual which they reflect. To be sure, one cannot rate the need for interesting and instructive books providing a guidance for a young man on a par with the need for a tie of fashionable colours. Both these needs and the activity they initiate are appraised differently. *A morally valid need is the one that meets the demands of the society* in which a given individual lives and that accords with the tastes, assessments and, which is particularly important, the commonly espoused *world view*. In socialist society such principles and such world view are the communist moral principles and the Marxist-Leninist world view.

By the nature of their objects needs can be divided into *material* and *spiritual*.

Material needs bring out the dependence of man on the objects of material culture (the needs for food, clothes, dwelling, household goods, etc.), whereas *spiritual needs* reveal his dependence on the products of social consciousness. Spiritual needs manifest themselves in the production and assimilation of spiritual culture. An individual feels a necessity to share his thoughts and feelings with other people, to read newspapers, books and magazines, see films and plays, listen to music, etc.

Spiritual needs are inseparably linked with material needs. The satisfaction of spiritual needs calls, of course, for material things (books, newspapers, writing and music paper, oilcolours, etc.) which are, in turn, objects of material needs.

Thus a need natural *by origin* may be material *by object*, and a need cultural *by origin* may be either material or spiritual *by object*. The proposed classification, as we see, covers the tremendous diversity of needs showing their relation to the history of the development of the mind, on the one hand, and to the object towards which they are oriented, on the other.

The inducement to activity connected with the satisfaction of the subject's needs which account for his activeness and determine its direction is called a *motive* or *motivation*. In needs the dependence of the subject on the environmental conditions reveals itself as the motivation of his behaviour and activity. Whereas needs represent the substance, the main motive force of all kinds of human activity, motives come out as concrete, diverse manifestations of this substance. Motives or motivation are viewed in psychology as the causes determining the directionality of the subject's behaviour and activity.

Development of Human Needs. Animal behaviour is always aimed *directly* at satisfying one or another need. The need not only evokes activeness, but also determines its forms. For instance, the need for food (hunger) elicits the animal's food activeness in the form of salivation, food hunting, prey catching and devouring, etc. A conditioned reflex may link this activity to new irritants (for instance, the ringing of a bell) or new actions (for instance, depressing a pedal). However, in all these instances the structure of the animal's behaviour remains invariable. A bell is singled out from the flow of external irritants just as a food signal. The animal's act of depressing a pedal comes out precisely as an act of behaviour resulting in the appearance of food. In other words, even in the most complex activity based on conditioned reflexes the animal's needs directly determine both the *reflective* and *regulative functions* of its psyche. The needs of the animal organism determine *what elements the animal psyche singles out* in the surrounding world and *what responses it initiates*.

The behaviour of man is based on an entirely different principle. Already the actions of a little child sitting in his chair and eating with a spoon cannot be deduced entirely from his natural needs. The spoon, for one, is not required to satisfy the child's hunger. However, in

the process of upbringing the child is conditioned to regard objects of this kind as necessary conditions for such satisfaction. It is not the need as such, but the *methods of its satisfaction adopted in society* that begin to dictate the forms of his behaviour.

Hence, the child's activeness from the outset is stimulated not by biologically significant objects, but by the human methods of their use, i.e., by the *functions of such objects in social practice*. The behavioural patterns thus assimilated by the child are the *methods of handling objects* in accordance with their functions in human practice as they have been evolved by society: sitting at a table, eating with a spoon, sleeping in bed, etc.

All parents and educators know only too well that such habits are not easy to inculcate. A child attempts to get on the table or under the chair, bangs his spoon against the table, puts his hands into the plate, forgets to ask for a chamberpot, etc. Persistent struggle against such "pranks" and "bad manners" is nothing else than the imparting by adults to the child of the socially sanctioned methods of handling the corresponding things, the inculcation of human forms of satisfying one's needs by using or manipulating the corresponding things. Under the influence of the human environment modifying the satisfaction of the child's needs the biological significance of things is gradually relegated to a secondary plan and their social significance begins to play the definitive role in the child's behaviour. As a result, his attitude to the environment undergoes a radical transformation—the child begins to single out new properties of things and react to the surrounding objects in a different way. **Activity and Its Goals.** Whereas the behaviour of animals is completely determined by the immediate environment, the activeness of man from early childhood is regulated by the experience of the entire human race and by the demands of society. This type of behaviour is so specific that the psychologists have coined a special term for it—activity. What are the distinguishing features of this specifically human type of activeness?

The first of them consists in that the *content of activity is not wholly determined by the need that initiates it*. Whereas the need as the motive sets off and stimulates the individual's activity, the latter's forms and content

are determined by social conditions, demands and experience. Thus a human being may be motivated to work by the need for food. Yet a machine tool operator, for instance, performs his functions not because his work satisfies his hunger, but because it enables him to fulfil a task he has been assigned—to manufacture a definite part. The content of his activity is determined not by a *need* as such, but by a *goal*—to make a definite product demanded by society. The *reason* for a definite kind of activity does not coincide with its *purpose*. The inducements, motivation of man's actions diverge from the immediate *goal* he pursues.

Hence, the first distinguishing feature of activity consists in that activity, being born of the need as its source, is controlled by the conscious goal as its regulator.

Mental regulation of activity can only be successful if the psyche reflects the *objective properties of things* and, using them (and not the organism's needs) as a guide, determines the *methods for achieving the set goal*. Besides, man in his activity should be able to control his behaviour so as to perform goal-oriented actions, namely, he must *stimulate and maintain necessary activeness which is not backed by the immediate satisfaction of the arising needs*. *Activity is directly linked with cognition and will, relies upon them for support and is impossible without cognitive and volitional processes.*

So, *activity is man's inner (mental) and outer (physical) activeness regulated by his conscious goal.*

Activity thus presupposes a *conscious goal* which shows up in man's activeness. All other aspects of activity, such as its motives, concrete actions, selection and processing of necessary information, may or may not rise to the level of consciousness. An individual may also be only partly aware of them or even misinterpret their true character. For instance, a child under school age is seldom aware of the needs that underlie his urge to play, or a junior schoolboy, of the motives for learning his lessons. An undisciplined teenager, too, fails to realise fully the true motives of his actions and usually tends to misinterpret them. Even adults are sometimes inclined to take for granted the secondary "masking" motives prompted by their consciousness as a justification for their incorrect or unworthy behaviour.

Not only motives, but also many thinking processes which have led to the selection of one or another plan of activity are seldom realised by man in full. As regards the methods whereby activity is effectuated, most of them are usually regulated unconsciously. Such is also the case with habitual action: walking, speaking, writing, driving a car, playing a musical instrument, etc.

The extent to which all these aspects of activity are reflected in consciousness determines the level of an individual's awareness of the corresponding activity.

However, whatever the level of this awareness, the *realisation of the goal* always remains a necessary characteristic of activity. In those cases when this characteristic is lacking, we have only *impulsive behaviour*, but no activity typical of human beings. In contrast to activity, impulsive behaviour is controlled directly by needs and emotions. It reflects nothing else than an individual's affects and instincts, not infrequently being selfish and antisocial. Impulsive behaviour, for instance, is characteristic of a person blinded by fury or irresistible passion.

Impulsive behaviour is not unconscious behaviour. However, acting impulsively (spontaneously), the individual is only *aware of the personal motive* which controls his behaviour and does not realise its social content represented in the goal.

II.4.2. Structure of Activity

Activity represents a form of active attitude to reality whereby man establishes real links between himself and the surrounding world. Through activity man exerts his influence on nature, external objects and other people. Realising and revealing in activity his inner properties, man poses *as subject* in relation to things and *as personality* in relation to other individuals. Being, in turn, an object of their reciprocal actions, the subject thus reveals the true, objective, essential properties of human beings, things, nature and society. Things are viewed by him *as objects*, and human beings, *as personalities*.

Actions and Movements. In order to determine the weight of a stone we must lift it, and in order to ascertain the reliability of a parachute, we must make a parachute

jump. By lifting a stone and descending with a parachute a person determines their real properties through activity. He can replace these real actions by symbolic ones, for instance, he can say that the stone is heavy or calculate the speed and trajectory of the descent by the corresponding formula. Yet practice, practical activity always goes first. This activity reveals not only the properties of a stone or a parachute, but of the man himself (his motives for lifting the stone, using the parachute, etc.). Practice determines and reveals what an individual knows and what he does not know, what he sees in the world and to what he is blind, what he chooses and what he rejects. In other words, it determines and reveals the content of the human mind and its mechanisms.

The goal towards which activity is directed is typically a more or less remote one, wherefore its attainment consists in the solution of a series of *particular tasks* confronting an individual.

For instance, the labour activity of a worker is on the whole directed towards the production of a definite range of products of the set quality at a definite rate. In order to achieve this goal, he must solve a number of minor tasks within each specified period, for instance, he must mark out a blank, load a machine, turn a part, etc.

These relatively separate units of activity aimed at achieving one simple intermediate aim are called actions.

The labour actions indicated above are *object-related* actions, i.e., aimed at changing the state or properties of the objects of the external world. Any object-related action consists of certain *movements* linked together in space and time.

For instance, the action consisting in writing letter "a" includes clamping a pen (pencil) between the thumb, the forefinger and the middle finger set in a definite way in respect of the pen and one another; raising the pen (pencil) above the paper and lowering it till the nib contacts the sheet in a definite place; moving the pen in a circle from right to left upwards and counterclockwise, stopping at the initial point at the top, moving downward along an inclined line, turning right after reaching the lower level of the circumference and finishing by drawing an arc from left to right.

Analysis of man's object-related movements shows that despite their external diversity all of them consist, as a rule, of three simple elements—"taking", "shifting" and "releasing" combined with auxiliary movements of the body, legs and head. In different kinds of movements these elements vary in trajectory, duration, force, speed, rate (number of repetitions per unit of time) and are differentiated in accordance with the part of the body that performs them. From the viewpoint of *quality*, movements are characterised by precision, neatness, dexterity and coordination.

Besides object-related movements, man's activity also includes movements enabling an individual to adopt and preserve a definite *posture* (standing, sitting, etc.), *move* (walking, running, etc.) and *communicate* with other individuals. The means of communication include expressive movements (facial and bodily expressions), semantic gestures and, finally, *speech movements*. Besides arms and legs, the above indicated movements are performed by muscles of the body and face, the larynx, vocal chords, etc.

Hence, the performance of an object-related or any other external action consists in the *execution of a definite series of movements*. It depends on the goal of the action, the properties of the object towards which this action is directed, and on the conditions under which it is accomplished.

Indeed, taking a glass requires a different set of movements from those involved in taking a pencil, just as skiing is different from walking. The displacement of a heavy weight requires a different exertion of one's strength than the shifting of a light parcel. Driving a large nail is different from driving a small one, and whitewashing a ceiling requires a different series of movements than painting a floor.

In all these examples the goal of the action is the same, but the *objects* are different. This difference of objects calls for a different structure of movements and muscular activity. Investigations of Soviet physiologists have shown that the work of muscles is controlled not only by the required motility of the assigned task, but always by the *conditions* under which the motor acts are to be accomplished. Muscles adjust, as it were, their active-

ness to the weight being lifted, the resistance of the object being pushed, the recoil of the joint levers, etc. in order to maintain the required direction and speed of movements.

Action Control and Monitoring. The accomplishment of a movement is constantly controlled and adjusted by *correlating its results with the final goal of the action*.

Patients with impaired control and adjustment of movements prove unable to execute even the simplest actions. They always miss the glass when attempting to take it from the table, carry it past their mouth when wishing to drink, and cannot put it back in place. They sink past the chair, cut their fingers with a knife instead of bread, are unable to draw a straight line, etc.

How do we monitor our actions? As yet, the picture is far from being clear. One thing, however, is indisputable—the desired effect is achieved with the help of sense organs (vision, audition, muscle sensation). The role of *sensory monitoring* can well be illustrated by experiments in which the subject is assigned to draw the outline of a geometrical figure, e.g., a six-pointed star, looking at its reflection in a mirror.

At first, all attempts usually prove unsuccessful as the pencil reflected in the mirror travels in the opposite direction to the hand's movement. It is only through training that the subject learns to coordinate the movement of his hand with visual data.

Even more interesting from this viewpoint are experiments in which the subjects were to use prismatic glasses heavily distorting the picture of the actual position of objects and hand movements.

It turned out that the subjects under these conditions were absolutely unable to control their movements (get hold of objects, touch them, set them in the assigned place, etc.) and needed prolonged training to overcome the effect of distorted vision. If visual signals were additionally delayed by approximately 0.27 sec, no training could help the subject to adapt himself to the situation. Incidentally, restrained animals are equally unable to control movements of their paw if they do not see it.

These experiments show convincingly that movements are controlled on the feedback principle. Feedback data are transmitted via sense organs as channels of

information and originate from definite perceived signs of objects and movements serving as *reference points of an action (afferent feedback)*.

Hence, the execution of an object-related or some other external action is not limited to the performance of a definite series of movements. It necessarily includes *sensory monitoring and correction of movements in accordance with their current results and properties of the objects of action*. This process is based on the *interiorisation of sensuous reference points informing the brain of the condition of the environment, the manner in which it reacts to the movements, and the attained results*.

Thus, the blacksmith proportions the force of his hammer's blow to the temperature of the forging which can be roughly determined by the metal glow. The carpenter proportions his pressure on the plane and the speed of the plane movement to the intensity of the muscle sensation depending on the resistance of the wood. The crane operator carries the cargo along a complex and the most suitable trajectory constantly adjusting it by carefully proportioned movements of arms and legs under visual control. The driver applying pressure to the brakes takes into account the speed and weight of the lorry, the condition of the road bed, etc.

All these reference points, however, determine movements *not by themselves*, but in accordance with the *goal of the action*. For instance, use of a pair of compasses for drawing circles and for measuring line segments calls for different series of movements. The movements of a pencil when writing letters "a" and "o" are different. The series of movements of a passenger trying to make a bus will by no means suit an athlete wishing to break a record. In all these cases we have identical objects of actions (a pair of compasses, a pencil and a sheet of paper) or even identical actions (running), but different goals, therefore the series of movements making up these actions are different.

In the final analysis, the series of movements making up an action is *controlled and regulated by its goal*. Indeed, it is from the viewpoint of the goal that we appraise the results of the accomplished movements and introduce the necessary corrections. Nothing else than the goal of an action determines the properties and conditions of things

which become the reference points of its execution, monitoring and correction.

Now, the goal is usually something that is absent at the moment and should be attained through action. Consequently, the goal is *represented in the brain by an image, a dynamic model* of the anticipated result of activity. It is with this *model of the desirable* (necessary) *future* that we correlate the actual results of an action, it is this model that controls the pattern of movements and corrects it. Even in a very simple set of actions, for instance, when an individual takes a glass of water and brings it to his lips in order to drink it his actions are controlled by the models of the desirable result (quenching thirst) and of the path his hand must follow to reach the glass and then, together with the glass, to come to the lips. These models of the forthcoming action (a programme of actions) and its results (a goal programme) which anticipate in the brain the action itself have been called by physiologists the "acceptor of action" and "outstripping reflection" (*Pyotr Anokhin*), "motive task" and "model of the necessary future" (*Nikolai Bernstein*), "necessary image" and "model of the future" (*Mittelstaedt, W. Ashby*), "prototype" and "dynamic model", etc.

The diversity of terms reflects the diversity of proposed hypotheses regarding the nature of these models, their development and functioning in the brain. We have no authentic knowledge on this subject so far. Yet we do know that the forthcoming actions and their results are somehow anticipated in the brain, otherwise, as we have seen, goal-oriented activity will not be possible at all. **Interiorisation and Exteriorisation of Activity.** How can the brain forecast the future and how can the mind reflect the results of actions which have not yet been performed? The possibility of forecasting stems from one basic characteristic of the surrounding world—its *law-governed character*. It means that different phenomena in the world are connected to one another by definite permanent links and relations, and that objects in the world have definite stable properties and structures revealing themselves under certain conditions (fire always burns; night is always followed by day; the acceleration of a body is proportional to the force applied to it; rearrangement of addenda does not change the sum, and so on).

Such *stable (invariant) relationships* among objects and among phenomena are called *essential properties* of objects and *law-like regularities* of phenomena. These essential and stable properties and regularities permit anticipating the "behavioural patterns" of objects and phenomena under definite conditions, i.e., make it possible to forecast their changes under these or those influences and to regulate them in accordance with the aim being pursued. The external, object-related activity is preceded, as it were, by internal, ideal activity. Actions related to objects are replaced by ideal (mental) manipulation of the objects' essential properties, i.e., the physical manipulation of things is eliminated in favour of the ideal manipulation of their meanings.

This process of transition from an external, real action to an internal, ideal one is called *interiorisation*. Owing to interiorisation man's mind becomes capable of manipulating images of objects which are not present in his field of vision at the moment. Man oversteps the bounds of the living present and his imagination carries him freely to the past and future in time and space. Man casts off the chains of the external situation which determines the entire behaviour of the animal.

As yet, psychology does not know all the details of interiorisation. It has been proved, however, beyond any doubt that an important instrument of this transition is *word* and that its vehicle is speech as vocal activity. The word singles out and consolidates in itself the essential properties of things and the methods of manipulating the information developed in the practical life of humanity. Therefore learning the correct use of words goes hand in hand with the assimilation of essential properties of things and methods of manipulating information. Through word man assimilates the experience of the whole human race, i.e., of hundreds of preceding generations, as well as of people and collectives which may be hundreds and thousands of miles away.

Manipulating words and other real symbols representing relations between things makes it possible therefore to manipulate information about the corresponding relations *in the absence of things themselves* and to regulate the activity and behaviour of man through the agency of experience and knowledge, ideals and require-

ments developed during the course of society's practical activity.

Man's activity is a very complex and peculiar process. It is not limited to a simple satisfaction of the individual's needs, but is largely determined by the goals and demands of society. Its distinguishing feature is the awareness of the goal and dependence on social experience for its attainment.

Man's activity is characterised by indissoluble connection between its external (physical) and internal (mental) aspects. The external aspect, the movements whereby man acts on the external world is determined and regulated by internal (mental) activity, the processes related to motivation, cognition and regulation. On the other hand, internal mental activity is guided and controlled by external activity which reveals properties of things and processes, effects their goal-oriented transformations, brings out the degree of adequacy of mental models, as well as the extent to which actions and their results coincide with their ideal images.

As has been shown above, internal, mental activity can be regarded as a result of the interiorisation of external, object-related activity. In a similar manner, external, object-related activity can be regarded as *exteriorisation* of internal, mental activity.

II.4.3. Interiorisation of Activity. Habits

Automation of Movements and Development of Habit. The above indicated aspects of any action may be called respectively its *motor* (motive), *sensory* (sensible) and *central* components. Accordingly, the functions performed by these components in the execution of an action may be defined as *execution, control, and regulation*. *The methods of execution, control and regulation of actions performed by man in his activity are known as methods of activity.*

Each of the above indicated functions can be realised by man both consciously and unconsciously. For instance, the series of movements of the larynx required to pronounce words never enters man's consciousness. By

contrast, the grammatical forms and the content of a sentence which an individual is going to pronounce are always anticipated in his consciousness. The individual is usually unaware of those complex combinations of muscular contractions and extensions which are needed to perform any movement. Such movements are evidently performed on a purely physiological basis, quite unconsciously. Yet the individual is normally aware of the final goals of his actions, as well as of their general character. For instance, a man cannot ride a bicycle in a state of complete unconsciousness. He must be generally cognizant of his destination, the path he follows, the speed of his travel, etc. The same is true of any labour, play and other actions. Finally, some movements can be performed at the levels of both conscious and unconscious regulation. Thus walking is a typical example of activity in which most movements are performed unconsciously. However, in rope walking the execution of the same movements, the sensory control and central regulation become an object of most intense awareness, particularly if the rope walker is not sufficiently experienced.

There may also be cases when certain aspects of an action call at first for detailed conscious regulation which gradually becomes unnecessary due to developing *automatisms*.

This partial automation of the execution and regulation of purposeful movements is nothing else than a habit.

It is worth noting here that we speak of *unconscious or automatic regulation* only with respect to *movements*, and that *regulation of movements* should not be confounded with *regulation of actions*. The increasing automation of movements may go hand in hand with the expansion of conscious regulation of actions which incorporate these movements.

Indeed, the automation of movements whereby a bicyclist maintains his balance enables him to keep an eye on the surrounding traffic, take account of the roadbed condition, etc. and thus improve conscious control of his actions. In like manner, the growing automatism in identifying the right keys permits a beginning pianist to increase sharply the level of conscious control of his performance in general and enables him to focus on nuances in order to convey the spirit of the musical composition.

The term "pure habit" is evidently applicable to animals only, because any activity of man, except in pathological cases, is controlled by consciousness. The automation of these or those components of an action only changes the object of conscious regulation and brings in the limelight of consciousness the general goals of the action, the conditions of its execution, the control and evaluation of its results.

Structure of Habit. Changes in the structure of the action resulting from its partial automation affect the pattern of movements, the methods of sensory control of the action and the methods of its central regulation.

1. *Patterns of Movements.* A number of individual movements which have been performed hitherto separately merge into a *single act*, one complex movement without any pauses or intervals between individual components (simple movements). For instance, the gear shifting procedure performed by the trainee as a step-by-step action is executed by the experienced driver as a single even movement of the hand. *All unnecessary movements are eliminated.* A child learning to write makes a lot of superfluous movements: sticks out his tongue, rocks himself to and fro in his chair, bends down his head, etc.

As his skill increases, all such movements disappear. The trainee learns to *combine movements*, i.e., to use both hands or both feet, if necessary. As a result, the *rate of his movements increases*. Hence, as the habit consolidates, the motility of the action becomes more economical in every respect, the pattern of movements grows simpler, the individual movements merge in a continuous process, being performed simultaneously and at a higher rate.

2. *Methods of Sensory Control of Action.* *Visual control* of movements largely *gives way to muscular* (kinesthetic) control. This change can well be illustrated by the example of a skilled typist who does her work without looking at the keyboard. Special *sensory syntheses* developed in the course of time enable the individual to appraise the correlation of different variables which determine the character of movements. Such syntheses can be exemplified by the driver's good eye and sense of speed, the carpenter's sense of material, the turner's and grinder's sense of size, the pilot's sense of attitude. An individual

learns to *quickly distinguish and single out important reference points* to control the results of an action. Thus the driver develops a capacity for distinguishing the running engine's tones indicative of its load, the steel-maker learns to identify the tints of a melt attesting to its composition, temperature, etc.

Hence, as the action becomes more and more habitual, the results and the conditions under which the action takes place lend themselves to ever more accurate and rapid quality control.

3. *Methods of Central Regulation of Action.* Attention is no longer focused on the perception of *methods of actions* and shifts mainly to the *situation and results of actions*. Some calculations, solutions and other intellectual operations are performed quickly and in a single continuous process (intuitively). Thus on perceiving aurally that the engine is overloaded, the driver immediately, without thinking, identifies the gear which is to be thrown in; casting a glance at instruments, the operator instantaneously identifies deviations in the work of the apparatus and decides on corrective actions. Internal readiness for subsequent movements comes about simultaneously with the execution of antecedent ones which sharply cuts down the reaction time. When starting the landing procedure, the pilot is already inwardly prepared for the entire series of stereotyped actions involved in landing under given conditions. Therefore changes from one movement to another are effected without preliminary planning. Subject to planning is only the method of landing. Such *antecedent awareness of a whole chain or series of methods which are to be implemented is called anticipation*.

Interiorisation of Activity and Exercises. How do these changes in the methods of action come about, what is their psychological mechanism?

Basically, it is a mechanism which includes elements of *research and selection*. When an individual attempts to master a definite action and checks upon its result, he gradually selects and consolidates the most expedient and suitable movements, reference points and methods of regulation, rejecting the impractical and inexpedient ones. Such *repeated execution of definite actions or of activity aimed at mastering them, based on understanding*

and accompanied by conscious control and correction is called exercise.

Change in the character of man's actions during the course of exercise reflects changes in the structure of his mental activity during the execution of these actions. Every new attempt accompanied by conscious control and adjustment results not only in memorising the methods and aims of actions. It generally involves *changes in the way a task is considered, in the methods used for its solution, in the regulation of the action.*

Let us consider, by way of example, changes in the activity of an apprentice during repeated performance of marking-out operations on several similar parts.

First part. The apprentice is faced with a new action. So far, he has only seen and understood how the action should be carried out. In order to carry it out independently, he has to translate the verbal instructions of his teacher and the visual images formed during demonstration into the language of motility, i.e., regulation of his own movements. Trying to perform the operation, noticing and correcting his mistakes, the apprentice for the first time begins to comprehend its "motile essence" and "feel with his muscles" the methods of its execution. The picture of the action in his mind, its visual image is supplemented with the muscle sensation needed to regulate the movements. It is precisely at this stage that the gap is bridged between the general idea of an action based on its image and logical representation, on the one hand, and the actual execution thereof, on the other. On this new base the apprentice forms a motor-sensory image of the operation and its object-related intellectual notion, i.e., the mental model of the action which regulates and controls its execution.

Second part. The apprentice approaches it with the already formed motor-sensory (kinesthetic) representation of the methods to be used in performing and regulating the necessary actions. Therefore he does not have to overcome most of the difficulties involved in transition from words to deeds, from image to action. Hence the leap-like improvement of his performance in both quality and speed characteristic at this stage.

Third and fourth parts. Changes in the working procedure from part to part are not as conspicuous as before,

consisting mainly in eliminating unnecessary movements, correcting faulty ones, combining associated movements in a continuous series and increasing unification of methods; as a result of this unification the movements become ever more automatic escaping the control of consciousness and approximating to a set of conditioned reflexes.

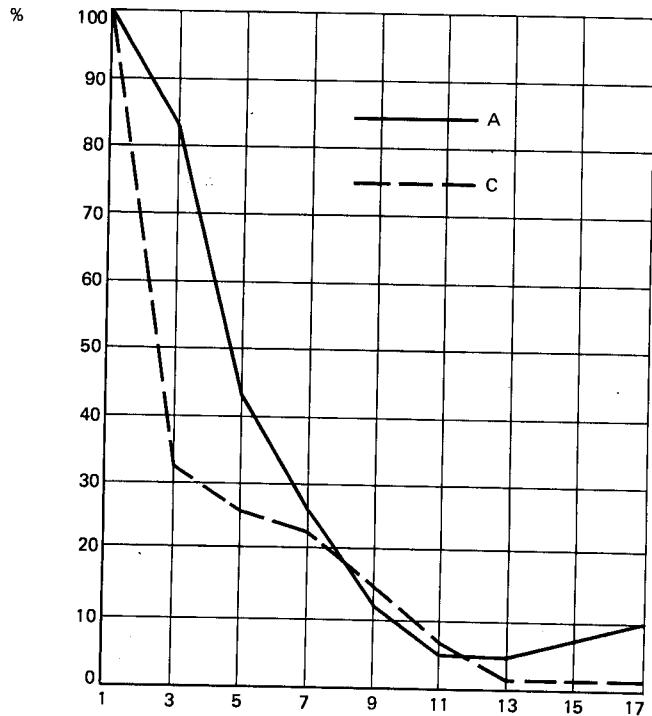


Fig. 3. Teaching curves: X-axis — number of attempts; Y — axis — time (distance), per cent of first attempt.

$N+N+I+... parts$. The automation of basic control and regulation patterns frees the mind, as it were, from petty tutelage and enables it to take a broader account of conditions of an action. The apprentice learns to control the speed of his actions, adapt them to changing tasks, new situations and new parts.

Exercise Curves. The process of mastering an action can be presented diagrammatically in quantitative terms by treating, for instance, one of the action variables (number of errors, number of correct solutions, time per part, total output) as a function of the number of exercises (attempts). In order to draw up such a diagram, we should lay off the number of attempts along the X-axis (abscissa), and the measured variable on the Y-axis (ordinate). The line connecting the plotted cross-points is called the *exercise curve* or the *learning curve*. It characterises the consolidation of the habit being formed.

Curves describing the results of concrete experiments show a great degree of diversity. Even with one and the same individual performing similar tasks curves are never identical. Generally speaking, however, all exercise curves may be divided into two types: (a) deceleration curves when the process of habit formation starts at a high rate and then gradually slows down approximating a certain limit, e.g., in speed, number of errors, etc. (b) acceleration curves when the habit formation starts slowly and gradually gains speed.

Figure 3 illustrates learning curves describing the formation of a maze mastering habit in adults (curve A) and children (curve C). The number of errors, the time spent or the distance covered in per cent of the original value in the first attempt are plotted on the Y-axis. As is evident from the graph, both curves are of the deceleration type. Figure 4 illustrates a learning curve of schoolchildren solving mathematical problems of one type: the ordinate represents the number of errors (wrong questions and wrong execution of operations) in per cent of the initial value.

The first type of learning curves is characteristic of a predominantly try-and-error method (which in the case of human subjects can be exemplified by mastering an unknown maze). The second type of curves is characteristic of problems whose correct solution mainly calls for understanding. In these cases the problem is solved correctly and errors are not repeated once the subject comprehends the method of their solution.

Habit as Consciously Automated Action. No habit can be formed without repeated attempts to perform a given action. Proceeding from this obvious fact, some psy-

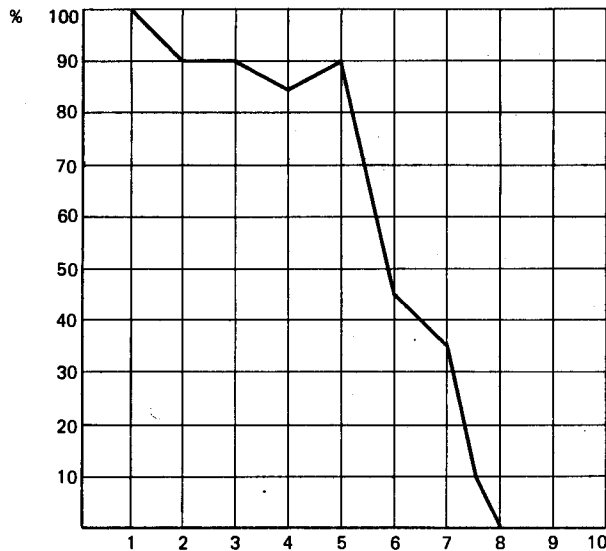


Fig. 4. Exercise curve: X-axis—number of one-type tasks; Y-axis—number of errors, per cent of initial result

chologists, particularly behaviourists, seek to identify the processes of habit formation in animals and man. However, the similarity of the physiological mechanisms should not overshadow the basic difference of the habit forming processes. In contrast to animals the performance of an action by man is always regulated in one way or another by the mind. For this reason the processes involving animals acquire an entirely different character as compared to man. His practical trials are conscious attempts to reproduce definite movements. The verification of results, the assessment of conditions and the correction of actions are also conscious to a greater or lesser extent. This restructures the very source of attempts at research. For instance, instinct as a base of imitation by animals gradually gives way to conscious purposeful *observation* of model actions being mastered by humans. Even more important, however, is the fact that the process of method selection and regulation by man depends to an ever

increasing degree on his understanding of their purpose and on his *notions* of their content.

The leading factors in the process of habit formation are *speech activity* understood as the verbal reproduction by man of observable and accomplishable actions and *ideal activity* understood as the reproduction in the mind of the image of the action to be performed. These basic distinguishing features of the habit forming mechanism in man underlie the regularities of the process of habit formation.

By habit is understood a *consciously* automated action or a *method of performing an automated action*. Its

Habit formation stage	Character of habit	Goal of habit	Action specifics
1. Acquaintance	Comprehension of actions and their representation	Getting familiar with methods for performing actions	Clear understanding of the goal, but a vague idea of the methods for its attainment; gross errors in the action
2. Preparation (analytical stage)	Conscious, but inert execution	Mastering individual elements of the action; analysis of methods for their execution	Clear understanding of the manner of performing an action, but inaccurate and unstable performance; many unnecessary movements, attention overstrained; concentration on actions; poor control
3. Unification (synthetic stage)	Automation of action elements	Combination and integration of elementary movements in a single action	Improved performance, merging of movements, elimination of unnecessary movements, shift of attention to the result; improvement of control, change-over to muscle control
4. Variation (situational stage)	Plastic adaptation to situation	Mastering voluntary regulation of the character of action	Flexible purposive performance of actions; control based on special sensory syntheses; intellectual syntheses (intuition)

purpose is to free the mind from control over the procedure of accomplishing one or another action and to switch it over to the goals of an action and conditions

under which it is performed. The main stages of this process may be illustrated by the given table.

The formation of an individual habit never takes place as an independent isolated process. It is influenced by and pervaded with all accumulated experience of mankind.

Interaction of Habits. Every habit is formed and functions in a system of the already existing habits. Some of them help the new habit to take root and become operational, others militate against it, still others tend to change it, etc. This phenomenon is known in psychology as *interaction of habits*.

What is the nature of such interaction? The action is *determined* by its goal, object and conditions (situation), but *accomplished as a system of definite methods of motile execution, sensory control and central regulation*. The success of the action, i.e., the efficacy of the habit depends on the extent to which these methods correspond to the goal, objects and conditions.

When faced with a new task, the individual at first tries to tackle it by the methods he has already mastered, and this is an important feature of the process of habit formation. Orienting himself on the new goal, he applies for its attainment the methods he has used in the past for the solution of similar tasks. Hence, *success in the transfer of known methods of activity* is contingent upon the individual's assessment of tasks from the viewpoint of the similarity of their solution. In point of fact, the habit forming process takes one of the two courses representing extreme situations.

Situation 1: the goal, or the objects, or the conditions of two actions are perceived by an individual as similar ones, whereas the actions actually differ either by the methods of their execution, or by control procedures, or by the methods of their central regulation. The situation arises in the form of the inadequacy of methods. Revealing this inadequacy, overcoming its effects and replacing the inexpedient methods by sound ones takes much time and calls for repeated attempts. The formation of a habit becomes more difficult and slows down. This phenomenon is known in psychology as the *negative transfer or interference of habits*.

Here are a few examples. At drawing lessons children

are taught to draw a vertical line from top to bottom, and at technical drawing lessons which come later, from bottom to top. The conflicting requirements create a serious problem for schoolchildren and hamper the formation of habits needed for technical drawing. The adverse effects of the interference mechanism has been dramatically demonstrated a few years ago in Sweden when the authorities announced a change from left to right driving. The result was a terrible mess in the streets and a record number of road accidents.

Situation 2: the goals, the objects or the conditions of two tasks are *outwardly different*, whereas the actions needed for their proper accomplishment are similar in terms of methods of execution, control or central regulation.

Thus good habits of work with a file are usually very helpful to a pupil learning to cut metal with a hack-saw. Indeed, despite the difference of the objects and goals of actions, the methods of their execution and sensory control are similar. In both situations the distribution of efforts between the two hands required to keep the tool in a horizontal position while working is practically the same. From the outset the second situation is characterised by correct actions facilitating the formation of the necessary habit. This is a case of a *positive transfer or induction of habits*.

The influence of experience and old habits on the formation of a new habit depends not only on the character of the actions themselves and their objects, but also on the individual's attitude to these actions and objects. The adverse effect of the negative transfer hindering the process of learning and particularly relearning may be weakened substantially, if the interfering tasks are spaced in time and the pupil is informed of their essential differences. On the other hand, the positive effect of the habit transfer may be greatly enhanced and the learning period cut down if the teacher specially demonstrates before the pupil the features of essential similarity between the tasks which look different.

The reorientation towards new objects accompanied by the divorce, separation of an action from those conditions under which it has been formed is an important event with far-reaching consequences. In a number of instances

such a transfer enables the individual to accomplish new types of tasks without any trials and errors, i.e., opens the way to a basically new type of behaviour—*intellectual behaviour*. The importance of such a “*transplanted*” action divorced from its original environment accounts for the new term whereby it is designated—*operation*.

The transformation of action into operation is only possible on the basis of definite mental activity: the perception of similarity, generalisation, etc. The possibility of such transformations extends also to the procedures involved in the central regulation of action, i.e., to the transformation of mental actions into operations.

Experiments with drawing the outline of a geometric figure reflected in the mirror showed that the correcting habits developed for the left hand proved helpful when changing to the right hand. The same transfer of methods also accounts for the fact that an individual's handwriting retains its characteristic features irrespective of the letters written by him. Moreover, these features show in writing with the left hand, with a pencil held between teeth and even clamped between toes.

Due to the closeness of structures inherent in the system of central regulation languages with similar grammatical systems and vocabularies (e.g., English and German, Russian and Ukrainian) are less difficult to learn than dissimilar languages. The same type of transfer permits applying mastered calculation techniques to very different numbers, using common formulae for the solution of different problems, etc. In the final count the transfer principle underlies the automatic implementation by man of logical constructs during the course of comprehension and processing of any information.

It is not fortuitous that the problem of habit transfer is one of the key issues in pedagogic psychology. Correct and successful reorientation of habitual actions on new tasks enables the individual to master new types of activity within short periods and with a minimum number of errors. The broader the range of objectives achievable through the use of habitual actions, the broader the scope of tasks the individual is capable of solving on the basis of his habits. Put another way, the broader and more accurate the transfer of acquired conscious auto-

matisms, the more fruitful the results of his studies, the more helpful they are in his activity.

Skills. Any type of behaviour in new conditions or in respect of new objects is based on the transfer of operations. The latter in turn rests on the similarity of those conditions or properties of things which are important for the goals of the individual's activity.

An individual may or may not be aware of this similarity. The more complex the activity, the remoter the goals and the greater the transformations of objects they require, the broader the intermediate intellectual activity needed to secure a successful transfer. However, in any case such a transfer can be regarded as a *skill*, i.e., *an ability to use the available knowledge and habits for the selection and implementation of methods of action in accordance with the set goal*.

A skill involves exteriorisation, i.e., the translation of knowledge into physical actions. Its starting point is the processing of information on an ideal level, i.e., in consciousness. Its outcome is the correlation of practical actions with the results of this ideal activity. For instance, an individual is faced with a problem—to determine the volume of a given geometrical body. In order to solve this problem, he has to find out, first of all, to what class of geometrical bodies it belongs. After that, he has to recall the methods for calculating the volume of such bodies, to determine the measurements to be taken, to take the corresponding measurements and, finally, to perform necessary calculations. As we see, the translation of knowledge into skill requires a series of habits and operations.

Thus, by skill is meant the *mastering of a complex system of mental and practical actions needed for purposeful regulation of activity by the individual through knowledge and habits available to him*. This system includes selection of knowledge related to the task, singling out of properties essential for the task, determination on this basis of a system of transformations leading to the accomplishment of the task, realisation of the transformations themselves, control over the attained results by correlating them with the set goal, and correction on this basis of the whole process described above.

The skill-forming process consists in mastering the

whole set of operations involved in the processing of information both available in knowledge and received from the object, as well as the operations related to the identification of this information and its correlation with actions.

It should be noted that the skill-forming process, i.e., skill teaching, may follow different lines which can be reduced to *two basic patterns*. In the first pattern the subject possesses necessary knowledge. The tasks set before him call for their rational use and the individual himself seeks the solutions identifying by the try-and-error method the corresponding reference points, the methods of processing available information and the methods of activity. This pattern which is the most widely used at present is the least effective.

In the second pattern the instructor controls the subject's mental activity inducing him to make effective use of the available knowledge.

In the latter case the pedagogue familiarises the pupil with reference points for selection of meaningful signs and operations, and organises his activity in the processing and implementation of obtained information for the solution of set problems. This approach is now given priority attention in pedagogic psychology.

II.4.4. Main Types of Man's Activity and Their Genesis

Man's activity as conscious activeness is formed and develops alongside the formation and development of his consciousness. It also serves as a basis for the formation and development of consciousness and as a source of its content.

Formation of Activity. The activity of an individual is inseparable from the system of his relations with other individuals. It necessarily involves assistance and participation of other people, i.e., acquires the character of *joint activity*. Its results exercise a definite influence on the surrounding world, on the life and destinies of other people. For this reason activity is always indicative not only of the individual's attitude to things, but also of his attitude to other people.

In other words, activity both *reveals and moulds an individual's personality*.

Participation in the goal-oriented socially useful activity of a united well-organised collective tends to foster team spirit, self-discipline and ability of an individual to link his personal interests with the interests of society. The concept of activity as the leading factor in moulding the personality was adopted by the outstanding Soviet pedagogue A. S. Makarenko as the basis for his theory and practice of educational work. Following this theory, he organised the entire life of the inmates of the children's home he was in charge of in such a way as to involve the children in all sorts of activity that tended to develop valuable human qualities (firmness of purpose, discipline, honesty, sense of responsibility, persistence). For instance, Makarenko practiced night hikes and watches demanding of the children the ability to overcome fear and display endurance and self-control. Acts of bravery which were often repeated gradually turned into a habit. The need for definite acts accomplished under definite conditions engendered habits that grew into personality traits.

Man's engagement in different types of activity comes out as an outgrowth of a protracted and complex process of internal development, and the child's activeness assumes the forms of conscious goal-oriented activity only as a result of sustained efforts of educators and instructors.

At first this activeness manifests itself in *impulsive behaviour*. The newborn baby's reactions are limited to just a few simple innate responses—defensive (contraction of the pupil under the effect of bright light or loud sound, crying and locomotor anxiety in case of pain), food-seeking (sucking reflex), labyrinthine (calming down when being rocked) and, some time later, orienting-exploring (turning the head towards the irritant, following a moving object with the eyes, etc). Beginning from the eleventh or twelfth day the baby begins to form the first conditioned reflexes. These provide the base for the development of *exploratory behaviour* (grasping, examining and manipulating various objects) which becomes manifest towards the end of the infant's first year and enables it to accumulate information on

properties of external objects and to master the coordination of movements. Starting from the second year, the baby stimulated by teaching and relying upon its instinct of imitation begins to develop *practical behaviour* mastering human ways of using various things and discovering their meanings in social practice (e.g., learning to sleep in bed, sit on a stool, play with a ball, draw with a pencil).

In unity with these forms of activeness the child develops *communicative behaviour* as the basic means for satisfying his needs and wishes, learns the demands made on him by society and gets access to various sources of information.

At first this behaviour is realised in prelinguistic forms (cries, mimicry, gestures). Starting from the seventh or eighth month the baby begins to master, first passively and then actively, the principal means of human communication, interaction and exchange of information—*linguistic behaviour*. The mastering of speech creates basic prerequisites for the separation of images from things and actions, for singling out, fixating and manipulating different meanings as instruments for behaviour control. **Play.** Already during the first years of its life the child develops prerequisites for mastering the simplest forms of activity. The first of such prerequisites is *play*.

It is known that play in the form of bustle, sham fights, running about, etc. is also characteristic of young animals. Some animals like to play with things, for instance, a kitten would lie in watch for a moving clew, jump at it, roll it over, toss up and seize again, a puppy would drag about and tear to pieces a rag, etc. The behaviour of young animals during play can be regarded primarily as the realisation of the organism's need for activity, a discharge of accumulated energy. This is attested to by the fact that their tendency to playful behaviour is inhibited by starvation or undernourishment, high ambient temperature or the effect of chemical substances raising the body temperature or depressing the brain activity. If an animal is deprived for some time of play partners, its excitability and game activeness after that sharply increase testifying, as it were, to a need to give vent to accumulated energy. This phenomenon is known in psychology as "game hunger."

Inducement to play is referable to connection between

game activity and the organism's energy exchange. Whence, however, are the forms of behaviour providing the framework for the realisation of game activity? Observations show that some of these forms are represented by animals' innate instinctive actions which is the case, for instance, with the hunting behaviour of the kitten. Others arise from imitation, for instance, the repetition by young chimpanzees of the actions of adult species and people. Still others are developed by the animal itself during its interaction with the surrounding world. Thus the sources of actions performed by animals' young are the same as in adults—specific instincts, imitation and learning. Therefore the young's actions cannot but be similar to the specific behaviour of adult animals. However, in contrast to the actions of adult animals serving to satisfy real biological needs, such as the need for food, protection against enemies, orientation in the environment, avoidance of danger, etc., the actions of the young ones are divorced from their real biological needs and performed for the sake of activity itself. This is the basic distinguishing feature of play behaviour. *Its purpose is the activity itself, and not the practical results attained through it.*

Investigations show that for a child, too, play is a form of the realisation of its activeness, a form of its vital activity. As such, it is connected with functional pleasure. It is induced by the need for activeness, and its sources are imitation and experience. Yet play actions of the child develop from the very beginning on the basis of human methods of using things and human forms of practical behaviour mastered in communication with adults and under their guidance. This is the fundamental characteristic of children's play which underlies the basic distinctions of its forms, sources, mechanisms, functions and results from the games of animals.

Besides *objects-instruments*, the child is confronted in its practical activity with other kinds of things—*toys*. The human method of using them is play, i.e., the representation through them of some other, real things and actions. Children learn this way of using toys from adults, who show the child how a doll is to be given water, rocked to sleep, taken for a walk, how a Teddy bear is to be fed, a toy car driven, etc.

Yet the very attitude to a toy as a substitute for a "real" thing arises in the child only after a new element comes into play—*word*.

A small child (aged from one to two) is unable, for instance, to transfer the actions of rocking, feeding, etc. from a doll to a stick. He cannot simulate an action without the corresponding object or transfer this action from one object to another. Such operations only become possible as the child starts mastering speech. In order to treat a piece of wood like a doll, the child should give the doll a name, for instance Katya. In order to transfer the action of feeding from a doll to a toy horse, adults must say to him: "Feed the horse", etc. Later word enables the child to effect an independent transfer to the toy of adults' actions on "real" things that the child can observe. Having learned the meaning of a word through practical actions or by observing the actions of adults, the child transfers these actions to the play-thing together with the word. The game consists here in separating the actions determining the meaning of the object from the object itself and their transfer to another object, a toy. Owing to play, the child learns to separate the meaning of a word from the external appearance of a thing and links this meaning to the actions on the thing, to its functions in human practical activity.

The farther this process goes, the more words are divorced from the objects they represent. The meaning of the word is more and more identified with an external action, and then with the idea of an action. A possibility arises for the substitution of verbal actions for real actions with things. Towards the age of four or five real actions in play with toys are more and more curtailed and give way to verbal actions. Instead of a detailed reproduction of the process of feeding a doll the child brings once a spoon to its lips and says: "Now I am feeding her... She has eaten", etc.

By the middle of the third year the child begins to counterpose its own actions to those of others and separate its self as the seat of its activity and wishes from the outer world and other people. Actions with regard to things begin to pose as people's functions with regard to things. The child enters the stage of *role games*. In a role game the child reproduces the social functions of adults observed

by him, the behaviour of adults as personalities. Whereas a two-year old girl feeding a doll plays a game of feeding, a four-year old child feeding a doll plays the part of her mother feeding the daughter. As the child's social experience expands, the content of the play based on domestic subjects ("mamma", "teacher", "movie", "creche", "zoo") is enriched, first, by industrial subjects ("pilots", "spacemen", "car", "factory"), and then by socio-political ones ("war", etc.). The content of the play more and more changes from the reproduction of object-related actions to the presentation of relations among people.

In point of fact, at this stage the child enters upon the process of practical assimilation of the meanings of words and surrounding phenomena. This process involves the acquaintance with the social meanings of adult's functions and attitudes as they reveal themselves in their behaviour observed by the child (with present-day children who listen to the radio, see films, watch television broadcasts, etc. the range of such observations is very broad).

Playing the role of a doctor, the child behaves "like a doctor". A little girl uses a pencil for a stethoscope, puts the doll to bed gravely shaking her head and saying: "You need an injection", etc. *The child's actions are governed by her notions of the doctor's functions, rather than the properties of things she is using at the moment*. In other words, the child develops a capacity for controlling its actions in accordance with its understanding of the assumed social role and befitting actions. Already at the developed stage of role games the child begins to interact with other children. Assigning the game roles and treating one another in accordance with the assumed roles (mother—daughter, doctor—patient), children master the patterns of social behaviour and learn to coordinate their actions in accordance with group imperatives.

At the next stage, *play by rule*, these tendencies become even more conspicuous and the actions come under the control of abstract demands or rules. The surrounding people, that is the participants in the game, begin to pose as bearers of such rules. The goal of activity itself shifts towards a socially meaningful result (to win the game). At this point play, in fact, comes to an end. Remaining a *play by social criteria* (absence of useful

product), by *psychological structure this activity approximates to labour* (the goal being not activity but its result) and *learning* (the goal being the mastering of the game).

Thus, play develops the child's ability to internalise the meanings of things and phenomena consolidated through linguistic exercises and to manipulate these meanings. It orients the child towards regarding his actions as operations ("playing for fun"), teaches the child to perform such operations on the basis of self-regulation (rules) and, finally, extends the child's self-consciousness from awareness of himself as the subject of object-related actions to awareness of himself as the bearer of a social role, i.e. the subject of human relations.

Learning. Considering the behaviour and activity of the child in ontogenesis, we run across a fact of crucial significance. Except for a few elementary unconditioned reflexes, the child shows *no* behavioural patterns and forms of activity exhibited by it at later stages. Practical and communicative behaviour, orientating and exploratory activity, seizing and manipulating movements, crawling, walking, speech and play, labour and social interaction make themselves manifest and begin to develop only some time after the child's birth. Moreover, every form of behaviour and every kind of activity appear in definite periods, consolidate at definite rates and undergo quantitative and qualitative changes at definite stages. All of them are indicative of the *child's development* which is inseparably linked with definite innate factors and genetic programmes, growth and anatomical-physiological changes of the organism, formation and diversification of the functional mechanisms of its higher nervous activity.

However, almost none of these forms of behaviour, none of these kinds of activity appears automatically by itself, irrespective of environmental conditions. All of them emerge and develop on the basis of the child's practical and social experience, as a result of its interaction with surrounding people and things. All that the child acquires while turning into man is a result of *learning*, i.e., assimilation of experience.

Human behaviour is determined by social and not biological experience. Social experience cannot be passed on biologically. It is contingent not on the qualities of the organism, but on the characteristic features of the

society in which the individual lives. Only those properties of the organism which are needed for practical assimilation of social experience, human forms of behaviour and activity can be passed on biologically as innate qualities. *This freedom of the child's behaviour from biological predetermination is a crucial advantage of man over the animal.* Owing to this advantage the evolution of human behaviour and methods of activity has been determined not by the biological development of the human organism, but by the historical development of society.

Hence learning comes out as the leading factor of development underlying the formation in the child of human forms of behaviour and reflection of reality.

Yet in all types of the child's behaviour and activity which we have been considering so far this final result, the internalisation of social experience, does not coincide with the goals of activity itself. The child does not manipulate things in order to learn something. When it makes its first steps and tries to pronounce the first words, it is not motivated by desire to learn to walk and speak. Its actions are directed towards satisfaction of immediate needs in exploratory activeness, towards acquiring things, influencing the surrounding people, etc. For the child, the internalisation of the corresponding actions and information is not the goal, but a means for satisfying the corresponding needs.

The time comes when the child embarks on a new course of activity. Its immediate aim is to master a definite body of information, a definite set of actions or behavioural patterns. Such *specific activity of the subject aimed at assimilation of new material or learning is called study.* It includes: (a) internalisation of information on the significant properties of the world needed for successful organisation of certain kinds of ideal and practical activity (the product of this process is *knowledge*); (b) mastering definite methods and operations which constitute all these types of activity (the product of this process is *habits*); (c) mastering methods of using the internalised information for correct selection and monitoring of methods and operations in accordance with the conditions of a definite task and with the set goal (the product of this process is *skills*).

Hence, *study is goal-directed activity in which the indi-*

vidual's actions are directed towards internalising definite knowledge, habits and skills as their conscious goal.

As can be seen from the above, *study is exclusively human activity. Animals are only capable of learning.* Even the human being, for that matter, becomes capable of studying only after he or she has developed an ability to subordinate his or her actions to a conscious ideal goal. This ability can only be formed in a child towards the sixth or seventh year on the basis of previous kinds of activity—play, speech, practical behaviour, etc. The first prerequisite for study as a type of activity is the development in a child of *conscious motives* for assimilating definite knowledge and acquiring definite habits and skills.

The role of active vehicles of social influence on the child's development belongs to adults. They organise its activity and behaviour within the framework of adopted social patterns. *This active orientation of the child's activity and behaviour towards the assimilation of mankind's social experience is known as teaching.* Viewed from the angle of its influence on the development of the child's personality this process is called *education*. The principal means for teaching and education are demonstration and explanation, encouragement and punishment, setting tasks and making demands, verification and correction. With the help of these instruments adults control the child's cognitive and practical activity, stimulating, directing, supervising and correcting its actions.

The vast range of questions related to teaching methods, means, objectives, scope of information imparted to pupils, habits and skills being developed fall within the province of *pedagogy*, a special branch of science concerned with the theory and practice of teaching.

Study as activity not only provides man with knowledge and gives him habits and skills required in different fields of social endeavour. It also develops his ability to control his mental processes, to select, organise and direct his actions, operations, habits and experience towards the solution of tasks he is faced with. In other words, study prepares man for labour.

Labour. *Labour is activity aimed at producing definite socially useful (or at least consumed by society) products, both material and ideal.* Labour is the leading, principal form of man's activity. Without labour human-

kind as a species would have ceased to exist. Therefore labour can be regarded as a *specific kind of men's behaviour* ensuring their survival, victory over other species and rational use of nature's powers and resources.

The goals of labour activity may be objects consumed by men and things required for production of such consumables—bread and machines, furniture and tools, clothes and cars, etc. Labour may be directed towards production of energy (heat, lighting, electricity, locomotion) and information (books, drawings, films). Its results may also be ideological products (scientific discoveries, works of art, ideas) and actions aimed at organising people's behaviour and labour (management, control, protection, education).

Products of labour need not necessarily be used by the individual himself to satisfy his own needs. The main thing is that the product should be needed by society as a whole. Therefore the goals of man's individual activity cease to be determined by his own needs. They are set for the individual by society and his activity becomes very much like fulfilment of a definite public assignment. *Man's labour activity is essentially social* as it is stimulated, directed and regulated by the needs of society.

The social character of labour reveals itself in yet another important aspect. Owing to the division of labour in modern society the individual never produces everything he needs; moreover, he typically never participates in the production of even a single product from the beginning to end. For this reason the individual must receive all that is necessary to sustain his existence from society in exchange for his labour. On the face of it the individual's needs are satisfied by society and not through his own labour efforts. The specific mode of this satisfaction derives from the system of *relations of production* prevalent in society. Therefore the production of any product in society is simultaneously the *formation of definite relations among people arising in the process of labour as well as during the distribution, exchange and consumption of its products.*

The actions performed by man during labour activity are determined not by his biological needs, but by the production goal and by his *relations* with other people during the attainment of this goal. In order to perform

and regulate this kind of actions, man must be capable of processing information with the use of his higher powers, primarily imagination and thinking.

There is, then, no need to invent some special properties of the "soul" in order to account for the sources of these remarkable abilities of the human mind. They derive from nothing else than the regularities of human activity, that is from the very existence of *Homo sapiens* as a labouring social being.

In the course of human history collective labour activity demanding of man the exercise of his highest mental functions has simultaneously created prerequisites and conditions for their formation.

Take, for instance, the behaviour of the beater in the primitive hunting horde. His actions by themselves were not aimed at getting the prey. Moreover, if he had been alone, they would have achieved just the opposite result, the prey would have easily escaped and he would have remained hungry. All his activity became meaningful only in combination with the activity of other hunters. To attain his aim, the beater had to take into account the actions of the hunters, that is to drive the deer towards them and not just to chase it. In this way his goal lost its biological meaning and became socially significant. It was no longer represented by internal instinctive experiences but manifested itself through the perception of actions on external objects. Thus man's practical activity itself separated the images of objects and object-related actions from the experience of a biological need urging man to activity.

The crucial characteristic of labour which differentiates it from simple appropriation of natural products is the *manufacture and use of tools*, i.e., acting on objects through the agency of other objects. Labour therefore reveals objective properties of objects in relation to one another. Every kind of labour as activity is based on these objective properties of things rather than on their biological meaning. For instance, in order to make a bone spear-head, it is necessary to take into account the relative hardness of bones and not their edibility. The actions involved in the manufacture of bone objects are governed by these objective properties of bones and not by their taste or nutritiousness.

Thus new meanings of things and new attitudes to them are born of man's practical activity, of social labour. Collective activity differentiates objective properties of things. It makes people exchange information with one another and consolidate it in special communicative actions called speech. It is only through collective activity that an individual can identify himself and other individuals as participants in activity. Finally, none other than collective activity teaches man to set himself ideal goals and use social experience as a guide for his actions.

This attitude to reality constitutes the foundation of consciousness. It turns man into the *subject* of activity in relation to things and into a *personality* in relation to people. It makes a master out of the former slave of the surrounding world, enables him to transform this world and strive towards distant goals turning man's actions into conscious planned activity and his adaptive subsistence on the Earth into active life full of meaning and aspiration for lofty ideals.

II.5.1. Concept of Communication

Complex Character of Communication. The interaction of man with the surrounding world develops within the framework of *objective relations* arising between people in their social life, first and foremost in their production activity.

Objective relations, such as relations of dependence, subordination, cooperation, mutual assistance, etc., are bound to arise in any real group of individuals. These objective relations between group members manifest themselves in subjective interpersonal relations which are studied by social psychology.

The main road of research into interpersonal relations and cooperation of group members is an in-depth analysis of various social factors and interaction of people belonging to a given group. According to Lenin, people's real intentions and feelings can only be judged by their *actions*.

Marxism teaches that any production calls for joint efforts. In order to produce, people must unite. Yet no community of human beings can conduct successful joint activities if there is no contact between people participating in it, if there is no adequate understanding between them. For instance, in order to teach his pupils, the teacher must establish communication with them.

Communication can be defined as a complex process of establishing and developing contacts between people which is rooted in the need for joint activities.

Communication includes exchange of information between participants in joint activities (the *communicative aspect* of the process). In their intercourse people rely upon language as one of the principal means of communication.

The second aspect of communication is *interaction of its participants*, i.e., exchange not only of words, but also of actions. Paying for his purchases, the buyer and the seller communicate with one another even if neither of them says a word: the buyer hands over the money and the seller gives him the purchases and counts out the change.

The third aspect of communication is *interpersonal perception*. Very much depends, for instance, on whether one of the participants in communication regards his partner as a trustworthy, clever, quick-witted and knowledgeable person or is prejudiced against him believing him to be dull and incapable of sound judgement. Thus in a single process of communication we can distinguish conventionally three aspects: *communicative* (transmission of information), *interactive* (joint activity of participants in the process) and *perceptive* ("eye contact").

Viewed as a unity of these three aspects, communication emerges as a means for organising joint activity and establishing mutual relations among its participants. The knowledge of the laws of communication and the development of sociability and communicativeness are particularly important for the pedagogue who can solve his professional tasks only if he succeeds in drawing his pupils in joint activity and in establishing interaction and mutual understanding in compliance with the tasks and goals of education, i.e., if he manages to establish viable *pedagogical communication*.

On the technical side pedagogical communication comes out as a *system of methods intended to provide interaction between the pedagogue and the pupil*. On the side of content it boils down, first and foremost, to the exchange of information and maintenance of mutual understanding and proper relations between the pedagogue and the pupil with the help of appropriate communicative means.

Didactic and educational tasks confronting the pedagogue in his activity cannot be successfully tackled without productive communication between the teacher and the pupil body. Communication for the pedagogue thus comes out, firstly, as a means for solving didactic tasks proper, secondly, as a system of socio-psychological support of the process of education, thirdly, as a method of promoting a definite system of relations between the teachers and

the pupils conducive to the success of education and training and, fourthly, as a process of moulding the school-child's personality. *Pedagogical communication is understood to be the system of interaction between the pedagogue and the pupil body based on appropriate methods and habits and consisting of exchange of information, exercise of appropriate influence on the pupils for didactic and educational purposes and the promotion of their mutual understanding. The pedagogue must initiate, organise and control this process.*

Pedagogical communication comes out, on the one hand, as the emotional background of the process of training and education and, on the other, as its immediate content.

Unity of Communication and Activity. Close relationship between communication and joint activity is only too obvious. Yet a question arises: is communication only a part of joint activity or are they two independent processes? In joint activity an individual must of necessity unite with other people and communicate with them, i.e., establish contacts, strive for mutual understanding, receive necessary information and transmit information in response, etc. Communication appears here as a part of activity, as its important informative aspect, as *communication (1)*.

However, on creating an object (making an instrument, expressing an idea, performing a calculation, repairing a machine, etc.) in the process of activity which already includes communication (1), the individual does not stop here; through the object that he has created he "transmits" himself, his qualities, his personality to other people.

An object created by man (a built house, a poetic line, a planted tree, a skillfully turned machine part, a written book, a composed or executed song) is, on the one hand, an object of activity and, on the other, a means whereby man asserts himself in social life, because this object has been produced *for other people*. This object mediates relations among people, creates *communication in the sense of production of a common object* equally belonging to the creator and the consumer.

It should be noted that in capitalist society, like in earlier feudal and slave-owning societies, communication

among people, understood as production of common objects, was hampered and invalidated due to the alienation of labour products. Having materialised, as it were, his labour in an object, the creator could not hope that he would preserve himself in those for whom it was intended, since the product of his labour did not belong to him and did not represent his individuality—in fact, it represented the individuality of its owner. Thus communication, mutual understanding and mutual respect of people was thwarted from the very beginning. The situation changes radically in socialist society free from exploitation of man by man where the personality is not sacrificed to somebody's economic interests and where the products of labour belong to those who create them.

Soviet pedagogue *V. A. Sukhomlinsky* wrote that man can only perpetuate himself in man. There lies his immortality, his happiness and purport of life. In contrast to animals, man procreating his species leaves for descendants his ideals, aspiration to beauty and commitment to the lofty and the sublime.

Communication as one's perpetuation in another is already *communication (2)*. Whereas communication (1) is the informative aspect of joint activity, communication (2) is essentially the interactive aspect of joint activity aimed at the production of a socially valuable and personally significant object. Here the relationship is reversed and activity poses as the necessary prerequisite for communication.

Hence activity is a part, an aspect of communication, and communication is a part, an aspect of activity. In either case *communication and activity constitute an inseparable unity*.

II.5.2. Communication as Exchange of Information

Communication and Language. The concept of communication as the production of something common that unites people in the process of their interaction and joint activity is based on the assumption that this something is, first and foremost, *language as a means of communication*. Language ensures communication between those

who communicate, since it is understood by the one who transmits information in a *coded form*, i.e., in the form of the meaning of words specially selected for this purpose, and by the one who receives this information, *decoding* it, i.e., deciphering these meanings and changing his behaviour in accordance with the information received.

The person addressing information to another person (*communicator*), and the person who receives it (*recipient*) should use, for the purposes of communication and joint activity, one and the same coding and decoding system, that is speak "a common language". If the communicator and the recipient use different coding systems, they cannot achieve mutual understanding and will not be successful in their joint activity. The biblical legend about the construction of a tower in Babel which failed because of the unexpected confusion of languages of the builders is illustrative of real difficulties which arise as a result of the blocking of coding and decoding processes because of the difference of languages and render interaction and joint activity impossible. The exchange of information becomes possible if the meanings attached to signs being used (words, gestures, hieroglyphs, etc.) are known to the participants in communication. *Meaning* is the semantic aspect of the *sign* as an element mediating the cognition of the surrounding world. Just as tools mediate people's labour activity, so signs mediate their cognitive activity and communication.

A system of verbal signs makes up language as a means for objectification, assimilation and transmission of socio-historical experience.

Language as a means for accumulation and transmission of social experience arose in the process of labour and started developing at the dawn of pre-class primitive society. In order to pass essential information to one another, people began to use articulate sounds which gradually came to be identified with definite meanings. Articulate sounds as a means of communication were very convenient, particularly in those cases when the primitive man's hands were occupied with objects and instruments of labour, and his eyes had to follow their movements. The conveyance of thoughts through the agency of sounds was also suitable when communication had to be main-

tained over a considerable distance, in the dark, in a fog or in the thicket.

Owing to communication through language the reflection of the world in the brain of an individual was constantly supplemented with current or past reflections in the brain of other individuals—they exchanged their thoughts and observations.

In intercourse man constantly learns to differentiate the essential from the unimportant, the necessary from the contingent, to pass from the images of individual objects to the stable reflection of their common properties in the meaning of words which represents their essential qualities inherent in a whole class of objects and, for this very reason, applicable to the concrete object in interest. When we pronounce the word "newspaper", we not only mean the newspaper sheet we are holding at the moment, but also indicate the class to which the given object belongs, i.e., its distinctions from other printed matter.

Words have a definite meaning, that is, they are correlated in a way with the world of objects. When the lecturer uses one or another word, he himself and his listeners associate it with one and the same phenomenon and have no misunderstanding. The system of meanings develops and is enriched throughout man's life. Its purpose-oriented formation is the pivotal task of both secondary and higher education.

Verbal Communication. Speech. *Speech is verbal communication, i.e., the process of communication with the help of language.* Words as the vehicle of verbal communication have meanings assigned to them by social experience. Words may be pronounced aloud, silently (to oneself), written or replaced in the case of deaf people by special gestures representing definite meanings (so-called *dactylogic speech* in which words are reproduced by dactyl letters, i.e., by configurations of fingers and their movements, and the *speech of gestures* in which a gesture substitutes for a whole word or a group of words).

Speech is divided into *written* and *oral*, the latter, in turn, falling into *dialogic* and *monologic*.

The simplest variety of oral speech is *dialogue*, i.e., a colloquy between two or more persons jointly discussing and settling some questions. Characteristic of oral

speech are remarks made by the interlocutors, repetition of phrases and individual words after the interlocutor, questions, additions, explanations, hints understood only by the participants in the conversation, various auxiliary words and interjections. The peculiarities of this speech largely depend on the degree of mutual understanding achieved by the interlocutors, as well as on their relations. More often than not the manner in which a teacher conducts a dialogue in his or her family circle will be very different from the way in which he or she speaks in the classroom during a lesson. Very important is the emotional level of conversation. An individual in a state of confusion, surprise, joy, fright or anger does not speak the way he would in the normal state; not only does his intonation change, we would often use different words and idiomatic expressions.

Monologue, the second variety of oral speech, is addressed by one speaker to another or many, listening to him. It may be the narration of a story, a report, etc. Monologic speech features a more complex composition and calls for a higher degree of elaboration of every point, greater consistency, stricter observance of the rules of grammar and logic. Monologic speech presents greater difficulties than dialogic speech and its advanced forms develop at a later stage of ontogenesis. The task of developing monologic speech faces the pedagogues throughout the school period. Indeed, it is not so seldom that we may see adults talking freely with one another, but finding it difficult to deliver an oral message (a report, a public speech, etc.) without a crib. This shortcoming is frequently traceable to the lack of due attention to the formation of monologic speech habits on the part of their schoolteachers.

In the history of mankind *written speech* came long after the emergence of oral speech. It was engendered by the need for communication among people separated by time and space; it has traversed a long path from *pictographs*, i.e., pictures or hieroglyphs representing and expressing an idea to contemporary alphabets making it possible to write thousands of words with the help of a comparatively small set of letters.

Writing has provided the most reliable method for passing from generation to generation the experience

accumulated by humanity, since its conveyance through the agency of oral speech entails the danger of distortion, alteration and even complete loss. Written speech plays an important part in the creation of complex generalisations used by science, and in the conveyance of artistic images. Writing and reading which are in the focus of the teacher's attention from the very first days of children's study are highly instrumental in expanding their intellectual horizons and in helping them to acquire and convey new knowledge. Written speech orients the pupil towards accuracy of expression, adherence to the rules of logic and grammar, penetration into the content and consistent thinking. With writing often comes comprehension and fixation in the memory.

Speech Mechanism. On the physiological side speech is based on the activity of the auditory and motor analysers. Temporal links between different irritations coming from the outside and movements of the vocal chords, larynx, tongue and other organs controlling the pronunciation of words close in the cerebral cortex. Speech is a function of the *second signalling system*. Word, according to Ivan Pavlov, is a signal of the first signalling system in the brain. The complex process of verbal communication is based on the action of subsequent engagement of its support mechanisms. The first stage is *speech programming*, that is the construction of what the individual *wants to express*, the semantic backbone of the pronouncement. For this purpose he selects the information he considers essential and sifts out secondary data. The second stage is the *construction of the syntactic structure* of a sentence. The individual sets out the general structure of a phrase, its grammatic form, and engages the mechanisms effecting the search for the necessary word and the selection of the sounds reproducing it with the highest accuracy. Finally, the individual pronounces the words translating them into *oral speech*. In the process of speaking the communicator *codes* the information subject to transmission. In the process of listening the interlocutor (recipient) *decodes* the received information, that is translates the sounds of the received speech into the meanings of words step by step, thereby grasping the meaning of the communicator's message. However, the communicator cannot receive the acknow-

ledge of his message until after the recipient becomes the communicator himself as a result of the exchange of communicative roles and gives the former communicator to understand (by his pronouncement) that his message was received and understood correctly. Mutual understanding which gradually arises in the course of dialogic communication due to constant alternation of communicative roles serves as the basis for concerted actions of participants in communication; without such understanding joint activity would be impossible.

The coding and decoding of verbal pronouncements depend on the functioning of brain centres and systems responsible for verbal communication. If such systems are in any way impaired, the individual develops various speech disorders or *aphasias*. They may show themselves in one's inability to construct a sentence without the loss of ability for understanding spoken speech, in faulty articulation (*disarthria*) without impairment of the capacity for word selection, in one's inability to comprehend spoken speech with the capacity for speaking fully preserved, etc.

As early as the middle of the 19th century two scientists discovered a specific area of the brain responsible for speech functions. The French anatomist and anthropologist, *Pierre Paul Broca*, found out that damage to the rear third part of the inferior frontal convolution of the left hemisphere led to pronunciation disturbances. Later the German psychiatrist and neuropathologist, *Karl Wernicke*, described cases of impaired comprehension of words as a result of damage to the rear third part of the superior temporal convolution of the left hemisphere. These areas of the brain tissue were designated as centres of motor speech (*Broca's centre*) and speech comprehension (*Wernicke's centre*). Yet later, mainly due to works of Soviet psychophysicologists (*A.R. Luria*, *N.A. Bernstein*, *P.K. Anokhin*, and others) it became clear that the physiological substratum of speech is not so much the activity of isolated brain areas (speech centres), as the complex organisation of the activity of the brain as a single whole. This new conception of the *dynamic*, i.e., mobile and not strictly anatomical *localisation of speech functions* is of paramount importance for correction of speech disturbances as it shifts the focus

of attention on the use of broad compensatory possibilities of the central nervous system.

Nonverbal Communication. Communication among people cannot be likened to transmission of information by telegraph where the communicator and the recipient exchange verbal messages. Human communication necessarily includes the participants' emotions. They are related in a definite way to the content of the messages and to the participants in communication and, accompanying a verbal message, represent a specific aspect of the exchange of information which may be called *nonverbal communication*. The means of nonverbal communication include *gestures, mimicry, intonation, pauses, postures, laughter, tears*, etc., which make up a sign system supplementing, strengthening and sometimes substituting for the means of verbal communication—words. On receiving a message about the misfortune that befell his friend, the interlocutor expresses his sympathy in words accompanied by nonverbal communicative signs: a rueful face, a low voice, holding his palm to the cheek and shaking his head, deep sighs, etc.

The means of nonverbal communication as a specific language of emotions are just as much a product of social development as the language of words, and may be different in different national cultures. For instance, the Bulgarian expresses his disagreement by nodding his head, whereas the Russian may take it for confirmation and agreement; conversely, the shaking of the head which means disagreement with the Russians may easily be mistaken by a Bulgarian for the sign of agreement.

Different age groups select different means for nonverbal communication. Thus children often resort to crying as a means of influencing adults and informing them of their wishes and moods. The communicative character of crying in children is attested to by their frequent warning: "I'm crying to mamma and not to you."

The effect of verbal communication depends to a considerable extent on the posture of the interlocutors. Thus a remark made in an off-hand manner is very indicative of the communicator's attitude to the recipient. In some training setups, for instance, when developing speech habits at foreign language lessons, the teacher prefers his pupils to sit in a circle opposite one another

and not in the manner they usually sit in the classroom (behind one another), as it greatly improves the communicability of the pupils and enhances the effectiveness of the lessons.

Correspondence between the means of nonverbal communication, on the one hand, and the aims and content of verbal messages on the other, is one of the elements of the culture of intercourse. Such correspondence is particularly important for the pedagogue as the means of both verbal and nonverbal communication are an instrument of his professional activity. Anton Makarenko pointed out that the pedagogue must be able to use scores of different intonations with one and the same word to convey very different meanings—order, request, advice, etc.

Development of Speech Habits. The satisfaction of man's needs is possible only through intercourse, joint activity with other people. This basic condition engenders the necessity for a subject to tell his partners something that is very important and meaningful for him. The first rudiments of articulate speech appear in a child at the end of his first year. They are represented by such accords as "ma-ma", "pa-pa" and others which do not call for complex articulation and can be easily pronounced. The adults correlate these accords with concrete persons thereby consolidating in the child's mind the association of each of these accords with the concrete person from his immediate environment ("this is mama").

In due course each of these accords turns for the child into a word which he uses to organise his interaction with adults. Now the word "mama" comes out as a means for satisfying his current needs. Pronouncing the word, the child seeks to get what he desires: attention, a caress, a toy, etc. The word becomes a means of communication. Subsequently the number of words at the child's disposal grows in an avalanche-like manner and towards the end of the second year the child not only exhibits a tremendous expansion of his vocabulary, but also shows an ability for correct use of grammatical forms; his sentences become longer and grow in complexity. The enrichment of the child's language continues throughout the whole preschool period.

The development of speech goes hand in hand with the advancement of nonverbal communicative facilities:

mimicry, pantomime, intonation. During this period the child forms feedback links in the process of communication learning to decipher the interlocutor's expression, identify approval or disapproval in his intonation, grasp the meaning of a gesture accompanying and strengthening the meaning of the adults' words. All this enables the child to modify his actions and achieve mutual understanding in intercourse.

Children's conscious attitude to language as a means of communication and to speech as the communication process is formed at school first at reading and writing lessons, and later, at language and literature lessons. Becoming the object of analysis specially conducted by the teacher, language emerges before the pupils as a complex system of signs with its own socially-significant rules whose assimilation will enable them not only to read, write and speak correctly, but also to master the spiritual wealth created before them by mankind.

The role of the pedagogue in the formation of speech communication skills in children of the preschool and school age can hardly be exaggerated. Special importance attaches to the teacher's own ability to speak freely and accurately, as it is the principal prerequisite for success in the development of his pupils' speech habits and capacity for thinking.

Vassily Sukhomlinsky stressed that the teacher's speech standards have a definitive influence on the efficacy of the pupils' intellectual labour at the lesson and pointed out the ways for their improvement: first, avoidance by the teacher of any obscurity and vagueness and attainment of utmost clarity in the explanation of basic notions which enable the pupil to pass from the simple to the complex, the concrete to the abstract; second, in-depth analysis of the textbooks used by the pupils and exposition of the logical sequence and cause-effect relationships. High standards of speech are a key to efficacy in the study process. "So much time is lost through endless repetitions," wrote Sukhomlinsky, "which become necessary when the subject, phenomenon, notion is not couched by the teacher in vivid language accessible to a child".

II.5.3. Communication as Interpersonal Interaction

Entering into communication, i.e., addressing somebody with a question, request, order, explaining or describing something, an individual of necessity sets himself the aim of exerting an influence on another individual, of getting from him an expected answer, having him fulfil an assignment or comprehending something he has not understood so far. The aims of communication reflect the need for people's joint activity. To be sure, this does not rule out the possibility of idle chatter, the so-called *fatuous communication*, aimless use of communicative means merely to maintain communication for communication's sake. If communication is not fatuous, it necessarily has or is supposed to have a certain result in the form of an alteration of other peoples' behaviour and activity. Typically, communication assumes the form of *interpersonal interaction*, that is the *sum total of ties and mutual influences arising in the process of individuals' joint activities*. Interpersonal interaction is a sequence of individuals' reactions to one another's actions: an action of individual A changing the behaviour of individual B evokes the latter's reactions which, in turn, influence the behaviour of individual A.

Social Control and Social Norms. Joint activity and communication proceed under the conditions of *social control* based on *social norms—standards of behaviour which are sanctioned by society and intended to regulate individuals' interaction and mutual relations*.

The standards of behaviour developed, adopted and cultivated by society as a specific system of obligatory norms are expected to be complied with by every individual who finds himself in a situation subject to control. Violation of these norms sets off the corresponding mechanisms of social restraint (disapproval, punishment) rectifying the deviant's behaviour. The existence and recognition of the norms of behaviour is attested to by similar reactions of surrounding people to somebody's act different from the behaviour of all others. Social norms are characterised by an extremely broad scope of application ranging from the models of behaviour meeting the requirements of labour discipline, soldier's

duty and patriotism to rules of politeness. By compliance with corresponding social norms is meant both the conscientious work of a steel-worker at the foundry and the observance by a school first-former of the recently learned rule to stand up at the teacher's entrance into the classroom.

Due regard for social norms makes people responsible for their behaviour and enables them to control their actions rating them as complying or not complying with requirements. Orientation on norms permits an individual to correlate the forms of his behaviour with standards, select those approved by society and reject unacceptable ones, direct and regulate his relations with other people. Interiorised norms are used by people as criteria for comparing their own and other individuals' behaviour. **Roles and Role Expectations in Communication Processes.** Social control in interaction processes is exercised in accordance with the roles performed by participants in communication. *By role psychologists understand the normatively approved model of behaviour expected of every individual of a given social status* (post, sex or age group, position in the family, etc.). Thus the subject may play the role of teacher or pupil, physician or patient, adult or child, chief or subordinate, mother or grandmother, man or woman, guest or host, etc. Every role must meet definite requirements and justify different expectations of the surrounding people.

One and the same man as a rule plays different roles in different communicative situations. Occupying, for instance, the post of director, he may fall ill and, fulfilling the doctor's prescriptions, find himself in the role of a patient; at the same time, in the family circle he preserves the role of his mother's dutiful son, receives guests as the host, etc. The multiplicity of roles not infrequently brings them into conflicts with one another—*role conflicts*. The teacher as a pedagogue cannot help noticing his son's shortcomings and is fully aware of the need to be more firm with him, yet as a father he sometimes indulges the child's caprices thus helping consolidate his negative traits. Paying a visit to the parents of a remiss pupil, the teacher as a guest is not supposed to tell his host and hostess unpleasant things about their child's behaviour, yet as a pedagogue he ought to do so.

The interaction of people performing various roles is regulated by *role expectations*. Whatever the real wishes of an individual, the surrounding people expect him to behave after a definite model. The manner in which a role is performed is subject to social control and assessment; any substantial deviation from standard is condemned.

For instance, it is commonly held that parents ought to be kind, affectionate and lenient to children's faults—such an attitude meets the role expectation and is approved and encouraged by society. Yet the excess of parental affection, all-forgiveness is severely censured. The brand of a "spoilt child" which may often be undeserved clearly indicates the upper limit of socially approved tenderness. The parents ought to be strict and exacting in respect of their children—this is also an imperative identifying the lower limit of general expectations. Indeed, in the eyes of society harshness and lack of tenderness to children on the part of parents are no less reprehensible than overindulgence. Between these extremes lies the range of attitudes assigned by society to the role of parent and regarded as acceptable. The same is true of the roles of other members of the family who belong to the older generation.

As regards the child, the expectations of the role he plays are known only too well—everybody wants to see him docile and diligent, respectful of the elders and assiduous in his studies, etc. The adults around the child, both within and without the family, seldom miss the opportunity of letting him know (whether he is under school age or a teenager) if he comes up to their expectations.

The process of communication can only be successful if the *behaviour of communicating individuals meets their mutual expectations*.

Every person entering into communication ascribes, more or less accurately, to his partners definite expectations in respect of his words and actions. *The capacity and ability of an individual for accurate prediction of other individuals' expectations regarding his behaviour is called tact*.

That does not mean, of course, that a tactful person must always and under all circumstances seek to justify these expectations. Should it happen so that a person's principles and convictions run counter to what in his

opinion is expected of him, he may display firmness and act without regard to the demands of tactfulness. Galileo's legendary words "And yet it turns round" cannot be construed, of course, as a breach of tactfulness with regard to inquisitors expecting his full and unconditional recantation; it is but striking evidence of his loyalty to principle, scientific honesty and civic courage.

To be sure, in everyday life misinterpretation or disregard of other people's expectations can only be assessed as *tactlessness*. It *frustrates people's expectations in the process of communication, hampers the interaction of communicating individuals and sometimes creates conflict situations*. Tactlessness may be comparatively harmless as, for instance, in the case of a person's detailed account of his own and his relatives' health and of the latest insignificant events in reply to a formal "How are you". Not infrequently, however, violation of the rules of a tactful behaviour leads to serious consequences, particularly in pedagogic communication. Here is just one example.

A teacher organised an elocution group of senior pupils wishing to master the art of recitation, and his lessons enjoyed considerable popularity. Its success, however, was marred by an unhappy incident. Once the teacher offered for practice the fable "Fastidious Bride" by the famous Russian fabulist, Ivan Krylov. No sooner had the teacher started reading, than one of the pupils rose to his feet and asked him to choose another fable, any but that particular one. The teacher wanted an explanation, but the pupil only said softly that he could not give it. Believing the request to be just a freak, the teacher brushed it aside and the disconcerted lad took his seat. It was only after the teacher had read the final lines with appropriate sarcasm:

*And happy finally she was
To get a cripple for a husband*

that he understood what had happened: the oppressive silence that fell on the group, the indignant faces of the boys and tears in one of the girls' eyes suddenly reminded him that among the members of the circle was the boy who had lost his leg in an accident a couple of years before and the girl he was in love with.

A teacher must be keenly aware of the fact that the pupil body consists of living human beings and that due regard should be given to every individual though the group may be treated as a single whole. Even a temporary loss of psychological contact with pupils may have dire consequences which are difficult to foresee. Regular impairments of mutual understanding between the teacher and the pupils which become a rule rather than an exception are bound to fix a gulf between them.

Due pedagogic tact helps the teacher to establish necessary contacts with his pupils and gives him broad possibilities for moulding and developing the child's personality.

Psychological Contact in Pedagogic Communication.

Contact between persons presupposes reciprocity in the process of communication between them. Communication can only be maintained and normally developed if the parties mutually respect and trust one another. Establishing contact with the pupils for teaching and education purposes, the pedagogue expects their respect which is due the role he plays. These well-grounded role expectations are backed up by the Rules for Pupils, school traditions and unanimous demands of the teachers. Yet the reciprocal character of contacts in communication presupposes also respect for and trust of the pupils on the part of the teacher. If the pedagogue, exacting and principled as he ought to be, also trusts his pupils and shows them due respect, he may be sure that even his most casual remarks will not be lost on the teenager—the same one who will pay no attention to apparently very convincing and well targeted arguments if he senses lack of respectful attitude to his personality.

The relations between the pedagogues and the pupils depend to a greater or less degree on the general climate in the school, the insight of the body of pedagogues into the child's psychology, as well as on the teachers' pedagogic and psychological culture in general. This objective dependence shows during the psychological analysis of any happening in school life, ranging from a minor fault of a junior pupil to an incident that casts the whole school in a whirl. Pedagogues who know how to combine exactingness and respect for the pupil create favourable psychological atmosphere. Exhibiting respect for pupils

in the process of communication with them, they foster in teenagers *self-respect* which provides the basis for further contacts. Reliance on schoolchildren's (particularly teenagers') self-respect is a sure way for exerting beneficial pedagogical influence upon them.

In contrast with the adult, the teenager is typically incapable of stable self-assessment, wherefore he looks for appraisal of his actions to individuals whom he holds in high esteem: his parents, pedagogues, peers, the elders, etc. As these superficial appraisals vary, he seeks to preserve self-respect as a sufficiently reliable basis for desirable communication with other people and tries to produce a favourable impression upon them, i.e., to create an image of himself he would like them to accept. Experienced pedagogues know how important it is to rely on teenagers' self-respect for establishing and maintaining close psychological contact with them.

The example we now give provides a good illustration. Valery P.'s performance at school was poor and he fell behind the class. He evidently lost all hope to catch up with it, became insensitive to bad marks and accepted the classmates' disrespect, the teachers' reprimands and the parents' reproaches. His form master, a teacher of physics, took the challenge and started coaching the boy. In order to achieve the desired psychological effect, she decided not to have him run after the class, but on the contrary, to give him the lead over his classmates explaining to him the new material before the lesson. When the class was labouring at new problems and even the strongest pupils gave up, the teacher would call Valery to the blackboard and he successfully got over the difficulties. The attitude of the class to Valery changed and he immediately sensed it. Soon the teacher assigned him to help a girl who could not master a new subject. The boy was proud of the teacher's trust and set about his task with enthusiasm. In order not to lose face with the girl, Valery conscientiously studied the new material and, this time on his own initiative, tackled the old subjects that he had missed. Regaining self-respect, Valery changed his attitude to studies in general and began to improve his performance in other disciplines. He did not want to lose what he had at last acquired—the respect of his peers and, consequently, the respect of his own self.

Self-respect is an accurate but fragile instrument. Should the adults damage the teenager's self-respect, be it through carelessness, ignorance or deliberately, they sap his power of resistance to evil influences and make him immune to good examples. However desolate a child may be, he is not lost to society as long as he preserves his self-respect: he still can be taught to respect other people and the society in which he lives. Consequently, his prospects are still optimistic. By contrast, the loss of psychological contact is likely to result in an interpersonal conflict.

Interpersonal Conflict. Communication processes do not always proceed smoothly and should not be conceived as something devoid of inner contradictions. In some situations communicating parties hold antagonistic stands which reflect mutually exclusive values, tasks and goals evoking mutual hostility and leading to an *interpersonal conflict*. The social significance of such conflicts may be different and depends on the values providing the base for interpersonal relations. Thus conflicting situations may result from the rivalry of two senior schoolgirls claiming the attention of one and the same young man, or from the relations of two boys one of whom has committed a dishonourable act. It stands to reason that the social evaluation of the causes and nature of these conflicts will be essentially different.

The motives lying behind interpersonal conflicts, their causes deserve special attention.

In the process of joint activity interpersonal conflicts may result from the operation of two types of determinants: *object-related business disagreements and divergence of personal pragmatic interests*.

If the interaction of people engaged in well-organised socially useful joint activity is characterised by the prevalence of object-related business disagreements, an arising conflict seldom leads to a disruption of interpersonal relations and is usually not accompanied by a rise of emotional tension and aggravation of animosity. A decision made after an open discussion of conflicting views puts an end to the conflict and helps achieve the common goal.

By contrast, contradictions in the sphere of personal pragmatic interests tend to change to enmity and open

hostility. Due to the absence of a common cause the people pursuing their narrow selfish interests become *competitors*, i.e., find themselves in a position in which the success of one party means the loss of the other. This cannot but aggravate interpersonal relations.

There may also be cases when individuals try to pass the divergence of personal pragmatic interests for object-related business disagreements or when prolonged business disagreements lead to personal animosity. In the latter case the sides sometimes try to ascribe the original conflict of principles to the difference of personal interests.

Conflict situations may also arise from semantic *barriers in communication* preventing the establishment of interaction between the communicating parties. *A semantic barrier in communication consists in a different interpretation by the partners of the sense of a demand, request or order leading to a lack of mutual understanding and hampering their interaction.*

For instance, a semantic barrier in the relations between adults and a child may arise due to the fact that the child, understanding correctly the meaning of the adults' demands, does not accept these demands as they run counter to his experience, views and attitudes. Special importance attaches to the semantic barriers arising in communication between the adults (teachers and parents) and the children (teenagers) because of the difference in age, life experience, interests and, which should be emphasised, adults' errors in implementing educational methods.

Semantic barriers can only be overcome if the pedagogue knows and takes into account the pupil's psychology, interests and convictions, age specifics and past experience, and acts with due regard to his prospects and difficulties.

The main task which should be solved for establishing mutual understanding between children and adults can be formulated thus: *children should be taught to use adults' language, and adults should be taught to understand children's language*. What is meant is not the development of the child's speech habits which was discussed earlier, nor the enrichment of his vocabulary or improvement of his pronunciation and spelling. The child masters language as the bearer of meanings in the preschool age, improves and enriches his knowledge throughout the

school period. Yet the interiorisation of language by a child is not limited to the meaning of words. Besides the generally accepted system of meanings, words like other phenomena of human consciousness have a certain *personal sense*, a certain personal significance which varies from individual to individual. Personal sense is determined by what *links the aims of an individual's activity with his motives*, i.e., by what represents the individual's needs.

One and the same word, action or circumstance may have different senses with different people. Thus a teacher's reproof administered to a schoolboy ("Again you had a fight with Petrov during a break") has one and the same meaning for both the pupil and the teacher and creates no difficulties for their communication: both of them understand what it is all about. Yet the personal sense of the remark may be different. For teachers a fight within the walls of a school is a breach of discipline, whereas for the pupil it may be yet another attempt to prevent stronger Petrov from making a mock of him.

Adults have every reason to desire the child to master the language not only with all meanings inherent in its vocabulary, but also with the system of personal senses adopted by them and oriented on the corresponding ethical and world-view values. This desire stems from the need to find a common language with children in order to come to terms with them and avoid conflicts. Yet the adult, keeping in sight this principal goal, i.e., the children's mastery of the adults' language with its system of personal senses should also try to fathom the personal senses of the *child*. His task will be greatly facilitated if he can *identify himself with the child*. Interpersonal conflicts in pedagogic communication are frequently referable to the pedagogue's inability or lack of desire to penetrate the schoolboy's system of interpersonal senses.

Influence in Interpersonal Relations. The close relationship existing between communication (1), i.e., exchange of information and establishment of communication in order to achieve the goal, and communication (2), i.e., continuation of one's Self in other people (the "transmission" of one's personality), gives an important dimension to the problem of *influence* which one individual can exert upon another without either of them being necessarily aware of it.

The problem of social influence acquires particular importance when we consider the psychological aspects of teaching and education. Teaching is primarily an informative process. The teacher imparts knowledge (passes on necessary information) to the pupil and the feedback from the latter in the form of an answer, test results, etc. gives the teacher information about the pupils' assimilation of the received data. Interaction takes place at the level of *meanings*. Yet the pedagogue, as we have already pointed out, not only conveys meanings, forming notions, but also transmits to the pupils the *sense* of these notions as he sees it. For instance, telling the pupils about World War II, the teacher does not limit himself to historical facts and conclusions, but tries to convey to the listeners his personal attitude to the events in interest. This conveyance or, rather, "transmission" of senses by the teacher is crucial for education which is inseparable from teaching just as sense is inseparable from meaning.

The influence exerted by the pedagogue on the pupils and determined by the aims of education involves a definite transformation of the sense of what the pupils see, hear and do. The influence exerted on them by different teachers varies in degree and content.

In one experiment a group of junior pupils were offered different toys and warned that they should not by any means take and unscrew one of them, a red matryoshka. The actions of each child left alone with the toys were covertly observed. A certain percentage of testees always violated the ban. During the second series of the same experiment children were prohibited from opening a red box, but allowed to play with other toys. In a conspicuous place right in front of the testees was the picture of one of their teachers. The experiment showed that the percentage of "infringers" varied with the picture: with one teacher it fell, with another remained the same as in the first series, with the third one rose appreciably. In the first and third instances the mere reminder of the teacher changed the sense of the situation: the "presence" of one pedagogue tended to increase the children's "law-abidance", whereas the "presence" of another provoked them to violate the ban.

Behind the influence exerted by the pedagogue on the children lie his traits and capability to impart his personal senses to the pupils, to imprint, as it were, his own personality on their mental make-up; this influence shows the impact of his character on the process of education and the efficacy of his pedagogic communication.

Friendly Communication. Friendship is a specific form of interpersonal communication characterised by *steady individual selective interpersonal relationships and interaction, mutual attachment of its members, a high degree of satisfaction with the communication process and by mutual expectance of reciprocal feelings and preferences.* The development of friendship presupposes adherence to its unwritten "code" which affirms the need for mutual understanding, frankness and openness in respect of each other, as well as active mutual assistance and mutual interest in the affairs of one another, sincerity and selflessness. Grave breaches of the friendship "code" result either in a cessation of the relationship, or in the transformation of friendship into superficial comity or even into its opposite—enmity.

The problem of friendship and friendly communication is particularly important with teenagers. This is borne out by numerous observations of pedagogues, teenagers' intimate diaries, as well as by the interest they show in traditional discussions on friendship and love. Yet the search for a friend often ends in disillusionment because of the gap between the true character of the teenagers' relations and the high standards of the code of friendship. The disappointments resulting from the discovery of such a gap sometimes spark off quarrels between teenagers, particularly between girls.

The need for a friend is very characteristic of the juvenile age. The teenager, as a rule, has a more or less clear idea of the standards of friendly communication, yet the most characteristic feature of juveniles is not so much the friendship between two individuals to which they aspire, as kind of *comradeship* implying a broader communication with the peers. Friendly relations enable the teenager to participate in a process of communication where he may extend his Self to many of his peers with the help of traits and abilities that are meaningful to him: he finds interest in discussing books with one of them,

playing table tennis with another, speaking about the future profession with a third one.

This juvenile comradeship should not be identified with superficial relations of amity, since the subject of friendly communication seeks to be represented in the activity of his peers through the agency of his individual qualities that are meaningful to him, and attempts to identify himself with others in a kind of "common cause", something of significance and value not only to himself, but also to others. Teenagers' friendship is but a stage in the development of friendly communication; its true value can only reveal itself in adults who have attained social maturity.

Experiments have shown that in senior forms the character of teenagers' friendly relations undergoes a noticeable change. Unlike middle-form children willing to continue studies in senior forms who do not link their mutual preferences with the choice of their path in life, senior pupils show a change to professional orientation and restructure their attachments accordingly. It has been revealed that the groups of senior pupils gravitating to one another base their preferences on professional orientations. If such a microgroup originally includes a classmate following a different vocation, he usually (though not always) drifts away and either joins another company with whom he has a greater affinity because of their professional orientation, or remains more or less isolated.

On the evidence of experimental data such cells of friendly communication are characterised by *latent profession-related orientation* activity initiated by the pupils themselves: the teenagers define for themselves their professional interests, share available information on the future profession, its possibilities, prospects, methods of vocational training, etc.

The ideal of friendly communication between two individuals is typically, but not exclusively, realised by teenagers in intimate relations between the sexes, in the first manifestations of early juvenile love.

II.5.4. Communication as Mutual Understanding

Besides the interactive and communicative aspects, communication also has a *perceptive aspect* which shows

in the process of mutual perception of the participants in communication.

Communication only becomes possible if the individuals entering into the process of interaction can assess the level of the mutual understanding of the participants and size up, as it were, their partner. Participants in communication seek to reproduce in their consciousness the partner's inner world and understand his feelings, motives of behaviour and attitude to significant objects.

Yet this reproduction of another individual's inner world is not a simple problem. The subject is immediately given only the external appearance of other people, their behaviour and actions used as communicative means; he has to make certain efforts in order to understand, on the basis of the information he has, the people he deals with, make a conclusion regarding their abilities, thoughts, intentions, etc. An individual act is not directly linked to the inner psychological mechanism behind it, wherefore interpersonal perception turns into the solution of a psychological problem. *The perceptive aspect of communication consists in the perception, understanding and assessment of one individual by another.* Getting to know other people, the individual receives a possibility to assess more accurately the prospects of their joint activity. The success of their joint efforts depends on the accuracy of his insight into their inner world.

Mechanisms of Mutual Perception. The process of communication includes at least two participants. How can each of them construct an image of the other, of his inner world, proceeding only from the other's external behaviour characteristics? In order to answer this question, we shall concern ourselves with the operation of three principal mechanisms of interpersonal perception: *identification, reflection and stereotyping.*

Identification is a method of understanding another individual by consciously or unconsciously identifying oneself with him. In different situations arising in the process of interaction people make guesses at another individual's inner state, intentions, thoughts, motives and feelings by placing themselves in his position. Seeing two obviously excited girls feverishly leafing a textbook in front of the college building during entrance exams a student can easily reconstruct their mental state by

restoring in his memory the time when he himself was standing at the door waiting for an invitation to enter the examination room.

However, the subject of communication needs to understand his partner not only in the abstract disinterested manner like an outsider—it is important for him to know how he himself will be perceived and understood by the other person. *The awareness of the subject of his own image formed in the partner's mind is called reflection.* Reflection is incorporated in the perception of another individual. To understand another person means, among other things, to be aware of his attitude to oneself as the subject of perception. Hence, the perception of one man by another can be likened to a double mirror image. An individual reflecting another individual reflects himself in the mirror of the other's perception. In communication processes identification and reflection come out as a single whole.

If every person always possessed full, scientifically valid information about people he communicates with, he would be able to map out all his tactical moves with absolute accuracy. Yet in everyday life the subject usually has no accurate information which makes him *ascribe to other persons the causes of their actions. The causal explanation by the subject of another person's actions by ascribing to him certain feelings, intentions, thoughts and motives of behaviour is called causal attribution or causal interpretation.* An erroneous causal interpretation of a child's behaviour by the pedagogue hampers or even renders impossible normal pedagogic communication at school. Causal attribution is usually performed unconsciously—either by identifying oneself with another individual, i.e., by ascribing to him those motives or feelings one believes he himself would have in a similar situation, or by including the partner in the process of communication into a definite category with stereotyped characteristics.

Stereotyping is the classification of the forms of behaviour and their causal interpretations (sometimes without any good reason) by rating them with already known or only seemingly known phenomena fitting in with social stereotypes. Stereotype in this sense is a fixed image of an individual used as a *cliché*. Stereotyping

may be a result of the generalisation by the subject of interpersonal perception of his personal experience, the information picked up from books, films, etc., and the opinions of friends and acquaintances that stuck in his mind. The pieces of knowledge thus obtained may be not only doubtful, but downright false representing a mixture of correct conclusions with absolute nonsense. However, stereotypes of interpersonal perception are often taken for tested standards allegedly providing a key to the understanding of other people.

The data obtained in an experimental opinion poll showed the popularity of utterly false stereotyped notions of direct correlation between a person's appearance and the traits of his character. Out of 72 polled individuals, 9 held that people with square chins possess strong will, 17 stated that a large forehead is indicative of superior intellect, 3 believed that unruly hair is a sure sign of a recalcitrant character, 5 contended that small stature bespeaks masterfulness, energy and lust for power, 5 affirmed that handsome individuals are either stupid or self-loving, and 2 were of the opinion that a person with thin pale lips is bound to be secretive and hypocritical.

It stands to reason that all these stereotypes were bound to influence the process of interpersonal perception tending to distort the image of the partners in communication and hamper normal intercourse.

Stereotyping as a mechanism of causal attribution underlies the racists' traditional interpretation of blacks' behaviour as sexually aggressive, cunning, unpredictable, etc. In this case stereotyping takes on the form of *bias*.

The character of causal attribution depends on a number of conditions which are well known to psychologists. Thus the perception of an unknown person is greatly influenced by the initial information available to the subject.

In a series of experiments a picture of one and the same individual was shown to two groups of students. In one group the experimenter referred to him as a distinguished scientist, in the other, as a criminal. The students were offered to describe his character proceeding from his appearance. The first group perceived the man as a hard-working, kind, sympathetic and intelligent person, the second, as a cruel, resolute and cunning indi-

vidual. One and the same detail of the picture, the man's eyes, elicited in the first instance such epithets as kind and intelligent, and in the second, as vicious and merciless.

As one can see, the initial information drastically biased the process of perception causing the subjects to fit their assessment of man's appearance to the stereotypes of scientist or criminal.

In pedagogic communication stereotypes biasing the teacher for or against pupils lie at the root of subjectivism.

US psychologists carried out the following experiment. A large group of experts (400 college professors) were asked to familiarise themselves with copies of students' personal records (questionnaires, autobiographies, photographs, sample compositions, etc.). Each expert received one file and was to give a comprehensive account of the student's personality following a definite pattern. The analysis of the experts' opinions showed that the accounts could be roughly divided into two groups, generally favourable and generally unfavourable. The answers of some experts could not be definitely included in either category. What was the idea of the experiment? According to its design, all the 400 experts received Xerox copies of *one and the same* file, but 200 sets of such copies contained a photo of a nice-looking young man, serious and intelligent, whereas the other 200 sets showed a foppish unpleasant individual of approximately the same age. The first photo produced a favourable impression and biased the experts towards the individual with good looks, the second picture had the opposite effect. The impact of the photograph overpowered the abundant objective data the experts had at their disposal. Indeed, they were not asked to appraise the student's appearance, yet it was precisely the appearance that tipped the scales and determined their judgement.

Regrettably, the teacher's subjectivity is frequently referable to the spell of appearance.

Prejudice and subjectivism often owe their origin to the initial information the pedagogue receives about the object of his care.

In the late 60s, American psychologists *Rosenthal* and *Jacobson* carried out a psychological experiment aimed at clarifying the role of initial information in the formation of a biased opinion.

As is known, special tests are used in a number of Western educational institutions for determining the intelligence quotient (IQ) indicating the individual's level of brightness and obtained by dividing the mental age by the chronological age and multiplying the result by 100. In this particular case tests were performed on two contingents of college entrants who were later assigned to different study groups. The students themselves were not informed of the results of the tests, but the experimentors let their professors know that, for instance, Smith had a very low IQ, and Jones, a very high one. Every group included two or three students that had been subjected to intelligence testing. Actually, the professors received deliberately falsified information—high or low intelligence quotients were assigned to the testees at random (the first on the list was declared gifted, the second dull, the third gifted, the fourth dull, etc.). In some time the experimentors checked the progress of the testees. The students with an allegedly high IQ were generally doing well, the professors were satisfied with their progress and praised them. As regards those “assigned” a low IQ, they were in a very difficult position: some of them have already been discharged, others just kept their head above water. Despite some exceptions, the general trend was obvious. What do the findings of this experiment, far from harmless to the students concerned, attest to? The professors “knowing” that they dealt with a gifted person did their best to let him reveal his talents or, “knowing” that the student was untalented, did not want to waste their time and treated him with undisguised scorn which could not but affect his status and general performance. The initial information imparted to the pedagogues biased their attitude to the student and they did their best to confirm their opinion of him.

A question naturally suggests itself: isn't it sometimes the biased attitude of the pedagogues which lies at the root of a child's poor performance at school? Their prejudice likely to stem from preconception or be provoked by the pupil's untidiness or naughtiness may turn into all-round subjectivism and attempts to justify the adopted stand.

The ascription of positive qualities to persons towards

whom the subject of perception is well disposed, and negative qualities to those he does not favour is one of the typical cases of causal attribution.

In one experiment records were kept of the marks given by teachers to unfamiliar children for an assignment they had fulfilled. The experimenter had found out beforehand which of the children seemed to them more attractive, and which less attractive. It turned out that even in those cases when the “attractive” children acting in collusion with the experimenter made more mistakes than the “unattractive” ones, the former were rated higher and were ascribed positive qualities, whereas the latter were denigrated. This dependence laid bare in the experiment is known as *halo effect*.

The halo effect consists in that a general favourable impression produced by an individual on the subject biases the latter to assess positively also those characteristics of the individual which are *not given* in perception; conversely, a general unfavourable impression results in a negative assessment. The halo effect usually arises when the subject of perception possesses but scanty information about the perceived individual. However, this effect may also manifest itself in the case of a known object of perception under the conditions of highly emotional attitude to him. Thus the tendency of some teachers to cultivate favouritism, inadmissible from the viewpoint of pedagogic principles, inevitably leads to subjectivist assessment of pupils' performance and biased perception of their personal characteristics.

The negative consequences of the halo effect are eliminated in joint socially useful activity which alters the character of interpersonal perception and provides a solid foundation for causal attribution. It is only in a real collective based on work-mediated interpersonal relations and socially important goals that individuals achieve adequate understanding of one another.

Feedback in Communication. Communication, it will be recalled, cannot be reduced to simple conveyance of information. For its success it must include *feedback*, i.e., *the reception by the subject of information about the results of his interaction with another subject*.

Passing some information to another individual, ordering him to do something, sending a request or asking

a question, the subject constantly receives information about the efficacy of his actions—communication of necessity presupposes reflection. Proceeding from this reciprocal information, the subject continuously modifies his behaviour, restructuring the system of his actions and the means of verbal communication in order to be understood correctly and attain the desired end. On the subjective side, a communicating individual may not even be aware of feedback, but unconsciously he always relies upon it.

The subject of communication becomes keenly aware of the role of feedback if the latter is blocked for some reason or other. Thus a senior pupil who is assigned to speak to his schoolmates via the intercom finds it very difficult to do so in the absence of the habitual response from the listeners—he begins to falter, speaks either too fast or too slowly, hesitates, his normal intonation disappears, etc. If a speaker cannot visually perceive the interlocutor, he becomes constrained, stops using his customary gestures, etc. The signals received during the perception of the interlocutor's behaviour help the subject to correct his subsequent actions and modify his remarks.

Generally speaking, the perception of the interlocutor or listener during communication is an important condition for mutual understanding. If a teacher does not heed the feedback information on how he is understood and perceived by the pupils, interaction becomes impossible and the pedagogic contact breaks. This is the reason why monologic forms of communication are more difficult than dialogic ones; the lecturer's possibilities of receiving feedback are not as broad as those of the instructor conducting a seminar or laboratory studies. An experienced pedagogue at a lesson "deciphers" momentarily the facial expressions, mimics, intonation and gestures of dozens of pupils and, perceiving their mental state, apprehensions, hopes, grief and intentions, modifies his behaviour in accordance with his understanding of their inner world and chooses the most suitable methods of exerting his influence on them. Thus feedback in the processes of interpersonal perception performs the *informative and self-regulatory functions*.

Certain components of man's appearance (face, hands, shoulders), his postures, gestures and intonation carry

information which should be taken into account during communication. Particularly informative in terms of feedback signals is the interlocutor's or listener's face. The teacher can always tell by the face of the pupil if the latter is listening to him attentively or does not hear him at all ("vacant look"), believes him or is doubtful ("skeptical expression"), etc.

To be sure, the perception of the subject of communication by other individuals can best be judged by the whole set of signals coming from the perceiver and, first and foremost, by their actions. While being lectured by a teacher, a schoolboy may look all attention; in fact, however, he is on thorns waiting eagerly for the pedagogue to finish and let him join his playing classmates.

Communication Training. The skills of productive communication develop spontaneously or arise as a by-product of training (the first-former is taught to give a "full answer", to stand up when being addressed by a senior, etc.). Senior pupils familiarise themselves with communication standards by reading popular literature on etiquette. Yet special training aimed at developing communication habits represents a separate task the importance of which for the pedagogue cannot be exaggerated. One of the ways to solve this problem is through *socio-psychological or communication training*.

Socio-psychological training has two kinds of objectives: first, studying the laws of communication in general and the special laws of pedagogic communication, in particular; second, mastering the technique of pedagogic communication, i.e., forming the habits and skills of professional pedagogic communication.

Hence, psychologists distinguish between the theoretical and practical aspects of the problem of socio-psychological training. The practical aspect boils down to *exercises* aimed at helping teachers develop habits and skills of communication with pupils: the ability to act consistently at all stages of a lesson (developed mainly during practical lessons at school), the ability to achieve muscular relaxation during lessons, the ability to distribute voluntary attention, and the ability for observation. Special importance attaches to elocution exercises aimed at improving oral speech standards and based on the use

of feedback audio and video tape recordings; the latter technique which is gaining ground is instrumental in developing adequate mimicry and pantomime in the process of pedagogic communication. It is common knowledge that a person listening to a recording of his own voice or, the more so, watching his videotaped performance on the screen, that is seeing himself, as it were, from aside like any other individual receives an excellent opportunity for correcting his speech, mimicry and pantomime.

Psychological-pedagogic training may be conducted in the form of *professional games* which simulate the object-oriented social context of the future specialist's professional activity and thereby permit modelling, more realistically than in traditional training setups, the conditions for moulding the specialist's personality. In such games the development of new skills is geared to the participants' future work.

Communication training as one of the methods of psychological influence enhances the individual's ability for communication and collective activity thereby improving his personal characteristics.

Chapter 6

COLLECTIVE

II.6.1. Groups and Their Classification

In his practical activity the pedagogue deals not only and not so much with every pupil separately, as with different groups to which his pupils belong: the class collective, the family, a street company that involved a teenager in its activity or a small group of boys united around some leader in the class. For this reason the teacher must know the main socio-psychological laws governing the activity of groups and collectives.

A *group* is a social unit differentiated from the social whole on the basis of a certain characteristic, e.g., class affiliation, the fact or nature of joint activities, the specificity of organisation, etc. Groups are divided into *small* and *large* which, in turn, fall into *real (contact)* and *conventional* groups, *formal (official)* and *informal (unofficial)*, groups with different levels of development: *developed* (collectives) and *underdeveloped* (associations, corporations and diffuse groups).

Large groups may be *real (contact)* social units which embrace a considerable number of people characterised by spatial and temporal proximity and maintaining contacts with one another. Such large groups may be exemplified by the teacher body of a large school; many of its pedagogues may have no direct links with one another, yet they may have common superiors (the principal, the head of studies), belong to the same party and trade union organisation, observe the same daily routine, etc.

Large groups may also be *conventional* communities of individuals differentiated as a whole on the basis of certain characteristics (class, nationality, sex, age, etc.). Individuals belonging to a large conventional group may

not even know one another; however, being included under a common head on some definite criterion, they may have common social and psychological traits. For instance, teenagers may be included in a large conventional group irrespective of where they live, what language they speak, whether they have ever met one another, etc. Their general social characteristics (secondary-school pupils), age (from 12 to 15), and psychology (juvenile tendency towards self-assertion) are in the main identical. The study of large conventional groups (in the context of developmental psychology, social psychology, etc.) makes it possible to single out their common properties and work out a scientifically grounded programme (strategy and tactics) of educational activities. Knowing the general regularities underlying the development of the teenagers' personality, the pedagogue can rely upon them as a guide in his purpose-oriented and fruitful educational work at school and in other children's establishments.

Small groups are always contact communities comprising directly communicating and interacting individuals. These groups may be *official (formal)*, i.e., possessing legally secured rights and obligations, a formalised hierarchical structure and appointed or elected leaders. Under the conditions of social division of labour official groups, such as the supply department of an industrial enterprise, the student body of a college, the teacher body of a school are assigned a definite field of social activity, and business contacts of their members are regulated by relevant documents.

Unofficial or, more commonly, *informal* groups are social units which have no legal status, but have the characteristics of an established system of interpersonal relations (friendship, sympathy, mutual understanding, trust, etc.). They may assume the form of an isolated unit (for instance, several pupils from different schools brought together by common interest in motorcycling), but may also arise within official groups and acquire rather a high degree of stability (a close set of friends in a class). Finally, an official group retaining all its characteristics may also possess all qualities of an informal group (close friendly relations, mutual sympathy of its members, etc.). Hence, there are no hard and fast

lines between formal and informal groups. One of the major tasks facing the teacher in his educational work is to help in creating such informal groups of pupils that would strengthen and enrich the activity of those official groups to which the pupils belong.

Communication and activity in any group (both large and small) are determined and regulated by the social relations which prescribe the mode of life of their members, shape their values, ideals, convictions and the world view.

The most important criterion for groups classification is the degree or level of their development. The *level of group development is indicative of the maturity of its members' interpersonal relations, representing the result of group consolidation*. In Western psychology the maturity of a group is characterised by the duration of its existence, the communication intensity of its members, i.e., the number of their contacts within a definite space of time, the presence of a hierarchical structure (relations of subordination), etc. By contrast, in defining the level of group development Soviet psychologists proceed from the activity of the group, its values and goals as the principal factors which determine the character of its members' interpersonal relations. It is precisely on this base that Soviet psychology classifies groups into *collectives, prosocial associations, diffuse groups, asocial associations and corporations*. The highest level of group development which manifests itself in the activity and interpersonal relations of group members is characteristic of collectives.

II.6.2. Collective as the Highest Form of Group Development

Small Group in Western Psychology. Western, particularly US psychologists, focus their attention on a *small group—a social unit comprising directly interacting and communicating individuals*. They regard a small group predominantly as a community based on a system of emotional bonds (sympathy, antipathy, indifference, pliability, etc.). The cohesion of small groups, the resistance of their structure to the forces tending to disrupt the interpersonal links, the efficacy of group

activity versus its size, the style of leadership, the group members' conformism or nonconformism vis-à-vis the group, as well as other problems of interpersonal relations became objects of experimental investigation and formed a new department of psychology—*group dynamics*. The regularities underlying the behaviour of people in different groups are in fact reduced to mechanistic relationships: the group exerts pressure and group members either yield or do not yield displaying conformism or nonconformism; some individuals attract the group, others repel it or are expelled by the group; if the number of contacts inside a group increases, the group links wear out and break (cohesion versus compatibility), etc.

In the early 20th century behaviourism, one of the most influential trends in American psychology, tended to describe man predominantly as a mechanism reacting to various stimuli. Now the followers of this school and other theoretical trends in social psychology are inclined to ascribe the same mechanistic characteristics to any social group regarding it as an aggregate of externally connected and interacting individuals. In the 1940s the US psychologists adduced experimental data as evidence that at least one third of all group members allegedly succumb to group pressure and subscribe to the majority's opinion imposed upon them, that is reveal unwillingness to express and defend their own views if they do not coincide with the views of other participants in the experiment. It was commonly believed that an individual subjected to group pressure could only choose between conformism and nonconformism. The aim of all investigations was in fact reduced to the elaboration of this basic conclusion. Psychologists studied the effect of group expansion on the conformism of its members, examined the subjects' interpretation of their own conformist behaviour, attempted to correlate conformist reactions with sex and age, etc.

In pedagogical practice the above theoretical alternative turned into a grave dilemma offering the educator but two equally unsatisfactory solutions: either to mould a personality capable of opposing the influence of social environment, group, collective, or to cultivate conformism, i.e., bring up individuals always inclined to agree with the majority, unwilling and incapable of taking

a firm stand in the face of opposition. This impasse called in question the validity of the basic premise and made the investigators take a closer look at the group that exerted its influence on the individual in the US psychologists' experiments. It became obvious that the object of their studies was in fact a chance aggregation of individuals accidentally brought together and commonly known as a diffuse group, and that the set-up of the experiments provided only for studying a purely mechanical influence of the group on a person, a group that was nothing but a sum total of individuals united exclusively by spatial and temporal proximity. In point of fact, the very understanding of interaction between a person and a group was basically wrong and could not but lead the psychologists to a blind alley. In order to overcome the deadlock it was necessary to revise the concept of group dynamics and find out if the model of group interaction really provided a key to the psychology of a collective.

Activity-mediated Interpersonal Relations in a Collective.

All distinguishing features of a collective, such as the character of the interpersonal relations of its members (their cohesion), the psychological climate in the collective, the perception of the collective by its members, the self-concept and self-respect of the individual in the collective, the mutual trust of its members and the prospects of the individual in the collective in connection with the prospects of the collective itself derive from the specificity of a collective as a group of people united by common socially valuable goals of joint activity.

The question, naturally, arises whether interpersonal relations in a collective are governed by the same laws that are allegedly in operation in small groups and whether these laws have a universal nature. The Soviet psychologists answer this question in the negative. Their research into interpersonal relations in real collectives clearly shows that the laws underlying the joint activity of collectives are essentially different from the regularities discovered by US psychologists in small groups and erroneously declared to be universal.

The first psychological phenomenon which was not and could not be revealed in a small group representing a diffuse community and which was clearly established

during investigation into interpersonal relations in a collective is *collectivist self-determination*. Experimentally, collectivist self-determination came into the limelight while investigating the phenomena of conformism and nonconformism with the help of a *dummy group* whose members had secretly agreed to delude a "naive" outsider, or while deliberately distorting the information coming from the group and made known to the individual under test by the investigator. The technique of the experiments provided for the solution of problems insignificant to the subjects. For instance, they were offered to define the length of straight line segments, the duration of short time intervals, etc.

In one experiment the subjects were trained for some time to determine one minute's period by counting the seconds to themselves without looking at a watch. Soon they learned to do so accurate to five seconds. After that they were placed in special cabins, told to count off one minute and inform the experimenter and other subjects about the expiration of one minute by pushing a button (the subjects knew this would cause the lamps on the experimenter's panel and in all the cabins to light up). Using a special arrangement, the experimenter could apply signals allegedly coming from one or several subjects to all the lamps in the test boxes. Closing the switch in, say, 35 seconds, and registering those who hastened to push their button, he easily identified the suggestible (conformable) and nonconformable individuals. The degree of conformability was determined by the difference between the subject's results in the preliminary and final tests.

The experiment showed that the percentage of conformist reactions was fairly high.

Such results were only to be expected in a group of people whose interaction is essentially superficial and relates to insignificant objectives not connected with their vital goals and values; in fact, the division of diffuse group members into conformists and nonconformists is inevitable. However, this kind of conformity investigation gives no cause for a conclusion that the above model of relationships can be extended to *any* group, including a collective whose activity is distinguished by personally meaningful and socially valuable content.

A hypothesis was therefore advanced that *interpersonal relations in communities based on joint socially meaningful activity are mediated by its goals and values*. If that were so, the true alternative to conformity would be not nonconformity (negativism, independence, etc.), but a new quality of *collectivity* which was to be investigated on the experimental basis.

The hypothesis determined the tactics of experimental investigations based on the use of the "dummy group" method. Indeed, this method enabled the experimenter to create a conflict situation by inducing, allegedly in the name of the group, its members to relinquish the group's values and made it possible to clearly demarcate the individuals displaying conformity and those capable of acting in accordance with their inner values.

This latter type of the individual's behaviour in a collective is commonly known as *collectivist self-determination*, which is seen in the *selective attitude of a collective's member to any influences (including those in his own collective), in the acceptance of one kind of influences and rejection of other kinds depending on the mediating factors: convictions, principles, ideals, goals of joint activity*.

Collectivist self-determination manifests itself under spontaneous or specially organised group pressure as a behaviour which is determined not by the direct influence of the group or the individual's inclination to conformism, but chiefly by the group's professed goals and aims of activity, by stable value orientations. In contrast with a diffuse group, the person's reaction to group pressure in a collective is characterised by the *prevalence* of self-determination which therefore comes out as a specific quality of interpersonal relations.

Life confirmed the hypothesis that the true alternative to conformism in communities uniting people for socially useful activity is not negativism (nonconformism, etc.) but genuine collectivism in the form of the person's self-determination in the group (collectivist self-determination).

The phenomenon of collectivist self-determination is the most important socio-psychological characteristic of the collective, a living "cell" of the social organism. Relations between two or several individuals cannot be

reduced to direct links between them. In groups engaged in common activity they are bound to be mediated by its content, values and goals. More or less direct interpersonal relations are typical of diffuse groups; as for collectives, they are notable for mediated links between their members that form during the course of the group's joint activity. The very fact that the collective is qualitatively different in psychological terms from small groups chosen by the adherents of the school of group dynamics for their experiments rules out the possibility of extending their findings to interpersonal relations in collectives. All attempts to do so have been foredoomed to failure. **Multilevel Structure of Interpersonal Relations in a Collective.** Unlike interpersonal relations in the diffuse group which are typically direct, group processes in the collective are mediated and form a *hierarchical multi-level (stratometric) structure*.

The core of this structure (A) is the joint activity itself, its semantic socio-economic and socio-political characteristic (see Fig. 5).

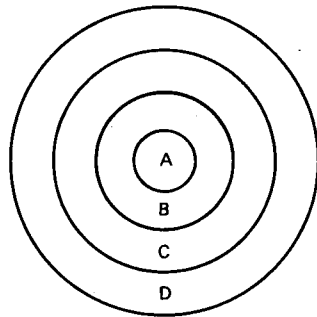


Fig. 5.

The first level (stratum B) is formed by the group members' attitudes to collective activity, its goals, tasks, principles and social meaning for each participant.

The second level (C) represents the characteristics of interpersonal relations mediated by the content of joint activity (its goals, tasks and progress), as well as by the principles, ideas and value orientations which are adopted in the group and, in the final analysis, reflect the ideological formations of society. Presumably, it also includes various phenomena of interpersonal relations,

such as collectivist self-determination, which will be discussed later, as well as effective mediation—the principle of existence and the principle of understanding of the second psychological stratum.

The third level of interpersonal relations (D) lying on the surface mainly shows emotional links that are not mediated in any appreciable degree *either* by the collective aims of activity *or* collective values. It does not mean, of course, that such links are completely unmediated. One can hardly expect relations between any two individuals to be absolutely free from any intermediate links in the shape of, say, certain interests, tastes, etc. Yet they may be practically unaffected by the content of group activity or reveal but a negligible amount of its influence.

Just as the regularities of interpersonal relations inherent in a diffuse group are not applicable to a collective, so the regularities characterising the phenomena of the surface stratum of a collective's interpersonal relations cannot be universalised and elevated to a status of essential characteristic. In like manner, the links in stratum C are necessary, but not sufficient to characterise a collective without taking due account of the relations in stratum B, i.e., without establishing the social sense of its members' activity, their motives, etc.

Collective and Its Psychological Distinctions from Other Groups. A collective is a group where interpersonal relations are mediated by a socially valuable and personally significant content of joint activities. This is the collective's basic psychological feature setting it apart from other groups. Besides the prevalence of collectivist self-determination and a comparatively low level of conformist reactions, the collective is characterised by a number of other psychological phenomena that will be considered later in the text.

Group typology can be illustrated graphically (see Fig. 6). The group field vectors indicate, on the one hand, the degree of mediation of interpersonal relations (C), and, on the other, the semantic aspect of mediation developing in two opposite directions: A—in the direction corresponding, most generally, to the socio-historical progress; and B—in the opposite direction. Let us denote vector A as prosocial development of mediatory factors, and vector B, as their asocial development.

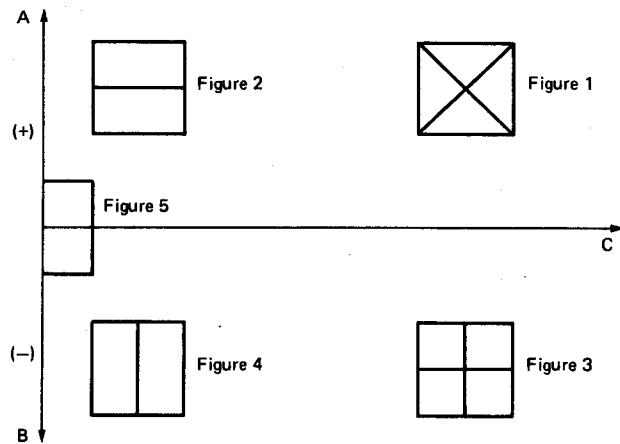


Fig. 6.

Now, using the three vectors (A, B and C) let us plot a diagram and consider its components.

Fig. 1 in the diagram represents the necessary features of the *collective* that meet the needs of social progress. The high social significance of the mediatory factors has a definitive influence on the interpersonal relations of the collective's members increasing their cohesion to a maximum possible degree.

Fig. 2 represents a community in which the group processes are but very little influenced by advanced social values. This may be a newly created group with a low level of its members' joint activity in which the success of one individual does not determine the success of others and the failure of one does not influence the performance of another. The ethical values operational in such a group have been imported from a broader social community and, not yet consolidated, are still external to the process of communication and joint labour of its members. The future of these values depends on the success of collective activity which constantly engenders and consolidates them. It is a *prosocial association*.

Fig. 3 represents a group characterised by a high level of mediation of interpersonal relations, but the mediatory

factors militate against social progress and are utterly reactionary. This group may be representative of any *antisocial corporation*.

Fig. 4 represents a community in which interpersonal relations are in fact not mediated by common factors of joint activity, being determined by asocial views and notions. It is an *asocial association*.

Finally, *Fig. 5* represents a typical diffuse group characterised by the absence of both the social value of mediatory factors and their influence on the system of its members' interpersonal relations. Such is, for instance, an experimental group of individuals accidentally brought together to solve socially insignificant problems.

These five extreme positions (the number of their intermediate combinations being practically unlimited) characterise respectively the following most conspicuous levels of group development:

1. Maximum degree of mediation and maximum social value of the activity factors mediating interpersonal relations. This is a collective (for instance, trade union bodies, scientific societies).
2. Minimal degree of mediation with the highest development of prosocial factors which might mediate interpersonal relations if the group were based on a corresponding joint activity. This is a prosocial association (for instance, a friendly company of students).
3. Absence of mediation resulting from the absence of joint activity. This is a diffuse group (for instance, bus passengers or patients in a common ward).
4. Minimal degree of the mediation of interpersonal relations by some joint activity with the highest degree of asociality of mediatory factors (for instance, a group of rowdy teenagers). This is an asocial association.
5. Maximum degree of mediation by activity and the extreme reactionary, antisocial character of mediatory factors. This is a corporation (for instance, the mafia).

Experiments have shown that the collective characterised by the highest level of group development is essentially different from all other groups. For instance, the regularities operating in the collective are often the reverse of those typical of diffuse groups. US social psychologists studying the relationship between the

intensity of emotional communication in a group and the efficacy of its activity come to contradictory conclusions: some of them obtain positive correlations, others, negative ones. The apparent contradictoriness of their findings can easily be eliminated if we differentiate the groups on the criterion of mediation of their members' interpersonal relations by the content of group activities. In contrast with diffuse groups, the efficacy of activity in a collective is always positively correlated with healthy emotional-psychological relations between its members. Groups with a low level of development show inverse correlation between their size and the members' desire to contribute to the common cause, whereas in a collective the growth of membership does not have an adverse effect on the participants' motivation to joint activity. Again, in a casual social aggregation an individual's chance of getting help he may need diminishes with an increase of the group size, which is not the case with a collective, etc.

Socially valuable and personally significant joint activity promotes and consolidates collectivist interpersonal relations and tends to eliminate contradictions between the individual and the collective. It gives rise to such a specific phenomenon unknown in interpersonal relations under other conditions as collectivity, characteristic of the highest level of group development.

II.6.3. Differentiation in Groups and Collectives

Individuals making up a group cannot hold similar positions in relation to one another and to the group's activity. Every group member in accordance with his business and personal qualities, his *status*, i.e., the rights and duties attesting to his *prestige* which reflects the degree of recognition by the group of his merits and personal qualities occupies a definite position in the system of group interpersonal relations. Thus one pupil is a recognised authority in the class on sports, another has a reputation as a wag and practical joker; one is good to talk about serious and important matters, whereas

another is not good for any talk; one can be depended upon in anything, whereas another is completely unreliable. The broad variety of characters represents a motley picture of *group differentiation* in a class where every pupil has a definite status and prestige.

When, for instance, a class is taken over by a new pedagogue, the school head-master or the head of studies tells him who is who in the class describing the relative standings of individual pupils in the class structure and differentiating the excellent and weak pupils, the active section and the "slough", the malicious trouble makers, the best sportsmen, etc. Such information is very important for the pedagogue, yet he must always bear in mind that behind this conspicuous diversity that catches one's eye lies an invisible tangle of personal preferences, choices, positions and ratings which can only be discerned in the course of prolonged, systematic and close pedagogic observations or brought out in experimental studies.

Psychologists distinguish two basic systems of internal group differentiation: *sociometric* and *referentometric* preferences and choices.

Interpersonal Selection. Sociometry. One may rank as a good pupil, yet fail to win the sympathy of his classmates. On the other hand, the reputation of one of the most undisciplined pupils need not necessarily prevent one from being a desirable friend for many. Sympathy, emotional preferences play an important part in interpersonal relations providing a key to the understanding of a complex picture of group differentiation.

The US psychologist, *Jacob Moreno*, proposed a method for studying interpersonal relations within groups and a set of procedures for measuring emotional preferences called by him *sociometry*. Using these procedures, psychologists can establish a quantitative measure of preference, indifference or rejection displayed by group members in interpersonal relations. Sociometry is widely used for revealing sympathies or antipathies among group members who may not be aware of such relations and of their own attitudes. The sociometric method provides quick results which lend themselves to mathematic processing and graphic representation (see the sociometric chart of group differentiation in Fig. 7).

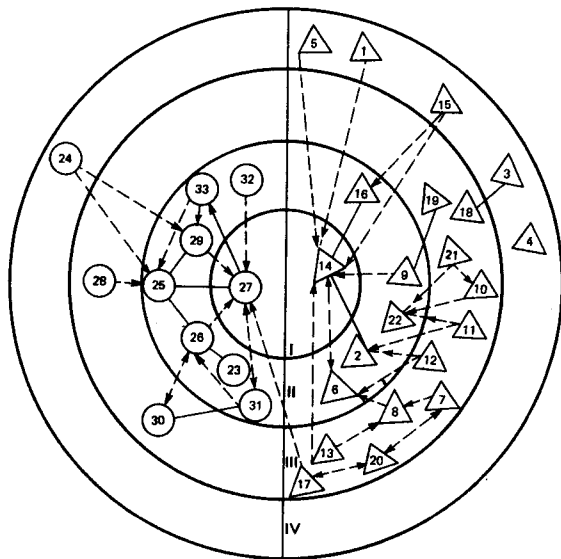


Fig. 7. Group differentiation in school form. Circles denote girls, triangles—boys.

The sociometric method is based on a point-blank question: "Whom would you prefer?" It can be referred to any sphere of human relations: whom would you prefer to sit with at a desk, to spend your leisure hours with, to have a good time with, to work with, etc. As a rule, the opinion poll is limited to the fields of joint labour and recreation. The questionnaire may also request the subject to specify the degree of desirability of his choice (I am very willing, willing, indifferent, not very willing, very unwilling) and offer a restricted range of options. Subsequent analysis of the choices recorded in a matrix shows a complex tangle of mutual sympathies and antipathies, reveals sociometric "stars" (chosen by the majority) and "outcasts" (rejected by all), and discloses a whole hierarchy between these two extremes.

The sociometric method is undoubtedly a very effective instrument of psychological research capable of providing

a fairly accurate picture of emotional preferences in a group within a much shorter period than the method of observation.

However, sociometric analysis can provide only a most general description of the communicative network arising in the process of interaction of group members. It does not disclose the reasons why an individual in some communities finds himself counterposed by the group, whereas in others there are no such breaks in the communicative network.

Besides, the system of links revealed with the help of sociometric techniques is by no means immutable. Today's "star" may find itself an "outcast" tomorrow. This mutability is not reflected in sociograms which tell us nothing about the causes of such changes. They also leave us in the dark regarding the motives of the group members for preferring some individuals to others, i.e., do not disclose the base of their sympathies and antipathies.

The model of a group as an emotional-psychological phenomenon which underlies sociometric investigations is not suitable for analysis of interpersonal relations of individuals on the basis of definite socially sanctioned norms, value orientations and assessments as it in fact reduces the investigation to a superficial record of interactions and mutual emotional appraisals and inclinations. This approach simply leaves out of account the goal-oriented activity of the group and its members.

The interaction of man as a personality with the environment is conditioned by and proceeds within a system of objective relations of his productive and social life. Behind the real links arising objectively in the process of the interaction of individuals we find a complex network of expectations, mutual interest of individuals in one another, various positions which reflect the established interpersonal attitudes. It stands to reason that the assessment of the character and significance of objectively arising links is determined, first and foremost, on the basis of the investigation of real facts, actions and behaviour of individuals, on the basis of the objective results of their joint activity.

One cannot draw far-reaching conclusions proceeding only from a known picture of mutual likes and dislikes within a group. Sociometry records only the external

side of existing bonds and is incapable by its very nature to reveal their hidden foundation.

The practice of sociometric research shows that the subjects do not necessarily disclose the real reason for this or that choice, wherefore their answers often obscure the true motives instead of laying them bare.

A question naturally arises how it is possible to reveal the real internal dynamics of group interpersonal relations if they are inaccessible to sociometry, incapable, for all its advantages over simple observation, to penetrate beyond the phenomena that lie on the surface. The external picture of interaction within a group is in fact a result of latent relations between group members, but sociometry does not bring out the causes of the popularity of some individuals and isolation of others.

Motivational Nucleus of Choice in Interpersonal Relations. This brings us to an important psychological task—to reveal the motives lying behind a person's readiness to establish an emotional (and business) contact with some group members and to reject others, i.e., to get an insight into the *motivational nucleus of choice in interpersonal relations*.

A direct question cannot be always expected to elicit a sincere answer; besides, an individual may sometimes be unaware of his real motives for preferences or rejections. For this reason special importance attaches to experimental investigations designed to reveal the motivation of interpersonal choices by indirect evidence.

In working out the design of an experiment for determining the motivational nucleus of a certain interpersonal choice the experimenter reasoned as follows. Suppose, pupil Larionov is granted the right to choose his desk-mate. If he chose Kovalev, and not Nosov or Smirnov, what would be his motives? Larionov's thoughts would evidently run like this: "Kovalev is merry and lively: one will never be bored with him, he is sure to find something funny even in the dullest lesson and make you laugh. He is very good to pass the time away with. However, he cannot prompt correctly and one cannot crib off him—he makes more mistakes than I do. Nosov? He always knows everything and his copybook will be at my service, I shall be able to crib all I need and ask him about everything I do not understand, but he is no fun at a les-

son... Whom should I choose?" So, if the choice is Kovalev, the motive for the preference will be the desire to have a good time, and if it is Nosov, the motive will be self-interest (the desire to profit by prompts and cribs).

These considerations provide the basis for a program of the experiment. A pupil may first be offered to compose a *sociometrically ordered series* ("Write whom you would like to sit with at a desk indicating who would come second, third, etc."), and then asked to construct two more series, one oriented on *motives for communication*, and the other, on *motives for study* ("Write the names of the classmates you always have a good time with indicating who comes first, second, etc." and "Write the names of the classmates who can be helpful to you in difficult study situations indicating who comes first, second, etc."). If the sociometric series coincides with or approximates to the communication-related series, it means that the motivational nucleus of choice evidently includes the motive for comfortable communication, if the sociometric choices approximate to the study-related series, the nucleus evidently includes the motive for getting help in studies. Using the coefficient of rank correlation, the experimenter may find out the degree of proximity between the sociometric series and one of the motive-related series, in other words, he can establish which of them is represented in the motivational nucleus of the interpersonal choice.

As may be seen from the above, ordered series may be based on different personal qualities. If we now rank these series in a hierarchical order and compare them with the series based on the sociometric instruction, we shall see how the corresponding personal qualities of group members are represented in the motivational nucleus of choice in the sociometric experiment.

The assessment of the obtained preferences makes it possible, first, to find out which personal qualities constitute predominantly the scale of individual preference; second, to establish the relative weight of each of the indicated personal traits by comparing the correlation coefficients with one another; third, to define the set of personal characteristics which correspond to high correlation coefficients. This set will constitute the motivational nucleus of selection in the system of interpersonal

relations. Once the nucleus is established, the experimenter can determine the person's need that governs his choice.

The motivational nucleus of preference provides a clue to the sociometric picture in a given group, and its knowledge helps the pedagogue to understand why such and such a pupil takes liking to that one and why a certain part of the group is rated as "stars", and another part, as "outcasts". The importance of knowing the answers to these questions for the pedagogue can hardly be exaggerated.

Experiments have shown that the content of the motivational nucleus in selecting a partner in the structure of interpersonal relations may be an indicator of the level attained by a given group as a collective. At the initial stage of group formation the choice is characterised by direct emotional response, and the choice of a partner is mainly oriented towards his external merits (sociable disposition, outward attractiveness, manner of dressing, etc.). By contrast, the choice of a partner in a group with a higher level of development is based not so much on emotions aroused by the first impression, as on the assessment of more profound personal qualities which reveal themselves in joint activity and in actions bespeaking a personality.

The development of a group as a collective is characterised by the increasing "value" of such personal qualities which, showing in goal-oriented actions, reflect the individual's world view and attitude to labour.

Interpersonal Choice. Referentometry. Under a sociometric approach to a group the main factors determining a choice in the system of interpersonal relations are sympathies and antipathies. One person selects another person just because he wants to be with him both in work and leisure. Yet sympathy cannot be regarded as the only reason why one person singles out another person and differentiates him from other group members by certain characteristics that appear to him the most important.

One of the individual's basic characteristics in a group consists in that he *refers himself to his group as a source of orientation* in the surrounding world. This reference is a natural consequence of the division of labour. Every participant in joint activity is interested in the assessment

of its significance, goals and tasks, evaluation of his own and other individuals' contributions, as well as in the reflection of his own personality in the mirror of common opinion. Such an interest is particularly characteristic of the collective where interpersonal relations are mediated by common cause, its content and values being determined by social ideology and the demands of society on a given collective.

In the process of active cooperation with other group members in the solution of concrete tasks set before the group the individual acquires his value orientations. Their internalisation presupposes a kind of control over the individual, actually exercised by the group or ascribed to it by the individual. Orientation on the values and opinion of the group causes the individual to single out a body of persons whose position and opinions are particularly important for him. These persons provide, as it were, a frame of reference for the individual's acts of *social perception*, i.e., comprehension and assessment of objects, goals, tasks and other people's activities meaningful for him. These persons turn for him into a kind of mirror in which he begins to see himself. All these orientations clearly point to a principle of preference and selectivity in interpersonal relations which is completely absent from sociometric studies.

The persons whose opinions and views the individual chooses as a frame of reference for his assessment of himself and other individuals are known as the *reference circle of communication* or *reference group*. For assessment of his actions, personal qualities, essential conditions of activity, objects of personal interest, etc., the individual looks to his reference group. Even if an individual has no information about the reference group's assessment of his personality, he cannot help trying to guess it. Indeed, the reference group can only remain a source of norms and values for an individual, if he constantly correlates with them his actual behaviour. Out of a multitude of surrounding people he chooses those whom he endows with *referentiality*, a specific quality of great subjective significance to him.

Referentiality manifests itself in a situation when a subject determines his attitude to objects significant to him (goals and tasks of activity, objective difficulties

arising in the course of their implementation, conflict situations, personal qualities of participants in joint activity including the individual himself, etc.).

The subject correlates himself with the objects of orientation by referring to the value orientations of another person, another or other members of the collective. The meaningful "other" becomes a kind of mirror which reflects the individual himself and everything that surrounds him. To be sure, group members possess reference qualities to a greater or lesser extent, and this accounts for the directionality of the choice, a higher degree of preference in relation to some members, and a lower degree, in relation to others.

Preference stemming from referentiality is essentially different from preference in sociometry. Referentiality is rooted in the deeper strata of intergroup activity which are mediated by values adopted in a given collective. An individual not only perceives the surrounding world through the agency of his friends' value orientations (convictions, views, opinions), but also modifies his own behaviour, self-concept and self-appraisal in accordance with their scale of values. In communication with his own reference circle a person as the subject of cognition becomes an object of self-cognition and singles out, consciously or unconsciously, the individuals who are capable of assessing those of his qualities he considers to be crucial.

In the light of the referentometric method the concept of group selectivity and preference based only on the sociometric approach appears to be too shallow and watered down to reveal the true nature of interpersonal relations and the essence of intergroup differentiation; it ignores activity characteristics of group processes and does not help understand the position of the individual within a group. Without due regard for referentiality the psychological concept of interpersonal relations appears to be far too narrow.

Every individual has a reference group whose demands he accepts unconditionally and whose opinion he takes for a guideline. As a rule, he takes his guidance not from one, but from several groups. One schoolboy's frame of reference, for instance, may be provided simultaneously by his family and company of friends from the nearby

houses, a gymnastic section in the sports society, as well as by his father's friend, whereas another teenager's reference group may include his class, teachers and two friends, both ardent stamp collectors.

A boy is surely lucky, if the demands, expectations, interests, ideals and all other value orientations of all his reference groups are more or less identical or at least contiguous and, which is particularly important, connected with socially meaningful goals and ideals. Yet it often happens that a company of teenagers approves and supports in every way such evaluations, interests, actions and wishes of a schoolboy which are completely unacceptable to his family and run counter to all of his parents' orientations. As for the boy, he sets much store by the opinions of both groups. As a result, a person belonging to two antagonistic reference groups faces a painful *inner conflict*. It is only the pedagogue's understanding of the nature of this conflict that can help the pupil to overcome it.

The facts of the child's complete indifference to everything that is dear, important and meaningful to his family or class which occur frequently in pedagogic practice are often referable to orientation on the opinions of a reference group which keeps in the shade and is unknown to the teacher. "Nothing matters to him, he does not recognise any authority, no one can influence him," says a boy's mother in a talk with the teacher and the latter may sometimes accept her opinion thereby committing a serious psychologic and pedagogic error. Indeed, a statement of this kind can only be accepted if it is known for sure that the boy's negativistic attitude towards the family and school is not a result of some reference group's latent influence.

Referentiality is revealed with the help of a specific technique developed in Soviet psychology and known as *referentometry*.

The referentometric method includes two procedures: the first is designed to familiarise the subject with the opinions of each group member concerning certain significant objects selected in advance and comprising the subject's own personal qualities, and the second is intended to reveal the persons selected by the subject for reference. This latter procedure compels the subject to show

high selectivity towards those group members whose opinions and assessments seem most significant to him.

The investigation of referentiality with the help of the referentometric method have yielded very interesting results and fully confirmed the hypothesis about the *preference in every collective of a special system of preferences and choices based on referentiality*. On the formal side, this system of links possesses the same characteristics as the sociometric system. The referentometric technique is highly productive and easy to implement, it lays bare the whole hierarchical structure of mutual preferences in the group, showing who is who and making it possible to reveal the motivational nucleus of choice and carry out the so-called *autoreferentometric experiment* (in which the subject prognosticates his position in the system of choices). It also permits mathematical processing and graphical representation of the obtained data, drawing up charts, making choice matrices, etc. However, in contrast with the sociometric approach tracing the choice to sympathies or antipathies, referentometry reveals the basic cause of group preferences—the *value factor*.

The values which constitute the deep-seated foundation of socially significant activity of a collective form at the same time the basis for intergroup preferences and for choice governed by referentiality. The value-related orientation is of course a far more substantive characteristic of group differentiation than mutual likes or dislikes in sociometry. The sociometric approach providing but a general outline of interpersonal relations in a group as a social unit with purely external and predominantly emotional links (“I want to be with him—I do not want to be with him; I like him—I do not like him”), cannot satisfy the needs of psychological studies of a collective in which the relations between members are mediated by the content of joint activities and cannot be explained without due regard for referentiality characteristics.

Having established by a referentometric test the group of persons significant for the subject (subjects) in interest as reference objects, the psychologist may prompt the pedagogue the targets for his selective educational efforts. Appropriate influence on the individual, assigned the role of a reference object by a group of persons, enables the pedagogue to sway, though indirectly, the whole

group. There is good reason to believe that it is one of the ways to overcome the traditional, though false antithesis of frontal (work with class) and individual (work with pupil) approaches in the solution of educational problems.

Group Leader. Every group structure is a peculiar prestige and status hierarchy of the group members with the top represented by referentometrically and sociometrically chosen persons, and the bottom consisting of outsiders, i.e., rejected individuals. The apex of this hierarchical pyramid is the group leader.

The group leader is a person whose right to make the most important decisions affecting the interests of all group members and determining the direction and character of group activity is recognised by all group members. Hence, the leader is the most referential person in the group in relation to its most important problems. The leader may or may not be a sociometric “star”—he need not necessarily evoke any personal sympathy of his group members, yet his referentiality in the group is indisputable. The leader may be a formal or informal head of the group. In the optimum variant the formal leader (manager) of a group and its informal leader are represented by one and the same person. If it is not the case, the efficacy of group activity depends on the relations between the formal leader (for instance, the class monitor) and the informal leader or leaders.

The system of interpersonal relations among teenagers is notable for extreme radicalism of mutual demands and expectations. The leader of a senior class collective often becomes the most referential person in the class, providing the standard of behaviour whereby all other pupils assess their own and their comrades' actions. Sometimes the pedagogues and parents hold a preconceived opinion that the leader of a class collective is necessarily an excellent pupil. This opinion, not quite unreasonable in relation to junior pupils, cannot be applied to senior classes which do not show direct correlation between the status of an excellent pupil and the leader of a collective. To be sure, success in studies commands respect, yet the position of leader among classmates can only be won by an excellent pupil if he is actively engaged in promoting the success of his com-

rades, particularly in organising systematic collective work in the class hours.

In the eyes of his classmates the leader of the collective comes out as a bearer of personal qualities which become reference points and provide for all a model of behaviour. The personal qualities of the leader meet the values adopted and recognised in a given age group. Experiments have shown that in assessing their peers senior pupils take into account those qualities which are not only considered to be the most valuable in their age, but are also the least developed or even absent. Those of their friends who possess them become the most influential and have the highest chance of winning prestige and becoming the class collective's leader. Here are some typical passages from pupils' compositions.

"We went together to the woods. I hurt my foot so badly that I could not walk. He put me on his shoulders and carried out of the woods, though he was quite exhausted... We had a class party. Everything was all right, but when all were already leaving, a couple of drunks began to pester a girl. Who was the first to stand up for her? Solovyov."

"I want to be like Valya. I lack her clarity, her firmness of purpose. But when we are together, she always helps me to assess events soberly."

The system of formal leadership of a class collective (the class monitor and other persons responsible for social activities) may or may not coincide with the informal hierarchy of group leaders. If in the final count interpersonal relations are subordinated to the common goal, the presence of informal leaders, far from hampering the collective's activity, may be very helpful. Normally, a class consisting of 30 or 40 pupils with the monitor at the head has several informal leaders, each with a number of followers. Knowing the real character of interpersonal relations in each of such mutually complementary informal groups, the pedagogue should orientate them towards the same goal. An experienced teacher can always use the contradictions arising among individual groups as a motive force of the collective's development.

Things will be different if the goals of individual groups begin to diverge from the common goal of the collective

and each group embarks on its own course. In that case the class collective in fact ceases to exist breaking up into several rival groups whose leaders' and even rank-and-file members' relations become more or less antagonistic. If the pedagogue senses the change in due time, he will take appropriate measures to rectify interpersonal relations in the class and restore the cohesion of the collective.

II.6.4. Integration in Groups and Collectives

The integration of a collective, its cohesion manifests itself in *collectivist identification, i.e., unity of value orientations and common responsibility of group members for successes and failures of their joint activity*. The integration of a person into a collective results in his *compatibility* with other group members in communication and activity.

Collectivist Identification. Collectivist identification is associating oneself with a collective in accordance with ethical principles. It implies a coincidence of attitudes towards oneself and other members of the collective and a "sublation" (transcendence) of the "me—they" antithesis which passes into "us".

Collectivist identification also implies the rejection of altruistic all-forgiveness and egoistic pragmatism with respect to one's associates. Humaneness, care for each member of the collective, combined with an exactingness, are a norm of collectivist relations (Makarenko, it will be recalled, stressed that complete trust and utmost exactingness are not two different things, but one). The observance of this norm creates a psychological climate conducive to all-round and harmonious development of the personality.

Behaviour in which an individual applies different moral norms to himself and others and places different requirements on himself and others and, proceeding from them, undertakes corresponding actions, is a violation of the principles of collectivist identification. The depth and intensity of collectivist identification viewed as a psychological characteristic of interpersonal relations lends itself to experimental study and quantitative assessment. This variable known as *efficient group*

emotional identification or sympathy as coparticipation is indicative of the force of collectivist spirit in a group.

So, *sympathy as coparticipation is collectivist identification characterised in that any unfavourable incident and the resulting frustration of one of the group members motivate the behaviour of other group members towards the implementation of the group goal and simultaneously towards the elimination of the effects of a given incident (frustrator).*

An experimental procedure specially devised to reveal such sympathy-motivated participation brings out the true nature of deep interpersonal relations of collectivist identification underlying the interaction of group members.

The design of the experiment in interest provides for use of special equipment enabling the experimenter to record the behaviour of each subject under the conditions when penalty threatens all group members including the subject himself (*integral sanctions*), and when penalty threatens only one of his comrades participating in the experiment (*partial sanctions*). The check task assigned to members of two competing groups provides for inevitable increase of the number of errors (and, consequently, severity of punishment) as a result of haste. The performance of the groups is rated only on the criterion of speed, a high quality of work being implied. Hence, the goal of the group activity in the experiment is to speed up the solution of the task. However, "haste makes waste"—the higher the speed, the greater the possibility of errors and, consequently, the threat of punishment. This conflict of motives constitutes the basic criterion for the future assessment of the group level of participation. The subjects never know the true objective of the experiment which they regard only as a test for coordination and efficacy of group activity under the conditions of contest with other groups.

The investigation was premised on the hypothesis that in groups with different levels of development the group behaviour indicative of latent interpersonal relations would be qualitatively different under the conditions of integral and partial sanctioning, and that these qualitative distinctions would lend themselves to quantitative expression and measurement. If a group lacks collectivist spirit

and its participation index is negligible, under partial penalty (one pays for all) the group should work much faster than under integral penalty. In this case the frustration of a partner is not taken into account, as all others and every individual separately are out of danger. The efforts needed to neutralise the effect of the frustrator at the first stage of the experiment (under integral punishment) become unnecessary. As a result, the work rate increases.

If the task solving time is approximately equal under the conditions of integral and partial punishment, it clearly attests to the presence of collectivist spirit, i.e., to the phenomenon of effective emotional identification within the group: indeed, though sanctions threaten only one person, all group members act as if each one faced punishment for the error. There is reason to believe that this type of interpersonal relations is indicative of the subject's identification of another individual's states with his own experiences.

The *first* and basic conclusion that can be drawn from these experiments is that they confirm the reality of collectivist participation as a specific socio-psychological phenomenon testifying to the ability of a group to identify itself with any of its members and to a possibility of measuring the level of development of collectivist attitudes within the group. The *second* conclusion is this: the most favourable conditions for the emergence of this phenomenon exist in groups approximating to the collective. In diffuse groups and, for instance, in groups of law-breakers participation based on sympathy is either negligible or non-existent. By contrast, members of a collective consider themselves as comrades, and this alters their behaviour. This is attested to by the equalisation of problem solving periods at the first and second stages of the main series of the experiments, as well as by the emotional utterances of the testees, their expressive gestures, etc. recorded by the experimenter.

In a collective the level of sympathy as coparticipation is preserved irrespective of whether penalty threatens a "veteran" of the collective or a novice. As is known, in groups with a low level of development the scapegoat is always a newcomer. In point of fact, the attitude to a newcomer is very indicative of the degree of humaneness

of interpersonal relations in a collective. Collectivist humanism manifests itself in the invariability of the empirical indicators of participation in those cases when punishment threatens a group member who is not yet known to the collective but who shoulders not only the duties of the collective, but also enjoys its rights. The findings of experimental investigations afford a convincing testimony to this fact.

Coparticipation as manifestation of collectivist identification is a specific indicator of the level of development of interpersonal relations in a group. Including moral values and norms of behaviour corresponding to ethical ideals, collectivist identification reaches its highest form in a collective strengthening the process of its integration. **Group Cohesion as Value-Oriented Unity.** The problem of group cohesion acquires special practical significance in the formation of groups that could best accomplish certain production, military or training tasks.

Understanding a social group in a mechanistic manner as an aggregation of interacting individuals maintaining direct (face to face) contacts with one another, US psychologists in fact identify the cohesion of a group with the communicability of its members. In their opinion, the quantity, frequency and intensity of contacts within a group are directly correlated with group cohesion—the number and force of positive or negative preferences are indicative of a definite level of group cohesion. Hence the principle of measurement—the group cohesion index is usually defined as a quotient obtained by dividing the actual number of mutual bonds by their maximum possible number in a given group. This method, however, can only establish the intensity of communication within a group, but not necessarily the cohesion of group members. The number of contacts may increase, for instance, due to the growing activity of those forces which objectively strive to break the group instead of strengthening its cohesion. This method may be instrumental in revealing what may be called ersatz cohesion of diffuse group members brought together by nothing else than emotional contacts, lacking unity and in fact falling out of the social context. Yet it would be a mistake to regard the above-indicated procedures as a method of revealing the cohesion of a collective.

A united collective is far more capable of overcoming difficulties and taking concerted actions than diffuse groups; it provides the most favourable conditions for the development of every individual and preservation of his identity under different, often unfavourable conditions. The question is how to reveal experimentally the presence or absence of cohesion in a collective and how to express its level in quantitative terms. The experimental investigation of socio-psychological parameters of a collective should take into account its most important characteristic—the mediated character of the arising group interaction.

Pedagogues and psychologists came to a conclusion that a person tends to perceive his collective as a *source of guidance and orientation*. This, in turn, leads to a high degree of homogeneity in the attitudes of collective members and in the assessment by them of the semantic aspect of their joint activity. There are good grounds to believe that group cohesion as the value-orientational unity increases in groups which have long been engaged in joint activities based on common goals and values. *Cohesion as the value-orientation unity is a characteristic feature of the system of intergroup bonds indicative of the degree of coincidence of assessments, attitudes and stands of the group in relation to the most significant group objects (persons, tasks, ideas, events).*

This general approach provides the basis for the experimental programme aimed at determining the indicator (index) of group cohesion. *The group cohesion index may be defined as the frequency of coincidence of assessments or stands of group members in relation to the objects essentially significant to the group as a whole.* The value-orientation unity of a group as the index of its cohesion does not by any means presuppose the coincidence of assessments and stands of group members in all respects, the standardisation, for instance, of individual tastes, aesthetic values, literary interests, etc. The versatility and wide divergence of such orientations do not undermine group cohesion. The value-orientation unity in a collective is, first and foremost, the *proximity of assessments in the ethical and business fields, in the approach to the goals and tasks of joint activity*. If, for instance, some group members believe the task facing them to be

impracticable or the group leader to be incapable of ensuring its implementation (or of being the head of the group), and other group members hold the opposite views, and if such differences are characteristic of the given group, cohesion is out of the question.

Proceeding from the results of concrete experimental investigations and analysis of the obtained data, psychologists drew a well reasoned conclusion that the quotient of the value-orientation unity in collectives is higher than that in diffuse groups.

Ascription and Acceptance of Responsibility. Besides collectivist identification and value-orientational unity, the integration of a collective manifests itself in the presence or absence of *adequacy in the ascription of responsibility for the results of joint activity*. The character of such ascription shows in the manner in which an individual responds to the probable application of social sanctions in the form of approval of success or punishment for failures in joint activity to himself or to other group members.

The phenomenon of responsibility placement has been treated in Western social psychology as a person's psychological susceptibility to the effect of two situational factors: the image of another person who may be blamed for failures or praised for successes, and the nature of activity involving the hypothetical responsibility (cooperation or competition).

Thus, Canadian psychologists demonstrated the dependence of the ascription of responsibility on the outward attractiveness of the other person. They have shown that commendable actions and successes are usually credited to pretty females, whereas unattractive ones are saddled with failures and reprehensible behaviour. Ascription of responsibility was usually studied in games without any connection with the concrete social medium and meaningful joint activities within groups.

Experiments conducted by Soviet psychologists attest to the fact that the character of responsibility placement depends on the level of group development. In collectives the acts of responsibility placement are generally characterised by objectivity and the individual contribution of every group member is assessed correctly irrespective of the ultimate success or failure of joint activity. In groups

with a low development level the results of experiments are very different. In such groups the subject tends to overemphasise his merits in case of successful joint activity, and is ready to lay the blame on all others or at least on "objective circumstances" if the results of the activity prove unsatisfactory. In such groups the ascription of responsibility is typically contingent on the individual psychological qualities of the subject of assessment, and this is precisely the sphere of all those regularities and relationships which have been established experimentally by Western social psychologists and unwarrantably applied to small groups in general.

Subjectivity in the ascription of responsibility for successes or failures of a group's joint activity subject to social assessment lies at the root of conflict situations in the group. Indeed, more often than not participants in joint activity are incapable of objective assessment of their own contribution to the common cause and their opinions are prompted by casual motives. The moral power of the collective neutralising the extremes of subjectivism creates the necessary conditions for compatibility of its members. Such compatibility is based on moral norms recognised by all members of the collective, such as not to dodge responsibility, not to shift blame on others, not to exaggerate one's own merits and belittle the role of others in common achievements, not to adduce "objective circumstances" as justification of one's poor performance, etc.

II.6.5. Collective and Collectivism in the Educational Process

Formation of Collectivist Attitudes at School. A collective is a community which creates the most favourable conditions for moulding the personality of teenagers and adolescents. The family collective, the school collective, the apprentice training teams and, finally, the labour collectives joined by yesterday's schoolchildren after completing their secondary education constitute the social medium which ensures the personality's formation, all-round development and collectivist education. *Collectivism* which consists in the ability to live and work in a collective is not just a feature of social relations; it is one

of the principles of communist ethics, of the moral behaviour of an individual in socialist society. Collectivism includes comradeship, mutual assistance, organisation and self-discipline.

Communist relations are based on the idea of joint socially useful activity. The school environment, the participation in the activity of primary school collectives, such as classes and teams, provide the necessary conditions for the formation and development of the ability to fight for a common cause. The very existence of a child organisation is a factor of tremendous educational importance. A child, a teenager, and a youth learn to take into account the interests of the whole collective—both their own primary collective and the collective of the entire school. Nadezhda Krupskaya, Lenin's wife and an eminent Soviet pedagogue, emphasised the need for a child to start participating in collective life as early as possible. She often repeated that the organisation of the child's life in the class and school collective will play the definitive role in the moulding of his personality.

Hence, *all kinds of schoolchildren's activity should be essentially collectivist*. Game, labour, study and other activities should be organised in such a way as to promote collectivist principles, inculcate the spirit of comradeship and mutual assistance, develop the ability to subordinate, if necessary, one's private interests to the interests of the collective. During the course of study and education all pupils must constantly see and feel that the results of joint work are directly dependent on the individual effort of every group member.

Very important for the unity of a pupils' collective are common emotional experiences during the course of various contests, sporting competitions, gatherings and parties. Such collective experiences accompanying various socially useful activities of schoolchildren are instrumental in forming a collective, as they bring pupils closer together and teach them to feel another individual's pain and joy.

Psychological indicators of collectivism which lend themselves to experimental investigation (collectivist self-determination and identification, adequacy in the placement of responsibility for successes or failures in joint activity, compassion as coparticipation, etc.) make it pos-

sible to identify united collectives that shape as a result of successful educational work in the family and at school.

The school moulds personality during the course of study and socially useful activity. Certain specific features of study cannot but tell on the structuring of pupils' interpersonal relations. Study which looks outwardly as joint activity because of the frontal character of the teacher's work in the classroom is in fact mainly based on individual effort and its results depend predominantly on individual achievements. In the traditional forms of study the need for business cooperation is reduced to a minimum and arises only occasionally. This is particularly true of the lesson which was and will be the most important form of school work. Interaction of subjects at a lesson (conversations, prompting, collective fulfilment of assignments, etc.) is regarded as undesirable and often reprehensible. True, various forms of mutual assistance in out-of-school hours, such as excellent pupils' helping weak ones to catch up with the class, joint preparation for exams, etc. are encouraged, and very rightly so. In this field practice has prompted quite a few forms of effective cooperation. One of them, described in the literature and psychologically well grounded, consists in that a weak senior pupil is assigned to coach a lagging junior, the result being not only the latter's improvement, but also a positive shift in the self concepts of both: the senior begins to think better of his own abilities and gains badly needed confidence, whereas the junior does not suffer from the awareness of his inferiority. Nevertheless, the lesson which remains the pivot of the teaching and educational work in school is characterised at present by the lowest level of collectivity.

Viewed as a collective-forming factor, school studies, of course, compare unfavourably with production, labour activity. The very character of modern production demands that it be based on joint, common activity. This commonness represented in the division and results of labour manifests itself in a very tangible form. The interdependence of participants in the process of production is embodied in the materialised products of labour. The success of one is a prerequisite for the success of others, the failure of one has an adverse effect on all the participants in the joint activity. Mutual assessments are based

on objective criteria used for the evaluation of each participant's contribution to the aggregate product of labour. Being conditioned by real object-related activity in the process of production, interpersonal relations have a mediated character and are therefore instrumental in forming a collective.

What is the source of the formation and development of collectives in the secondary school where favourable conditions are also provided for the emergence of other groups approaching in many respects the level of collectives? The *collective-moulding factors* operating in the school environment include *pupils' labour* in the form of participation in collective production, various kinds of socially useful activity, participation in the work of different circles, extra-school studies affording the pupils real opportunities for interaction and mutual assistance.

From the viewpoint of social psychology, special interest attaches to the problem of lesson as a means of forming pupils' collectives and developing collectivist interpersonal relations mediated by the content and values of children's joint activities.

It deserves mention in this context that in recent years Soviet school has witnessed increasing use of new methods of class work known as *group techniques*. These techniques which have not yet gone beyond the experimental stage are distinguished by direct interaction of pupils, their joint efforts directed towards the assimilation of new material.

Group methods of class work involve considerable changes not only in the teaching methods, but also in the education of schoolchildren. Owing to group activity which takes place in the atmosphere of close cooperation and implies an exchange of products of activity and, consequently, a rise of relations of interdependence and mutual control, the *process of teaching under such conditions may acquire the features of genuine collectivism*. Communication with peers which plays a crucial role in the development of the pupil's personality but is typically extraneous to his studies becomes an essential characteristic of his class work. As a result, the pupil's labour at the lesson, his spiritual gains, expansion of knowledge and interests turn into an immediate object of communication.

The fundamental changes in the schoolchild's activity, his study and communication that play the most important part in his life cannot but bring about qualitatively new socio-psychological phenomena in the life of a group and in the level of its development. Indeed, the pedagogues practicing group techniques note their obvious influence on the moulding of the pupil's personality.

It is noteworthy that the group forms of teaching lead to the so-called "inversion" of relationships characteristic of noncollectivist forms of class work. For instance, in contrast with groups using individual teaching methods and typically characterised by inverse relationships between their progress and size (the greater the number of pupils, the less attention each one receives from the pedagogue), the *groups employing collective techniques are free from this unfavourable influence*; moreover, within certain limits they show direct dependence between the efficacy of teaching and the group size.

Besides school, an important role in promoting the spirit of collectivism and fostering collectivist attitudes belongs to the family.

Is the family a collective? This question can be answered in the affirmative, if all the family members are known to be engaged in common activity, socially valuable and personally significant, which mediates the interfamily relations.

Forming Collectivism in the Family. The family is a small social group which is based on matrimony and kinship and performs a vital social function of bringing up the younger generation and ensuring its members' personal happiness. The achievement of these goals calls for mutual moral responsibility and effective mutual assistance of all family members. The family is characterised by joint activity whose aims go outside the framework of interfamily relations being socially determined and socially valuable. If a given concrete family comes under this definition, there is every reason to believe that it contains the necessary prerequisites for the formation of a collective as a highly developed group. Such a family is sure to provide fertile soil for the socio-psychological phenomena which have time and again been brought to light in psychological investigations of collectives (this applies primarily to such a vitally important quality of inter-

personal relations as group cohesion, the value-orientation unity of all family members). It means that the opinions, views, stands of all members of a given family on its vital issues are largely contiguous or even coincide. This is the base of family unity and, simultaneously, a necessary prerequisite for proper upbringing of children, i.e., for successful implementation by the family of one of its vital functions.

The presence of value-orientation unity is a crucial principle of family education, a highly important characteristic of family as a collective.

One of the most significant indicators of collectivist relationships in any collective, particularly in the family, is fairness in the assessment of responsibilities for success or failure in joint activity. Adequate attribution of responsibility is not only a sign of a favourable psychological climate in the family but also a prerequisite for the compatibility of family members. The inability of family members to show fairness in the assessment of their contributions to joint activity shatters the foundation of family's unity and is bound to lead to conflicts. This equally applies to any of the family members, both to the elder and younger generations.

As has been shown above, collectivist identification is an essential quality of the collective as a group with a high level of development.

Collectivist identification in the family implies the rejection of both altruistic all-forgiveness and egoistic, pragmatic attitude to the child. It presupposes effective care of the children, concern for their well-being, combined with the exactingness the parents would extend to themselves if they were in the children's position.

The type of relationships that comes closest to true collectivism and true humaneness calls for a single standard of behaviour both in the family circle and in the outer world. This standard characteristic of socialist society should be based on one great moral principle: do unto others as you would be done by.

In socialist society and in a family collective, which is its cell, the eternal controversy between "me" and "them" is actually replaced by the concept "us".

Chapter 7

PERSONALITY

II.7.1. Concept of Personality in Psychology

On separating from the animal world due to his ability to produce instruments of labour, man embarked on the path of social development in joint activity and communication with others of his kind. On this path he gradually becomes a personality—the subject of cognition and active transformation of the material world, society and his own self.

Individual and Personality. Man is born as a human being. This statement which at first glance looks like a school truth and is taken for granted needs some qualification. Indeed, it only affirms the genetic predetermination of the emergence of natural prerequisites for the development of human traits and qualities. In a new-born baby the configuration of the body provides for a possibility of erect gait, the structure of the brain allows intellectual development, and that of the hand, the manipulation of instruments of labour, etc. All these possibilities making the human baby potential man demarcate it from the animal's young which cannot acquire such qualities under any conditions. Hence, the above statement boils down to the assertion that the human baby belongs to the *Homo sapiens* species. The notion of *individual* with respect to a human being only signifies his *generic affiliation*. It can be applied with equally good reason to a new-born baby, an adult, a thinker, an idiot, a savage and a highly educated citizen of a civilised country.

To say that a concrete man is an individual is to say very little. It is, in fact, to say that he is *potentially* a man. All other, even most general characteristics imply the description and explanation of qualities without which

he remains but a statistical unit in a demographic reference book and not a real man who is not only different from others in appearance, but also acts, thinks, suffers differently and occupies a unique position in the system of social relations, in society and in the historical process. Born as an individual, man acquires a specific *social quality*—he *becomes* a personality. When still a child, an individual gets involved in the existing system of social relations, and his further development resulting from his participation in different forms of joint activities is determined by social practice.

By *personality* in psychology is meant an integrated social quality acquired by an individual in object-related activity and communication and characterising his involvement in social relations in quantitative and qualitative terms.

This definition certainly needs to be elaborated. To begin with, by stating that personality is an individual's *quality* we affirm the individual's and personality's unity but simultaneously deny the identity of these two notions (in like manner, we can predicate light sensitivity of photographic film, but cannot say that photographic film is light sensitivity or that light sensitivity is photographic film). The identity of notions "personality" and "individual" is denied by all leading Soviet psychologists (B. G. Ananiev, A. N. Leontiev, B. F. Lomov, S. L. Rubinshtein and others).

In order to describe personality as a peculiar social quality acquired by an individual, we need to take a closer look at its uncommon character. First of all we must clarify why it can be viewed as system-related, "suprasensuous". At first glance it would seem that the individual possesses quite sensuous (i.e., accessible to sense perceptions) properties: corporeality, individual features of behaviour, speech, mimicry, etc. How can he, then, display qualities which cannot be perceived in their immediate sensuous form? The thing is that personality, very much like surplus value representing a certain "suprasensuous" quality which cannot be discerned in a commodity through any microscope but which contains the worker's unpaid labour—and this has been shown by Karl Marx with utmost clarity—is the embodiment of a *system of relations*, social by nature, which are interiorised

by the individual and become part and parcel of his subjective reality as an integrated (complex) quality. Such relations can only be brought to light by scientific analysis, they do not lend themselves to sense perception.

Now, to embody the system of social relations is to be their subject. A child involved in interpersonal relations with adults comes out initially as an object of their activity; however, interiorising the content of the activity they offer him as the leading factor in his development, for instance, by studying he gradually turns into its subject.

Social relations are not something external to the subject, they are an *integral part or aspect* of personality as the individual's social quality.

If the generic essence of man distinguishing him from all other living beings is the ensemble of *all* social relations, the essence of every concrete individual, that is the abstract inherent in each individual as a personality is the ensemble of *concrete* social links and relations in which he participates as a subject. These links and relations exist *outside him*, i.e., in social being, and are therefore impersonal, objective (a slave is fully dependent on his master), and at the same time *inside him* as a personality and are therefore subjective (the slave hates his master, submits to or rebels against him, i.e., enters into socially conditioned relations with him).

The affirmation of the unity, but not identity of the notions "individual" and "personality" may provoke a question: can there be an individual who is not a personality, or a personality who is not an individual? Theoretically speaking, the question should be answered in the affirmative. Indeed, an individual who has grown up outside human society will not exhibit any personality traits in his first encounter with human beings, as such traits are always a product of socio-historical conditions; he will only demonstrate individual qualities characterising him as a representative of a biological species. His natural potentialities can only be translated into reality if the surrounding people succeed in "drawing" him into joint activity and communication. The study of children brought up by animals points to the extreme complexity of this task. In such situations we have individuals who *have not actualised their possibilities* and so have not turned into personalities.

We can also recognise, though with certain reservations, that there may exist a personality *without any real individual* behind it. This, however, would be a *quasi-personality* like the hero of *The Gadfly* by Ethel Voinich who was not modelled on any real individual but nevertheless exerted a tremendous influence on the revolutionary youth seeking to develop such personality traits as courage, resolution and firm adherence to principle.

Such imaginary individual-personality situations, like any other mental experiment, provide a better insight into the problem of dialectical unity of these two notions. **Personality as the Subject of Interpersonal Relations.** The notion of personality, being essentially different from that of individual, can only acquire its true meaning in the context of stable interpersonal links mediated by the content, values and sense of joint activity for each of its participants. These interpersonal links are objective, but "suprasensuous" by their character. They manifest themselves in concrete individual qualities and actions of people belonging to a given collective, but are not reducible to them. They represent a specific quality of the group activity, the quality which mediates these personal manifestations determining the status of each individual in the system of interpersonal links and, in a broader perspective, in the system of social relations.

The interpersonal links moulding the personality in a collective manifest themselves in the form of communication or *relations between subjects* existing alongside the *relations between the subject and the object* characteristic of object-oriented activity. Yet the fact of mediation remains central not only to object-oriented activity, but also to communication. A deeper investigation reveals that seemingly direct subject-subject relations are in fact mediated by some objects (material or ideal). That means that the relation of one individual to another is mediated by the object of activity (the subject-object-subject relation).

In turn, what at first sight appears to be a direct act of object-related activity of an individual is in fact an act of mediation, the mediating link for a personality being already not the object of activity, not its objective sense, but the personality of another individual as a participant in the activity; this other personality performs, as it were,

the function of a lens whereby an individual can improve his perception, understanding and feel of the object of activity. In everyday life we often turn for advice to another person when we are faced with a difficult task.

In summary, the *personality should be construed as a subject of a relatively stable system of object-oriented and subject-oriented interpersonal relations*, mediated by an object or a subject, arising in activity and communication.

Personality and Individuality. Every personality is characterised by a unique combination of features and peculiarities. *By individuality is meant a combination of psychological traits of a person constituting his uniqueness, his distinction from other persons.* Individuality shows in the traits of a person's temperament, character, habits, prevalent interests, qualities of cognitive processes (perception, memory, thinking, imagination), in his abilities, individual style of activity, etc. There are no two persons with the same combination of the above indicated psychological traits—man's personality is unique in its individuality.

Like the notions of "individual" and "personality", the notions of "personality" and "individuality" make a unity, but are not identical. The ability to sum up and multiply large numbers in the head, dexterity and determination, pensiveness, a habit to bite nails, risibility and other peculiar features are characteristic of man as an individual, but do not make up his personality—if only for the fact that they may not be represented in the forms of activity and communication that are essential for the group to which the individual belongs. If features of a subject's individuality are not represented in the system of interpersonal relations, they are not essential for evaluation of his personality and have no conditions for development. Only those individual qualities which are "*involved*" to a *maximum possible degree in the activity constituting the foundation of a given social community* may be regarded as personality traits. For instance, dexterity and determination characteristic of the individuality of a given teenager were not characteristic of his personality till he was included in a sports team competing for a town championship, or till he volunteered to organise the crossing of a swift cold river on a many-days'

walking tour. A man's individual qualities may lie dormant till they become necessary in the system of interpersonal relations in which he poses as a personality.

Hence, individuality is only one of the aspects of a man's personality.¹

An individual approach to a pupil which plays an important part in pedagogical work implies due account of the child's psychological peculiarities of memory, attention, temperament, abilities, etc., i.e., his distinctions from other pupils of his age. The pedagogue, however, should understand that an individual approach is but one of the aspects of a broader, *personality-oriented approach* to a schoolchild which is based on the study of the whole system of his relations with adults, teachers, parents, schoolmates and peers of both sexes, street acquaintances, and others. It is only within the framework of well-organised pedagogic communication between the pupils and the teacher that the latter succeeds in finding out how a given boy or girl fits in the class collective, what place they occupy in the hierarchy of interpersonal relations, what makes them act in this or that way, what changes undergoes the personality of the schoolchild who has merged with the collective or failed to do so. These are the conditions which are absolutely essential for the implementation of the personality-oriented approach to a schoolchild as a subject of his system of relations. It is only this kind of approach going beyond the fixation of the child's individual peculiarities of thinking, will, memory, feelings, and aimed at revealing *the manner in which the individual is represented in the collective and the collective is represented in his personality* that can be regarded as a true personality-oriented approach consistent with the Marxist understanding of human essence as the ensemble of social relations. It should be noted in this context that collective study, as well as participation in the labour activity of apprentice teams, provides the most favourable conditions for the implementation of such an approach.

An individual approach in pedagogy and psychology divorced from a personality-oriented approach tends to degenerate into the attitude of a collector striving, as it

¹ The psychological traits of individuality are discussed at length in the three last chapters, "Temperament", "Character" and "Abilities".

were, to make an inventory of the child's individual qualities without knowing what to do with it.

The pedagogue who is always committed to the enrichment of the spiritual world of the pupil as a subject of joint activity and interpersonal relations must never lose sight of his personality.

II.7.2. Personality Structure

Individuality and Personality Structures. The fact that the notions "personality" and "individuality", contiguous as they are, do not coincide rules out the concept of personality as a certain assemblage of man's individual psychological traits and qualities. In non-Marxist trends of psychological thought which treat the notions "personality" and "individuality" (as well as the notions "individual" and "personality"), as identical and do not regard personality as a subject of the essentially social system of relations, as a systems social quality of individual, the structures of personality and individuality are completely identical. Representatives of these psychological schools maintain that a description of man's personality boils down to an account of the structure of his individuality. For this purpose psychologists use special *personality inventories* in the form of lists of questions, in answering which the subject gives an assessment of his own self, his individual and personal qualities. Analysing these answers and subjecting them to mathematical processing, the investigator obtains a numerical index of the subject's relative level of one or another quality on a corresponding scale; this approach is in fact based on the assumption that the personality structure is represented by a definite set of these scales. It appears, however, that such methods can be at best instrumental in describing man's individuality, but not the whole of his personality as the assemblage of social relations in which the individual is involved.

Indeed, if we take into account the fact that the personality always poses as the subject of its "actual relations" with a concrete social environment, the structure of the personality must of necessity include these "actual relations" and the links arising in the activity and communication of concrete social groups and collectives.

However, all inventories are oriented on the individual's self-assessment in an amorphous social medium, an abstract "medium in general". The real interpersonal relations of the individual, the "essence of personality" are something the inventories can never reveal. As already noted, the inventories allegedly capable of yielding a profile of the personality do not in fact go beyond attempts at describing the individuality, revealing the principle of organisation of its traits around certain pivotal qualities (*factors*). Figuratively speaking, inventories can only help the investigator to arrange a rich "collection" of individual psychological traits in several show-cases provided with appropriate labels ("schizothymia-cyclothymia", "introversion-extraversion", "emotional stability-emotional instability", etc).

Psychology has revealed numerous traits characteristic of a person's individuality, such as conformity, aggressiveness, ambitiousness, proneness to anxiety, etc. These psychological phenomena are in fact correlated, implicitly or explicitly, with a certain social medium *in respect of which* the subject exhibits conformity, aggressiveness, anxiety, etc. However, in contrast with individual qualities of subjects which are treated in such studies as flexible, mutable and semantically variable, the social environment is construed as immutable, amorphous and devoid of any semantic content, i.e. as a "medium in general". Viewing the "personality-environment" problem from a traditionally mechanistic angle, this trend conceives social environment either as an object of efforts applied by an active personality, or as group pressure sustained by a passive personality. The concept of active *interaction* between the personality and its social environment has not been incorporated in Western science either in the theoretical constructs of the psychology of personality, or in the psychological methods of personality studies.

The approach to social environment as a "medium in general" engendered the notion of *personality in general*, divorced from the system of socially determined relations wherein it exists, acts and develops. This amorphous social environment in fact constitutes the background of all personality inventories used by the non-Marxist traditional psychology of personality.

The fact is that individual psychological traits exhibited by a personality in any concrete social group not infrequently fail to conform to its environment. Man's individuality *undergoes an essential change* under the conditions of joint object-related activity and communication characteristic of a given level of group development. Under such conditions individual psychological qualities presumably change as *personal* qualities, as an aspect of interpersonal relations. This hypothesis has been verified and confirmed by a number of concrete investigations.

The objective of one of such investigations was to check the above-indicated assumption in respect of pliability (conformity) as a personal trait, and in respect of the opposite trait, collectivist self-determination, as a phenomenon of interpersonal relations in a group (see II.6). An experiment was staged on a number of really existing groups that formed a hierarchy of development levels ranging from a diffuse group to a true collective, and showed that about one third of all subjects in each group, irrespective of the level of its development, revealed a conformist tendency in a socially insignificant situation. These findings are in accord with data obtained through personality inventories. Then the same subjects were placed under a different set of conditions intended to induce the phenomenon of collectivist self-determination so as to ascertain their behaviour in a new situation. The findings confirmed that the individuals who belonged to the group with the highest level of development and who had been found to be pliant to socially insignificant group pressures revealed collectivist self-determination, i.e. an ability to resist an influence directed against collective values. In other words, such an individual psychological quality as pliability undergoes an essential change in the personality of an individual who is a member of the collective.

Other investigations were intended to establish if such an individual trait as *extrapunitiveness* (a reaction to frustration in which the frustrated individual shows aggression to the cause of frustration) is inherent in the behaviour of a member of a good collective, i.e. if it is a necessary manifestation of his personality. An initial personality test had revealed a group of sportsmen with pronounced extrapunitiveness (there are many such

individuals in sports teams). This individual trait could well be expected (and with good reason) to dominate the personality of such sportsmen in their leading sports activity. Actually, however, in highly developed groups of sportsmen (in genuine collectives) the persons labelled as extrapunitives in the personality test displayed collectivist identification towards the members of their team (see II.6), i.e. revealed personality qualities which are the direct opposite of extrapunitiveness.

This clearly shows that the structure of man's personality is obviously broader than the structure of his individuality. The former should include not only his individual traits and the general structure of his individuality which find their fullest expression in temperament, character, abilities, etc., but also the manner in which the personality reveals itself in groups with different levels of development, i.e. in interpersonal relations mediated by the leading activity of the group. From the viewpoint of Marxist psychology the findings of the investigation of *personality as individuality are not directly applicable to personality as the subject of interpersonal relations*; the traits characterising an individual are essentially different under different conditions, depending on the development level of the community in which the individual's personality is moulded and on the character, values and goals of the activity mediating interpersonal relations in the group.

The Biological and the Social in the Structure of Personality. The relationship of the biological (natural) and social principles in the structure of man's personality is one of the most complex and controversial problems in modern psychology.

Characteristic of non-Marxist psychology are conceptions proceeding from the existence of two basic substructures in man's personality, one brought about by the *biological* factor, and the other, by the *social* one. A theory was advanced, according to which man's personality falls into endopsychic and exopsychic systems. Endopsyche as one of the substructures of personality expresses the internal interdependence of psychic elements and functions representing, as it were, the inner mechanism of human personality identified with man's neuro-psychic organisation, whereas exopsyche pertains to mental activ-

ity which has effects outside the individual. Endopsyche includes such qualities as perception, memory, thinking, imagination, ability for volitional acts, impulsiveness, etc., and exopsyche is represented by man's system of relations and his experience, i.e. interests, inclinations, ideals, prevailing emotions, accumulated knowledge, etc. In contrast with endopsyche which has a natural, biological foundation, exopsyche is determined by the social factor. In the final analysis modern multi-factor theories of personality reduce the personality structure to the operation of two basic factors—the biological and the social ones.

How are we to assess the two-factor theory? Man's personality which is simultaneously a product and a subject of the historical process could not preserve its biological structure intact as something contiguous to and independent of the social organisation. The natural prerequisites for an individual's development, his bodily organisation, his nervous and endocrine systems, the advantages and disadvantages of his physical organisation have a powerful influence on the formation of his individual psychological traits. Yet the *biological factor, as it affects man's personality, acquires social meaning* and lives on (psychologically) in the social form. Thus psychological traits inherent in a subject's individual make-up and resulting from some brain pathology *can turn* into his personal traits, concrete qualities of his personality only under the influence of the social factor. Natural, organic qualities and traits come out in the structure of personality as its socially conditioned elements.

Of course, human individuality bears the hallmark of its natural, biological organisation. The question is not whether we should give heed to the biological and social factors in the structure of personality—both must be taken into account by all means—but whether their relation is understood correctly. The theory of two factors mechanistically counterposes the social and biological factors, the environment and the biological organisation, exopsyche and endopsyche. In reality such external, mechanistic contrast is fruitless and gives no clue to the structure of personality. Marxist psychology offers a different approach to the problem of the natural and the social in the formation and structure of personality.

It can be shown by taking a specific example of investigation designed to bring to light the formation of personality traits of individuals whose height did not exceed 80-130 cm. Previous studies had established considerable similarity in the individuality of these people who had no other abnormal deviations from the standard. They were notable for a specific infantile sense of humour, uncritical optimism, ingenuousness, high tolerance to situations involving considerable emotional stress, absence of any diffidence, etc. *These personality traits cannot be included either in endopsyché, or in exopsyché if only for the fact that, being the result of the natural qualities of dwarfs, they can only evolve and take shape under specific social conditions existing from the moment their difference from the peers revealed itself.* It is precisely because the people surrounding a dwarf treat him differently from other individuals, regarding him as a toy and being surprised that his thoughts and feelings are similar to those of ordinary people that dwarfs develop a specific individuality which masks their depression and sometimes aggressiveness towards others and themselves. To be sure, if a dwarf grew in a community of individuals having a similar height, his personality traits, as well as the personality traits of other members of the community would be entirely different.

Natural, organic qualities and traits exist in the structure of human individuality as socially conditioned elements. The natural (anatomic, physiological and other qualities) and the social make a unitary whole and cannot be mechanically contrasted to one another as independent personality substructures.

So, recognising the role of both the natural (biological) and the social in the structure of individuality, we cannot, on these grounds alone, affirm the existence of purely biological substructures in man's personality: the biological in man exists in a different form, having undergone essential transformation.

Three Components of Personality Structure. As already noted, the structure of personality includes, first of all, the *systems organisation of its individuality* which is represented in the person's temperament, character and abilities and is necessary, but not sufficient for understanding the psychology of personality. Hence, we may

single out the first component of the personality structure—its *intraindividual subsystem*.

Being a subject of a system of actual relations with society, that is with the groups into which it is integrated, the personality cannot be confined within a certain closed space inside the individual's organism, but reveals itself in the sphere of interpersonal relations. Indeed, it is not the individual by himself, but the processes of interaction which involve at least two individuals (but actually a whole community, a group, a collective) that can be regarded as the manifestation of the personality of each of the participants in this interaction.

The personality in the system of its actual relations acquires, as it were, its other being different from the individual's corporeal being. From the standpoint of Marxist philosophy the real existence of a personality manifests itself in the sum total of object-related links with other individuals mediated by their activity, wherefore one of the characteristics of the personality structure necessarily lies outside the individual's body in a "space" constituting the personality's *interindividual subsystem*.

It is noteworthy that by shifting the focus on the interindividual "space" we add a new dimension to the phenomena arising in a collective and get the possibility of answering the question: do such manifestations as collectivist self-determination, collectivist identification and others derive from a group or a personality? When the qualities of a personality and its very existence are not confined to the individual's body but extend beyond his "skin" into the interindividual "space" we overcome the false alternative (either personality, or group) resulting from the identification of the notions, "individual" and "personality". Personal qualities come out as a manifestation of group relations, and group qualities reveal themselves in the concrete form of personality manifestations.

The intraindividual and interindividual subsystems do not cover all personality manifestations. There is yet another component of the personality structure which may be called *metaindividual* or *supraindividual substructure*. Viewed from this angle, the personality not only transcends the physical limits of the individual's body, but also goes outside the framework of his actual spatial and temporal links with other persons. In this case, the psy-

chologist focusses, as it were, on the voluntary or involuntary "investments" of the subject in other individuals, the imprint of his activity on other people. The individual as a personality thus comes out as the subject of active transformations in the intellectual and emotional-volitional sphere of people connected with him in one way or another. The meta-individual substructure of personality in fact represents an active process of one's continuation in other individuals—the kind of continuation which is not limited to direct influence exerted by a person on other persons, but lasts long after the actual interaction between them ceases. This process of the subject's continuation in another individual, the "ideal" representation of his self as a personality in other people in the form of "investments" made in them is known in psychology as *personalisation*.

The phenomenon of personalisation lies at the root of the problem of personal immortality that has always exercised the minds of the people. If man's personality is something more than what is represented in the corporeal subject and is capable of living on in other people, it does not die "completely" with the death of the individual's body. An individual as the vehicle of personality ceases to exist but, personalised in other people, lives on, plunging them in deep sorrow over the tragic gulf between the ideal presence of the individual and his material absence. The solemn words "he lives on in us after his death" are neither a piece of mysticism, nor a figure of speech—it is a statement of the disintegration of the wholeness of a psychological structure with one of its components remaining intact.

If we could record the essential changes brought about by a given individual's object-related activity and communication with other individuals in their ideal image of himself, we should probably receive the fullest possible account of him as a personality. An individual can attain the rank of a historic personality in a definite socio-historical situation as defined in the Marxist conception of the role of personality in history only if these changes affect a fairly broad section of the population and are assessed not only by his contemporaries, but also by history which alone can define his personal contribution to social practice with sufficient accuracy.

A true personality capable of swaying the destinies of the broad masses in the process of effective interaction with them may be likened to a source of powerful radiation which may be both useful and deleterious, healing and killing, accelerating and decelerating, etc. By contrast, an individual with low personality characteristics may be likened to the neutrino—a particle which can penetrate any medium, however dense it may be, without causing in it either useful or harmful changes. Impersonality is a quality of the individual to whom other people are *indifferent*, whose presence or absence does not bring any change in their life, does not transform their behaviour, does not make them happier or otherwise.

The phenomenon of personalisation can be established experimentally as has been confirmed by a large number of investigations.

In one of them schoolchildren were asked to assess intellectual, volitional, moral and other qualities of an unknown agemate by his photograph. Since the stranger's external appearance looked very ordinary and uninformative, the assessments given by the subjects were amorphous and indefinite. He was not considered either clever or stupid, etc. In the second series of the experiment the pupils were shown a similar photograph of another schoolboy and simultaneously the experimenter switched on a record of *the voice of one of the teachers*. The content of his speech could not be grasped by the testees, the more so that it had nothing to do with their assignment. However, the voice of one teacher brought about a sharp polarisation of the assessments—the stranger was rated as stupid, evil, cunning, etc., or, on the contrary, as clever, kind, ingenuous, etc., whereas the voice of another teacher effected no change in the original assessments, leaving them as amorphous as in the first experimental series. Clearly, the first pedagogue's personality was better represented in his pupils, he was more personalised in them than the second pedagogue.

Thus the structure of man's personality includes three components, three subsystems: the individuality, its representation in the system of interpersonal relations and in other individuals; it must be characterised as a unity of all the three aspects, as the subject of interpersonal, socially-determined links and relations.

The unity of the personality in all its three substructures can be illustrated by taking a specific example of such an important characteristic as *authoritativeness*.

Authority arises in the system of interpersonal relations and, depending on the level of the group development, manifests itself in some communities as uncompromising authoritarianism, the exercise of the right of the stronger, predominantly as the authority of power, and in others, having a high level of development, as a democratic "power of authority". In the latter case personal authority comes out as group authority, and group authority reveals itself as personal authority (represented in the *interindividual* subsystem of personality). Within the framework of the *metaindividual* subsystem of personality authoritativeness is the recognition by others of an individual's right to make decisions in situations significant for them, it is an imprint of the individual's activity on their personalities. In groups with a low level of development authoritativeness results from the conformism of their members, whereas in collectives it derives from collectivist self-determination. Hence, authoritativeness in a collective is an ideal representation of the subject predominantly in others (he may sometimes be unaware of the degree of his authority) and, only as a result of it, in the subject himself. Finally, in the interindividual "space" of the personality it is the sum total of the subject's psychological qualities: wilfulness, cruelty, conceit, intolerance of criticism in one case, and adherence to principle, high intellect, reasonable exactingness, etc. (*intraindividual subsystem of personality*), in the other.

The metaindividual subsystem of personality more than the others represents one of the basic spiritual needs of man—the need to be a personality, i.e. *to effect significant changes in other people's intellectual and emotional spheres by his activity*. A subject may or may not be aware of this need, it may be more intense with one individual than with another, its realisation may have favourable or unfavourable consequences for other people and, finally, one individual may possess ample means to satisfy it (high intellect, richness and subtlety of emotions, large variety of skills, exceptional courage and determination), whereas the possibilities of another individual may be very limited.

The need of an individual to be a personality takes on concrete historical forms and has a class content. In pre-socialist social formations this need could be fully satisfied only by representatives of the ruling classes and was suppressed in every way in working people.

In corporate groups every individual strives to be a "personality" by depersonalising all others, that is by suppressing their need and capacity for being personalities. Experimental investigations have shown that the collective as a group with the highest development level provides the best conditions for the satisfaction of a subject's natural urge to become a personality (to be personalised, extended to other people).

With a proper system of teaching and education, every individual living in socialist society has all necessary conditions for satisfying his need to become a personality in socially useful activity. In order to understand a school-child, the pedagogue should assess his personality in the context of his actual relations with peers, parents and teachers, and not regard it as a mechanical combination of individual qualities, as a definite combination of "atoms" forming an isolated "molecule" in the class and school organism. One cannot expect to get an insight into a child's personality without studying and understanding the groups to which the child belongs, in which he acts and communicates with other individuals, makes and receives "investments", transforming the intellectual and emotional spheres of other individuals and thereby transforming his own personality. The pedagogue should focus on the activeness of the child's personality and its socio-meaningful orientation.

II.7.3. Activeness and Orientation of Personality

Activeness of Personality and Its Life Stand. *By the activeness of personality is meant man's ability to effect socially meaningful transformations in the environment manifesting themselves in communication, joint activity and creative endeavour.* The most general, integral characteristic of the personality's activeness is its *active life stand expressed in the personality's adherence to definite*

principles, persistence in opinions and unity of word and deed. In socialist society the active vital stand implies public spirit, collectivism, creative attitude to labour, moral substance based on Marxist-Leninist world view, intolerance of violations of social ethical standards.

One of the principal manifestations of the active vital stand characteristic of members of socialist society is the so-called *extranormative activeness* in socially useful activity. *It reveals itself in activity which is not strictly obligatory for a given personality, but which corresponds to the ideals and higher values of socialist society.*

An active life stand of a personality is attested to by its collectivist self-determination opposed both to conformism and to the negativist (nonconformist) type of behaviour.

The formation of an active life stand of young people is one of the chief goals of ethical education.

In interpreting the nature and source of personality's activeness Marxist psychology differs fundamentally from bourgeois, predominantly American, psychological theories.

Critical Analysis of Bourgeois Theories of Personality and Its Activeness. The most influential current theories of personality in bourgeois psychology are firmly rooted in the *psychoanalytic theoretical tradition* and conceptions of so-called *humanistic psychology* (existential theories of personality).

Psychoanalysis dates from the early 20th century when Austrian psychiatrist and psychologist Sigmund Freud came out with a new theory of the source and nature of man's activeness. In his opinion, shared by a considerable number of his followers, man's activeness derives from instinctive urges, mainly from the sexual instinct and the instinct of self-preservation inherited from his animal ancestors. Yet in society instincts cannot manifest themselves as freely as in the animal world because of the numerous social bans and "censorship" causing the individual to repress his natural urges. Instinctive impulses are thus displaced from the individual's conscious life to the sphere of the subconscious as something disgraceful, impermissible and compromising. However, they do not disappear; preserving their charge of energy, their activeness, they continue exercising control over man's be-

haviour reincarnating (*sublimating*) in various forms of human culture and other products of man's activity. In the sphere of the subconscious instinctive urges merge in accordance with their origin into various "*complexes*" or unconscious psychic structures (clusters of ideas and impulses) which are alleged to be the true cause of personality's activeness. According to Freud and his adherents, one of the main tasks of psychology consists in revealing subconscious "*complexes*" and bringing them to the consciousness of the patient through psychoanalysis, thereby allegedly eliminating the possibility of internal conflicts of a personality (the method of *psychoanalysis*). One of such latent man's inner struggles, chiefly unconscious, is the Oedipus complex which plays an important part in Freud's theory.

According to Freud, in early childhood every individual is confronted with a dramatic situation similar to the conflict described in a Greek tragedy by Sophocles *Oedipus-Rex*: Oedipus, the hero, unwittingly killed his father and married his mother. Freud held that a four-year old boy's erotic desire for his mother and the ensuing wish that his father were dead ("*Oedipus complex*") runs up against the fear of horrible punishment for incestuous desires ("*castration complex*").

All subsequent development of the personality was conceived by the Freudians as a conflict between various "*complexes*" displaced into the sphere of the subconscious.

Careful examination of this conception of personality's activeness (for all his errors Freud deserves credit for highlighting the problems of the unconscious and motivation) shows that activeness is construed in it as a biological, *natural force*, not to speak of absolutely groundless fantasies about the child's sexual urges and fears. Freud views the activeness of personality by analogy with animal instincts, i.e. regards it as basically unconscious despite all its modifications, "*sublimations*" and conflicts with a hostile social environment. The latter's function is actually reduced to imposing restrictions and establishing "*censorship*" over natural impulses. This conception viewing man as a biological, and not social being is premised on the assumption that man and society are essentially alien to each other and that their "*harmonious*"

relations are only possible with eternal suppression of the former by the latter and with perpetual threat of the revolt of the subconscious in the form of aggression, neuroses, etc.

Freud's attempts to deduce the entire activity of personality exclusively from sexual impulses were opposed by a number of non-Marxist psychologists whose views gradually crystallised into what later received the name of *neo-Freudianism*. Representatives of the new trend (*Abraham Kardiner, Erich Fromm, Karen Horney* and others) combined the basic tenets of classical Freudianism with certain new principles. As regards the activeness of personality, the neo-Freudianists rejected the idea of the priority of sexual impulses and departed from the undisguised biological concept of man putting in the foreground the dependence of personality on the environment and viewing the former as a simple, direct projection of the social medium. As a result, the principal characteristics of the environment have turned into the personality's forms of activeness, such as, for instance, a rage for love and approval, a lust for power, prestige and possession, a tendency towards submission and acceptance of group authority, escapism from society, etc. These conceptions are, in fact, nothing else than mystification of man's activeness.

In another bourgeois, predominantly American, theoretical trend known as "humanistic psychology", the conception of personality and its activeness at first glance appears to be diametrically opposed to the psychoanalytic tradition. In contrast with the psychoanalysts who seek the source of activeness in the subject's *past* and turn their eyes to the child's early impressions and experiences "displaced to the unconscious", "humanistic psychology" which goes back to the works of *Karl Rogers, Adolf Maslow, Gordon Allport* and other writers holding similar views sees the main factor of personality's activeness in orientation towards the *future*, aspiration for the maximum possible *self-realisation (self-actualisation)*.

Maslow, Rogers and other representatives of humanistic psychology turn self-actualisation into an essentially egocentric process. Self-actualisation, according to A. Maslow, is nothing but an impulse towards the realisation of one's ego which attests to profound individual-

ism of "self-actualising" personalities; they are distinguished by creative activeness, an urge to express themselves with the maximum possible fullness, and there are few of them—only about 1 per cent of all population. This concept of egocentricity or self-actualisation proposed by A. Maslow and his followers is in fact a mere fiction, if a self-actualising individual is to be conceived as a subject of activity and communication who succeeds in leaving the hallmark of his personality on the personalities of other people, i.e. restructures by his actions their emotional and intellectual sphere. To be sure, a sculptor carving a statue and yielding to an urge to embody his idea in marble is indeed aware of and driven by this irresistible impulse, regarding it as the immediate cause of his creative endeavour. This is precisely the stage which is grasped—and never transcended—by different theories of "self-expression" and "self-actualisation" after the fashion of Maslow. These theories, however, do not explain why the artist should strive to demonstrate his creation to the largest possible number of people, particularly to those whom he himself considers to be connoisseurs, i.e. his reference group. Proceeding from Maslow's concept of self-actualisation, one would expect an artist who has succeeded in expressing himself in the object of his work and even got his pay to rest content and his ambition to be consummated. However, the subject-object (artist-picture) act evidently does not terminate the artist's creative activity and his urge remains unsatisfied until he adds yet another element to the above relationship and, turning it into a subject-object-subject (artist-picture-onlooker) chain, personalises himself in those "others" who are significant to him.

"Humanistic psychology", as well as the psychoanalytic theory cannot increase our insight into human personality and are unable to reveal the determinants, the motive forces behind man's activeness. Both psychoanalytic and existential concepts of personality are premised on the opposition of a lone individual and the hostile society. If this premise which actually reflects the essence of capitalist society held good for all times, man's prospects would be cheerless indeed, as his options would be eternally limited to conformism, all-round rejection of the world, or withdrawal into his own self (escapism).

The main thrust of the psychoanalytic and existential theories of personality are over *self-change* rather than the improvement of the *world* in which the personality lives and acts. Attempts to perpetuate antagonism between man and society characteristic of all non-Marxist psychological thought are quite understandable from the historical viewpoint, but they lead nowhere.

The world is changed by people themselves, yet in order to effect such changes consciously *the personality should be oriented towards revolutionary activity which changes the personality itself*. As has been shown above, dialectical-materialist psychology contends that personality's activeness is mainly revealed in his *activity* and mostly in joint activity.

Personality's Orientation. In order to understand *what causes* an individual to become active, we must look into his needs; however, if we are interested in the outcome of his activity, we should determine his personality's orientation, i.e. the *objectives* he pursues.

For instance, a schoolboy wants to continue his education in a college. This need, common to very many pupils, does not yet tell us anything about his motives, i.e. the *aims* he wants to achieve (for instance, he may wish to enter a college for prestige considerations, or not to upset his parents, or to gain knowledge and skills in a profession that attracts him, or to prolong the period of studies irrespective of the type of the college, and so on). Outwardly, his actions during preparation for entrance exams may be identical in all cases, yet psychologically they are very different, just as their motives. The latter will also play different roles in the subsequent period determining the student's performance at the college: with some youths the studies will be a means for acquiring new knowledge and professional skills and enriching their personality, whereas with others, governed by superficial and transient motives, the college years will leave no profound mark on their psychological makeup.

By orientation of man's personality is meant the sum total of stable motives which direct the personality's activity towards certain goals and are relatively independent of current situations.

Thus a young man who has set himself a task to become a builder and preserves his high motivation under any,

even unfavourable, circumstances (for instance, in face of the opposition of his conservative parents who believe that their child ought to choose a more prestigious profession) affords a good example of personality's orientation.

In order to reveal a given pupil's stable motives, the pedagogue should analyse his behaviour in a broad psychological context. Only an integrated approach will enable him to determine if a given action is characteristic of a given teenager, to prognosticate the possibility of its repetition, to prevent the development of objectionable personality traits and encourage the development of positive qualities.

An individual's motives may be *conscious* in varying degree, or he may be completely *unaware* of them.

Personality's orientation is largely determined by *conscious* motives.

Identifying the object of a need as a goal, an individual correlates his private aims with the aims of the collective to which he belongs and either modifies his objectives or masks them if they are incompatible with the goals of his collective and society at large.

When an individual is aware not only of a goal as an ideal anticipation of the result of activity, but also of a feasibility of the attainment of this goal, we can speak of the *personality's prospect*. The pedagogue working with a collective and, through it, with an individual pupil should seek to open new prospects by using the already available ones and to substitute more valuable prospects for less valuable ones.

By *frustration* is meant a psychological state of gloom and oppression which is opposite to the state of an individual aware of his prospect. It arises *because of some real or imaginary obstacle to achieving a goal*.

Frustration leads to various changes in the behaviour and self-awareness of a personality.

Interests. *An interest can be defined as a motive facilitating a person's orientation in a certain field, helping him familiarise himself with new facts and securing a more complete and profound reflection of reality.* Subjectively, an interest manifests itself in the positive emotional tenor which colours the process of cognition and engages the individual's attention towards an object of interest.

The importance of interests in the processes of activity is very high. Interests induce the individual to actively seek the ways and means for satisfying the arising thirst for knowledge and understanding. *The satisfaction of an interest expressing an individual's orientation does not, as a rule, extinguish it* but leads to the emergence of new interests corresponding to a higher level of cognitive activity.

Thus a pupil's interest in history will not be quenched by a report he may be asked to make in the hobby group about the past of his native town—on the contrary, his interest will become more profound and gain in scope, encompassing local lore among other things.

Hence, *interests manifest themselves as a constant inducement to cognition*. Interests may be classified according to content, goal, scope and stability.

Differentiation of interests in terms of *content* reveals the objects of cognitive needs and their real significance for the goals of given activity and, on a larger scale, for the society to which the personality in question belongs. From the viewpoint of psychology, the directionality of an individual's interest and the social value of the object of his cognitive needs are of crucial importance. One of the principal tasks of the school is to evoke and foster serious and meaningful interests that would stimulate the teenager's and youth's cognitive and labour activity not only at school, but also outside it.

Differentiation of interests according to goal reveals *immediate* and *mediated* interests. Immediate interests are evoked by the emotional attractiveness of a meaningful object, whereas mediated interests result from the coincidence of the real social significance of the object of interest (for instance, study) and its subjective significance for the individual ("it is interesting as it falls in with my interests"). Both in labour and study a lot of things are devoid of immediate emotional attractiveness, wherefore the importance of mediated interests which play the leading role in the conscious organisation of labour processes.

Interests differ in *scope*. With some people they may be concentrated in one field, and with others they are distributed among many objects characterised by stable significance. The dispersion of interests is not infrequently regarded as a negative trait of personality, yet it would be a mistake to view a broad scope of interests as a short-

coming. Observations show that broad rather than narrow interests are indicative of a favourable personality development.

Interests can also be classified in accordance with their *stability*. The stability of interests shows in their duration and intensity. Stable interests indicative of the basic needs of a person become the essential qualities of his psychological makeup. A stable interest attests to a waking ability and therefore has a certain diagnostic value.

Senior schoolchildren are notable for a certain instability of interests which is their developmental characteristic. Their interests not infrequently take the form of fervid, but short-lived passions, for instance, simultaneously for mathematics, history, philosophy, psychology and logic. Applying themselves to many things with ardour, such schoolchildren do not go to the root of the matter and soon strike up another interest. Interests in different activities lighting up and dying down in developmental age guide youths in their search for vocation and help them reveal and display their talents. The task of the pedagogues consists, of course, not in inducing a youth to pursue the line he has first shown interest in, but in deepening and expanding his interests, making them effective and turning them into a propensity for the kind of activity on which his interests may converge.

Interests are an important but not the sole aspect of the motivation of activity. The essential motive of behaviour is conviction.

Personality's Convictions and World Outlook. *By convictions is meant a system of motives inducing a person to act in accordance with his beliefs, principles and world outlook.* The content of the needs coming out in the form of convictions reveals itself as the knowledge of the surroundings, i.e. nature and society, as their understanding by the individual. When this knowledge turns into an integral ordered system of views (philosophic, aesthetic, moral, scientific, etc.), it can be regarded as an individual's *world outlook*.

The world outlook has a class character. In socialist society the dominant world outlook is Marxism-Leninism. The Marxist world outlook is a truly scientific ideology giving people correct understanding of the laws of social development.

Soviet psychology studies the formation of the world outlook under the influence of communist education, reveals the regularities underlying an individual's progress towards objective assessment of social events, shows the development of his moral principles, aesthetic tastes, scientific views of natural phenomena, etc.

The evolution of convictions affects primarily their conceptual aspect; they come under an increasing influence of the personality's world outlook. The beliefs, ideas and principles expressed by an individual are determined by the entire content of his life. They are integrated in the system of his views as their necessary component and acquire for an individual a specific personal sense, wherefore he feels an imperative need to affirm such beliefs and principles, advocate them and induce other people to share them.

The degree and character of the orientation of activeness vary from person to person. Often an individual knows how he ought to behave in one or another conflict situation or what opinion he should support in an argument, yet he does not feel himself committed and does not experience the need to actively assert his views. A discrepancy between an individual's knowledge, on the one hand, and his needs and motives, on the other, is indicative of a rift in the sphere of his convictions. Such an individual's words and deeds are often at variance, he lacks unity of knowledge and behaviour and, pursuing a double-standard line, fails to take an active stand on vital issues. In other words, his real convictions are essentially different from those he professes and demonstrates before others. Being conscious of it, such an individual may take great pains to pass himself off as a whole-hearted, principled man.

The motives we have so far been discussing are those an individual is *aware* of. Put another way, the person who has them is conscious of what induces him to activity, what constitutes the content of his needs. However, far from all motives can be included in this category. Much importance in the motivation of human actions attaches to unconscious motives which shall be considered in the next paragraph.

Personality Sets. *Set or attitude in psychology means a person's unconscious state of readiness (predisposition)*

to an activity whereby he can satisfy a certain need. Set implies an integral modification of the subject predisposing him to a *definite* perception and apprehension of an object or to a definite course of action in relation to it in accordance with his past experience. The formation of fixed sets determining a person's behaviour has been brought to light by the Soviet psychologist *Dmitri Uznadze* (1886/87-1950) and his associates in a series of investigations which are now regarded as classical.

Such sets can be exemplified, for instance, by the attitudes of the first-formers to their teacher manifesting themselves in the children's readiness to carry out any of her instructions and assent to all her ways, including those they would normally balk at.

Bias constituting the core of many sets is usually traceable either to hasty conclusions based on an individual's personal experience, or to the uncritical assimilation of *stereotypes*—schematised judgements adopted in definite social quarters.

Sets in relation to various facts of social life (events, people, etc.) may be *positive* (such is the case with a patient willingly and accurately fulfilling a prescription because of his positive attitude towards medicine in general, and his doctor in particular), and *negative*, assuming the character of prejudice.

A number of popular notions regarding Black people's human qualities, mental abilities, "sexual aggressiveness", etc., are largely referable to the prejudice resulting from the discrimination of the Negro population in the USA. Such prejudice is characteristic of the racists' behaviour and way of thinking. Significantly, a racist is usually unaware of his biased attitude and regards his behaviour as resulting from an objective and independent assessment of facts. In some instances this unconscious set (prejudice) comes into obvious conflict with indisputable facts (for instance, a Black man saves the racist's child at the risk of his own life), yet such glaring contradictions usually have little effect, as the existing sets are supported by the whole system of racist propaganda (the child's rescuer will simply be declared an exception).

The degree of awareness of a set may vary from individual to individual. In some cases, when a person needs to analyse and define his stand, his hitherto unconscious

set reveals itself as a conviction, i.e. as a motive for activity the person is fully aware of.

As a result of investigations, psychologists have distinguished three components in the structure of sets: cognitive, emotional and behavioural. The *cognitive substructure* is the image of what an individual is ready to cognise and perceive; the *emotional value-related substructure* is a complex of sympathies and antipathies in relation to the object of the set; the *behavioural substructure* is the individual's readiness to act in a definite way in relation to the object of the set, i.e. to exert volitional efforts.

II.7.4. Self-Awareness of Personality

Discovery of the Self. Entering into a system of social relations, interacting and communicating with the surrounding people, an individual singles himself out of the environment, forms an image of himself as the subject of his physical and mental states, actions and processes, and poses as his own ego opposed to, and yet inseparably linked with, other egos. On the subjective side the perception of one's own self consists primarily in that the subject understands his *identity* with himself in the present, past and future. Indeed, my "Self" today, despite any possible changes of my status in any new and unexpected situation and despite any restructuring of my life, consciousness, views and attitudes that may occur is the *Self of the same individual* that existed yesterday, and will exist tomorrow. A characteristic symptom of certain mental diseases is the loss of identity with one's own Self.

Awareness of one's Self is a result of a long process of personality formation which starts in infancy. A one-year-old child is already capable of distinguishing sensations originating in his body from those caused by external objects. At the age of 2 or 3 a child can clearly differentiate between his own object-related actions he enjoys and those of adults as is evidenced from his constantly repeated demand, "Let me do it myself!" He begins to identify himself with the subject of his own actions and starts using the personal pronoun in his speech, thereby not only singling himself out from the surroundings, but also opposing himself to other individuals ("It is mine, it is not yours!").

At the preschool age and in junior forms the child makes the first steps (under the guidance of the adults, parents and teachers) in the assessment of his mental qualities (memory, thinking, etc.), so far only in terms of his successes or failures ("I have all fives, but in arithmetic I've got a three because I cannot copy correctly from the blackboard. The teacher gave me low marks so many times for lack of attention!"). The developmental age is notable for the gradual formation of a complex system of socio-ethical self-assessments as a result of the increasingly active participation of the teenager and the youth in social and labour activity. The development of *self-consciousness* terminates in the formation of the *basic image of the Self*.

Image of the Self. A teenager is characterised by an increasing tendency towards self-education, a desire to find his place in life and understand himself as a subject of interpersonal relations. Such attitudes are indicative of the formation of self-consciousness. Senior pupils form the image of their own Self (Self-Image, Self-Concept). *The concept of the Self is a relatively stable and more or less conscious mental construct, emotionally experienced as a unique system of the individual's ideas about himself underlying his attitude to other individuals.* The image of the Self includes the attitude of the individual towards his own ego: he may in fact view himself as he views another individual, respecting or despising, loving and hating himself and even understanding that he does or does not understand himself—in his own Self the individual is represented by his actions *as if he were another person*. The image of the Self is thus incorporated in the structure of the personality, it comes out as an *attitude towards one's own Self*. Like every set, the image of the Self includes three components. First, the *cognitive component* which is the individual's assessments of his abilities, external appearance, social significance, etc. Thus a youth who is being brought up in a family idolising material aspects of life is likely to regard his dashing appearance (ascribed by him to the fashionable expensive garments he wears) as the principal feature of his Self concept. One of his peers may place in the foreground the unforgettable victory in a district table-tennis contest, another may attach similar significance to his dramatic

failure in the same contest and also to the difficulties he encounters in studying physics and mathematics. Second, the *emotional-evaluative component*: self-esteem, self-criticism, egoism, self-disparagement, etc. Third, the *behavioural (volitional) component* which shows in the teenager's desire to be understood, to win the friends' and teachers' sympathy and respect, to elevate his status or, on the contrary, in the desire to keep in the shade, to avoid appraisal and criticism, to conceal his shortcomings, etc.

The Self concept is both the cause and effect of social interaction. In point of fact, psychologists distinguish many images of the Self in a given individual which alternately come into the limelight of self-consciousness and recede into the background in a given situation of social interaction. The Self concept is a dynamic rather than static psychological image of a given personality.

The image of the Self can be experienced by an individual as the idea about himself at the present moment and is commonly denoted in psychology as "*real Self*" (perhaps, a more correct term would be "*current Self*"). When a teenager thinks or says to himself: "I despise myself", his words are in fact nothing else but an expression of juvenile maximalism and should not be regarded as a stable quality of his Self concept. Normally, in due time his idea about himself will change to the opposite.

The image of the Self includes the subject's "*ideal Self*", i.e. what, in the subject's opinion, he ought to be in order to comply with the social standards and come up to the surrounding people's expectations. The "*ideal Self*" is the necessary *reference point* in the personality's *self-education*. If the pedagogue knows the character and significance of this reference point, he can exert a considerable influence on his pupil. It is essential that the pedagogue should identify the youth's *ideal* on which he wants to model himself, since the social values of such ideals are very different and their motivational significance is great.

There may yet be the so-called "*imagined Self*", that is what the subject would wish to be if that were possible. This image is a very important component of the personality's Self concept, particularly in senior school age in view of the adolescents' propensity to make plans for the

future and indulge in fancy dreams merging into a dream.

Designing one's imagined Self is in the nature of both youths and adults. In evaluating the motivational significance of the imagined Self it is important to know if fanciful imagination has not replaced the individual's sober estimate of his possibilities and sound assessment of the real character of his relations with the surroundings. The prevalence in the structure of personality of fantastic Self notions tends to disorganise the individual's activity and Self concept unless such notions induce him to work towards the desired goal; the obvious discrepancy between one's desires and reality may cause a severe trauma to the individual.

The degree of adequacy of one's Self concept is established by studying one of its principal aspects, the personality's self-appraisal.

Self-Appraisal and Its Role in the Development of the Personality's Self Concept. *Self-appraisal is the assessment by an individual of his own Self, his prospects, qualities and position in relation to other people.* It is the most important and best explored aspect of the personality's Self concept in psychology. Self-appraisal is an important instrument in the regulation of personal behaviour.

What is the mechanism of self-appraisal? We recall that man becomes a personality as a result of joint activity and communication. All personal qualities arise and become consolidated in the process and for the purpose of joint activity and communication with other people. Seeking to identify guidelines and reference points for his behaviour while included in the sphere of joint activity and communication, a subject constantly correlates his actions with the expectations of the surrounding people by referring to their opinions, feelings and demands. In the final count, whatever man does for himself as a social being (be it in the nature of studies or commitment to do or to prevent something), he does it *also* for others, perhaps *more* for others than for himself, even if he believes the opposite to be true.

Learning the qualities of another individual, a person receives necessary information enabling him to assess his own Self. The already existing self-appraisals are a result of constant correlation of what an individual observes in himself with what he sees in other people. An individual

already knowing something about himself takes a closer look at another person, compares himself with that person and assumes that the latter, like himself, is not indifferent to his personal qualities, actions and behaviour. All this becomes part and parcel of the individual's self-appraisal and determines his psychological attitudes. In other words, an individual always has a reference group (real or imaginary) whose values, ideals, interests etc. provide a frame of reference for his behaviour.

Since the subject constantly correlates his actions with the opinions and value orientations of the reference group, it is important to compare his Self concept with the values and norms serving as his frame of reference. In the process of communication a person always compares himself with a certain model and is either pleased or displeased with the results. What is the psychological mechanism of such a verification?

The psychologists use a number of experimental methods to reveal an individual's self-appraisal in quantitative and qualitative terms.

For instance, using the rank correlation factor, an experimenter can correlate an individual's notion of a consecutive series of model personal qualities (i.e. disclose his "ideal Self") with his "current Self" (i.e. with a series of qualities arranged, in the individual's opinion, in the same sequence in which they are represented in his own Self).

Significantly, in this experiment the subject does not have to disclose his real and ideal Selves—he just performs the necessary calculations in accordance with the formula received from the experimenter and is not afraid to "blab out", i.e. to give more information about himself than he deems necessary. The obtained personality self-appraisal factors make it possible to assess the Self concept in quantitative terms.

It appears that every individual has a kind of "internal gauge" indicating his self-appraisal, his satisfaction or dissatisfaction with himself. This overall assessment by an individual of his own qualities plays a very important part. Both overestimation and underestimation of one's own Self may become an internal source of personality conflicts which assume very different forms.

An individual with an exaggerated self-appraisal de-

velops a tendency to overrate his possibilities and not infrequently runs against opposition on the part of other people rejecting his claims. He becomes embittered, suspicious and mistrustful or, on the contrary, arrogant and aggressive. As a result, he may lose necessary interpersonal contacts and withdraw into himself.

An unduly low self-appraisal may lead to the so-called *inferiority complex*, characterised by a permanent lack of self-confidence, loss of initiative, indifference, feelings of shame and guilt, anxiety.

The complexity, heterogeneity of self-appraisal, its model-mediated character, i.e. dependence on the personality's values and ideals, is referable to the fact, far from always realised by the individual, that it originates from a kind of *projection* of the real Self on the ideal Self.

However, an individual's self-appraisal alone does not yet characterise his position. Much depends on the assessment of the individual by the group he belongs to, the opinion of his comrades he counts upon (*expected appraisal*). It can be revealed with the help of a similar experimental procedure and may also be high, medium, or low, it may be close to or far from the level of the individual's self-appraisal and, finally, it may be different in different reference groups. It has been noted that, being stable in one's own collective, the expected appraisal essentially changes and becomes unstable when the individual enters a new collective and establishes new contacts.

Thus a teenager sure of himself in the family environment loses part of his confidence in a new class collective where pupils do not know him, have not developed a definite attitude towards him and base their opinions on observations, often casual and superficial.

By ascertaining the fact of the individual's return to the originally expected appraisal of his Self in a new environment we simultaneously establish the degree of his assimilation in the group, the level of mutual understanding he has reached with new comrades and the way he feels in the new collective. Experimental data show that a system of appraisals acts as a regulator of group interpersonal relations. Thus a *person's high self-appraisal usually tends to lower the level of expected appraisal.*

Indeed, having learned by experience that his self-appraisal and the attitude to him on the part of other people are at variance, the individual no longer expects from them a high opinion of himself. It has also been found out that a high assessment of the surrounding people by an individual tends to increase his standing in the group, i.e. the assessment of his personality by its members. This presumably attests to the fact that the individual has been integrated in the group, adopted its interests, respects its values and displays the sense of collectivism. In turn, the collective stores up, as it were, the good feelings of one of its members and *reciprocates by increasing the assessment of his personality*. This is one of the manifestations of the force of cohesion inherent in a collective.

By contrast, an individual with exaggerated self-appraisal, low appraisal of the surrounding people and low expected appraisal of his Self on their part is bound to run into interpersonal conflicts and ascribe hard-heartedness to all who surround him. Another individual distinguished by an unduly high expectations regarding the assessment of his personality by other people may display a condescending attitude to those he associates with and a good deal of self-assurance. Even if these qualities do not manifest themselves in his behaviour, they are always there potentially and may surface at any opportune moment.

The structure of personality includes three indicators: *self-appraisal*, *expected appraisal*, and the *appraisal of the personality by a group*. Whether an individual wants it or not, objectively he has to take into account these subjective indicators of his status in a group, his general performance, the attitudes to himself and his own attitudes to others. He must take them into account even if he is not aware of them and knows nothing about the operation of the psychological mechanism of assessments and self-assessment. In fact, this mechanism is the *interiorised mechanism of social contacts, orientations and values*. An individual cannot but refer to its signals when entering into communication and engaging in any kind of activity. This referencing is predominantly unconscious, the individual in fact adjusting himself to the modes of behaviour determined by the aforementioned indicators.

An unconscious process should not be confused with an uncontrolled process. *All essentially significant appraisals are formed in a person's conscious life*. Before being interiorised, they are tangibly represented in interpersonal contacts. Thus the family, teachers, friends, books, films, etc. actively form a child's ideal and real Selves and teach him to correlate them. After learning to relate himself to others, the child learns to appraise the surrounding people on the same criteria he used for the appraisal of his own Self. Man learns to scrutinise a social group like a mirror and then to interiorise the reflected image of his Self.

In order to exercise conscious control over the process of education, the pedagogue should have a clear idea of the operation of the individual's own unconscious controls of behaviour taking into account the entire system of his assessments of himself and others in its dynamics. To better understand the individual, he should always take him in the context of his relations with all reference groups and never lose sight of the social essence of his personality however pectoral and individuated its manifestations may be.

Self-Appraisal and Ambition Level. Self-appraisal is closely linked with the level of a person's ambition which can be defined as *the desired level of his self-appraisal or Self concept showing in the difficulty of the goal or task he sets himself*.

The desire to raise the level of self-appraisal in those cases when an individual can choose the degree of difficulty of his next action leads to a conflict of two tendencies: the tendency to increase the level of ambition in order to attain a greater success, and the tendency to reduce this level in order to avoid a failure. The ambition level usually increases in case of success and the individual shows readiness to tackle more difficult problems, and decreases if the individual's activity proves unsuccessful.

The individual's level of aspirations in a specific kind of activity lends itself to rather an accurate assessment.

Here is one example. A high jump beginner will not feel frustrated over knocking off the bar at 1.7 m, as he does not expect to break a record. Nor will he rejoice at making 1.1 m, as this goal is not difficult to attain. Gradually raising the bar and asking the youth if a given

height suits him as the test result, the coach can easily determine the level of his aspirations.

This simple model shows that a person controls his ambition by setting himself an intermediate task, not too easy and not too difficult, so as to preserve his self-appraisal at a sufficiently high level.

An individual defines his ambition not only by anticipating his success or failure, but mainly by taking into account and evaluating, sometimes half-consciously, his past successes or failures. The formation of a pupil's level of aspirations can be traced in his studies, by the subjects of reports he chooses to make for the group, by social assignments he volunteers for, etc.

An investigation has shown that there are persons among testees whose main concern in the face of risk is to *avoid a failure* rather than to achieve a success. If such persons have to choose between tasks of different degrees of complexity, they take either the easiest, or the most difficult tasks. In the first case they are sure of success (the risk is reduced to a minimum), and in the second case a failure can be easily accounted for by the exceptional difficulty of the task. In both cases the subject's self-esteem will not suffer and his Self concept will not be damaged.

The investigation of a person's level of aspirations not only on the side of efficacy, but also from the standpoint of their content, their links with the aims and tasks of the collective to which the person belongs adds yet another dimension to the motivation of his behaviour and enables the pedagogue to define the targets of the educational strategy. In some cases priority should be given to the task of raising the person's level of aspirations; if a pupil has a low opinion of himself and his potentialities, he is likely to develop a stable inferiority complex and lose confidence in himself. Repeated failures may lead to an overall decline of his self-appraisal, serious emotional breakdowns and conflicts with a result that he will give up his studies as a bad job. A teacher regularly putting down bad marks in the class register opposite this pupil's name and apparently giving the correct assessment of his knowledge makes a serious blunder if he disregards the psychology of the pupil who has reconciled himself to the situation.

A pupil can be encouraged and his level of ambition raised by different methods depending on his individuality, character of frustration, the real possibilities of the pedagogue, etc. These methods include direct assistance on the part of the teacher and the class collective, as well as various techniques designed to *open up prospects for the development of personality*. Such prospects may be initially revealed in another field not connected with the frustration area. The activeness thus stimulated can then be switched over to the sphere where it is necessary to build up the person's aspirations and restore the level of his self-appraisal. Given due regard for the pupil's personality and a reasonably optimistic view of his prospects, the pedagogue may enlist the support of the pupils' and teachers' collectives and find the right approach to the child or youth restoring his self-respect and confidence in his powers.

In other cases the pedagogue should somewhat scale down the child's or youth's ambition, particularly if the goals the pupil sets himself are not justified by the real situation and his self-appraisal is exaggerated, i.e. if he begins to show conceit, develops a kind of superiority complex, etc. It becomes necessary to do so not only because a pupil with excessive ambitions is rebuffed by the collective as a boaster and show-off, but also because his exaggerated self-appraisal repeatedly deflated by real failures generates acute emotional conflicts.

Often the pupil striving to brave personal failures incompatible with his inflated opinion of himself displays stubbornness and touchiness, pretends to be satisfied, or attributes his setbacks to somebody's opposition, ill will and becomes suspicious, resentful and aggressive. If frequently recurring, such mental states tend to grow into stable traits.

Psychological Defence of Personality. Being keenly aware of the relationship between his claims and real achievements, man registers in his Self concept any change in their balance through the mechanism of self-appraisal. Way back in the early 20th century US psychologist *William James*, whose general psychological theory was justly criticised by Marxist psychologists for pragmatism, advanced an essentially correct idea that *self-respect*, one of the basic components of the Self concept, is determined

by the relation between the actual achievements of the individual and his claims. He proposed a formula in which the numerator expressed the real achievements of a person, and the denominator, his pretensions:

$$\text{Self-respect} = \frac{\text{success}}{\text{claims}}$$

As is known, an increase of the numerator and decrease of the denominator result in the increase of the fraction. Therefore an individual wishing to preserve his self-respect should either exert himself and achieve success which is often a difficult task, or reduce the level of his claims, in which case he may rest content even with very moderate achievements.

It stands to reason that proper education should be oriented towards the first method. An individual in his activity (study, labour, etc.) should not give in to difficulties, but try to overcome them, displaying his will and strong character and thereby preserving optimum correlation between success and reasonable claims. We must not, however, close our eyes to the fact that some people choose the second way for preservation of self-respect, reducing the level of their aspirations, i.e. resort to the *passive psychological defence of their Self concept*.

To be sure, psychological defence cannot be reduced to scaling down the individual's aspirations; it is a *specific regulatory system used by an individual to overcome psychological discomfort, i.e. the experiences threatening his Self concept, and to preserve it at a level desirable and possible under a given set of circumstances*. The notion of psychological defence is close to that of defence mechanisms used by Sigmund Freud, the leader of psychoanalysis, who interpreted it in terms of mechanistic biological reductionism. Freud held that man's unconscious instincts (predominantly the sexual urge) come into conflict with the defence mechanisms of the conscious Self, the "inner censorship" of personality, and undergo various transformations. It would be wrong, however, to ascribe to Freud the discovery of "defence mechanisms" and "psychological defence". Long before him this mechanism was described by the classics of Russian literature Fyodor Dostoyevsky, Lev Tolstoy and other

writers who showed profound insight into human psychology.

For instance, one of the mechanisms of psychological defence is *aggression* resulting from man's frustration over his inability to overcome barriers on the way towards his goal. Aggression sometimes takes the form of a direct assault against other individuals, and sometimes is expressed in threats, rudeness, hostility not only towards the circumstances or persons responsible for such barriers, but also in relation of anybody who happens to be near at hand. Sometimes frustration leads to aggression that is confined within the sphere of imagination. The offended individual gloats over imaginary scenes of vengeance doing nothing to actualise it. Sometimes frustration culminates in aggression directed by the individual against himself. Finally, frustration may cause a person to *substitute* one kind of activity which is or appears to be blocked, by another kind, which is or appears to be feasible or promising. This is yet another mechanism of psychological defence known as *transference*. In his trilogy *Childhood. Adolescence. Youth* Lev Tolstoy gives an excellent description of psychological defence in the form of *rationalisation* and *displacement* through the mouth of his main hero: "I was too conceited to become resigned to my position and consoled myself as the fox did, persuading myself that the grapes were still sour; that is, I tried to despise all the pleasures afforded one by good looks, which I saw Volodya enjoying and which I envied with all the powers of my heart, and so exerted all the powers of my mind and imagination to find pleasure in haughty solitude."¹

The essence of the mechanism of displacement is aptly conveyed by such expressions as "ostrich attitude" and "none so blind".

II.7.5. Formation of Personality

Personality is formed in the process of activity (manual and intellectual labour, study, etc.) under concrete historical conditions. The leading role in the processes of personality formation belongs to teaching and education in groups and collectives.

¹ Lev Tolstoy, *Childhood. Adolescence. Youth*, Raduga Publishers, Moscow, 1988, p. 148.

Concept of Personality Formation in Psychology and Pedagogy. The notion "personality formation" is used in two senses. In the first sense it means the *development of personality as a process and its result* and is the object of psychological investigation. The aim of such investigation is to ascertain the present structure of personality, i.e. its *actual* qualities that can be revealed experimentally, and to define its *potentialities* given purpose-oriented education. This sense of the notion under consideration is characteristic of the *psychological approach* to the problem.

Taken in the second sense, the *formation of personality is viewed from the angle of purpose-oriented education* which is characteristic of the *pedagogical approach* to the problem. This approach consists in the identification of *concrete tasks and implementation of various personality-moulding methods*. It implies the need to define the traits that would enable the individual to meet the historically conditioned demands of society.

The teacher should be careful not to confound the psychological with the pedagogical approach to the formation of personality, otherwise he will run the risk of mistaking his wish for objective reality. His attention should be focused on the qualities which are to be formed in the pupils rather than on the level they have already attained. Developing methods of educational work, pedagogy proposes various techniques for achieving the set goal and points out *ways* towards formation of such important personal qualities as loyalty to principle, truthfulness, kindness, and others.

By contrast, psychology studies the *initial level of development* of these traits in concrete pupils belonging to concrete collectives (pupil bodies, professional groups, families, etc.), ascertains the *results* of educational efforts, i.e. finds out what qualities have been *actually* formed and what tasks have not been accomplished, which of the changes that took place in a teenager's personality have become productive and socially valuable, and which of them have proved useless or undesirable, makes an overall assessment of the process of personality formation focusing on specific difficulties, achieved results, etc.

The pedagogical and psychological approaches to the formation of personality are not identical, but make a

unitary whole. It is useless to study the formation of personality in psychological terms without knowing the methods used by the pedagogues and the aims they pursued, without attempting to improve the existing practice. Equally futile would be the work of a pedagogue if he does not avail himself of the psychologist's opportunities for revealing pupils' real qualities, if he does not know the psychological causes of undesirable traits which develop sometimes in his pupils *despite* the implementation of apparently faultless forms and methods of education, if he closes his eyes to numerous, often contradictory psychological consequences of his pedagogical work, etc.

In a personality-forming psychological-pedagogical experiment the pedagogical and psychological approaches may be combined in the person of the experimenter. Yet even in this case there should be a clear demarcation between the *objectives of the psychologist in his role of the pedagogue* (the aims of education are set not by psychology, but by society, and the methods of their attainment are developed by pedagogy) and the *objectives of the pedagogue posing in the role of the psychologist*; the former should be concerned with the qualities that are to be developed in a pupil and the methods which are to be used to attain this aim, whereas the latter should concentrate on the changes that have occurred in the developing personality as a result of the pedagogical influence.

Motive Forces of Personality Development. The development of personality, the emergence and consolidation of its major psychological properties and traits take place under the conditions of personality-moulding pedagogical influence. What is the motive power and the source of this development of personality towards social maturity?

The history of psychology knows two trends offering different answers to this question. These trends came to be known as the *biogenetic and sociogenetic theories of development*.

The *biogenetic theory* maintains that the development of personality is determined by a biological, predominantly hereditary factor. Personality therefore develops spontaneously. According to this point of view, man is naturally predisposed not only to some temperamental peculiarities of emotional reactions showing in the degree of their energy and speed, but also to a definite set of mo-

tives favouring the development of certain traits (e.g. a predisposition to criminal behaviour, to successful administrative activity, etc.). This approach is premised on the assumption that nature has programmed not only the forms of man's mental activity, but also its content, that is predetermined the stages of his mental development and their sequence.

The proponents of the biogenetic conception viewing personality as a product of fatal biological factors with no capacity for inherent activeness in fact seek to turn the pedagogue into a passive witness of the emergence and evolution of preordained traits. "Let the child be an egoist, let him cheat and defraud till these forces exhaust themselves; glaring acts of selfishness help the child to form the idea of his Self"—such were their exhortations of the teachers whom they only left the right to know what qualities the child was destined to develop and the obligation not to interfere with the natural course of events.

The *sociogenetic theory* regards personality as a result of the direct effect of the social environment, as a copy of this environment. Like the biogenetic theory, this conception also ignores the developing personality's own activeness, assigning the individual the passive role of adapting himself to the surroundings. The sociogenetic conception cannot account for the fact that one and the same social environment often breeds very different personalities.

Thus neither the biogenetic, nor the sociogenetic theory provides a key to the laws of the development of personality. Neither of them is capable of revealing the motive forces of man's mental development. Nor are we any the wiser with the theory of mechanical interaction or *convergence* of two factors (environment and heredity) which does not overcome the errors of the two previous doctrines, but rather doubles them.

The dialectico-materialist approach to the problem of the motive forces of personality development calls for analysis of those contradictions whose resolution underlies the process of dialectical development, the transition from the lower (simple) to the higher (complex) stage. The activeness of personality derives from the sum total of needs inducing an individual to activity via a complex

system of conscious and unconscious motives. The process of the satisfaction of needs is internally *contradictory*. Needs are usually not satisfied immediately after they arise. Their satisfaction demands material means, a definite level of readiness of the person for activity, a certain amount of knowledge, skills, etc. *The motive forces of the development of personality show in the contradictions between man's needs changing in activity and the real possibilities of their satisfaction.*

The satisfaction of needs again and again reproduces the situation revealing a contradiction between the attained level of man's needs and the real possibilities of their satisfaction. The overcoming of contradictions leading to the development of personality is effected in activity and consists in mastering, in the course of study, of the means (methods, techniques, operations, skills, knowledge, etc.) for implementation of this activity. The satisfaction of needs in activity necessarily engenders new needs of a higher level.

This is why a developing personality constantly reproducing ever new needs (and, consequently, a widely ramified system of motivation) is itself a product of developing needs. *The formation of personality, therefore, largely depends on the selection, development and formation of needs, on the change of their structure and elevation to a high moral level characteristic of the needs of an individual in communist society.*

Development of Personality and the Mind: Unity, but not Identity. In the life of a concrete individual as a representative of human society his personality and his mind make a unitary whole. The brain of an individual is capable of reflecting the objective world and regulating the individual's behaviour in accordance with this reflection. An individual comes out as a personality, as a subject of interpersonal, essentially social relations. One cannot conceive of an individual included in a system of social relations, i.e. of a personality, without the world of consciousness, just as one cannot conceive of a human being endowed with consciousness yet not posing as a subject of interpersonal relations, i.e. not being a personality. This does not mean, however, that an individual's personality and his mind are identical notions. Their unity does not imply their identity.

Here is one example. Attraction, a feeling arising in interpersonal perception and making one person pleasant in the eyes of another is treated in psychology as a quality of the subject's personality. Yet attraction cannot be regarded as his mind's quality if only for the fact that the subject is attractive *to others*, and it is in the minds of those others that a specific emotional attitude, conscious or unconscious, develops to the subject and a corresponding social predisposition (set) is formed. Of course, in order to understand the mechanism of attraction the psychologist should take into account the qualities of the subject's mind, but this will be of little use to the psychologist if he does not know the real situation, the objective interpersonal relations within the framework of which the subject's attractiveness develops, reveals itself and is evaluated by other individuals. Indeed, these objective links arise not in the subject's mind, but in the sphere of interpersonal relations or, to put it more broadly, in social relations in which the subject participates as a personality. Even the most scrupulous psychological analysis of an individual's mental characteristics, e.g. the sphere of his motives and needs will not reveal the reasons for his attractiveness in some communities and repulsiveness in others. In order to understand this, we need a psychological analysis of the communities themselves; in point of fact, such an analysis becomes an essential prerequisite for the understanding of human personality.

The need to single out the process of formation of personality as a complex social quality of an individual, a subject of the system of human relations derives from the difference of the notions "individual" and "personality", "mind" and "personality" and, consequently, "mental development" and "personality development" despite their close affinity. Personality comes out as the cause and result of changes effected by the subject's activity in the motivational-semantic formations of the people interacting with him, and in his own Self as "Other". Interpersonal relations as the characteristics of the subject of these relations, as well as the "contributions" he makes to the vital activity of other people, to their personal senses whereby the subject becomes represented in them and thereby in his own Self, come out in unity with the person's individuality.

In their unity, these manifestations of the individual in the system of social relations characterise him as a personality. Thus the mind as a form of the active reflection of objective reality by the subject manifests itself as a necessary aspect of the existence of personality, as its major intraindividual characteristic.

The methodological principles of the theory of personality have been outlined in the framework of a new developing trend (*Alexander Asmolov*) which regards personality as a systemic organisation developed by an individual in object-oriented activity and offers solutions to a number of personality-related problems, first and foremost the problem of the sociogenetic characteristics of the development of the mind and personality, as well as of the history of human society in general (socio-evolutionary approach). The new theoretical concepts and hypotheses evolved as a result of extensive research in recent years are intended to give a psychological explanation of the process of personality development without divorcing it from the development of the mind on the one hand, and without dissolving it in the general stream of the mental development of the child, on the other hand. In line with this general trend A. V. Petrovsky and V. A. Petrovsky have proposed a socio-psychological conception of the development of the child's and teenager's personalities.

What is the *definitive factor* of the development of personality in ontogenesis? According to social psychology, it is *the activity-mediated type of interpersonal relations which arise between the individual and the most referential group (groups) in that period*. These relations are mediated by the content and character of activities set by this reference group, as well as by the type of communication that prevails in it.

The socio-psychological theory of personality was propped up by hypotheses based on the stratometric concept of groups and collectives and on the notions of the individual's personalisation through the "investments" he makes in other individuals by his activity, transforming their emotional-volitional and intellectual sphere, i.e. their behaviour.

The stratometric concept based on the principle of mediation of interpersonal relations by the content, values and joint activity makes it possible to differentiate groups

in accordance with the level of their development as determined mainly by the extent of mediation of interpersonal relations and by the group social or asocial character (diffused group, prosocial association, collective, asocial association, corporation). Experiments have shown that the regularities revealed at one development level are either inoperative or produce the opposite effect at another level. Consequently, the level of the development of a group plays an important part in the personality development of its members.

According to the personalisation concept, an individual is characterised by a need to be a personality, i.e. to possess a set of individual characteristics and qualities enabling him to act in such a way as to satisfy the need to be a personality. The possibility for the realisation of this need exists only in a group with a high level of development—a collective where the personalisation of each of its members is the necessary precondition for the personalisation of all.

Personality Development in a Relatively Stable Group. Generally speaking, the development of personality can be conceived as a process of its integration in a new social environment.

Whether we speak of a child passing from kindergarten to school, a teenager entering a new company, a student starting to work in a labour collective, a conscript joining his army unit, or discuss the development of personality on a broad scale as a single long-term process lasting from infancy to civic maturity, we can only conceive of it as an individual's entry into the sphere of socio-historical being represented in his life by participation in the activity of various groups, in which the individual must adapt himself to circumstances and which he actively studies.

The stability of this new environment changes in degree and we may only conventionally call it invariable. In reality, it undergoes constant change resulting from the operation of social factors and also depending on the activeness of the people accommodating themselves in it.

The development of a personality entering a relatively stable social medium can be represented by a model (see Fig. 8). In this environment the development of personality is subject to internal, psychological laws reproduced more or less independently of the specific qualities of the

community where such development takes place; be it in the junior forms of a school, in a new company, in an industrial collective or in an army unit—they will be basically identical. We shall distinguish three main stages or phases in the development of personality in a relatively stable community: *adaptation, individuation and integration*.

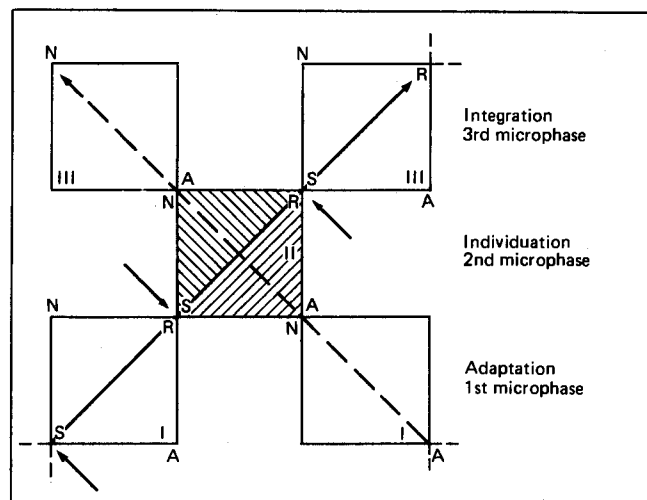


Fig. 8. Model of personality development in group (N—need to be personality, A—ability, S—source, R—result. The arrows indicate the prosocial development of personality, the dashed line, the asocial development).

At the adaptation stage the subject actively assimilates the effective norms of the community and masters the corresponding forms and means of activity. Having brought into the new group all that makes his individuality, the subject cannot satisfy his need to reveal himself as a personality until after he learns the code of the group (the norms of behaviour pertaining to ethics, study, production, etc.) and masters the methods and means of activity adopted by other group members. He develops an objective need "to be like all others", to adapt himself to the new environment in the largest possible measure. He

achieves it more or less successfully by "parting" with some of his individual distinctions and "merging", if only in imagination, with the mass. His possible feeling of loss accompanying such assimilation may be purely subjective, as an individual often "continues" himself by his deeds and lives on in other people effecting changes in their motivational-semantic sphere—the changes that are significant to them, and not to him. It is already at this stage that an individual may objectively, under certain circumstances, emerge as a personality for others, though he may not be fully aware of this significant fact. Under favourable conditions, an individual may develop new qualities which other group members already possess or are forming in the process of joint activity and which correspond to the existing high level of group development and are instrumental in maintaining it.

The second stage, individuation, results from the aggravating contradiction between the achieved result of adaptation and the need of the individual, not met at the first stage, for maximum possible personalisation. The contradiction reveals itself in the subject's attempts to assert his individuality. Thus a teenager, finding himself in a new company of elders, at first tries to avoid conspicuousness and carefully assimilates the group's standards of communication, vocabulary, style of clothes, interests and tastes. Only after overcoming the difficulties of the adaptation period he gets a feeling of dissatisfaction and becomes vaguely (and sometimes acutely) aware of the fact that, following this tactic, he is losing himself as a personality for the simple reason that other members of the group cannot discern his distinguishing features. Using to the utmost his ability to be ideally represented in his friends, the teenager summons up all his internal resources for an effective translation of his individuality (erudition, sporting achievements, "competence" in relations between the sexes, audacity verging on bravado, a special style of dancing, etc.) and steps up his search in the reference group for persons suitable for his optimal personalisation.

The third stage, integration, is determined by contradictions between the subject's desire that arose at the previous stage to be ideally represented in the community by his peculiarities and distinctions meaningful to him, on

the one hand, and the community's need to adopt, approve and cultivate only those individual features which appeal to it as according with its values, contributing to the success of joint activity, etc., on the other hand.

Young workers, members of a production team who have adapted themselves to the new environment, seek to assert themselves in the collective which sizes up their individuality. As a result, their distinctive features such as gumption, sense of humour, selflessness, etc. are accepted and encouraged by the collective—the individual integrates into the community. Integration may also result from a reverse process when the community rather than the newcomer adapts itself to the latter's needs for personification and makes him its leader. In either case, however, mutual transformation of the individual and the group is inevitable.

If the contradiction between the individual and the group cannot be resolved, the former is either displaced from a given community, or becomes actually isolated within the group. This leads to the consolidation of his egocentric characteristics, or even results in a regression to an earlier stage of the development of his personality. In the latter case a good collective takes appropriate educational measures ensuring the young man's effective adaptation which has evidently not been completed at the first stage. Under the conditions of joint activity in the third stage the individual develops new personality traits which may be lacking even in other group members but which meet the needs of group development and satisfy the individual's own need to make an effective "investment" in the life of the collective.

Each of the above-indicated stages represents a fraction of a single process of the development of personality, one of its necessary components accommodating developmental "microcycles". If an individual fails to overcome the difficulties of the adaptation period in a stable social environment which he regards as meaningful to him and proves unable to enter the second stage, he is likely to develop such traits as conformity, dependence, timidity, lack of initiative and confidence in his powers. Failing to adapt himself, he suffers a serious distortion of personal qualities. Seeking, at the individuating stage, to ensure his representation in the members of a meaning-

ful community and suffering a rebuff as his individual qualities fail to meet the needs of the community, he tends to develop such personal traits as negativism, aggressiveness, suspiciousness and exaggerated self-appraisal. If the subject passes successfully the integration phase in a highly organised prosocial community, he develops collectivism as a personal trait (developed collectivist self-determination, collectivist identification, etc.).

Considerable changes in personality occur in the above-indicated sequence each time the social environment of a given individual undergoes a radical transformation. Thus a leader who has lost his position for some reason or other sometimes has to pass again through the adaptation stage in the same community, brace his courage and energy for active individuation and reintegrate into the community by making a new contribution to its development and thereby promoting his own development as a personality. Owing to the fact that the social environment of an individual changes more than once during the span of his life, he gets involved in a number of relatively stable reference communities and his adaptation-deadaptation, individuation-deindividuation, integration-deintegration cycles constantly repeat themselves, the new traits of his character become consolidated and he develops a fairly stable *structure of individuality*.

Prepared by active adaptation and individuation, a person's integration into a social environment based on the principles of the socialist way of life is a crucial phase in the development of personality just because it plays a definitive role in the formation of a collective as a whole and of each of its members.

So, *the source of the development and assertion of personality is the contradiction between the individual's need for personalisation and the objective need of his reference group to encourage only those features of his individuality which correspond to the tasks, norms, and conditions existing for the development of the group*. The successful overcoming of this contradiction ensures the individual's integration into collective and, in a broader sense, into the existing system of social relations.

Development of Personality in a Changing Environment. The proceeds of personality development, complex as it is under relatively stable conditions, becomes much more

complex in the real social environment subject to constant change and development. This environment reveals ever new facets and confronts an individual with ever new situations thrusting him into new groups and challenging his power of adaptation. For instance, the relatively even development of the teenager's personality in senior forms at school undergoes a dramatic change when the youth joins a production team at a factory or is conscripted into the army. The specificity of an individual's integration into communities with different levels of development derives from the specific socio-psychological regularities characteristic of such communities, and their extrapolation to groups with a different level of development may result in serious theoretical errors and wrong practical decisions.

During his life-time an individual finds himself participating, sequentially and in parallel, in the activity of a number of communities with very different socio-psychological characteristics. Accepted in one reference group, he may be rejected in another, though he joins it right after the first group, or may even participate in the activities of both groups simultaneously. He has to reaffirm his personal status again and again. The individual bogs down in contradictions which hamper the development of his personality and may even lead to neurotic derangements. His reference groups themselves do not stand still and constitute a dynamic system, the adaptation to which is only possible on condition that the individual actively participates in the reproduction of its changes. Therefore, besides the internal dynamics of personality within a relatively stable social community the psychologist should take into account the objective dynamics and the specificity of those groups to which a given individual belongs.

Personality is formed in a hierarchy of groups representing different stages of ontogenesis. The character and specifics of personality development are set by the genesis of the group into which a given individual (child, teenager, youth) is integrated in different age periods. The most advantageous conditions for the effective formation of valuable personal qualities can only be provided by a *collective*, a group featuring the highest level of development.

Age Dynamics of Personality. The general approach outlined above provides a key to understanding the process of age-related personality development.

Soviet pedagogy and psychology distinguish the following age stages of personality development reflecting the concrete historical conditions of education in the Soviet Union: *infancy and early childhood* (from birth to age 3), *preschool childhood* (age 3 to 6), *junior school age* (6 to 11), *middle school age or the teenage period* (11 to 15), and *senior school age* (15 to 17).

In early childhood an individual is usually brought up in a family which, depending on the principles of education adopted in it, poses either as a prosocial association, or as a collective (in case of the "family cooperation" tactics), or turns into something like a tutelage council with all its negative features characteristic of groups with a low level of development (in case, for instance, of the "tight guardianship" policy pursued by the adults). Depending on the atmosphere that prevails in the family, the child from the outset grows either as an open-hearted, honest, tender and considerate little man who is not afraid of acknowledging his faults and blunders, or as a cowardly, lazy, greedy and self-willed egoist. The importance of infancy and early childhood for the moulding of personality which was pointed out by many psychologists and not infrequently mystified in psychoanalytic doctrines derives from the extreme malleability of this age referable to the peculiarities of the child's neuro-psychic organisation and high degree of activeness; growing from the first year of his conscious life in a sufficiently developed group, the child assimilates the type of relations that exist in it and translates them into the traits of his emerging personality.

The stage of *infancy and early childhood* is notable for the following results in the development of personality: first, adaptation to the environment by learning the simplest habits and mastering the language as a means of communication with the socium (with the Self as yet unidentified); second, individuation, opposing oneself to the environment ("my mother", "my toys", etc.), demonstration of distinctions from others in behaviour; third, integration, i.e. the ability to control one's own behaviour, take into account others, submit to the adults' demands, etc.

Under the concrete system of socialist upbringing the development of the child's personality, starting in the family, normally continues in the kindergarten (beginning from the age of 3 or 4), in a group of peers under the direction of an educator. Here the child encounters a new environment. The transition to this new stage is not brought about by the operation of inner psychological laws (which only ensure the child's preparedness for the change), but is an outgrowth of social conditions, such as, for instance, the availability of a ramified system of preschool institutions, their high reputation, the need for parents to work in the country's economy, etc. If the transition to a new age level and a new environment has not been prepared in the previous period, the child may face a crisis situation (like in any transition to the next stage).

The group mistress in the kindergarten typically becomes for the child of preschool age one of the most influential reference subjects (on a par with parents). Relying upon the family for assistance and using various kinds and forms of activity (games, studies, exercises, work habits, social assignments) as instruments of mediation, the educator seeks to rally the children and develop such socially valuable traits as humaneness, industry, collectivism, and others. The three phases within this period are: adaptation, consisting in the assimilation of the norms and behaviour patterns approved by the parents and the educators; individuation, consisting in the child's attempts to find in himself something that would distinguish him from other children either on the positive side, in various kinds of activity, or on the negative side, in pranks and whims (in both cases the child looks for appreciation not so much to other children as to the parents and educators); integration, consisting in the attainment of a balance between the child's unconscious desire to assert his own uniqueness and the adults' readiness to accept only those of his features which accord with their principal task (determined by social conditions)—to make him pass to a new stage of social upbringing, i.e. to school.

In *junior school age* the child's environment is much the same as in the previous period. On passing the three standard accommodation stages, the pupil finds himself

integrated in a totally new community, a group of classmates, which at first has a diffuse character in view of the absence of any collective forms of study. The teacher who controls this group is even more influential with the children as a reference object than the kindergarten's mistress, as he regulates the child's relations with other adults, primarily with his parents, by giving him high or low marks every day and thereby shaping their attitudes towards him and his attitude to himself as "other". Significantly, the main factor in the development of the junior pupil's personality is not so much the study itself as the adults' attitude to his general performance, his discipline and diligence. The study proper as a personality-forming factor evidently acquires its greatest significance in senior school age, which is characterised by the pupil's conscious attitude towards his work at school and by the formation of a world outlook as a result of the single process of teaching and education (at lessons of literature, history, biology, etc.).

The third phase of junior school age consists apparently not so much in the integration of the child in the "pupils-pupils" system, as in the "pupils-teacher" and "pupils-parents" systems.

Middle school age or the *teenage period* is distinct from the previous period in that the teenager entering it does not have to integrate into a new group (unless he finds a reference group outside the school which is often the case). His personality continues developing in the same group (also subject to change), but under different conditions and in different circumstances (several teachers instead of one teacher for all subjects in junior classes, shift in priorities in favour of social activities with encouragement of initiative, rudiments of joint labour activities, discos, etc.) vis-à-vis the cardinal restructuring of the organism due to oncoming puberty. The group itself undergoes a qualitative change. The differentiation of tasks in different kinds of activity results in appreciable differentiation of fellow pupils' interests, leading in some cases to the formation of prosocial associations (the result of pupils' participation in the activity of youth groups, tourist and sporting teams, etc.), and in others, to the emergence of associations hampering and sometimes distorting the development of personality.

The teenager's personality may develop simultaneously in several reference groups claiming priority in their significance to him. His successful integration into one of them (e.g. a school theatrical circle) may concur with his alienation from, say, a company of street friends in which he has already successfully passed the adaptation stage. Individual qualities valued in one group may be rejected in another, engaged in a different kind of activity and committed to a different scale of values which block the subject's successful integration. Contradictions inherent in the teenager's intergroup position are no less significant than the contradictions arising in the micro-cycles of his development.

The need "to be a personality" acquires at this age a distinct form of self-affirmation traceable to a relatively prolonged period of individuation, since personally significant qualities of a teenager, enabling him to integrate, for instance, into a group of peers, are often at variance with the demands of the teachers, parents and adults in general who relegate him to the stage of primary adaptation.

The plurality of reference groups, their transient character and significant distinctions, while hampering the teenager's integration, create at the same time important prerequisites for the development of specific traits in his character and for the formation of new psychological qualities. Indeed, groups with a high level of development provide a possibility for an individual to achieve stable positive integration into a new social environment either by joining a new community (for instance, a workers' collective after graduation from school), or by switching, together with other members of the existing group, to some new kind of activity, thrilling, socially useful and of professional character so that the group values and goals will henceforth mediate its members' interpersonal relations. At this fluid stage a prosocial reference group gravitates towards a real collective, whereas an asocial association tends to degenerate into a corporate body.

The process of personality development in collectives extends beyond the temporal limits of senior school age which can be termed as *early youth*. The adaptation, individuation and integration of personality in a work collective provide a basis for the development of a mature

personality and create necessary prerequisites for the formation of the collective itself. Thus in a highly developed group the characteristics of a collective turn into the characteristics of personality (a group quality comes out as a personal quality, and vice versa).

The age-related genesis of personality can be presented in the form of a multi-stage diagram characterising in very general terms the development of an individual towards social maturity and offering a breakdown of this development into separate stages (*eras, epochs, periods and phases*) (See Fig. 9).

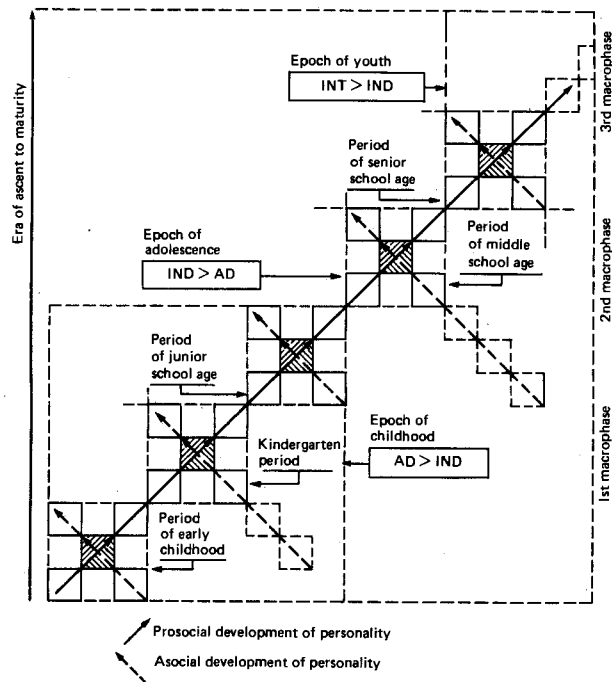


Fig. 9.

The whole of the preschool and school age period is included into one "era of ascent to social maturity". This period does not end with early youth, but continues, after individuals graduate from the secondary school,

in work collectives where yesterday's pupils attain economic, legal, political and moral maturity and turn into full-fledged members of socialist society.

The singling out of the "era of ascent to social maturity" appears to be expedient and necessary. If we conceive the social environment in terms of global characteristics as possessing relative stability and bear in mind that the goal of social education and upbringing in socialist society from the very first days of the child's life is the all-round development of personality, the entire period terminating in the attainment of this goal can be regarded as a single and integral stage. It includes *three phases of personality development—adaptation, individuation and integration in a social community*. Viewed as *macrophases of one era*, these phases are denoted as three epochs: *childhood (predominantly adaptation), adolescence (individuation), and youth (integration)*. At the end of this era the child turns into a mature independent personality, legally capable and economically gainful, prepared to reproduce and bring up his own kind, that is to continue his own Self in his children. The third macrophase (epoch), starting at school, extends beyond its chronological bounds. Adolescence comes out as an epoch of change, aggravation of contradictions typical of the stage of individuation.

Epochs are divided into periods of personality development in a concrete environment, in groups differing from one another by the level of their development, and specific for each age. Periods, in turn, fall into phases or, more accurately, *microphases* of personality development. The epoch of childhood which is the longest macrophase of personality development covers three age periods (infancy and early childhood, preschool childhood and junior school age); the epoch of adolescence coincides with the teenage period. The epoch of youth also partly coincides with the period of early youth (which terminates with the individual's graduation from school). The first macrophase (epoch of childhood) is characterised by the relative prevalence of adaptation over individuation, the second (epoch of adolescence), by the relative prevalence of individuation over adaptation, and the third (epoch of youth), by the prevalence of integration over individuation.

The conception of personality development reflects the influence of social psychology providing the general approach to the problem. At the same time it is based on rich experience amassed by investigators within the framework of developmental psychology proper. The integration of social and developmental approaches opens up broad vistas for each of the scientific disciplines and for psychology as a single whole. Their unity reveals itself in full measure in the study of interpersonal relations in the family and at school which form the child's personality according to the adopted principles of education and with due regard for the impact of the objective laws of socio-psychological development of the individual.

Part Three

COGNITIVE PROCESSES

Chapter 8

SENSATIONS AND PERCEPTIONS

III.8.1. Sensation

Sensations in Man's Life and Activity. We become aware of the richness of the surrounding world, of sounds and colours, smells and temperature, dimensions and many other characteristics of objects through *sense organs which provide the human organism with ample information about the condition of the external and internal mediums in the form of sensations.*

Sensation is an elementary psychic process which is initiated by the direct influence of material irritants on the corresponding receptors and reflects properties and phenomena of the objective world, as well as the organism's inner states.

Sense organs receive, sort out, accumulate and transmit information to the brain which continually processes an endless flow of data and provides an adequate reflection of the objective world and the states of the organism itself. The nervous impulses arising on this basis are carried to the executive organs responsible for the regulation of body temperature, operation of the digestive organs, locomotor system, endocrine glands, adjustment of sense organs themselves, etc. This extremely complex work consisting of thousands of operations per second is carried out continuously.

Sensation represents in fact the only connection between consciousness and the environment. We wouldn't know anything about the forms of matter or forms of movement if it were not for sensations. Sense organs give man orientation in the surrounding world. If man were

deprived of all sense organs, he would not know what goes on around him, would not be able to communicate with other people, to find food, or avoid danger. Prominent Russian physician *Sergei Botkin* (1832-1889) described a rare case of a woman patient who had lost all sentience except the ability to see with one eye and touch with a small area of her arm. When she closed the eye and no one touched the sensitive spot on her arm, she fell asleep.

Man needs to maintain permanent contact with the surrounding world. The adaptation of the organism to the environment understood in the broadest sense demands a certain balance of information between the environment and the organism. If this balance is disturbed as a result of information overload or information underload (*sensory deprivation*), the organism suffers serious functional disorders. Very illustrative in this respect are the results of medico-biological studies conducted over the past few years within the framework of the space exploration programme under the conditions of restricted sensory contact with the environment. The subjects almost completely isolated from the outer world in special chambers (constant monotonous sound, frosted glasses admitting only a small amount of light, protective cylinders on arms and legs keeping off tactual sensations, etc.) fell into a state of anxiety in a few hours and insisted that the experiment be stopped. Experiments under partial sensory deprivation, for instance, isolation of certain areas of the body from external effects, have shown that the sensitivity of such areas to touch, pain and temperature variation becomes impaired. The testees subjected to prolonged exposure to monochromatic light develop visual hallucinations. These and many other facts attest to the human organism's strong need for contact with the environment in the form of sensations.

The importance of sensations in the vital activity of man can scarcely be exaggerated, as they are the source of our knowledge about the world and ourselves. What is then the essence of sensations? The correct answer to this question was offered by the *Leninist theory of reflection* whose main principles were expounded by Lenin in his work *Materialism and Empirio-criticism*.
Sensations in the Light of the Leninist Theory of Reflec-

tion. The materialist teaching of sensations avers that *objects and their properties are primary, whereas sensations are a result of the action of matter on sense organs*. It also contends that sensations give us a correct copy of objective reality, i.e. reflect the world as it is. *The criterion of the authenticity of sensations and any other reflection of reality is practice, the subject's activity*.

The Leninist theory of reflection is opposed to unscientific, idealist doctrines, namely, to the interpretation of sensations by *Berkeley, Hume, Mach* and other *subjective idealists* as the only reality (hence the concept of the world as the sum total of sensations), and to the understanding of sensations as mere *symbols of external effects* (*Müller, Helmholtz*). In support of the latter theory its adherents adduced the specialisation of receptors in accordance with kinds of irritants, as well as the relativity of sensations consisting in that the same irritant acting on different sense organs may evoke different sensations (e.g. the eye retina produces sensations of light when stimulated by light, electrical current or pressure, whereas a mechanical irritant may elicit the sensation of pressure, sound or light depending on whether it acts on the skin, ear or eye). Basing himself on these facts, *Johann Müller* contended that sensation depends not on the quality of the irritant, but on the *specific energy of the sense organ being stimulated*. In his opinion, there is no similarity between our sensations and objects of the outer world: sensations are but mere symbols, "hieroglyphs" of the latter.

Though the facts referred to by Müller are true, they give no ground for broad generalisations. Firstly, not all irritants are as universal as electric current or a mechanical stimulant. Sounds, smells and other irritants acting on the eye will not evoke visual sensations. In like manner, light and smell cannot produce aural impressions. In point of fact, such relatively universal irritants as electric current and mechanical stimulants are but rare exceptions. Secondly, the sensations caused by different irritants acting on one and the same receptor are not similar in quality. Thus a mechanical blow or electric current acting on the ear produce a coarse auditory sensation which is not comparable with the richness of auditory sensations caused by acoustic (air) vibrations.

A distinction should be made between irritants which correspond to a given sense organ and those which do not. This fact alone attests to fine specialisation of sense organs capable of differentiating one kind of energy from another and reflecting specific properties of objects and objective phenomena. The specialisation of sense organs is a product of long evolution, and the organs themselves, their structural features and properties reflect man's adaptation to the environment.

Man owes his capacity for fine differentiation of sensations to his social and labour practice, the entire history of social development. Ensuring the adaptation of the organism to the outer world, sense organs can successfully perform their function only on condition that they correctly reflect the objective properties of the environment. We thus deal with "sense organs of specific energies", and not with "specific energy of sense organs". In other words, it is not the specificity of sense organs that produces the specificity of sensations, but just the other way round—the specific qualities of the outer world condition the specificity of sense organs. Sensations are not symbols or hieroglyphs; they reflect the real properties of objects and phenomena of the material world acting on the subject's sense organs and existing outside and independent of his mind.

Sensations and Perceptive Activity. *Sensations are subjective images of the objective world.* Yet a sensation results not only from the action of a material irritant on the organism, but also from the activity of the organism itself. This activity may be expressed either by internal processes only, or by both internal processes and external motions, yet it must be always there. *Sensations arise as a result of the transformation of the specific energy of the irritant acting at a given moment on the receptor into the energy of nervous processes.* Hence, sensation is not only an image or, more accurately, its component, but also activity. Numerous and diverse studies of the role of effector processes in the generation of sensations have led the psychologists to the conclusion that *sensation as a psychic phenomenon becomes impossible if the organism's response is either absent, or inadequate.* Indeed, a motionless eye, like a motionless hand, stops being an organ of cognition. *Sense organs are closely linked with*

organs of movement which perform not only adaptive, executive functions, but also directly participate in obtaining information. Thus the function of taction and movement are integrated in one organ, the hand, though the executive (effective) and tactual (receptive) movements of the hand are obviously different. *Ivan Pavlov* called such movements *orientation-exploration reactions* characteristic of what may be termed *perceptive behaviour* in contrast with executive behaviour. The aim of perceptive regulation is to increase the inflow of information and optimise the process of sensation.

III.8.2. Perception and Its Specificity

Perception is a reflection of objects or phenomena in man's consciousness as a result of their direct effect on sense organs. During perception individual sensations are integrated into images of things and events. In contrast with sensations which reflect individual properties of an irritant, *perception reflects the object as a whole, as a unity of its properties.* Perception is not the sum total of individual sensations, but a qualitatively new stage of sensuous knowledge with its specific features. The most important characteristics of perception are *objectivity, wholeness, structure organisation, constancy and meaningfulness.*

Objectivity, Wholeness and Structure Organisation of Perception. The objectivity of perception is expressed in the so-called *act of objectification*, i.e. *in relating the data received from the outside to the outer world.* Without such object-relatedness perception would not be able to perform its orienting and regulating function in man's practical activity. The relatedness of perception to external objects is not an inborn quality; the subject discovers the objective character of the world with the help of a definite system of actions in which taction and motion play the leading role. As has been pointed out by *Ivan Sechenov*, the quality of objectivity develops on the basis of processes which in the final count always manifest themselves in external motor acts ensuring contact with the object itself. Without motility our perceptions would lack the quality of objectivity, i.e. of being related to objects of the external world.

A case is on record where a patient with disturbed visual perception partly preserved his visual analyser's capacity for sensitivity and basic distinction. As a result of a brain concussion the patient's eyeballs were completely motionless. All that the subject could see was either a continuous stream of light, or fog with a ray of light struggling through. During the first rehabilitation period he began to distinguish spots, amorphous and meaningless, different in brightness and size. Yet the patient's vision did not go beyond sensations and he was unable to reproduce any object or its qualities either verbally, or graphically. It was only in three months that his vision regained the capacity for perception.

As we see, visual sensation by itself cannot provide the reflection of an object.

A number of authors described the retina of a frog as a "detector of insects". This "detector" provokes reflexory movements of the tongue when a small shadow cast, for instance, by a fly falls on the retina. The frog's eye registers only a few signs of an object, mainly informing the brain about its movement and presence of angles in its form and ignoring all other data. Can a frog form an objective image of a fly under such conditions? The answer will obviously be negative and its correctness is borne out by the fact that a frog can die from starvation with dead flies lying all around it.

Objectivity as a quality of perception *plays a very important part in the regulation of behaviour*. A brick of clay and a block of TNT may be very similar in appearance and to the touch, yet their qualities are quite different. We usually identify objects not by their appearance, but by the way we use them in practice or by their main properties. This is where the objectivity of our perceptions stands us in good stead.

Objectivity also plays an important part in the subsequent formation of *perceptual processes* themselves, i.e. the processes of perception. When a subject discovers a discrepancy between the external world and its reflection, he has to turn to new methods of perception ensuring a more adequate reflection.

Another feature of perception is its *wholeness*. In contrast to sensation reflecting individual properties of an object which acts on the sense organ, *perception provides*

an integral image of an object. To be sure, this integral image arises from the generalisation of our knowledge of individual properties and qualities of objects received in the form of various sensations.

Closely linked with the wholeness of perception is its *structure organisation*. Perception is essentially different from our momentary sensations and is not their sum total. In point of fact, we perceive an abstraction of these sensations, a generalised structure which takes some time to evolve. When a man listens to a melody, the notes heard earlier are still ringing in his ear when a new note comes on. Usually the listener understands a musical composition, i.e. perceives its structure as a whole. It stands to reason that the last of the heard notes cannot provide the basis for such an understanding: the listener's mind retains the entire structure of the melody with its inter-related components.

Very similar is the process of the perception of rhythm. We can hear only one stroke at a time, but rhythm is not an ensemble of strokes; it is a system of vibrating beats related to one another in a definite manner, and it is this relationship that determines the perception of rhythm.

The wholeness and the structuredness of perception are referable to the qualities of reflected objects, on the one hand, and to man's object-related activity, on the other hand. *Sechenov* underscored that both these features result from the reflexory activity of analysers. **Constancy of Perception.** External objects possessing, as it were, an infinite number of the degrees of freedom in relation to the perceiving subject and emerging before him under infinitely varying conditions constantly change their appearance and reveal ever new qualities and properties. Perceptive processes change accordingly. However, owing to *the ability of the perceptive system* (i.e. the set of analysers implementing a given act of perception) *to offset these changes* we perceive the surrounding objects as relatively stable in form, size, colour, etc.

This quality of perception can be shown by taking a specific example of size. As is known, the image of an object (including its image on the retina) increases when the distance to it diminishes, and vice versa. However, though the image of the object on the eye retina changes with the distance of observation, its perceived dimen-

sions remain practically invariable. Just take a look at the spectators in a theatre: all faces seem to us almost equal in size though the images of the faces in the distant rows are actually much smaller than those of the faces close to us. Now look at your fingers, those on the outstretched hand and those on the book you are reading: they seem to be of the same size, though the image of the former on the eye retina is half the size of the image of the latter.

What is the origin of this constancy of perception? Could this quality be innate?

In order to check this hypothesis psychologists investigated the perception of people who live permanently in a thick forest and had never before seen objects at a great distance. When these people were shown such objects, they perceived them not as remote, but as small. Similar disorders of perception are observed in plainsmen looking down from a great height. When we look at people or motorcars from an upper storey window of a high-rise building, they also seem to us small. However, builders who are used to working at high altitudes perceive the objects on the ground in their true proportions.

Here is another fact testifying against the hypothesis of inborn constancy of perception. A patient who went blind in childhood and recovered his eyesight after an operation at a mature age believed during convalescence that he could safely jump out of his ward's window without causing himself any injuries, though the window was 10 or 12 metres above ground. His wrong assessment of altitude presumably resulted from the perception of remote objects on the ground as just small ones.

The actual source of perception constancy is the activeness of the perceptive system itself. Out of the variegated and changeful stream of movements of the receptors and resulting sensations the subject singles out a relatively constant, invariant structure of the object being perceived. Repeated perceptions of one and the same objects under different conditions ensure the *invariance of the perceptual image* relative to these changeful conditions and to the movements of the receptor itself and, consequently, impart stability, constancy to this image. The variations caused by changes in the conditions of perception and by the active movements of the observer's

sense organs are not registered by the organs themselves; the latter only perceive something relatively invariant, for instance, the form of some object, its dimensions, etc.

Highly illustrative of the ability of our perceptive system to correct inevitable errors resulting from the infinite variety of environmental conditions affecting the perception of objects and to form adequate images are experiments with special glasses which distort visual perceptions by turning over the images, changing straight lines to curves, etc. When an individual puts on such glasses and is placed in an unknown environment, he gradually learns to correct the distortions caused by the glasses and finally stops noticing such distortions though they are reflected on the eye retina.

Thus *constancy derives from the very nature of perception as a peculiar self-regulating action with inherent feedback and an ability to adjust itself to the object being perceived and to the conditions of its existence.* The constancy of perception forming in the process of man's object-related activity is a necessary condition of his life. Without such constancy man's orientation in the infinitely diverse and changeful world would be impossible. The constancy of perception referable to the relative stability of the outer world reflects the unity of objects and their conditions of existence.

Meaningfulness of Perception. Though perception results from the direct action of an irritant on receptors, *perceptual images are always meaningful* to the perceiving individual in one way or another. *Perception in man is closely linked with thinking*, with the understanding of the object's essence. *To perceive an object consciously is to give it mentally a name*, i.e. to include it in a definite group, a class of objects, to *generalise it in a word*. Even when we see an unknown object, we attempt to assimilate it to familiar objects, to categorise it. Perception does not depend on the set of irritants acting on our sense organs, but is a dynamic search for the best interpretation, explanation of the available data. Very characteristic in this respect are the so-called ambiguous pictures which are alternately perceived either as a figure, or as the background (Fig. 10). These pictures clearly show that the perception of an object involves its identification (two profiles and a vase).

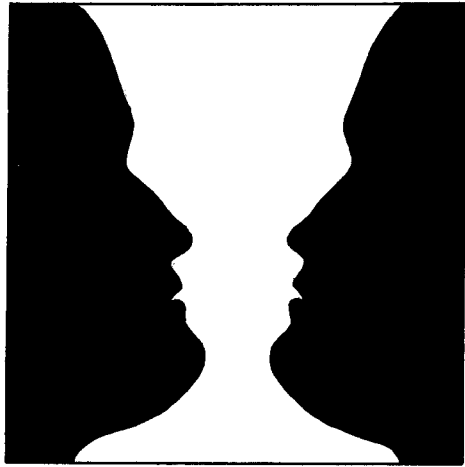


Fig. 10.

In summary, what we may say is this. Perception is an active process consisting of a multitude of perceptual actions and aimed at forming an adequate image of an object. The activeness of perception consists primarily in the participation of the effector (motor) components of analysers in the process of perception (hand movement in taction, eye movement in visual perception, etc.). Besides, activeness is also necessary at the macrolevel to enable the perceiving individual to actively change his position in relation to the object.

Apperception. *Perception depends* not only on the irritant, but also *on the perceiving subject himself*. It is not an eye, an ear that perceives—it is a concrete living individual. Perception always, to a greater or lesser extent, *bespeaks the influence of the perceiver's personality*, his traits, attitude to what he perceives, needs, interests, aspirations, wishes and feelings. The dependence of perception on the *content of the perceiver's mental life, on his personality is commonly known as apperception*.

Numerous findings show that a picture perceived by a subject is not the sum total of momentary sensations; it often contains such details which are completely absent

at the moment of perception from his eye retina, but are prompted, as it were, by his previous experience.

Perception is an active process providing the subject with information for framing and verification of hypotheses. However, the character of these hypotheses is determined by the content of the subject's past experience. When an individual is shown several arbitrary combinations of straight lines and curves and asked, "What could this be?", his perception from the very beginning involves a search for those heads under which a given figure could be included. He puts forward and checks on various hypotheses, trying to identify a figure with one or another category.

Hence, *perception of an object activates, as it were, the traces of past perceptions*. It is therefore only natural that one and the same object is perceived and reproduced differently by different people.

In an experiment two groups of subjects were shown relatively polysemantic pictures. Each of these pictures was assigned two conventional names. The pictures presented to one group were called by their first name, and those presented to the other group, by their second name. The subjects were asked to reproduce the pictures after their presentation. The results showed that the verbal designation of a picture had a marked effect on its reproduction. In the first group 74 per cent of all reproductions looked similar to the objects called by the first name, in the second group, 73 per cent of the reproductions resembled the objects denoted by the second name.

The effect of an individual's past experience on the process of perception was demonstrated in an experiment where the subjects wore eye-glasses turning the retina image upside-down. During the first days of the experiment the testees saw all the surrounding objects the wrong way except those whose inverted position was physically impossible. Thus an unlit candle was perceived as standing upside-down, yet as soon as it was lit it was perceived in its normal upright position, i.e. with the flame directed upwards.

Special interest attaches to the "distorted room" demonstration designed by American psychologist *Adelbert Ames*. The room looks normal from a certain vantage point but objects and people in it appear distorted in size

(for instance, an adult looks smaller than a little child). Presumably, people are so used to normal rectangular rooms, that in a distorted room they are ready to perceive distorted objects rather than a distorted room. It is interesting that in such a room wives do not see their husbands changed but perceive the room as distorted. In a situation of this kind, i.e. in the face of contradictory information the perceptive system has to make a choice, which depends on the previous experience of the subject: the room does not distort well-known objects. The illusion of visual perception gradually diminishes as the testees familiarise themselves with the objects by feeling them with their hands; finally they begin to perceive the room correctly, i.e. as distorted.

Perception depends on the past experience of the subject. The richer the individual's experience and the greater his knowledge, the richer his perception, the more he will see in the object.

The content of perception is also determined by the task facing the individual and the motives of his activity. For instance, when listening to a musical composition performed by an orchestra, we perceive the whole piece in its integrity, without distinguishing the sounds of individual instruments. It is only by setting ourselves a specific task to do so that we succeed in achieving this aim: the part performed by a particular instrument will come into the limelight of our consciousness and become the *object of perception*, whereas all else will recede into the background.

An important factor influencing the content of perception is *the subject's attitude*. Numerous cases are on record where the perception of an object was distorted under the influence of the subject's set.

The content of perception can also be changed by emotions which participate in the process of perception. The importance of emotional reactions in perception is borne out by numerous experiments.

The influence of the subject's past experience, motives and tasks of activity, as well as of his set and emotional state (including *convictions, world outlook, interests, etc.*) clearly shows that *perception is an active process which may be controlled.*

Physiology of Perception. Like sensation, perception is a

reflectory process. *Ivan Pavlov* has shown that *perception is based on conditioned reflexes*, temporal nervous links forming in the cortex of the brain hemispheres in response to the action of objects or phenomena of the outer world (complex irritants) on the analyser receptors. *The cortex nuclei of the analysers carry out complex analysis and synthesis of such irritants.* "In harmony with continuously and variably fluctuating nature the brain hemispheres alternately single out (analyse) agents as conditioned irritants breaking them up into minute elements and integrate (synthesise) them into variegated complexes."¹ Performing analysis, the brain identifies the object of perception and separates it from the background, whereupon it synthesises all the properties of this object into an integral image.

As compared to sensations, perception is a higher form of the analytical and synthetical activity of the brain. Without analysis meaningful perception is impossible. Thus a foreign speech unknown to the subject is perceived by him as a continuous stream of sounds. In order to make them meaningful, i.e. to understand the speech, it is necessary to break it into separate sentences and words with their meanings. Yet in the process of speech perception analysis goes hand in hand with synthesis wherefore we perceive not separate unrelated sounds, but words and sentences. The physiological substratum of synthesis is the process of establishment of temporal nervous links.

Perception is based on two kinds of nervous links: those formed *within the bounds of one analyser*, and those established *between different analysers*. In the first case the organism is acted upon by a combined irritant of one modality. Such an irritant may be a tune representing a peculiar combination of separate sounds acting on the auditory analyser. The whole complex acts as a single combined irritant. The nervous links are set up in response not only to the irritants themselves, but also to relations between them—temporal, spatial, etc. (*reflex to relationship*). As a result, the cerebral cortex acts as an integrator, i.e. performs complex synthesis.

¹ I. P. Pavlov, *Lectures on the Operation of Brain Hemispheres. Complete Collection of Works*, 2nd revised edition, USSR Academy of Sciences, Moscow-Leningrad, 1951, Vol. IV, p. 163 (in Russian).

The other kind of nervous links arising under the effect of a combined irritant are those between different analysers. In *Ivan Sechenov's* view, the perception of an object or space is referable to an association of visual, kinesthetic, tactual and other *sensations*. Necessarily added to such associations in man is the *aural image of the word* which denotes a given object or spatial relation.

In the act of vision during perception of the size of objects, their remoteness, etc., purely visual sensations are always associated with kinesthetic ones. These links may be somewhat impaired under the effect of certain medicines which strengthen or weaken the eye muscles. The resulting pathological state manifests itself in macropsia or micropsia (an increase or decrease in the apparent size of visual objects respectively).

Temporal nervous links underlying perceptions reflect the objective relations existing between objects and phenomena of the outer world.

Owing to links arising between analysers, we can reflect in perception also such properties of objects or phenomena for which the organism has no special analysers (for instance, the size of an object, specific gravity). That is why perceptions reflect the world more profoundly than sensations.

To sum up. *The complex image-building process of perception is based on the systems of intra-analyser and inter-analyser links providing optimal conditions for the identification of irritants and recognition of relationships between properties of an object as a complex whole.* **Classification of Perceptions.** The classification of perceptions, like that of sensations, is based on the distinctions of analysers participating in perception. Depending on what analyser plays the leading part in perception, we distinguish *visual, auditory, tactual, kinesthetic, olfactory and gustatory perceptions.*

Normally, perception is effected by a number of interacting analysers. *Kinesthetic (muscular) sensations participate to a greater or lesser extent in all kinds of perceptions.* This can be illustrated by taking an example of tactual perception which involves the participation of both the tactile and muscular analysers. The muscular analyser also participates in auditory and visual perceptions.

Different kinds of perception are seldom isolated, they are usually combined into complex perceptions. Thus a pupil's perception of a text at a lesson includes the visual, auditory and kinesthetic components.

Perceptions may also be classified in accordance with the forms of the existence of matter: space, time and movement. In this classification we distinguish *perceptions of space, perceptions of time and perceptions of motion.*

III.8.3. Perception as Action

The Part Played by Motor Components in Perception. Perception is a peculiar action *directed towards exploration and integral reflection of an object.* An essential component of perception is motility. Motor acts can be exemplified by the movement of a hand feeling an object, an eye tracing the visible contour of an object, a larynx reproducing an audible sound, etc.

Very important is the part performed by motor components in the act of taction. As is known, the capacity for passive taction is inherent in the entire skin of the human body. Active taction is notable for a high degree of accuracy—the hand's movement over the surface of an object provides its adequate reflection.

The eye and hand functions have much in common. Like the hand, the eye consecutively examines, "explores" the contours of a picture or an object. Describing their functional similarity, *Sechenov* wrote: "Whether we speak of contours and magnitude, or of the distance and relative position of objects, the locomotor reactions of an eye in seeing and hands in feeling are completely identical in terms of meaning."¹ The hand "teaches" the eye its methods of exploration, its tactics and strategy.

The analysis of hand movements in the process of taction and eye movements in the process of vision has shown that they fall into two large classes. The first class includes *searching, setting and correcting motions* whereby the hand (or eye) searches for a given object of perception, sets itself in the "initial position" and corrects

¹ I. M. Sechenov, "Taction as a Sense Corresponding to Vision", *Selected Philosophical and Psychological Works*, Gospolitizdat, Moscow, 1947, p. 555 (in Russian).

this position. The second class includes the *movements participating in the construction of an image, measurement of the spatial characteristics of an object, identification of familiar objects*, etc. This is the class of *gnostic movements, perceptual actions proper*.

The criteria of the adequacy of an individual's perceptual images are conditioned by his environment and education, and do not remain constant. This is attested to, for instance, by the post-operative experience of individuals who are born blind and undergo cataractectomy years later. The observation of a man who went blind at an age of 10 months and regained his vision in 51 years showed that after the operation, when the bandage was taken off his eyes, he saw nothing but a blur. He did not see the world of objects the way we do when we open our eyes. Gradually his vision came back, yet he perceived the world as being dim and diffuse. For a long time his visual perception was limited to what he had learnt earlier by taction. The patient never learnt to read with his eyes, yet he could recognise typed capital letters and numbers—precisely the kind of characters he had been taught to read in the school for the blind. His drawings attested to inability to reproduce anything he had not familiarised himself with by taction. Even a year after the recovery of vision he could not draw a complex object unless he had explored it with his hands.

Observation of people who were born blind and whose eyesight was restored at a mature age attests to the fact that *perception only comes about by way of learning*.

Perception is a system of perceptual actions, and mastering such actions calls for special training and practice.

Observation. Observation, an important form of voluntary perception, *consists in purposeful systematic perception of objects or phenomena of the outer world*.

In observation perception comes out as independent activity. In order to observe, an individual should learn how to use his organs of taction, vision, audition, etc. We often do not distinguish separate sounds in foreign speech, do not hear a false note in a musical composition or fail to detect the wrong colour in a picture. Observation can and must be practised. We can speak of cultivated perception and observation just as we speak about cultivated speech. If we may borrow the summary of Marcel Min-

naert, a prominent Dutch astronomer: "It is up to you to recover your sight—just touch your eyes with a magic rod on which is written: I know what to look at."¹

Indeed, success in observation largely depends on the clear *formulation of the task*. The observer needs a "compass" indicating the direction of observation. This "compass" is the task facing the observer, the plan of his observation.

Considerable importance attaches to *preliminary preparation for observation, the observer's past experience and knowledge*. The more experienced and knowledgeable an individual, the richer his perception. In organising the activity of pupils, the teacher should take due account of these laws of observation. In order to ensure that the pupils grasp the new material, the teacher should duly prepare them, activate their past experience and help them connect it with the new material setting new tasks before them and directing their attention towards the set goal.

Another means to achieve the same end, i.e. to orientate the pupils' observation and improve their perception of new data is to implement to a maximum possible degree the *principle of visuality of teaching* which has long been practised in pedagogy.

The visuality of teaching is attained by using special means (visual aids, special equipment, demonstrations, various excursions, etc.) in combination with the teacher's word.

Till recently these means were regarded as auxiliary and used only for illustration purposes to help the pupil internalise the new knowledge and evoke his interest in the subject. However, the latest results of experimental studies give a new dimension to the implementation of the well-known principle of visuality.

It appears that the familiar setup where the pedagogue conveys some information to pupils at a lesson is not the most effective teaching technique. Teaching should be organised *as an active process of thinking* on the part of the pupil. The final result of this activity, the internalisation by pupils of new knowledge, is the goal of the teach-

¹ Marcel Gilles Minnaert, *De Natuurkunde van't Vrije Veld*. Veld. B. I. Licht en Kleur in het Landschap, Zutphen, W. J. Thieme and Cie, 1937, S. V.

ing process. Now, what are the most effective means to achieve this goal? Experimental studies have shown that the essential component of the decision-making process is the manipulation of a certain image of a situation formed on the basis of orientational-exploratory perceptual activity. This phase, that is the phase of the individual's withdrawal or abstraction from a concrete situation, is nothing else than the activity involved in the restructuring of the image in accordance with the set task.

The need to interiorise a problem situation in order to make a decision testifies to the extreme importance of correct approach to the principle of visuality in teaching. The visual aids used in this process should not be a mere illustration to the material the teacher explains. In order to save the pupil the torment of appropriating new knowledge which is nearly as painful as the solution of creative problems in science or art, the teacher should extend the principle of visuality beyond the process of image creation to the process of image restructuring in accordance with the set task. In this approach primary importance attaches not only to the character of visual aids, but also to the sequence of their presentation at a lesson. This sequence should orient the pupils' activity towards the creation of a new cognitive model in their minds.

The principle of visuality eliciting active observation and intense mental activity on the part of pupils is a powerful instrument helping them assimilate new knowledge.

Chapter 9.

MEMORY

III.9.1. Concept of Memory

One of the basic characteristics of the mind consists in that the reflection of external influences is constantly used by an individual in his subsequent behaviour. The growing complexity of behaviour is referable to the accumulation of individual experience. Such accumulation would be impossible if the images of the outer world arising in the cerebral cortex were allowed to disappear without leaving a trace. Forming different links with one another, these images are preserved and reproduced in accordance with the needs of the individual's life and activity.

Definition of Memory. *Memory can be defined as memorisation, retention and subsequent reproduction by an individual of his experience.* It includes four principal processes: *memorising, retaining, reproducing and forgetting.* These processes are not independent mental capacities. They are formed in activity and determined by it. The *memorisation* by a person of a definite material is connected with the accumulation of individual experience during his vital activity. The use in subsequent activity of what has been memorised calls for *reproduction*. If certain material drops out of a person's activity it is *forgotten*. The *retention* of material in memory depends on its participation in the person's activity, since the behaviour of an individual at each given moment is determined by the *whole* of his life experience.

Thus memory is the most important, definitive characteristic of man's mental life. The role of memory cannot be reduced to forming images of the past (such images are called in psychology *representations*). No action is conceivable outside the processes of memory, since

any, even the most elementary mental act necessarily presupposes the retention of each of its current elements for "adhesion" to subsequent ones. No development is possible without a capacity for such "adhesion": according to *Ivan Sechenov*, man without it would forever remain in the position of a new-born child.

Being the most important characteristic of all mental processes, memory ensures the *unity and integrity of human personality*.

Memory was once considered to be among the best explored areas of psychology. However, recent studies of the laws of memory have again brought it into the foreground. The results of these studies largely determine the progress of very diverse disciplines, including those which are apparently very remote from psychological research (technology in the first place).

Modern investigation of memory focuses on the problem of its mechanisms, and difference in their understanding underlies the differences between current theories of memory.

At present, psychology has no single comprehensive theory of memory. The broad variety of hypothetic conceptions and models is attributable to the intensification of research undertaken, particularly over the last few years, by representatives of different disciplines. The two traditional levels of memory studies, the psychological and neurophysiological ones, have been supplemented by research at the biochemical level. Mention should also be made of the cybernetic approach to memory mechanisms and regularities which is rapidly gaining prominence.

Psychological Theories of Memory. The *psychological* level of memory studies, chronologically the oldest, is represented by the greatest number of various trends and theories. They can be classified and assessed according to the role which they assign to the *subject's activeness* in the formation of memory processes, and according to the interpretation of the nature of this activeness. Most of the psychological theories of memory focus either on the *object* (material) taken by itself, or on the *subject* ("pure" activeness of consciousness) irrespective of the semantic sphere of *interaction* between the subject and the object, i.e. without any relation to the individual's

activity. Hence the inevitable one-sidedness of the conceptions under consideration.

The first group of theories fall within the mainstream of so-called *associationism*. The central notion of this trend, that of association or mental connection, constitutes the necessary principle of all mental structures. According to this principle, definite mental structures arising in consciousness simultaneously or consecutively one after another are held together by an association so that a repeated emergence of one of the elements of this chain inevitably recalls to consciousness the representation of all other elements.

Thus, according to associationism, the *simultaneity* of the emergence of two impressions in consciousness is the necessary and sufficient reason for the formation of a tie between them. This postulate relieved the adherents of association psychology of the need to engage in an in-depth investigation of the mechanisms of memorisation and they confined themselves to the description of *external conditions* required for the emergence of "simultaneous impressions". The broad variety of such conditions was reduced by them to three main types: (a) spatial-temporal contiguity of corresponding objects; (b) their similarity; (c) their difference or opposition.

In accordance with these three types of relations between phenomena of the outer world the associationists distinguished three types of association: associations *by contiguity*, *by similarity* and *by contrast*. This classification dates to *Aristotle's* three principles of the "cohesion" of representations. Under these three heads the associationists included, not without a stretch, all the existing diversity of relations, including those of cause and effect. Since cause and effect, they reasoned, always form a temporal relationship (*propter hoc, ergo post hoc*), they lumped the cause-effect associations into the category of associations by contiguity.

The notion of association, which took firm root in psychology, was given later a new, more profound interpretation. Memorisation is indeed the linking of the new with the old, already existing in the individual's experience. The operation of linking is laid bare when we succeed in unfolding, item by item, the next memory process, i.e. the reproduction of some material. How do we

recall something by using, for instance, the "reminder knot" method? The knot we accidentally come across refers us to the situation which caused us to tie it; the situation reminds us of the interlocutor who, in turn, points to the subject of the conversation and thus to the object sought for. However, if the formation of such association chains depended only on the spatial and temporal contiguity of phenomena, one and the same situation would evoke similar associations in different people. Actually, associations arise *selectively* and the proponents of association psychology did not indicate the *determinants* of this selectivity. In point of fact, they did not go beyond the statement of facts which were to be accounted for in scientific terms much later.

The critical analysis of the doctrine of associationism provided a basis for a number of new theories and conceptions of memory in psychology. Their real thrust shows in the objects of their criticism in associative psychology and largely derives from their attitude to the very notion of association.

The most uncompromising stand against associationism was made by the exponents of *Gestalt psychology* (*Gestalt* means image, form, pattern in German). The pivotal notion of the new doctrine, that of *Gestalt*, implied the primacy of the perceptual structure as a whole, irreducible to the sum total of its parts, or separate elements. The Gestalt psychologists came out against the elemental approach of association psychology to phenomena of consciousness and opposed to it the principle of synthesis, the primacy of the whole in relation to its parts. Proceeding from this premise, the new theory regards the *organisation of material* as the basis and the analogous structure of traces in the brain as its derivative (the principle of isomorphism or structural similarity).

To be sure, a definite organisation of material plays an important role in the process of memorisation, but the organisation itself is nothing else than the function of the subject's activity. The Gestalt psychologists conceive wholeness as the primordial, ultimate principle and view the laws of Gestalt (like the laws of association) as something existing outside and independent of the subject's activity. Methodologically, Gestalt psychology and association psychology proceed from the same principle.

In contrast with associationism and other theories assigning human consciousness the passive role, a number of trends in psychology underscored the active role of consciousness in memory processes and stressed the importance of attention, intention and comprehension in memorisation and reproduction. Yet in these theories, too, memory processes were in fact divorced from the subject's activity and therefore misinterpreted. For instance, their proponents treated intention merely as a volitional effort, as "pure" activeness of consciousness which did not cause any restructuring of the process of memorisation or recall.

Since activeness, voluntariness and comprehension were ascribed only to the higher stages of memory, its lower stages were interpreted in terms of the traditional notion of association by contiguity. This gave rise to the conception of two kinds of links, associative and semantic, which is closely connected with the theory of two types of memory, mechanistic ("memory of matter") and logical ("memory of spirit" alleged to be absolutely independent of matter). This idealistic theory proved very persistent and was finally overcome only in the Soviet psychology of memory.

The recent decades have been marked by the increasing popularity of the theory which centres upon the individual's activity as the key factor determining the formation of all mental processes, including the processes of memory. According to this theory, the processes of memorisation, retention and reproduction of certain material depend on its importance for the subject's activity.

It has been proved experimentally that the most productive links are formed in memory in those cases when the material is closely related to the *goal of an action*. The characteristics of such links, e.g. their strength and lability depend on the *degree of participation of the corresponding material in the subsequent activity of the subject, on the significance of these links from the viewpoint of the attainment of the set goals*.

Thus the central tenet of this theory in contradistinction to those described earlier may be formulated thus: *the formation of links between various representations depends not so much on the material being memorised as on what the subject does with it.*

Physiological Theories of Memory. The physiological theories of memory mechanisms are closely linked with the basic propositions of *Pavlov's* teaching about the regularities of higher nervous activity. The teaching about the formation of conditioned temporal links is a theory of the formation of the subject's individual experience, i.e. a theory of memorisation at the physiological level. Indeed, a conditioned reflex as an act establishing a link between the new and the already fixed content represents the physiological basis of the act of memorising.

Crucial for the understanding of this act as a cause-effect relationship is the notion of *reinforcement*. In its pure form, reinforcement is nothing else than the *achievement* by an individual of the immediate *goal of his action*. In other cases it is a *stimulus* which motivates an action or modifies (corrects) it (e.g. in case of negative reinforcement). Reinforcement results from the coincidence of a new-formed link with the attainment of an action's goal: "as soon as a link coincides with the attainment of a goal, it gets fixed and consolidated" (Ivan Pavlov). All characteristics of this relationship, primarily its strength, are determined by the character of reinforcement as a measure of vital (biological) purposiveness of a given action. The modifying (correcting) function of reinforcement in the accomplishment of an action was revealed with utmost clarity by Soviet physiologist *Pyotr Anokhin* who showed the crucial role of reinforcement in the regulation of a subject's activeness, in the closing of the reflex ring.

The physiological notion of reinforcement correlated with the psychological notion of goal represents an interface between physiology and psychology in the investigation of the memorising mechanisms. The synthesis of the two notions enriching both of them gives us good grounds to believe that, from the viewpoint of its vital function, memory is oriented towards the future rather than the past: the memory of the past would be senseless if it could not be used in the future. The storing up of the results of successful actions is a probabilistic prediction of their usefulness for attainment of *future* goals.

Closely related to physiological theories is the so-called *physical theory of memory*. Its name derives from the contention of its authors that any nervous impulse passing

through a definite group of neurons leaves behind it a physical trace in the form of electrical and mechanical changes of *synapses*, i.e. junctions between two neurons. Such changes facilitate the secondary passage of the impulse along the trail that has been blazed.

Scientists believe that the reflection of an object, for instance, the tracing of its outline with an eye in the process of its visual perception, is accompanied by a corresponding movement of the nervous impulse through a definite group of neurons; modelling, as it were, the object being perceived, this impulse leaves a stable spatial-temporal trace in the neuron structure (wherefore the physical theory is also called the *theory of neuron models*). According to the adherents of this theory, the mechanism of memorisation, retention and reproduction consists in the formation and subsequent activation of neuron models.

Contemporary neurophysiological investigations are notable for ever more profound penetration in the mechanisms of consolidation and retention of traces on the neuron and molecular level. It has been established, for instance, that the *axons* (the relatively elongated parts of neurons) either contact the *dendrites* of other cells, or return to their own cell bodies. This system of nervous contacts permits circulation of *excitation impulses of different complexity* and thereby ensures the self-charging of a cell, since the charge arising in it returns either to the given cell strengthening its excitation, or passes away via a circuit of neurons. The stable loops of reverberating excitation confined to a given system are regarded by some investigators as the *physiological substrate of the process of trace retention*. Within this system the traces change from the so-called *short-term memory* to the *long-term memory*. Some researchers believe that both of them are based on a common mechanism, others contend that there are two different mechanisms with different characteristics. The final solution of this problem will largely depend on the findings of biochemical investigations.

Biochemical Theories of Memory. As we have seen, the neuro-physiological level of research into memory mechanisms at the present stage comes closer and closer to the *biochemical* level and not infrequently merges with it. This is borne out by numerous investigations

carried out at the interface of these two fields. The findings of these investigations prompted, for instance, a hypothesis about a *two-stage character* of the process of memorising. According to this hypothesis, a short-term electrochemical reaction occurring in the brain at the first stage (immediately after the action of the irritant) causes reversible physiological changes in the neurons. The second stage arising as the continuation of the first one is the biochemical reaction proper resulting in the formation of new proteins. The first stage lasting several seconds or minutes is considered to be the physiological mechanism of short-term memory. The second stage leading to irreversible chemical changes in neurons is believed to represent the mechanism of long-term memory.

If an experimental animal is taught to do (or not to do) something, and then the short-term electrochemical reaction is momentarily interrupted before it starts passing into a biochemical reaction, the animal will not be able to recall what it was taught.

In an experiment a rat was placed on a platform located not high above the floor. The animal would immediately jump down. However, after experiencing a pain from an electric shock during one of such jumps, the rat placed on the platform even 24 hours after the painful experience did not jump down and waited till it was taken off. In another rat the reaction of short-term memorising was interrupted immediately after it had received a shock. On the next day the rat behaved as if nothing had happened to it.

It is known that a temporary loss of consciousness in human beings also causes them to forget everything that immediately preceded the period of unconsciousness.

It can be assumed with good reason that subject to erasure are those traces of external influence which had no time to consolidate themselves due to the interruption of the short-term electrochemical reactions before the beginning of the corresponding biochemical changes.

Adherents of *chemical theories of memory* contend that the processes of consolidation, retention and reproduction of traces are referable to specific chemical changes taking place in neurons under the effect of external irritants. Such changes consist in various regroupings of protein molecules of neurons, primarily the

molecules of so-called nucleic acids. Desoxyribonucleic acid (DNA) is considered to be the vehicle of *genetic, hereditary* memory, and ribonucleic acid (RNA), the base of *ontogenetic, individual* memory. The experiments carried out by Swedish biochemist Heden have shown that the irritation of a neuron brings about an increase in the content of RNA in it and leaves lasting biochemical traces, enabling the neuron to *resonate* in response to a repeated action of familiar irritants.

RNA is extremely changeful, the number of its possible specific alternations ranging from 10^{15} to 10^{20} ; subject to change is the pattern of its components, their location in space, the velocity of disintegration, etc. It means that RNA can retain an enormous number of information codes. Presumably, the ability of RNA to exhibit resonance in response to specific structures of familiar irritants remaining at the same time insensitive to other effects constitutes the intimate biochemical mechanism of the faculty of memory.

The achievements of the latest, particularly biochemical investigations give us much ground for optimism regarding the possibility of control of human memory in the future. Yet they have also given rise to a number of false, sometimes fantastic ideas, e.g. about a possibility of teaching people by exposing their nervous system to direct chemical effects, imparting knowledge through the agency of special memory pills, etc.

It is worth noting in this context that though the processes of human memory indeed involve a very complex *interaction* of nervous structures at all levels, *they are determined "from top"*, that is *by man's activity*, and are governed by the principle "from the whole down to its parts". In accordance with this principle, the traces of external effects are materialised in the *organism-organ-cell* direction, and not vice versa. No pharmacologic catalysts of memory can change this fundamental fact.

Special investigations of the effect of various environmental conditions on the morphological and chemical structure of the animal brain provide ample evidence in support of this view. Thus it has been established that the cerebral cortex of rats exposed to emotionally diverse stimulating influences becomes larger, thicker and heavier

than that of animals dragging out psychologically monotonous existence. The chemical composition of the developed rat's brain also undergoes specific changes, such as, for instance, an increase in the quantity of acetylcholine, an enzyme responsible for the passage of impulses across the synapse. Thus the psychological level, the level of the individual's activity proves to be definitive in relation to the functioning of the lower levels.

Of course, the above-indicated structural and chemical changes in brain neurons, being a *product of the previous activity*, become a necessary *condition* for the individual's more complex *subsequent actions* by getting integrated into the mechanism of their realisation. What we contend, then, is not that chemical mechanisms are secondary and derivative, but rather that they cannot be formed "from bottom", for instance, by direct injection of some ready-made chemical substances into the brain. This is precisely how we should understand the proposition about the determining role of higher memory levels in relation to the lower ones.

To be sure, investigations into memory mechanisms at different levels are mutually beneficial.

III.9.2. Types of Memory

Since memory plays an important part in all aspects of man's life and activity, its manifestations are exceedingly diverse. The classification of memory should be based primarily on the specifics of the activity involving the processes of memorisation and reproduction. This also applies to those cases when one or another type of memory (for instance, visual or aural memory) comes out as a feature of an individual's mental make-up. Indeed, a mental quality first evolves in activity, and then manifests itself in it.

The most general base for the classification of memory is the dependence of its characteristics on the activity which involves the processes of memorisation and reproduction. Usually we classify memory on three main criteria: *by the character of mental activeness* prevailing in the individual's activity we distinguish *motor, emotional, imaginal* and *verbal-logical* types; *by the character of*

goals, set in the individual's activity—*voluntary* and *involuntary* types; by the *period of retention of information* important for the individuals' activity, *short-term, long-term* and *operational* types.

Motor, Emotional, Imaginal and Verbal-logical Memory. Different kinds of activity may be characterised by the prevalence of different kinds of mental activeness: motor, emotional, sensory and intellectual. Each of these kinds of activeness is expressed in the corresponding actions and their products: movements, emotions, images, thoughts. The specific types of memory that serve them are commonly known in psychology as *motor, emotional, imaginal* and *verbal-logical memory*.

Motor memory consists in the memorisation, retention and reproduction of various movements and their systems. There are people with pronounced prevalence of this type of memory over all others. One psychologist confessed that he was completely unable to reproduce in memory a musical piece and could only reproduce a recently heard opera as a dumb show. Other people, by contrast, may be utterly devoid of motor memory. The tremendous importance of this type of memory consists in that it provides a basis for the formation of various practical and labour habits, as well as the habits of walking, writing, etc. Without motor memory we would have to learn repeatedly to perform one or another action. Normally we can distinguish an individual with good motor memory by his adroitness, knack and clever fingers.

Emotional memory is a capacity to remember emotions. Emotions always signal the degree of satisfaction of our needs and interests and are indicative of our relations with the environment. Emotional memory plays therefore a very important role in the life and activity of every individual. The emotions once experienced and memorised serve as signals, either inducing us to action or preventing us from doing something that evoked unpleasant emotions in the past. The ability to commiserate with another individual, to feel with the hero of a book is based on emotional memory.

In a sense, emotional memory may prove stronger than other types of memory. Everyone knows from experience that many events, books, films are only remembered by

the impression they have produced and feelings they have evoked. Yet impressions of this kind are not unrelated to concrete objects: they may be the first link in a long chain of associations.

Imaginal memory retains representations (e.g. landscapes, tableaux), as well as individual sounds, smells and tastes. It may be *visual, auditory, tactual, olfactory* and *gustatory*. Unlike visual and auditory types which are usually well developed and play the leading role in the vital orientation of all normal people, the tactual, olfactory and gustatory types of memory may be regarded as a kind of professional qualities: similar to the corresponding sensations, these types of memory are subject to intensive development under specific conditions of man's activity. Thus they may attain a strikingly high level as a result of the reconstruction of functional systems due to the compensation or substitution for the impaired types of memory, for instance, in the blind, deaf, etc.

Highly developed imaginal memory is a characteristic feature of artistic professions.

Certain individuals possess so-called *eidetic* memory distinguished by uncommonly vivid imagery. Eidetic images result from the excitation of sense organs by external irritants and are similar to representations in that they arise in the absence of the object; however, due to their unique vividness which is completely absent from ordinary representations eidetic images approximate to perceptions. Thus an individual endowed with eidetic memory can "see" an absent object in its minutest detail "shifting", as it were, his gaze from one of its portions to another as though he were actually perceiving it. Reasoning by analogy, we may well presume that there are individuals with no less vivid auditory and, perhaps, even tactual memory.

The content of *verbal-logical* memory is thoughts. The twofold qualification of this type of memory is referable to the fact that thoughts do not exist outside language. Now, since thoughts can be expressed by different linguistic means, their reproduction can be oriented either on their content only, or on their literal (verbal) form. In the latter case, if the material is not subjected to any semantic processing, its literal memorisa-

tion loses its logical quality and becomes a purely mechanical operation.

Verbal-logical memory dominated by the second signalling system is characteristic only of human beings. In contrast with motor, emotional and imaginal types of memory which, though differing in complexity in man and animals, are possessed by both, verbal-logical memory is a typical human faculty. Based on and reinforced by other types of memory, verbal-logical memory determines their development and plays the leading part in the assimilation of knowledge by pupils in the process of teaching.

Involuntary and Voluntary Memory. The memory properties which have been considered above evolve in the process of activity and turn into essential characteristics of memory. Once formed, they can manifest themselves independently of the individual's activity, that is, its varying motives, goals and methods.

However, memory can also be classified in accordance with the specifics of the individual's immediate activity. In this case, depending on the goal of the activity, we distinguish *involuntary* and *voluntary* memory.

Involuntary memory is characterised by the absence of a special aim to memorise or reproduce something. By contrast, if an individual *sets himself the task* to memorise some material, we speak of *voluntary memory*. In the latter case the processes of memorisation and reproduction take the form of special *mnemonic* actions.

The involuntary and voluntary types of memory represent two successive stages of memory development. Everyone knows from experience the importance of involuntary memory which involves no special mnemonic intentions and efforts on our part, yet provides the basis for the bulk of our experience (in terms of both scope and significance). However, not infrequently an individual is faced with a situation when he has to control his memory. In such cases he chiefly relies on his voluntary memory enabling him to memorise or recall the material he needs.

Short-term and Long-term Memory. Operational Memory. Recent years have been marked by extensive research into the processes taking place at the initial stage of memorisation, that is, in the period before the

traces of external influences have consolidated and while such traces are being formed. This or that kind of material can only be retained by memory, if it is duly processed by the subject. Such processing calls for a certain period known as the *trace consolidation time*. Subjectively, this process is experienced as an echo of the event that has just taken place: for a moment the subject continues seeing, hearing, etc., what he is no longer perceiving ("she was still before my eyes, her voice was still ringing in my ears", etc.). These processes are unstable and transient, yet they are so specific and their role in the functioning of the experience accumulation mechanisms is so important, that psychologists regard them as a special kind of memorisation, retention and reproduction of information known as *short-term memory*.

The classification of memory into short-term and long-term types is an innovation which has superseded the distinction between immediate and mediated memorising. The term "immediate memorising" suggested the automatic, as it were, character of impression occurring without any activeness on the part of the subject. By contrast, mediated memorising implied the use of definite and more or less elaborated techniques. At present the division of memory into immediate and mediated is apparently out-of-date, chiefly because it has been found out that even short-term memorisation calls for a certain degree of the subject's activeness and involves appropriate techniques. In other words, short-time memorisation is also mediated. Its methods cannot be detected by self-observation, as they are highly automatised internal actions.

As distinct from *long-term memory* characterised by durable retention of material after its multiple reiteration and reproduction, short-term memory is notable for a very brief period of retention after a single momentary perception and immediate reproduction (within a few seconds after the perception).

The expression "short-term memory" reflects an external, temporal parameter of the phenomenon irrespective of how this phenomenon is related to the individual's activity, its goals and motives. Yet it also implies the relation of the temporal parameter of events to their

significance for the organism. The duration of an event is in itself important for memory, since a durable (re-current) effect is fraught, as it were, with a possibility of its reiteration in the future and kind of alerts memory for its reception. The consolidation of traces can therefore be regarded as a peculiar assessment by an organism of the meaningfulness of the given material for attainment of vital goals in the future. However, the influence of the temporal factor by itself is not unlimited: deprived of sense, prolonged irritation evokes nothing but protective inhibition, and not its transference to long-term memory.

In relevant literature the expression "short-term memory" is often replaced by its synonyms, such as "momentary memory", "primary memory", "immediate memory", and so on. Some authors, however, also use the term "operational memory" as one of the synonymic expressions, thereby seeking to underscore the "business-like" and not temporal character of short-term memory. Such usage may lead to ambiguity, as *operational memory* in Soviet psychology has acquired a different meaning. It came to denote mnemonic processes directly serving man's actions and operations. When we perform some complex operation, e.g. an arithmetic calculation, we accomplish it by parts, stage by stage. In doing so we carry "in our mind" some intermediate results till we need them. As we move towards the final result, the specific "processed" material may be cast off, i.e. forgotten. Similar phenomena take place in reading, copying and, in general, executing any more or less complex action. The individual pieces of material manipulated by the subject may be different (thus the child starts reading by putting together separate letters). The volume of such pieces or *operational units of memory* has an appreciable effect on one or another kind of activity and accounts for the importance attached to the formation of optimal operational units.

This notion of operational memory is different from those of long-term and short-term memory, though they undoubtedly have some points in common. Operational memory forms a "working mixture" of materials coming both from short-term and long-term memory. As long as this material is functional, it falls within the province of operational memory.

Interrelation of Different Types of Memory. The criteria used here for categorisation of memory reflect different aspects of human activity which is a unitary whole. A similar unity is represented by the corresponding types of memory. Thus the memory of thoughts about a concept, being essentially of the verbal-logical type, is simultaneously classified as voluntary or involuntary and as short-term or long-term.

On the other hand, different types of memory singled out on one and the same criterion also turn out to be interrelated. Thus the motor, imaginal and verbal-logical memories cannot exist independently of one another if only for the fact that the corresponding aspects of objects and phenomena of the outer world and, consequently, the forms of their reflection make a single whole. Complex continuity links exist also between involuntary and voluntary memory (the essence of these links will be described later when we discuss the process of memorisation). As regards short-term and long-term memories, they represent two stages of a single process. Indeed, nothing can penetrate long-term memory without passing short-term memory which plays the role of an inlet filter and initiates all processes characteristic of memory in general.

III.9.3. Memory Processes

When classifying memory under one or another head, we proceed from definite stable properties and aspects characteristic of memory irrespective of the concrete function it performs in activity: consolidation, retention or recall of material. For instance, the division of memory into motor, emotional, imaginal and verbal-logical types reflects its *form* (image, word, etc.) which is applicable to all processes—memorisation, retention and reproduction of the object.

Besides the classification of memory as such, psychologists also distinguish its *processes*. In this case for criterions of classification are taken different *functions* exercised by memory in the individual's life and activity. The processes of memory include *memorisation* (consolidation), *reproduction* (recall, renewal), and also *retention* and

loss (forgetting) of the material. The above-indicated processes are highly illustrative of the connection of memory with activity, as well as of the character of its independent (mnemonic) actions.

Though the comparison of memory processes clearly reveals their apparently antithetical functions, these processes should be viewed as a single whole. Their unity shows not only in their obvious external connection and interdependence (e.g. reproduction characteristics are largely determined by the specificity of the material memorisation, retention and loss), but also in even closer relations of mutual penetration and dialectical transition of one process into another.

Since the process of renewal is not just automatic reading of material, but its conscious structuring and even restructuring, the very process of reproduction necessarily includes also the processes of short-term memorisation and retention. Moreover, the process of reproduction always goes hand in hand with long-term memorisation. The so-called recapitulation of material is nothing else than its reproduction, yet it is also a process of its learning.

The processes of retention and forgetting (loss of material) can be analysed in a similar manner, provided, of course, that they are conceived as *processes*. Thus retention can be understood as a function of the *participation* of material stored in memory in the individual's activity. This participation may be unconscious, but any action of an individual is always influenced by his life's experience. From this viewpoint forgetting one or another fragment of material means only its removal from the individual's activity. In other words, forgetting is never absolute. Psychologically, it means nothing else than a difficulty (or impossibility) of transferring certain material in the mind to the short-term memory, to the sphere of consciousness. It is precisely in this sense of the degree of oblivion that the notion of forgetting is used in common language. Yet forgetting as a process starts genetically when the subject turns his attention to a different object. Any shift of the subject's attention from object *A* to object *B* is tantamount, in a way, to the forgetting of object *A*. We therefore consign to oblivion not only what is difficult or impossible to reproduce, but

also the content of our experience which is not present in our consciousness, of which we are not aware at the moment. Forgetting is thus inherent in any mental process, including any memory process. Memorisation itself as a movement of the beam of consciousness over an object necessarily includes temporary forgetting of the material. This is a concrete manifestation of the unity of opposite memory processes.

In summary, what we may say is this. Memory is an extremely complex, but single and continuous process. It is not possible to conceive of any state of consciousness that is completely divorced from memory.

Memory processes are determined by an individual's activity, its orientation on certain goals.

In the ordinary analysis of individual memory processes we abstract ourselves from their complex dialectical links and identify one or another process by its dominating characteristics.

III.9.4. Memorisation

Memorisation can be defined as a *memory process which consolidates new material by linking it to the earlier gains*. It is a necessary condition for enriching the individual's experience with new knowledge and new forms of behaviour. Memorisation is always *selective*: memory retains only a small part of what acts on our sense organs. What is the basis of this selectivity?

Memorisation and Action. Experiments have shown that memorisation in general and involuntary memorisation in particular is a natural product of the subject's *actions* with respect to the object.

In one experiment the testees were asked to classify pictures of various objects. Besides an object, each picture carried a certain number. After the experiment, the subjects were asked to recall what they had seen in the pictures. As it turned out, they remembered the objects quite well and had practically overlooked the numbers (some even said that they had seen none). In another experiment the subjects were asked to arrange the pictures in the ascending order of magnitude of their numbers, and the results were reversed: the testees had

memorised the numbers well and almost completely ignored the objects.

Hence, an individual commits to memory what he is concerned with in his *activity*. The same regularity has also been revealed in experiments with practical, labour actions.

On the evidence of the facts described above the simple *contiguity* of events (pictures and numbers) is not sufficient by itself for an individual to memorise them. All depends on what the individual *is doing* with the material in question. To be sure, identical external conditions of activity do not vouch for absolutely identical results of memorisation in different individuals since these conditions are always mediated by man's past experience, his individuality. Such distinctions, however, only underscore the need to view every action of an individual in the context of his personal circumstances, i.e. in connection with the specificity of his motives, goals and methods of their attainment.

The parameters of the memorisation process are determined by the *motives, goals and methods of the individual's activity*. This is the essence of the activity-related concept of memory which underlies the strategy of memory research in Soviet psychology and provides the right perspective for the description of the memorisation process in all its forms and at all stages, including the very initial level, that of *short-term memorisation*. **Short-term and Long-term Memorisation.** What is short-term memorisation? If we were asked to repeat several random figures, letters or words right after they are dictated to us, we surely should do it without any difficulty. Even the reproduction of a series of senseless syllables would not give us much trouble (provided their total number does not exceed five or six). In a short while, however, we would not be able to do so. It is an example of short-term memorisation. In order to commit a given series to our long-term memory, we must repeat it several times and, perhaps, use special mnemonic techniques (for instance, joining syllables into words and combining the latter in an artificial sentence). This would be long-term memorisation.

Investigations into short-term memorisation prompted mainly by the needs of engineering psychology have

assumed great theoretical significance. In point of fact, all problems of contemporary psychology of memory converge towards the regularities of its short-term processes, that is, the nature of memory mechanisms. This pivotal problem of memory studies can only be solved by the integration of all levels of research: psychological, neurophysical and biochemical.

The very expression "short-term memorisation" shows that the corresponding classification is based on time. Yet the time parameter, important as it is for the understanding of memory phenomena, is not sufficient to permit comprehensive description of short-term memorisation. Indeed, the analysis of memory processes should show the dependence of memory *on the character of man's activity* under different time settings. It has been established that memorisation is controlled by the programme set from top, i.e. determined by the character of man's *active attitude* to the material to be memorised.

Investigations are now under way aimed at establishing the relationship between short-term memorisation and the character of the individual's activity, the specificity of the task he is performing. Till recently investigations of short-term memorisation were mainly concerned with variations of two factors: the time of exposure and the material to be memorised. The goal of the activity performed by the testee remained invariable as he had always been set a mnemonic task. It is quite natural therefore that the volume of memorisation under a given exposure period remained constant. The latest data testify to the fact that different cognitive and mnemonic tasks exert different influences on the productivity of short-term memorisation. These data show that short-term memorisation, at least within the time periods it has been under scrutiny, is not just direct imprinting of the exposed material in the individual's mind.

It was found out that under the conditions of momentary exposure only those tasks prove productive which can be accomplished *by rote*. Conversely, those tasks which call for complex processing of material reduce the efficacy of memorisation. *Short-term memorisation*, therefore, could be defined as a process which *takes place within a brief space of man's activity allowing for automatic processing of exposed material*.

So-called *operational memorisation* may be regarded as one of the intermediate levels between short-term and long-term memorisation. It could be defined as a *memory process serving man's current actions* and is one of the prerequisites for obtaining the result of every concrete operation within the framework of a given action.

Investigations have shown that the characteristics of operational memory, such as its volume, accuracy, lability, etc. are determined by the content and structure of the activity being served, on the one hand, and by the degree of its development, on the other hand.

The productiveness of operational memory and, consequently, the success of the activity it serves largely depend on what we already know as *operational units of memory*, i.e. *the volume of material retained by memory during attainment of the action's goal*. Operational units of memory may have different levels. The formation of operational units of the optimal level is the principal method of improving the productivity of operational memory and the activity it serves.

At the level of operational memorisation information passes from short-term memory to long-term memory. Thus when reading a connected text, we must retain in our memory the meanings of separate letters before they are combined into words, the meanings of words before they are combined into sentences, etc. After accomplishment of each of these operations, the corresponding concrete meanings are lost (we do not remember, for instance, the first word of the second sentence in the third paragraph on the previous page). Yet if we forgot the whole of the material "processed" in intermediate operations, we would not be able to continue the action after every operation. Subject to transfer to a higher level are ever more general meanings which integrate the particular meanings passed through the system of semantic filters.

Long-term memory receives only *strategic, and not tactical information* required for attainment of the individual's vital goals. Long-term memorisation, being a natural product of an individual's activity, is not just a concomitant trace of his actions, but primarily a necessary internal condition thereof. Put another way, the memorisation of any material is a product of a

previous action and at the same time a condition, an instrument of the accomplishment of the next one.

Involuntary and Voluntary Memorisation. In accordance with the goals of activity which includes the processes of memorisation, we can distinguish two main types of memorisation: *involuntary* and *voluntary*.

Involuntary memorisation is a product of cognitive and practical actions and a prerequisite for their accomplishment. Since memorisation itself is not our goal, it appears to us as a spontaneous act. Actually, however, it is a strictly ordered process determined by the specifics of our activity. Investigations show that the productivity of involuntary memorisation largely depends on the significance of the material retained by memory for the subject's activity. *If the material is an integral part of the subject's goal in his activity, it imprints itself in his mind easier than if it is related to the conditions or methods of the attainment of this goal.*

In a series of experiments first-form children and college students were asked to do five simple sums. Quite unexpectedly, both groups of subjects were asked to recall the conditions of the sums and the numbers they had manipulated. It turned out that the first-formers could reproduce three times as many numbers as the students. Their better performance is referable to the fact that they were not yet able to add and subtract by rote. Doing such sums was to them a meaningful purposive action.

In contrast to the first-formers, for whom the manipulation of numbers constituted the *goal* of their action, the students ranked it as belonging to the *method*, i.e. as something of secondary importance.

The material playing different roles in the activity of an individual is of different significance to him and, consequently, elicits from him different attitudes and different kinds of support. The content of the main goal calls for a more active attitude and receives a more effective support as the attained result of activity. Naturally, it penetrates the individual's memory easier and is held by it more firmly than the material pertaining to the conditions of goal attainment. It has also been shown that *the more substantive the links established by an individual in the goal-related material, the better it is memorised and the longer retained.*

Studies of involuntary memorisation of a text which pupils were to comprehend have revealed that a text of medium difficulty lent itself more readily to memorisation than a very easy text. As regards a difficult text, the pupils memorised it easier if they used more active methods of its analysis, such as, for instance, drawing up a plan, than if they used a ready-made plan of the same text.

Consequently, *the material which calls for active mental effort is more amenable to involuntary memorisation.*

It is common knowledge that our involuntary memory holds firmly and in full, sometimes for life, only what is *of vital importance to us*, what evokes our *interest and emotions*. Involuntary memorisation will be *the more productive, the more we are interested in the content of the task we perform*. Thus if a pupil is interested in a lesson, he memorises its content better than if he listens to the teacher merely to preserve decorum. A special investigation into conditions of involuntary memorisation in training has shown that one of such basic conditions is the creation of internal cognitive motives for study. The desired aim is achieved by developing a *system of study objectives* in which every achievement becomes a *necessary means* for the next step.

Voluntary memorisation is a product of special *mnemonic actions* aimed predominantly at committing something to memory. The productivity of such actions also depends on the specificity of goals, motives and methods of accomplishment. Special investigations have shown that one of the chief prerequisites for voluntary memorisation consists in a clear formulation of the task to memorise the material accurately, fully and in right succession. Different mnemonic goals affect the character of the process of the memorisation, the selection of proper methods and, consequently, the attained results.

In one experimental study pupils were asked to memorise two stories. They were told that the first story would be checked the next day and the second story was to be memorised for long. Both stories were checked in four weeks. It turned out that the pupils remembered the second story much better than the first one. It is well known that the material memorised only for passing

examinations, without preorientation towards firm and durable retention, is forgotten very soon.

Thus the role of a mnemonic task cannot be restricted merely to an intention to memorise. Different mnemonic tasks evoke different attitudes to the material, to its content, structure, linguistic form, etc., thereby determining the selection of the corresponding methods of memorisation. For this reason, the pedagogue should differentiate the tasks he sets his pupils and clearly indicate *what is to be memorised and in what manner*.

Motives for memorising play an important part in voluntary memorisation. Imparted information comprehended and committed to memory by pupils may be quickly forgotten if it lacks durable significance to them. Persons with a low sense of duty and responsibility are often liable to forget much of what they ought to remember.

Central to the conditions of productive voluntary memorisation is the proper *use of rational memorisation techniques*. Knowledge is a definite system of facts, notions and judgements. In order to memorise them, it is necessary to single out certain semantic units, establish links between them and use logical methods related to more or less developed processes of thinking. *Understanding is a necessary condition for logical, meaningful memorisation.* Comprehended material lends itself to memorisation more readily and is better retained in memory because it is meaningfully associated with the already assimilated knowledge, with an individual's past experience. By contrast, obscure or unclarified material is always something apart from the content of an individual's consciousness, something without substantive bonds with his past experience. Material which has not been understood usually holds but little interest to an individual.

One of the principal methods of logical memorisation is the *drawing up of a plan of the material to be committed to memory*. It includes three stages: first, breaking down the material into components; second, classing them under appropriate heads or arranging around some pivotal points easily associated with the entire content of a given part; third, linking the leads or pivotal points in a single chain of associations. The

integration of individual thoughts and propositions into semantic components cuts down the number of units to be memorised without reducing the total volume of the material. Its memorisation is also facilitated owing to the fact that the plan turns the material into a well-ordered dismembered system amenable to comprehension already at the reading stage.

Unlike *the plan intended to facilitate the comprehension* of material, *the plan drawn up for its memorisation* singles out all minor items, the heads only pointing to or reminding of what is to be reproduced (wherefore they are often incomplete and fragmentary in form).

Of great importance is *comparison* as a logic of memorisation, particularly with emphasis on distinctions between objects. This method helps the subject to specialise links during memorisation and orients him on a definite course of image reproduction. The establishment of only general links between objects may hamper their recall, particularly if such links are of a very broad character.

The sharper the distinctions between objects, the faster and more securely they are fixed in memory. For this reason it is always advisable to start comparing objects with obvious distinctions, and only after that to pass to less conspicuous details. As a result of a series of experiments *Ivan Pavlov* came to the conclusion that a reflexory bond established by the nervous system in response to an irritant acts faster and endures longer not when the irritant is repeatedly reinforced, but when its reinforcement is intermittent and alternates with the action of another, non-reinforced irritant similar to the first one.

Associations by similarity and contrast provide the basis for such complex methods of voluntary memorisation as the classification and *systematisation* of material.

When the logical processing of material *rests on a solid foundation of image connections*, memorisation becomes more meaningful and the durability of retention increases. It is therefore recommended that the material subject to memorisation should be associated with appropriate images.

One of the principal methods of memorisation is to *reproduce*, to retell to oneself the material which is to

be memorised. This method, however, should only be used after the material has been comprehended, particularly when it is difficult to understand. The retelling of material using one's own words improves its understanding. Poorly digested material is usually identifiable by an "alien" linguistic form, whereas the material that has been understood readily lends itself to translation into the "mother" tongue.

Reproduction accelerates and rationalises memorisation, particularly when learning material by heart, since by retelling it we reveal our weak spots and exercise self-control. It is important that reproduction should not be replaced by recognition. Indeed, it is easier to recognise than to recall, but it is *only the ability to recall that gives us the necessary confidence in our knowledge.*

A large volume of study material calling for repeated reproduction can be memorised by three methods: *partially* (partial method), *wholly* (integral method), or both wholly and partially (*combined method*). The most rational is the combined method, the least rational—the partial method. In the latter case the subject has no orientation on the general meaning of the whole, therefore separate parts are learned independently of one another. This tends to reduce the retention period drastically. More productive is the integral method which gives the subject the general content of the material and thereby facilitates the process of understanding and memorisation of individual parts in their interrelation. However, parts may differ in complexity and the middle portion is usually less amenable to learning, than the beginning and the end of the piece, particularly if the volume of the material is large. In such cases the combined method appears to be the most advantageous as it enables the individual to comprehend the material in its entirety, breaking it up simultaneously into separate sections, and then to learn such sections one after another, particularly the most difficult ones, and, finally, to recapitulate the whole.

This method of learning corresponds in the largest measure to the *structure of the mnemonic action consisting of the following operations: general orientation in the material, identification of individual groups, setting up first intragroup, then intergroup relations.*

An individual's ability to reproduce material is not necessarily a sign of its durable retention, therefore the teacher should always arrange for repeated recapitulation in order to fix the material in the pupils' memory.

According to Russian pedagogue *Konstantin Ushinsky*, a teacher who is remiss in recapitulation and disregards the need to consolidate a pupil's knowledge can be likened to a drunk coachman with poorly fastened baggage: he keeps riding on without looking back and arrives at his destination with an empty coach, boasting only of a long distance covered.

It will be remembered, however, that recapitulation can only be productive if it is purposive, meaningful and active, otherwise it will lead to rote memorisation. The best method of recapitulation consists, therefore, in including the assimilated material in pupils' subsequent activity. The experience gained in experimental teaching has shown that if the curriculum material is arranged in a carefully thought-out system of tasks, in which each subsequent stage is based on the precedent one, all essential material necessarily repeats itself in the subsequent activity of the pupil so that he comes across it again and again at every new level and in different contexts. Under such conditions pupils internalise the necessary knowledge even without learning, i.e. involuntarily. Merging into new information, the earlier assimilated knowledge is not only renewed and updated but, being placed in a new perspective and receiving yet another dimension, undergoes a qualitative change.

Involuntary and Voluntary Memorisation in Assimilation of Knowledge. Teaching should be oriented not only on voluntary, but also on involuntary memorisation. Comparative studies have revealed their place and role in the assimilation of new knowledge by pupils and defined the conditions under which they are the most effective.

Involuntary memorisation of objects (depicted on cards) in the process of their classification, i.e. during active mental activity provided better results than voluntary memorisation based only on the perception of material. In like manner, when pupils were drawing up a plan of a comparatively complex text in order to better understand its content, their performance was better than in voluntary memorisation, based only on simple reading.

Consequently, *when involuntary memorisation is backed up by meaningful and active methods of processing the material, it proves more productive than voluntary memorisation, unless it is based on similar methods.*

When identical material processing methods are employed (e.g. classification of objects), involuntary memorisation remaining more productive in preschool and early school age, gradually loses its advantages in middle-form children and in adults whose voluntary memorisation becomes more productive. These changes in the efficacy of involuntary and voluntary memorisation are traceable to complex links arising between cognitive and mnemonic actions in the process of their formation. Mnemonic actions forming on the basis of cognitive actions lag behind them. Classification may become instrumental in memorisation when it reaches a sufficiently high level of development as a cognitive action. Indeed, it is only after an individual has learned to classify material that he can use this mental action as a method of voluntary memorisation. This regularity has also manifested itself in experiments on involuntary and voluntary memorisation of a text in which the subjects used a ready-made plan of the text or drew it up themselves.

The productivity of involuntary memorisation is at its maximum when pupils perform a *cognitive* task, i.e. when the material requires active comprehension. The reason for it lies in the fact that it is difficult or altogether impossible to combine the process of comprehension with the accomplishment of a mnemonic task. By contrast, voluntary memorisation attains the peak of productivity when the comprehension of material can be fully subordinated to the accomplishment of a mnemonic task. Orientation towards involuntary memorisation should therefore be practised in studying new material, whereas a mnemonic task should be set at the stage of its consolidation. Hence, the efficacy of the pedagogue's control of his pupils' memorisation processes largely depends on the *identification and differentiation of cognitive and mnemonic tasks.*

Chapter 10 IDEATION

III.10.1. General Characteristics of Thinking

Man's whole life consists in solving acute and urgent tasks and problems. The emergence of such problems and unexpected difficulties is eloquent proof that the surrounding world contains many unknown, strange and hidden things and phenomena. They constantly exercise man's mind and challenge him to penetrate deeper and deeper into the mysteries of nature, and discover ever new processes, properties and relations between people and things. Thinking is born of man's need to understand new, unknown properties of objects he constantly meets with in the course of his life. His old store of knowledge proves insufficient. The Universe is infinite, just as the process of its cognition. Thinking is always oriented towards the new, the unknown. While thinking, every individual makes discoveries, be they ever so small and only for himself.

Inseparable from speech, thinking is a socially-conditioned mental process of search for and discovery of the essentially new. Being capable of mediated and generalised reflection of reality with the help of analysis and synthesis, thought derives from practical activity and, evolving from sensuous knowledge, extends far beyond its bounds.

Sensuous Knowledge and Thinking. Cognitive activity starting from sensations and perceptions passes on to thinking. Any, even the most sophisticated thinking is never divorced from sensuous knowledge, i.e. from sensations, perceptions and representations. There is only one source of thinking material—sensuous knowledge. Through sensations and perceptions, thinking is directly linked to the outer world and is its reflection. The

correctness (adequacy) of this reflection is continually checked by practice, during practical transformation of nature and society.

The sensuous picture of the world emerging from our daily sensations and perceptions is necessary, but not sufficient for its profound all-round cognition. Indeed, this sensuous image of directly observed reality hardly reveals extremely complex interdependence of separate objects, events, phenomena, etc., their causes and effects, transitions from one to another. It is simply impossible to unravel this tangle of dependences and links represented by our perceptions in all its colourfulness and immediacy with the help of senses alone. For instance, the sensation of heat which we get by touching an object with our hand does not give us a clear idea of the thermal condition of the object itself. This sensation depends, first, on the thermal condition of the object and, second, on the condition of the individual himself (that is, on whether the individual touched warmer or colder objects before the experience in question). Already this very simple example shows that in sensuous knowledge the above-indicated dependences come out as a single undivided whole. Perception gives only the total, aggregate result of interaction between the subject (man) and the object of cognition. Yet in order to live and act we must, first of all, know external objects by themselves, i.e. objectively, irrespective of what they seem to us and, for that matter, irrespective of whether they are subject to cognition at all.

Transition from sensations and perceptions to thinking is necessary to explain the details of which the whole picture is made up, i.e. to detach them from their environment and examine each one separately or, put another way, to go beyond the immediate effect of interaction between the subject and the object of cognition which is impossible within the framework of sensuous knowledge alone. Thus Yoga, a Hindu school, taught that true knowledge could only be attained by utmost concentration on the object and suppression of all irrelevant forms of mental activity. Yoga developed a special technique, the so-called octonary method aimed, first, at achieving body control (by practising various postures, doing breathing exercises, etc.) and, second,

control over mental processes, such as attention and thinking.

Thinking ensures further, more profound penetration into the outer world and gives us an insight into relationships between objects, events and phenomena. This can be illustrated by using the same simple example of determining an object's thermal condition. Thinking permits us to separate mentally each of the two above-indicated dependences, abstract them, as it were, from each other. This is achieved by mediation—we simply disregard the state of the individual who seeks to establish the thermal condition of the object because its temperature can be measured *in a mediated way*, with the help of a thermometer and not directly, by touch. As a result of this abstraction, the sensuous image of an object emerges as a function of the object itself, i.e. is determined objectively. This example is illustrative of the manner in which abstract, mediated thinking performs its function, withdrawing as it were from some properties of an object (interaction between hand and object) merely to concentrate on its other properties (actual temperature, etc.).

The process of thinking based on sensations, perceptions and representations *oversteps the limits of sensuous knowledge*, i.e. the individual begins to cognise such phenomena of the outer world, their properties and relations which are not given him in perceptions *directly* and therefore are not directly observable. For instance, one of the most complex problems of contemporary physics is the development of a theory of elementary particles. These minute particles, however, cannot be observed even with the help of the most powerful modern microscope. In other words, they do not lend themselves to direct observation, they can only be contemplated mentally. Yet by mental, mediated thinking scientists have proved that such invisible elementary particles do exist in reality and possess certain properties. Again, these properties of unobservable particles are cognised in thought indirectly, through mediation.

Thinking begins where sensuous knowledge proves insufficient or even powerless. Thinking carries on mind's cognitive work started in sensations, perceptions and representations, and goes beyond their limits.

We can easily understand, for instance, that the speed of an interplanetary vehicle, moving to a distant star at 50,000 km/sec., is only one-sixth of that of a ray of light, though we are unable to directly perceive or even imagine the difference of the speed of objects moving at 300,000 km/sec. and 50,000 km/sec. In real cognitive activity of every individual, sensuous knowledge and thinking are interdependent and continuously pass into each other.

Thinking and Speech. Thinking is interrelated not only with sensuous knowledge, but also with *language, speech*. This is where we have one of the basic distinctions between the human and animal psyche. The elementary, primitive thinking of animals is always image-related and efficacious, it cannot overstep the bounds of image and rise to abstractions and contemplation. It is only concerned with immediately perceivable objects, those directly before the eyes of the animal. Such primitive thinking manipulates objects on the image-effectual level and never rises above it.

The possibility of abstracting one or another quality from the object of cognition became a reality only with the emergence of *speech* which enabled man to fix the idea or notion of such a quality in a special word. Thought materialises in word and becomes immediate reality both for other people and for ourselves. *Human thinking, whatever the form it may assume, is impossible without language*. Every thought evolves and develops in inseparable unity with speech. The more elaborate a thought, the clearer the words, both in oral and written speech, that express it. Conversely, the more precise the formulation of an idea, the clearer and more understandable the idea itself.

Special observations during psychological experiments show that some pupils and even adults find it difficult to solve a problem without thinking aloud. When they start verbalising their thoughts, repeating the main propositions (even if they are at first erroneous) one after another with ever increasing accuracy, they find their task less difficult. An individual explaining something to other people and formulating his ideas makes them clearer to himself. Such rendering of a thought into words calls for breaking it up into separate components and causes

the individual to focus his attention on its different parts, thereby helping him to get a better understanding of his own ideas. Thus the process of thinking turns into discourse, consecutive and logical *reasoning* which consists in a clear-cut and correct correlation of all main ideas arising in the process of thinking. The word, the formulation of a thought provides therefore important prerequisites for *discursive*, i.e. rational, logical and conscious thinking. Once formulated and fixed in words, the thought does not die down right after being born. It lives on in speech or even writing and, if need be, we may recur to it, weigh it more carefully, verify and correlate it with other thoughts in our mind. The formulation of thoughts in the speech process is crucial for their formation. An important role in this process also belongs to the so-called *inner speech*: solving a problem, the individual confers, as it were, only with himself, thinking not out loud, but silently.

In summary, what we may say is this. *Human thinking is inseparably linked with language, speech*. It necessarily exists in a material, verbal form.

Social Character of Thinking. The organic, indissoluble connection of thinking and language affords convincing testimony to *social, historical character of human thinking*. Cognition necessarily presupposes the continuity of all knowledge acquired by man in the course of his historical development. This historical continuity is only possible if knowledge is fixated, consolidated, preserved and passed on from one individual to another, from generation to generation. Such fixation of basic results of cognition is effected through the agency of language, in books, magazines, etc., and the social nature of human thinking comes in bold relief in all of these. Man's intellectual development presupposes the *assimilation* of knowledge amassed by humanity in the course of socio-historical development. The process of cognition of the world by an individual is contingent on and mediated by the historical development of scientific knowledge, the results of which are internalised by every individual through education and training, in communication with all mankind.

During the entire school period the child is confronted with a *ready-made*, historically established and known

system of knowledge, concepts, etc., evolved and elaborated by humanity in the course of its previous history. Yet what is known to humanity and is not new to it is necessarily new and not known to the child. Therefore the assimilation of the rich knowledge amassed by mankind calls for considerable *thinking* efforts and a good deal of creative work on the part of the child despite the fact that he is to internalise the already existing system of notions and his efforts are guided by adults. This fact does not rule out the need for independent thinking on the part of the child—moreover, it calls for a creative approach, otherwise the assimilation of knowledge will be a purely formal, superficial, mechanistic process. Ideation is a necessary prerequisite both for the assimilation of already available knowledge (e.g. by children) and for the acquisition of new knowledge (primarily by scientists) in the course of mankind's historical development.

On the operational plane, thinking emerges as a system of logical operations, each of which performs a definite function in the process of cognition and is interconnected, in an extremely complicated way, with other operations, such as analysis, synthesis and generalisation.

Analysis and Synthesis. *Analysis is the separation of an object into components, the abstraction of its aspects, elements, properties, links, relations, etc. from the whole.* For instance, seeking to understand the principle of operation of some mechanism or machine, we start with separating its components and breaking it up into parts. This is basically how we analyse every object in the process of cognition.

During analysis of some object, some of its properties which appear to be the most important, significant, essential and interesting, turn out to be the strongest irritants and therefore come to the foreground. Such irritants provoke an active process of excitation (primarily in the cerebral cortex) and inhibit, in accordance with the physiological law of induction, the differentiation of other properties of the same object, which are weak irritants. Hence, the physiological foundation of the psychic process of analysis is a definite relationship between the excitation and inhibition in the higher departments of the brain.

Synthesis is the reconstruction of a whole from its parts separated by analysis. The process of synthesis consists in the integration and correlation of those elements which have been separated from the object under cognition. For instance, by relating separate parts of a mechanism to one another, we establish links between them and come to know how they interact. This is how we carry out synthesis, i.e. establish links and relationships between different elements. The physiological foundation of synthesis is the closing of temporal nervous links in the cerebral cortex.

Analysis and synthesis are always interdependent. Their inseparable unity clearly manifests itself already in the cognitive process of correlation. At the initial stages of the cognition of the outer world, man familiarises himself with different objects mainly by comparison. Every comparison of two or several objects starts with relating them to one another, i.e. from synthesis. In the course of this operation man analyses the related phenomena, objects, events, etc., i.e. he finds out what they have in common and in what they differ. For instance, the child compares different representatives of the class of mammals and, with the teacher's assistance, gradually reveals their most common features. So comparison leads to generalisation.

Generalisation, which accompanies the process of comparison of different objects and results from their analysis, consists in the separation of their common features. These may be of two kinds: *similar* features and *essential* features. Thus, we may find something that is common to most diverse objects; for instance, using the criterion of common colour, we can include in one group, or one category such different objects as a cherry, a peony, blood, raw meat, a boiled lobster, etc. Yet this similarity (common feature) does not yet represent the really essential properties of the above-listed objects. In this particular case their similarity is based on very superficial, unimportant features. Generalisations which are made during such flimsy shallow analysis are of little value and constantly lead to errors. Indeed, a generalisation based on a superficial analysis of the external qualities of, say, a whale may delude us into classing whales with fishes and not mammals. Compar-

ing these animals as indicated above, we rate them on the criteria of similarity (external appearance, fish-like form of the body) rather than essentiality. Contrariwise, if we identify, through analysis, those common features which are essential, we are sure to class whales as mammals.

Consequently, *any essential property is at the same time common to a given group of similar objects, yet not the other way round: not every common (similar) property is essential* for a given group of objects. Common essential properties can only be identified in the course and as a result of in-depth analysis and synthesis.

The laws of analysis, synthesis and generalisation are the *main* specific laws of ideation which alone can account for all its external manifestations. Here is just one example. Teachers are not unfamiliar with a situation where a pupil who has successfully solved a given problem or proved a given theorem cannot effect a transfer, i.e. apply this solution to a similar problem with different conditions or a similar geometrical figure of a slightly different configuration. Thus a pupil who has just proved a theorem on the sum of the angles of a triangle represented in the drawing by an acute-angle triangle, often fails to sustain the proof if his drawing is turned 90° or if he is given a drawing with an obtuse-angle triangle. Such facts, frequently described and practically very important, call for a psychological explanation. It appears that one of the causes of transfer or non-transfer of knowledge from a given situation to another situation is the variation (alteration) of conditions of a problem. If we make an essential change in the conditions of problems whose solution is based on one and the same theorem, the subject transfers the solution from one problem to another. Conversely, without such variation no transfer is possible. As a result, one may get an impression that transfer depends directly on variation. This, however, would be an inadequate, superficial explanation of an outwardly observable fact (transfer), lacking psychological insight.

Indeed, the variation of conditions (position of the drawing, etc.) under which a task is presented to the pupil is not the pupil's but the teacher's action. Linking transfer to variation is correlating directly the external,

pedagogic influence (variation by the teacher of the problem conditions) only with the *result* of the pupils' thinking activity, i.e. with the external fact of transfer or non-transfer. This correlation does not lay bare the pupil's thinking *process*, the internal, specific laws of his activity leading to the known external result. This leaves us in the dark regarding the manner in which the conditions of his thinking are mediated by the external, pedagogic influence and, consequently, rules out the possibility of purpose-oriented teaching and formation of the pupil's thinking ability.

In reality, the variation of problem conditions has a stimulating effect on the thinking of the pupil and predisposes him to *analyse* the proposed problem, single out and *generalise* its most *essential* components. As he goes on separating and generalising essential conditions of different problems, he performs the transfer of the solution from one problem to another essentially similar to the first one. Thus, behind the external correlation *between variation and transfer* emerges the psychologically analysable, internal dependence *between analysis and generalisation*. The outwardly observable *result* (transfer) turns out to be a regular product of the pupil's thinking *process*. In order to transfer the solution from one problem to another, the pupil must discover the essential features common to both problems. It is the analysis of their similarity and the disclosure of the general principle underlying their solution that provide the internal, psychological basis for such transfer.

Motivation of Thinking. Analysis and synthesis, as well as thinking as a whole and, for that matter, any other activity, are always induced by some *needs* of an individual. If there are no needs, there is no activity which is elicited by them.

Studying the process of thinking like any other mental activity, psychology takes into account and specially investigates the *needs* and *motives* which induce a given individual to engage in cognitive activity, the concrete circumstances under which a need for analysis and synthesis arises, etc. (in contrast to psychology, formal logic abstracts itself not only from the interrelations of thinking and sensuous cognition, but also from the interdependence of thinking of an individual and his needs,

motives and emotions). Thinking is not a function of "pure" thought, the logical process as such; its subject is an individual, a *human being* with definite capabilities, feelings and needs. The inseparable connection between thinking and needs clearly reveals itself in the crucial fact that ideation is always the *ideation of a concrete individual* with all his diverse relationships with nature, society and other individuals.

The motives of thinking investigated in psychology fall into two kinds: *specific cognitive* motives and *non-specific* motives. In the first case thinking is stimulated by interests and motives which represent cognitive needs (intellectual curiosity, etc.). In the second case thinking starts under the influence of more or less external factors rather than purely cognitive interests. For instance, a pupil may start preparing his lessons and racking his brains over a problem not because of a desire to learn something new, but simply because he has to comply with the adults' demands, for fear of falling behind his friends, etc. Yet whatever the initial motivation of thinking, an individual once engaged in the thinking process falls under the influence of cognitive motives proper. It often happens that a pupil sits down to his lessons only under compulsion, yet subsequently he develops a purely cognitive interest in what he is doing, reading or solving.

In summary, an individual starts thinking under the influence of these or those needs and gradually develops ever more profound and strong motives for cognition.

III.10.2. Types of Thinking

Psychologists commonly distinguish the following types of thinking: sensory-pictorial, pictorial and abstract (theoretical).

Sensory-Pictorial Thinking. At the initial stage of human history people solved their problems on a purely practical basis; theoretical activity evolved from practice at a later stage. For instance, our remote ancestors first learned to measure plots of land practically by counting their steps, etc., and the knowledge that was gradually accumulated in the course of this practical activity pro-

vided a basis for the inception and development of geometry as a special theoretical discipline. Practical and theoretical activities are indissoluble, *the former being primary and the latter, secondary*. Theoretical thinking stands out from practical activity only at a relatively high stage of the latter's development.

Practical, and not purely theoretical activity is the starting point of both the historical development of mankind as a whole and the individual mental development of every child. The child's thinking develops within the framework of practical activity. *In infancy and early childhood (till 3 years inclusive) it is predominantly of the sensory-pictorial type*. The child learns about external objects by analysing and synthesising his perceptions while he practically, with his own hands, manipulates these objects, correlates them with one another, breaks and restores their unity. Inquisitive children often break their toys just because they want to find out "what they have inside".

Pictorial Thinking. In its simplest form *pictorial* thinking is mainly characteristic of *preschool age* (4-7 years). Though thinking is still connected with practical actions, this connection is not as close and direct as in the previous period. In investigating an object of interest, the child need not necessarily touch it with his hands. In many cases he does not need to manipulate the object systematically, yet he must always perceive it and have a clear image of it in his mind. Put another way, children under school age think only in terms of pictures or images and are incapable of mastering concepts in the strict sense of the word.

The lack of conceptual thinking in children under school age has been clearly demonstrated by Swiss psychologist Jean Piaget in the following experiments.

Children aged about 7 are shown two absolutely identical balls equal in volume and made of pastry. They carefully examine both balls and say that they are equal. After that one of the balls is flattened to a cake right before their eyes. The children see for themselves that not a single lump of pastry has been added to the flattened ball, simply its shape has been changed. Yet the testees believe that the quantity of pastry in the cake has increased.

The thing is that the *pictorial thinking* of children is still unmediated and is *fully controlled* by their *perception*, they are still unable to abstract themselves with the help of concepts from certain most conspicuous properties of the object they perceive. Thinking of the cake, the children see that it occupies a larger area on the table than the ball. Their thinking, essentially pictorial and dominated by perception, leads them to the conclusion that the cake contains more pastry than the ball.

Abstract Thinking. *Abstract thinking*, i.e. thinking in terms of abstract notions arises, at first in simple forms, in children of *school age* on the basis of practical and sensory pictorial experience. At this stage thinking manifests itself not only in practical actions and images (perceptions and representations), but, first and foremost, in the form of abstract concepts and reasoning.

The mastering of concepts in the process of assimilation by schoolchildren of fundamentals of various disciplines, such as mathematics, physics and history, is of tremendous importance for their intellectual development. The formation and assimilation of mathematical, geographic, physical, biological and many other concepts in the course of school studies have been the object of numerous psychological investigations (*P. Y. Galperin, V. V. Davydov, G. S. Kostyuk, N. A. Menchinskaya, R. G. Natadze, D. B. Elkonin* and others). The authors examined in great detail the specificity of the child's intellectual development, focusing on the characteristic features of concepts and showing in what sequence and under what conditions they are internalised by pupils. At the end of the school period children develop, in a greater or less degree, a *system* of concepts. They start manipulating not only separate notions, such as specific gravity, mammals, critical realism, but whole classes or systems of notions (e.g. a system of geometrical concepts).

As already noted, even the most abstract thinking extending far beyond the limits of sensuous knowledge never breaks completely with sensations, perceptions and representations. This inseparable connection between thinking activity and sensory-pictorial experience plays a particularly important role in the pupils' concept-forming process.

Visualisation and imagery may play different roles in the intellectual development of children. On the one hand, they facilitate this process. In the early period the child finds it easier to manipulate visual images, concrete sensuous material. For instance, the assimilation by the child of many historical notions, such as *boyar* (lord) or *smerd* (serf) is greatly facilitated if he can associate them with the corresponding pictures, drawings and illustrations.

On the other hand, *not every kind* of visualisation and *not under any condition* is conducive to the formation of abstract thinking in schoolchildren. An excessive quantity of vivid, pictorial details in visual aids and illustrations may distract the child's attention from the basic, essential characteristics of an object under examination and thereby hamper his thinking operations (analysis and generalisation).

Many pupils of the sixth form find it easier to solve "abstract" textual physical problems on "Pressure" than similar problems on the same subject with a greater number of concrete sensuous details where the essential relations between physical and other phenomena are kind of masked, overshadowed by visual images of objects (for instance, it is not easy to separate and abstract the principles of lever from a concrete sensuously tangible model of excavator). For this reason, when using visual aids, illustrations, pictures and diagrams, the teacher should be careful to preserve balance between their sensuously concrete and abstract components.

It would be wrong to think, however, that the development of abstract thinking in schoolchildren during assimilation of concepts puts an end to the development of their sensory-pictorial and pictorial types of thinking or even eliminates them altogether. On the contrary, these primary and initial forms of any thinking continue, as before, changing and improving alongside abstract thinking and under its reciprocal influence. All types and forms of thinking, both in children and adults, are subject to constant development, though to a different degree. For instance, technicians, engineers and designers attain a high level of sensory-pictorial thinking, writers—of pictorial (concrete-sensuous) thinking, etc.

III.10.3. Imagination, Principal Types and Processes

Imagination and Problem Situation. Like thinking, imagination or fantasy¹ is also one of the highest cognitive processes characteristic of specifically human mental activity. Without imagining the result of labour, a human being cannot set to work. *The anticipation of the expected result with the help of fantasy constitutes the basic distinction of human labour from instinctive behaviour of animals.* Any labour process necessarily includes imagination which is an essential aspect of artistic, design, research, literary, musical or any other creative activity. Strictly speaking, imagination is no less important in making a simple table by domestic craft methods than in composing an operatic air or writing a story: the joiner should have a mental picture of the table with such details as the table form, height, length and width, the method of leg attachment, and its suitability to serve the purpose of a dinner, laboratory or writing table. In other words, before starting work, the joiner should have in his head an image of the ready product.

Imagination is a necessary element of man's creative activity consisting in the construction of an image of the product of labour and providing for a possibility of developing a programme of behaviour in case of an indefinite problem situation. Imagination may also be instrumental in creating images which do not programme, but substitute for activity.

The first and foremost purpose of imagination as a mental process is *to produce the images not only of the final result of labour before the beginning of the labour process (e.g. a table as a ready-made article), but also its intermediate products (e.g. table components subject to assembly).* Consequently, imagination serves as a guide in man's activity, creating a mental model of a final or intermediate product of labour and thereby helping its objectification.

Imagination is closely linked with thinking. Like thinking, it helps foresee the future.

Now, what do thinking and imagination have in com-

¹ Imagination and fantasy are synonyms.

mon and what are their distinctions? Both thinking and imagination arise in problem situations, i.e. when it is necessary to find new solutions; like thinking, imagination is motivated by the person's needs. The real process of the satisfaction of needs may be preceded by an imaginary, illusory satisfaction, i.e. by vividly imagining a situation in which these needs can be really satisfied. However, imagination anticipates reality *in the form of concrete images, vivid representations*, whereas the anticipatory reflection of reality in the processes of thinking takes the form of notions enabling generalised and mediated cognition of the world.

Hence, the mind possesses *two systems capable of anticipating the results of man's activity* in a problem situation: *an organised system of images (representations) and an organised system of notions.* Whereas imagination is based on the possibility of image selection, thinking is based on the possibility of new combinations of notions. Such selection and combination often proceed simultaneously at two levels, since the systems of images and notions are interrelated: for instance, selection of a method of action effected by logical reasoning is organically connected with a vivid visualisation of the action.

While comparing thinking and imagination, it is necessary to note that problem situations may be characterised by a higher or lower degree of uncertainty. If the initial data of a task, for instance, a scientific problem, are known, its solution is predominantly subject to laws of thinking. Things will be different when a problem situation is distinguished by a high degree of uncertainty and the initial data are hardly amenable to accurate analysis. In this case the mechanisms of imagination come into play. For instance, a certain vagueness of initial data characteristic of the work of a writer largely accounts for the important role of fantasy in literary creation. Tracing the fate of his characters in imagination, he is confronted with a much higher degree of indeterminacy than a designer or an engineer, since the laws of human mind and behaviour are far more complex and far less studied than the laws of physics.

Depending on the circumstances characteristic of a problem situation, one and the same task can be solved both with the help of imagination and thinking. There is

good reason to believe that *imagination is the most active at an early stage of cognition when the indeterminacy of the situation is at its highest*. The more habitual, accurate and determinate the situation, the less room for fantasy. It is obvious that there is no need to use imagination to cognise phenomena whose laws are already known. On the other hand, if the data available to us are rather vague and a definite answer cannot be provided by thinking, imagination takes over.

The strength of imagination consists in that it enables an individual to make a decision and find a way in a problem situation even if he has no sufficient knowledge required for thinking. Imagination makes it possible to skip certain stages of thinking and construct an image of the final result. Yet the strength of imagination is simultaneously its weakness. Solutions prompted by imagination often lack accuracy and scientific rigour. Nevertheless, *the necessity to act under the conditions of information deficiency caused man to develop an instrument of imagination*. This instrument will never be idle since the surrounding world will always have unexplored areas.

Types of Imagination. The characteristic features of imagination are activeness and efficacy. However, imagination can be and is used not only as an instrument of the person's creative activity directed towards the transformation of the surrounding world. Under some circumstances imagination comes out as a *substitute for activity*, as its surrogate. In such cases an individual temporarily withdraws into a world of fantastic notions divorced from reality in order to escape from the tasks that seem to him insoluble, from the need to act, from hard conditions of life, the results of his own errors, etc. The character of Manilov depicted by Russian writer Nikolai Gogol in his picturesque novel *Dead Souls* represents a generalised image of individuals who seek to avoid activity and escape into a world of empty dreams. Here fantasy creates images which are not and often cannot be translated into reality. This form of imagination is known as *passive imagination*.

An individual may indulge in passive imagination intentionally: *fantastic images invoked voluntarily but divorced from the will that could translate them into*

reality are called reveries. Day-dreaming of something joyful, pleasant, attractive is peculiar to all people. Reveries clearly reveal the connection of the products of fantasy with needs. However, prevalence of reveries in the processes of imagination testifies to the individual's passiveness and is indicative of certain defects in personality development. If an individual is passive, if he does not strive for a better future and his present life is difficult and cheerless, he often indulges in day-dreaming and withdraws into an illusory world of fancy where all his needs are fully satisfied, where he always has luck and occupies a position he can never hope to attain in real life.

Passive imagination may also arise unintentionally, mainly in a state of blurred consciousness and partly inhibited second signalling system, during a period of temporary inaction, in somnolence and sleep (dreaming), in affective and pathological states (hallucinations), etc.

Whereas *passive imagination* may be classified into *intentional and unintentional*, *active imagination* can be *creative and reproductive*.

Reproductive imagination is based on the creation of various images corresponding to descriptions. Thus the reading of textbooks and fiction, the study of geographic maps and historical descriptions necessarily involve the imaginative reproduction of the material contained in these sources.

While reading books, many schoolchildren have a habit of skipping or glancing over the description of nature, urban landscapes and portraits of characters. As a result, they give no food to their reproductive imagination and drastically restrain the artistic perception and emotional development of their personality, preventing the fantasy from unfolding vivid and colourful pictures. The study of geographic maps is a good method of exercising reproductive imagination. The habit of travelling over the map and imagining different places helps the child to develop observancy. Spatial imagination required for study of solid geometry develops during careful examination of drawings and life-size bodies at different angles.

In contrast with reproductive imagination, *creative imagination is concerned with the independent creation of new images to be objectified in original and valuable*

products of activity. Arising in labour, creative imagination is an inseparable component of technical, artistic and any other creative activity assuming the form of active and purpose-oriented manipulation of visual representations in search of ways and means for the satisfaction of one's needs.

The value of human personality largely depends on what type of imagination prevails in its structure. The predominance in a youth of creative imagination realised in concrete activity over passive, empty day-dreaming attests to a high level of his personality development. **Analytico-synthetic Character of Imagination Processes.** Having established the function performed by imagination in man's activity, we now turn to processes which lead to constructing images in the mind and to the structure of these processes.

How does the mind create fancy images that provide guidance for man in his practical and creative activity, and what is their structure? The processes of imagination have an *analytico-synthetic character*, very much like the processes of perception, memory and thinking. Already in perception and memory analysis makes it possible to single out and preserve certain common, essential features of an object and to dismiss inessential ones. This analysis terminates in synthesis, i.e. in the creation of a kind of standard whereby the mind identifies those objects which, however much they may change, do not go beyond the limits of a definite measure of similarity. Analysis and synthesis in imagination serve a different purpose and, in the process of active manipulation of images, reveal different trends.

The main trend of memory is to restore images, bringing them as close as possible to the standard, i.e. in fact to produce the exact replica of a behavioural situation that occurred in the past or an object that was perceived and comprehended. By contrast, *the main trend of imagination is to transform representations* (images) making it possible *to develop a model of a new situation that has not occurred before.* Both trends are relative: we recognise our old acquaintance many years after we met him last, though his features, clothes, even his voice have changed considerably, and in exactly the same manner we can trace known features in any new image created by our fantasy.

Describing imagination on the side of its mechanisms, we ought to underscore that it consists essentially in the *process of transformation of representations, in the creation of new images on the basis of those already available to the mind.* Imagination, fantasy can be described as a reflection of reality in novel, strange, unexpected combinations and associations. Indeed, even if we imagine something quite extraordinary, a careful examination will show that all elements making up our fancy image are taken from real life, come from our past experience and are results of intentional or unintentional analysis of a multitude of facts.

The synthesis of representations in the processes of imagination assumes different forms (see Fig. 11).



Fig. 11.

The most elementary form of image synthesis is *agglutination* or pasting together of different qualities, properties or parts which are separated in reality. The agglutination principle underlies the construction of many characters of fairy tales (mermaids, a hut on hen's feet, Pegasus, centaurs, etc.). It is also used in engineering (for instance, the amphibious tank combining the qualities of a tank and a boat, the accordion which is a hybrid from a piano and a bayan).

Close to agglutination as a form of transformation of representations stands *exaggeration which is characterised not only* by enlargement or diminution of an object, e.g. a giant as big as a mountain and a boy as small as a thumb (Tom Thumb), but also by a change in the number of components of an object or by their displacement (multi-arm goddesses in the Hindu mythology, dragons with seven heads, etc.).

A fancy image can also be created by *accentuation* or putting special emphasis on certain features. This method is used for creation of friendly jests and malicious caricatures. In another method known as *schematisation*, the representations which make up a fancy image merge into one another, their distinctions are smoothed out and similarities come to the foreground. A good example of schematisation is the ornamental pattern whose elements are borrowed by the artist from the vegetable kingdom. Finally, the synthesis of representations in imagination may be accomplished through *typification* widely used in fiction, sculpture and painting. This method consists in distinguishing the essential features of similar objects or phenomena and embodying them in a concrete image.

The process of creation presupposes the emergence of a multitude of associations (their actualisation, however, is different in creation and in memory processes). The general trend in the formation of associations is determined by the needs and motives of creation. Sophia Tolstaya's diary contains an interesting record of Lev Tolstoy's description of the psychological aspects of his work at the novel *Anna Karenina* throwing light on the specificity of her husband's associative thinking. His account runs thus: "I am sitting downstairs in my study and examining a white silk stitch on the elbow of my gown. The stitch is very beautiful and I begin to

wonder how it occurs to people to devise all those patterns, trimmings, embroideries. I know that there exists a whole world of female occupations, fashions and considerations so important to women, and understand that all that must be a lot of fun and that women may like it and take all those things very seriously. Just then my thoughts turn to the novel and Anna.... All of a sudden that stitch gave me a whole chapter. Indeed, Anna is deprived of the joy of sharing in that part of female life as she is lonely, all women have turned away from her and she has no one to talk to about her everyday purely female cares and needs."

The specificity of creative imagination consists in that it deviates from the habitual course of associations, subordinating them to those emotions, thoughts and wishes which dominate the creator's mind. Though the mechanism of associations remains the same (associations by similarity, contiguity or contrast), the selection of representations is determined by these prevailing trends. What associations, for instance, can be evoked by the sign "Watchmaker" in the mind of an ordinary man? His imagination will probably run thus: "Watchmaker.... My watch is slow and has long been in need of cleaning.... I'll have to drop in some time." A poet whose glance accidentally fell on the same sign was inspired to write the following lines:

*Repair, please, the year that's gone—
It has been lived amiss.*

His imagination sparked off by an outward impression (the sign) evolved a chain of associations—"Watchmaker—repair of watches, of "time"—of minutes, weeks, months"—which, passing through the filter of his emotional state, materialised in the corresponding poetic image. This peculiar train of associations deviating from the traditional course of habitual links is an essential aspect of creative fantasy.

III.10.4. Fantasy in Children's Play and Adults' Creative Activity

Fantasy and Play. Preschool childhood and the first school years dominated by play as the leading type of

the child's activity are characterised by the rapid development of imagination processes.

The key element of play or game is an imaginary situation in which the child, not restrained by rules of logic and requirements of verisimilitude, freely manipulates the store of notions and representations accumulated by him. The image of fantasy comes out as the programme of play—imagining himself a spaceman, the child constructs accordingly his own behaviour and the behaviour of his agemates: he takes leave of his “relations and friends”, reports to the “chief designer”, simulates both the space vehicle at start and himself in the vehicle, etc. Role games giving rich food for thought enable the child to deepen and consolidate important personality qualities (courage, determination, self-discipline, resourcefulness). Comparing his own and other children's behaviour in an imaginary situation with the behaviour of a real reference personality, the child learns to make necessary assessments and comparisons.

Imagination plays an extremely important role in the accomplishment and organisation of activity and is itself formed in different kinds of activity and dies down when the child stops acting. In the preschool period the child's imagination, needing at first some external support (mainly toys), gradually turns into an independent internal activity, enabling the child to engage in elementary verbal (composition of tales, stories and verse) and artistic (drawing pictures) creative work. The child's imagination develops side by side with the assimilation of speech and, consequently, in the process of communication with adults. Speech enables children to imagine objects they have never seen before. Significantly, retarded verbal development has an adverse effect on imagination, making it less vivid and restricted in scope.

Fantasy is an important prerequisite for normal development of the child's personality; it is essential for free exercise of his creative powers. Soviet writer Kornei Chukovsky in his famous book *From Two to Five*, notable for very subtle and profound psychological observations and conclusions, tells the story of a mother who was opposed to children's day-dreaming and whose son, as if in revenge for being barred from fairy tales, began to pester her with wild fancies from morning to night:

“Now he invents that he was visited in his room by a red elephant, now he insists that he has a she-bear friend called Cora and tells everybody not to sit in the chair next to him because—‘Don't you see it—it is occupied by Cora’, or would suddenly cry: ‘Don't go that way, mama, there are wolves there!’”¹ When children's imagination is underdeveloped for some reason or other, mainly owing to some serious drawback in educational work, they start doubting the existence of quite real, though unusual things. Chukovsky recalls this characteristic episode: when the talk at one of the lessons got around to sharks, a little boy shouted: “Sharks do not exist!”²

In preschool age *fantasy comes out as one of the most important prerequisites for the assimilation of social experience*. Correct, adequate notions of the surroundings take root in the child's conscious mind only through the agency of imagination. Very indicative in this respect are the so-called transpositions or rearrangement of elements making up a familiar image. Thus a four-year girl gaily sings: “I'll give you a piece of milk and a jar of pie.” Such transpositions enjoyed by practically all children are a product of their imagination like all other fantastic images, resulting from the need for an emotional comic effect. The important thing is that such deliberate distortions of reality are implicitly referred to correct notions of the world which, by refuting the absurdities and in point of fact with their assistance, become firmly consolidated in the child's consciousness. Incorrect fantastic coordination of things (“Little Red Riding Hood ate the wolf”) helps realise regular relationships between objects and thus becomes a reliable aid in the child's cognitive activity.

There is ample psychological evidence to prove that the fantastic image serves for the child as an instrument of cognition and assimilation of social experience. Imagination enables children to cognise the outer world in play, while the adults draw on it to transform it in their creative activity.

¹ K. I. Chukovsky, *From Two to Five*, Detskaya Literatura Publishers, Moscow, 1968, p. 277.

² *Ibidem*, p. 286.

Fantasy in Artistic and Scientific Creation. *Fantasy comes out as a necessary element of creative activity in art and literature.* The most important characteristic of imagination participating in the creative activity of an artist or writer is its high emotionality. An image, a situation, an unexpected turn of the plot arising in the writer's head pass through a kind of "concentrator", i.e. the emotional sphere of creative personality. Experiencing certain feelings and embodying them in artistic images, the writer, artist and composer, in turn, make the readers, spectators and listeners experience sorrow or joy. The stormy passions of great Beethoven expressed in a musical form in his symphonies and sonatas have been evoking reciprocal feelings in many generations of musicians and listeners.

Some authors take imaginary situations very close to heart and painfully respond to their heroes' misfortunes.

This is attested to, for instance, by the following passage from a letter of Gustave Flaubert to one of his friends: "Since two o'clock yesterday afternoon (except for about twenty-five minutes for dinner), I have been writing 'Bovary'. I'm in full fornication, in the very midst of it: my lovers are sweating and gasping. This has been one of the rare days in my life passed completely in illusion, from beginning to end."¹ To be sure, such ingenuous feelings accompanying the writer's work are something out of the ordinary, yet in artistic creation fantasy and deep human emotions are inseparable.

The history of scientific discoveries abounds in examples of imagination playing a major role in research activity. Suffice it to mention the once popular concept of thermogen, a hypothetic heat fluid providing a fantastic model of thermal phenomena in physical theories of the late 18th century. This model proved unworkable and naive, as the notion of fluidity was far too narrow to express the essence of heat phenomena. However, it was instrumental in describing and interpreting some physical facts and obtaining new results in thermodynamics. The model of "thermal substance" served as a stepping stone to the discovery of the second principle of

¹ *The Letters of Gustave Flaubert, 1830-1857*, The Belknap Press of Harvard University Press, Cambridge, Massachusetts, 1981, p. 203.

thermodynamics, playing a crucial role in modern physical concepts. No less illustrative is the history of another fantastic construct—the idea of cosmic ether, a peculiar medium allegedly filling the Universe. This model, subsequently rejected by the theory of relativity, enabled the scientists to create the wave theory of light.

Imagination plays an important role *at early stages of the exploration of a scientific problem* and not infrequently paves the way for remarkable discoveries. However, after the scientist guided by it has put his finger on some important regularities, after such regularities have been studied under experimental conditions and crystallised in a law, and after the latter has been confirmed by practice and linked to the already existing concepts, the process of cognition rises to a new level—the level of theory and rigorous scientific thinking. Any attempt to indulge in fancy dreams at this higher level is fruitless and will inevitably lead to errors.

The *psychology of scientific creation* is one of the most promising fields of modern psychology. Numerous investigations carried out in this field focus on the role of imagination in the processes of scientific and technological creativity. This puts in the limelight the history of scientific discoveries. If we look into the history of one or another discipline that has attained a high level of development, i.e. the level of elaborate theoretical concepts, extensive mathematical analysis, etc., we shall see that the early stages of this discipline were dominated by conjectures and fantastic assumptions which filled the gaps in scientific knowledge. With the advance of science imagination gradually recedes to the background, giving way to positive knowledge. Stability, however, does not last long. Owing to further accumulation of scientific data and improvement of research methods, even the most "reliable" theories sooner or later find themselves confronted by facts which run counter to the generally recognised schemes and cannot be accounted for; the need for imagination, the most daring at that, arises again. Fantasy provides a possibility for a revolution in science, it paves the way for research and is always in the forefront of scientific progress.

Part Four

EMOTIONAL-VOLITIONAL SPHERE OF PERSONALITY

Chapter 11

FEELINGS

IV.11.1. Feelings and Their Physiological Base

General Concept. Man not only cognises reality in the processes of perception, memory, imagination and thinking, but also develops certain *attitudes* and experiences certain *feelings* towards different facts of life. Such internal personal attitudes derive from activity and communication in which they arise, change, consolidate or die down. Under the category of feelings we may include both a repugnance towards a liar who has deceived someone from vile motives and a fleeting pleasure that one may experience at the sight of a ray of sun bursting through clouds after a long rain.

By feelings are implied man's inner attitudes experienced in different forms towards events in his life, the objects of his cognition and his activity.

A feeling experienced by an individual is a peculiar mental state in which the perception and understanding of something, the knowledge about something comes out *in unity* with the individual's personal attitude to what he perceives, comprehends, knows or is ignorant of. In all such cases an individual experiences one or another feeling as a peculiar *emotional state*. At the same time the experiencing of a feeling is a changeful *mental process* with its own dynamic qualities. For instance, experiencing the loss of a dear person involves an active reassessment of one's own place in life which has changed after the irreparable loss, a reappraisal of values, the summoning up of one's courage to overcome

a critical situation, etc. This stormy emotional process results in the establishment of a certain balance between the positive and negative assessments of the situation brought about by the loss, and of one's own self in this situation. Emotional experience is thus connected with an objective necessity to endure and cope with a situation that has become critical. Such experience comes out as a peculiar emotional activity of high intensity and, not infrequently, high productivity instrumental in the restructuring of an individual's inner world and attainment of the necessary balance.

Different *forms* assumed by feelings—*emotions, affects, moods, stresses, passions* and, finally, feelings in the *narrow* sense of the word constitute man's *emotional sphere* as one of the regulators of his behaviour, a living source of knowledge and an expression of complex and highly diverse relations among people.

Man's Feelings and Needs. Feelings help distinguish objects that meet the needs of an individual and stimulate the activity directed towards their satisfaction. The feeling of joy accompanying a scientific discovery brisks up the work of the researcher and sustains the intensity of the process of satisfaction of the cognitive need. Interest as a form of the need's manifestation is always characterised by a high degree of emotionality.

On the subjective side, feelings are always indicative of *the manner in which an individual satisfies his needs*. Positive emotional states (delight, pleasure, etc.) arising in the process of communication and activity attest to normal satisfaction of the individual's needs. By contrast, unsatisfied needs give rise to negative emotions (shame, repentance, anxiety, etc.).

Psychologists believe that emotional states are determined by the quality and intensity of the individual's actual need and by his assessment of the possibility of its satisfaction. This view of the nature and origin of emotions came to be known as *the information theory of emotions*. Whether an individual is aware of it or not, he compares the information about what is required to satisfy his need with what is available to him at the moment the need arises. If the subjective possibility of the satisfaction of the need is high, the individual experiences positive feelings. Negative emotions result

from the subject's more or less clear awareness of the impossibility (real or imaginary) to satisfy his need or of a decrease of his chances to satisfy it as compared with his earlier expectations. The information theory of emotions undoubtedly has its merits, though it can hardly account for all phenomena of the extremely diverse and rich emotional sphere of the personality. For one thing, far from all emotions can be accommodated in the proposed unidimensional scheme. For instance, the emotion of surprise cannot be rated with either positive or negative emotional states.

The principal characteristic of emotional states is their *regulatory function*. Man's experiences play the role of *signals* informing him of the ongoing process of the satisfaction of his needs, of the obstacles he encounters, the questions he has to clear up or pay more attention to, the things that have to be changed. Thus a teacher, who was ruffled by an unpleasant talk with the principal and vented his anger on a remiss pupil, may experience, on calming down, the feelings of distress, shame and remorse for his lack of self-control. These emotions tend to induce the teacher to redress the wrong, find a way to show the boy that he is sorry for his sharp words and, in general, to restructure his relations with the pupil on the basis of an objective assessment of the conflict situation.

Emotions signal a favourable or unfavourable turn of events, the degree of determinacy of the subject's position in the system of his object-oriented and interpersonal relations, thereby providing guidelines for his behaviour in the conditions of communication and activity.

Feelings represent one of the specific forms of the reflection of reality. In contrast with cognitive processes which reflect objects and phenomena of reality, *feelings reflect the relations between the subject with his specific needs and the objects or phenomena of reality which he cognises or changes.*

Here is a simple example. If a teacher of history hears of a drastic reduction of class hours assigned to his discipline in the schools of some foreign country, this information may evoke his interest and even cause him to ponder over the news. By contrast, if the same teacher is informed of even a small reduction of class hours

allotted for a concrete historical theme in his own school in accordance with some new order, the news will certainly elicit a strong emotional reaction on his part. His response will result from a change in the relation between his needs (the wish to expound historical facts in a simple form and in the fullest possible manner) and their object (the material according to the programme).

Physiological Base of Feelings. Like all mental processes, emotional states (feelings) are a product of the brain's activity. Emotions are caused by changes occurring in the surroundings. These changes heighten or lower the organism's vital activity, replace old needs by new ones and bring about changes inside the organism. The physiological processes characteristic of emotions (feelings) involve complex unconditioned and conditioned reflexes. As is known, conditioned reflex circuits close and are consolidated in the cerebral cortex, whereas complex unconditioned reflexes are effected via subcortical centres, the superior colliculi (vision centres) located near the rear portion of the midbrain, and other centres transferring nervous excitation from the higher departments of the brain to the vegetative nervous system. The experience of a feeling is a result of joint activity of the cortex and subcortical centres.

The more important for an individual the changes in his organism and the environment, the more profound his feelings. The resulting serious restructuring of the system of temporary links initiate processes of excitation which, spreading over the cortex, involve subcortical centres. The brain departments located below the cortex include various centres of the organism's physiological activity: breathing, cardiovascular, digestive, secretory, and others. For this reason the excitation of subcortical centres stimulates the intensive activity of a number of internal organs. As a result, emotions are accompanied by changes in the breathing and pulse rates (an individual may pant and choke with excitation, his heart may sink or start pounding), in the blood circulation in different parts of the organism (an individual may turn red with shame or pale with horror), in the functioning of endocrine glands (tears from grief, parched throat as a result of excitement, cold sweat from fright), etc. All these processes in internal organs can be easily registered

and observed by the individual himself and therefore have long been mistaken for the cause of emotions as such. We still use such expressions as "a heart of stone", "to be sick at heart", "to gain somebody's heart", and others. The naiveté of such views in the light of modern physiology and psychology is quite obvious. What was regarded as a cause is actually nothing else but the effect of the processes taking place in man's brain.

Under normal conditions the cerebral cortex exercises an inhibiting influence on subcortical centres, thereby restraining the external manifestation of emotions. In case of an overexcitation of the cortex as a result of the action of very strong stimulants, in a state of exhaustion or intoxication the excitation spreads over subcortical centres (due to the irradiation effect) and the individual loses his normal self-control. On the other hand, the subcortical centres and the diencephalon may be involved in a large-scale process of inhibition (under the effect of negative induction) which manifests itself in depression, weak or constrained muscular movements, low pulse and breathing rates, etc. Hence, emotions may both intensify and depress man's vital activity.

The findings of recent physiological experiments on animals with electrodes implanted in definite parts of their hypothalamus have shown that certain highly specialised brain structures play an important role in the arousal of emotional states.

The stimulation of some areas gave rise to obviously pleasant sensations which the testees wanted to experience again. Such areas were called "*centres of pleasure*". It was noticed that the stimulation by electric current of other brain structures caused the animal to experience negative emotions and it strove in every way to avoid them; these areas were therefore called "*centres of suffering*". It has been established that different areas responsible for negative emotions and located in different parts of the brain are connected with one another and form a *single* system. Therefore negative emotions are experienced in a comparatively uniform manner signalling a generally unsatisfactory condition of the organism. By contrast, the "*centres of pleasure*" are characterised by a *lower* level of integration which accounts for a greater diversity, greater differentiation of positive emotions.

To be sure, it would not be correct to draw a parallel between the specific functions of the human brain and the physiology of emotional states in animals, yet the above-mentioned facts obviously give good theoretical grounds for a hypothesis that human emotions must necessarily have physiological prerequisites.

Data essential for understanding the nature of emotions were also obtained in studies of the *functional asymmetry of the brain*. It has been revealed, in particular, that the *left* hemisphere is predominantly responsible for the arousal and sustention of positive emotions, whereas the *right* hemisphere is mainly concerned with negative emotions.

All investigations of the physiological base of emotions clearly point to their bipolar dimensions: pleasure—displeasure, enjoyment—suffering, etc. This polarity of emotional states is referable to the specialisation of brain structures and reflects the regularities of physiological processes.

IV.11.2. Forms of Feelings

A feeling is experienced as an unpleasant, pleasant or mixed accompaniment of any mental process. It enters the individual's conscious mind not in its own guise, but as a property of objects or actions (wherefore we say "a pleasant man", "an unpleasant smack", "a fearful bull", "a funny expression", "delicate foliage", "a merry outing", etc). Not infrequently this sensuous accompaniment is nothing else than an echo of past emotional experiences. Sometimes it is indicative of the degree of the individual's satisfaction with an object, of the general tenor (successful or unsuccessful) of his activity. For instance, the solution of one and the same geometrical problem may be accompanied by different feelings depending on the individual's performance.

Specific feelings arising from man's ability or inability to satisfy his needs take different forms: *emotions*, *affects*, *moods*, *stress states* and *feelings proper* (in the narrow sense of the word).

Emotions. The terms "emotion" and "feeling" are often used as synonyms. In a more narrow sense, emotion may be defined as a direct time-related experience of some

more permanent feeling, as an aroused mental state. It implies, for instance, not the feeling of love for music as an individual's permanent quality, but a state of enjoyment and admiration which the individual experiences at a concert when listening to good music well performed. The same feeling can be experienced in the form of a negative emotion of indignation when he hears good music in bad rendition. Let us take another example. Fear as a feeling, i.e. as a definite peculiar attitude to definite objects, their combinations or vital situations may be experienced in different emotional processes: sometimes an individual flees from the fearful, sometimes he freezes and stands paralysed with terror, and sometimes he may rush headlong into danger out of desperation.

In some cases emotions are characterised by vigour, they stir an individual to activity and bold statements and add to his strength; such emotions are called *sthenic*. An overjoyed man is ready to move heaven and earth together. Taking compassion on a friend, he seeks ways to help him. A sthenic emotion drives an individual to action, he cannot sit idle. In other cases emotions (called *asthenic*) enfeeble a man, plunging him into apathy, despondency or a state of resignation. Thus fear can cause his legs give way under him. Sometimes, experiencing a strong feeling, an individual withdraws into himself. In such cases compassion, good as it may be, becomes a fruitless emotional experience, and shame turns into secret agonising remorse.

Affects. By affects are implied intensive and relatively short emotional processes. They are characterised by considerable *changes of consciousness, impaired control* over one's actions, loss of self-control and alteration of the organism's entire vital activity. Affects are short-lived as they cause a sudden release of a great amount of energy, a burst of emotion, and are very much like an explosion or a squall. Normal emotion can be likened to rough sea, and affect, to a gale.

In its development affect passes through several consecutive stages. Seized with a fit of rage, terror, confusion, wild delight or despair, an individual reflects the world and expresses his emotions differently at different moments; his self-control and regulation of external movements undergo a series of changes.

At the beginning of an affective state all mental faculties of the individual concentrate on the object of his emotion and he forgets about everything else, even things of practical importance for him. His expressive movements become more and more uncontrollable. The mounting affect is typically identified by tears and sobs, wild laughter and exclamations, characteristic gestures and facial expressions, quickened or irregular breathing. Due to excessive strain his face becomes distorted and gestures involuntary. Inductive inhibition spreads over the cortex which disrupts the thinking processes; excitation in subcortical centres grows. The individual experiences a strong temptation to give way to the emotion that has seized him: fear, rage, despair, etc. However, at this stage every normal individual is still capable of retaining his self-control, that is, stemming the onset of the emotional storm. Common experience has long since devised a good remedy: in order to restrain yourself, try to count at least to ten.

If the affect finally gets the upper hand, the individual loses self-control and commits unaccountable reckless actions which he will later recall with shame or remember but vaguely (if at all). Inhibition spreads over the cortex and inactivates the existing systems of temporal links representing the individual's experience, his cultural and ethical principles. The affective fit is followed by a sense of utter exhaustion, collapse, despondency, indifference to everything, stupor, and often sleepiness.

It should be noted that in certain cases any feeling can be experienced in the affective form. For instance, cases are on record of affective enthusiasm in stadiums or concert halls during performance of singing and instrumental ensembles. Affective states in such situations sometimes result in excesses with dramatic consequences (fits of hysterics, fist fights, etc.). Well known in psychology and even better described in works of fiction are affective states of "mad" love. Even scientific discoveries that come as a reward after many years of arduous work are sometimes accompanied by a violent outburst of triumph and enthusiasm. So, the nature of affect and its impact depend on the feeling that is experienced by the individual and on the extent to which he controls his behaviour.

Mood. By moods is implied *the general emotional state providing a background for the individual's behaviour over a considerable period of time.* Moods can be joyful or sad, cheerful or listless, excited or depressed, serious or frivolous, irritable or benevolent, etc. An individual's reactions to a friendly joke or remark depend to a considerable degree on whether he is in a good or bad mood.

Moods are usually unaccountable and elusive. The individual may not even notice them. Sometimes, however, a mood, e.g. a state of elation, cheerfulness or, on the contrary, anxiety, acquires a considerable degree of intensity. In such cases it affects the individual's mental activity (his train of thoughts, the quickness of his mind), his movements and actions, and even the productivity of the work he is performing.

Moods may have different causes, both immediate and remote. The main source of the individual's moods is the degree of his satisfaction with the entire course of his life, particularly with his work, family life, school studies, the manner in which various contradictions in his life are settled, etc. A durable state of anxiety or depression is a sure sign that there is something wrong in his life.

Moods largely depend on the individual's health, particularly on the condition of his nervous system and endocrine glands which control metabolism.

A disease may also have an adverse effect on the individual's general mood. Physical exercises and sports are known to be a very effective remedy for low spirits, yet the best antidote is the individual's confidence in the usefulness of the work he is doing, his satisfaction with it, as well as the moral support of the collective or the person dear to him.

The individual experiencing a certain mood is not always aware of its source. However, moods have their origins which, given necessary skill, may always be traced down. Thus an individual's low spirits may be referable to his failure to keep a promise, to write a promised letter or finish a job. All these omissions hang over and vex the individual, though he would often insist that his low spirits have no reasonable ground. In such cases he should try to establish the true cause of the melancholy and, if pos-

sible, eliminate it (keep the word, write the letter, finish the job, etc.).

Stress. A *stress state or emotional stress* denotes a special form of emotion which is close to affect by its psychological characteristics but approximates to mood by its duration. Emotional stress appears in situations involving danger, offence, shame, strain, etc., but seldom reaches the intensity of affect. It is generally notable for disorganised behaviour and speech and manifests itself either in disorderly activity or, under conditions calling for resolute actions, in sluggishness and flaccidity. However, when stress is moderate, it may stir the individual to activity and invigorate him. Danger often whips up man's powers making him act bravely and resolutely. The individual's behaviour under stress largely depends on the type of his nervous system, the strength or weakness of his nervous processes. Examination is usually a good indicator of the individual's resistance to stress factors. Some examinees lose their presence of mind, their memory goes blank and they fail to concentrate on questions, whereas others brace themselves up and show better performance than under ordinary circumstances.

Main Emotional States and Their External Manifestations. The experience of feelings in the form of emotions, affects, moods and stresses is generally accompanied by more or less overt signs. These include facial expressive movements (mimicry), gestures, postures, intonation, dilation or contraction of pupils. Expressive movements may be both unconscious and conscious. In the latter case they may be used intentionally in the process of communication as nonverbal communicative means. Thus an individual may demonstrate his indignation with clenched fists, narrowed lids, threatening intonation, etc.

We may distinguish the following basic emotional states, each having its own gamut of psychological characteristics and external manifestations:

Interest (as emotion)—positive emotional state conducive to studies, acquisition of knowledge and development of habits and skills.

Joy—positive emotional state arising from the possibility of full satisfaction of an actual need which hitherto was doubtful or uncertain.

Surprise—emotional reaction to a sudden emergence

of new circumstances, without definite positive or negative effect. Surprise inhibits all previous emotions and, focusing the individual's attention on the object which has elicited it, may pass into interest.

Suffering—negative emotional state that results from the reception by the subject of authentic (or seemingly authentic) information frustrating his hopes to satisfy his vital needs. Suffering usually takes the form of an emotional stress producing an *asthenic* (weakening) effect.

Rage—negative emotional state, usually in the form of affect, caused by a sudden emergence of a serious obstacle to the satisfaction of an extremely important need. In contrast with suffering, rage has a *sthenic* effect, causing an upsurge, however short-lived, of vital powers.

Aversion—negative emotional state evoked by objects, people, circumstances, etc., the contact with which (physical interaction, communication, etc.) runs counter to the subject's ideological, ethical and aesthetic principles and sets. In interpersonal relations aversion combined with anger may motivate aggressive behaviour, in which aggression is stimulated by anger, and aversion by the wish to "get rid of somebody or something".

Contempt—negative emotional state arising in interpersonal relations as a result of a discrepancy between the life principles, views and behaviour of the individual and the life principles, views and behaviour of the object of his feeling. The latter appear to the individual as base, incompatible with generally recognised ethical norms and aesthetic criteria. Contempt may result in the depersonalisation of the individual or group for which it is held.

Fear—negative emotional state evoked in a subject by information about possible menace to his well-being, real or imaginary danger that may threaten him. In contrast with suffering caused by the direct blocking of the individual's vital needs, fear results from the anticipation of hypothetical damage, inducing the individual to act upon an uncertain (or exaggerated) forecast. The emotional state characteristic of fear is well described by the popular saying "Fear takes molehills for moun-

tains." Fear may exert both a sthenic and asthenic effect ("weak in the knees from fear") and take the form of a stress, persistent depression and anxiety, or affect (horror as the extreme variant of fear).

Shame—negative state arising from the individual's awareness of a discrepancy between his intentions, actions and appearance, on the one hand, and the norms and moral requirements of the surrounding people shared by himself, on the other hand.

The above-indicated list of principal emotional states is not based on any classification table (the total number of emotions listed in relevant reference books is enormous). Each emotion may be represented as a set of states ranked in the increasing order of intensity: quiet content, joy, delight, elation, rapture, etc., or diffidence, embarrassment, shame, guilt, etc., or displeasure, distress, suffering, grief. It would be wrong to think, however, that the smaller number of principal positive emotional states (three out of nine) attests to the predominance of negative emotions in human life. The greater diversity of negative emotions evidently enables man to improve his adaptation to unfavourable environmental conditions signalled by the subtly differentiated negative emotional reactions (states).

The experience of a feeling need not necessarily be always unidimensional. An emotional state may include two opposite feelings in a peculiar combination like, for instance, love and hatred in jealousy (*ambivalence of feelings*).

Great English natural scientist *Charles Darwin* advanced a hypothesis that expressive movements accompanying man's feelings originated from instinctive movements of his animal ancestors. The fists clenched in a rage and bared teeth in ancient anthropoid apes were nothing else than defensive unconditioned reflexes keeping the enemy at a respectful distance.

Man's feelings, traceable as they are to complex unconditioned reactions, are nevertheless social by nature. The basic distinction between human and animal feelings consists, firstly, in that human feelings are immeasurably more complex even in those cases when they are similar in man and animals. It becomes obvious when we compare rage, fear, curiosity, joy and depres-

sion in humans and animals, both in terms of their origin and manifestations.

Secondly, man can experience many feelings that are not known to animals. The great diversity of relations arising among people in the process of labour, in political and cultural activities and in family life gave rise to a great number of purely human feelings, such as contempt, pride, envy, triumph, boredom, respect, the sense of duty, etc. Each of these feelings has its own specific ways of expression (through intonation, in mimicry, gestures, laughter, tears, etc.).

Thirdly, man can master his feelings, restraining their inappropriate manifestations. Often people experiencing strong and profound emotions remain outwardly calm and pretend indifference so as not to give themselves away. An individual may even try to feign opposite feelings in order to suppress or conceal the real ones: he smiles in grief or pain, and pulls a straight face when he wants to laugh.

IV.11.3. Feelings and Personality

Feelings accompanying man's cognitive processes* and volitional regulation of his activity are one of the most vivid manifestations of personality. *They derive from stable attitudes of an individual to the objects of his cognition and activity.* To describe a person is to tell, first and foremost, what the concrete individual likes, what he hates, despises, envies, what he is proud or ashamed of, what he rejoices at, etc. The objects of a person's stable feelings, their intensity, character and frequency of manifestation in the form of emotions, affects, stresses and moods are indicative of his emotional world and, consequently, reveal his individuality. For this reason in-depth analysis of emotional processes should be focused not on transient states, but on stable feelings characterising the subject's personality.

Feelings in the Narrow Sense. Unlike emotions, affects, moods and stresses notable for a situational character and reflecting the individual's attitude to one or another object at a given moment, under concrete conditions, *feelings proper reflect the individual's attitude to the*

object of his stable needs, i.e. reveal the orientation of his personality. They are characterised by stability and duration expressed not in terms of hours and days, but months and years. Feelings are always related to objective reality, they are evoked by facts, events, people and circumstances representing stable objects of the individual's positive or negative motivation. Stable motives can permanently activate the individual, that is, arouse him to sustained activity only if they become objects of stable feelings.

For the individual himself, his feelings emerge as forms of the existence of his needs. Indeed, an observer (e.g. the investigating psychologist) may reveal the individual's motives behind his actions and explain them in causal terms using the method of *causal attribution*, but the individual himself experiences the motives of his behaviour and activity as feelings. It means that motives appear to the subject in the guise of feelings which tell him in what respect and how much one or another object is important for the satisfaction of his needs. The more stable the motives determining the directionality of the subject's personality, the closer to heart he takes everything that helps or impedes his activity or behaviour; his attitudes take the form of feelings indicative of the success or failure of the process of satisfaction of his needs.

Feelings which have developed as a result of the generalisation of emotional experience assume the leading role in the emotional sphere of the personality, determining the dynamics and content of situational emotions, moods and affects.

Feeling determines the dynamics and content of emotions notable, as has been indicated above, for their situational character. For instance, a feeling of love for one's dear may manifest itself differently, depending on circumstances: in joy when the loved one is successful, and in grief when he is not, in pride in him or indignation at his behaviour if he does not meet the subject's expectations. The stronger the feeling, the less liable it is to be overshadowed by the effect of momentary emotions.

A mother may experience an emotion of anger with her daughter's action, yet in some time her love for the

daughter will get the upper hand, the action will be forgotten and the daughter pardoned. This is the strong and simultaneously the weak side of the feeling. Only a great number of actions are needed for accumulation of negative emotions that would cause a noticeable transformation of the feeling, not to speak of its change to the opposite. By contrast, a relatively indefinite emotional attitude of one person to another may be changed to an all-round positive or negative feeling by only one strong positive or negative emotion aroused in the former by the latter. This mechanism is often accountable for the formation of a biased attitude to one or another pupil—the danger a teacher must always be aware of in his pedagogical practice.

Passions. *Passions* constitute a special kind of man's stable feelings. The inner attitude of people to what they are concerned with and to what happens in their life usually acquires a stable character and becomes a constant motive force of their activity. This force determines the specificity of the individual's perceptions, representations and thoughts related to the object of his interest, the manner in which he experiences passing emotions, affects and moods. It becomes an inducement to definite actions and a powerful inhibitor of another kind of actions which run counter to the deep-rooted feeling. Feeling is thus integrated into man's thinking and activity. *Passion can be defined as a stable, intense and all-embracing sentiment determining the directionality of the individual's thoughts and actions.*

Passion causes an individual to concentrate all his thoughts on the object of his feelings, visualise in detail the satisfaction of needs underlying them, think up and ponder over actual or only possible obstacles and difficulties on the way to such satisfaction. Thus in a patriot fighting for national independence the feeling of love for his motherland rooted in his deepest needs and most cherished dreams turns into an irresistible force making him risk his life and persistently seek the ways towards final victory.

Things which are not related to the dominant passion seem of secondary importance, are relegated to the background, cease to excite and interest the individual, and are sometimes simply forgotten. By contrast, everything

that has any connection to the individual's passion stirs his imagination, attracts attention, grips his mind and becomes imprinted on the memory (sometimes in the minutest detail). A thwarted passion usually gives rise to violent emotions and even affective outbursts (of rage, indignation, despair, resentment, etc.).

Sometimes the noblest, loftiest feeling, such as, for instance, love for one's own country, invention, or science as a way to truth and an instrument of service to motherland may turn into a passion. In such cases the passion may rouse an individual to heroic deeds, sustain his tireless efforts for many years, turn into a source of scientific discoveries and creative achievements. However, passion can also stem from morally reprehensible feelings that may be rooted in the conditions of the individual's development or in his personal traits. In such cases we speak of low passions (e.g., a passion for drugs, alcohol, etc.) and censure the person who succumbed to base instincts and let himself degenerate.

Love. There exist many stable feelings (turning or not turning into passion) which embrace all thoughts and wishes of an individual and are highly characteristic of his emotional sphere. Very prominent among them, particularly in youth, is the feeling of love which may be regarded as an example of stable emotion. Love is one of the most important feelings characteristic only of the human being. The term "love" is used in psychology in two senses, the broad and the narrow ones. In the broad sense (generic notion) love denotes a positive emotion of high intensity which singles out its object from all other objects and places it in the centre of the individual's vital needs and interests. Such is the individual's love for his native country, his mother and children, for music, etc.

In the narrow sense (specific notion) love is an individual's intense and relatively stable sentiment physiologically conditioned by sexual needs and expressed in a desire to be most fully represented by his significant personal features in the life of another person in a way that would arouse in the latter the need for a reciprocal sentiment of the same intensity and stability. The feeling of love is profoundly intimate and accompanied by situationally conditioned and changeful emotions of tender-

ness, ecstasy, despondency, etc., by an elevated or depressed mood, sometimes by affects of elation or grief. The fusion of an individual's sexual needs, ensuring in the final count the continuation of the race, and love as a supreme sentiment giving the individual optimal opportunities for personalisation, i.e. for *continuation and ideal representation in a significant other person* (in the loved one) practically prohibits the separation of one from the other in reflexion.

The dual character of love gave cause to different philosophical and psychological schools to absolutise one or the other principle, the biological or the "spiritual". Love was reduced either to the sexual instinct (which is characteristic not only of numerous trends of modern psychology, but also of the bourgeois culture as a whole tending to treat love as "sex"), or to a purely "spiritual" sentiment, with the physiological side denied or depreciated (this latter tendency found its expression in the apology of "platonic" love in Christianity and in the denigration of physiological manifestations of this feeling as something base, low and sinful). The truth is that though physiological needs are a requisite for the appearance and sustention of the feeling of love between man and woman, love in its intimate psychological characteristics is a socially conditioned sentiment, since the biological in the personality of man is sublated, that is, superceded, transcended, and assumes a social character.

The feeling of love is a peculiar reflection of class relationships and the cultural heritage. In contrast with the society in which relations among people are based on the buy-and-sell principles distorting the institution of marriage and, consequently, deforming the ethical base of sexual relations, socialist society provides the most favourable conditions for manifestations of love as an essential aspect of the spiritual wealth of man.

Particular significance attaches to adolescent love in view of its specificity. It is common knowledge that some pedagogues adopt a very guarded attitude to this feeling, especially among senior pupils. Of course, adolescent love, like the love of adults, stems from physiology, the sexual need. Yet in early youth and particularly in adolescence love is very different from what it is in

mature age. As a rule, teenagers do not clearly differentiate the needs underlying it and are not even fully cognisant of how they are satisfied. Sometimes adults (pedagogues, parents and acquaintances) watching the relations of a pair of lovers involuntarily read into their minds their own sexual experience; the lovers often instinctively feel that the elders view their relations from the wrong angle and respond to questioning with sullen mistrust, derision and even rudeness, seeking to avoid moral admonition. Though love at this age is objectively based on sexual urge, the latter is often thwarted by the character of the lovers' behaviour. Some ill-advised pedagogue, "banning", censuring and deriding adolescent love, succeeds only in causing the young people who have fallen in love with one another to fence themselves off from the collective with a wall of mistrust, suspicion and mockery and to withdraw further into their shell of intimacy.

Numerous attempts have been made in psychology to investigate love's internal structure as an integral system and to correlate its individual components with different characteristics of an individual. One of the most significant achievements in this field was the establishment of a correlation between an individual's ability for love and his attitude towards himself. This and a number of other findings, as well as the crucial role of love in marriage and family life enhance the importance of love problems in psychotherapy, education and the system of psychological aid.

Chapter 12

WILL

IV.12.1. Concept of Will

Will can be defined as conscious self-regulation by man of his activities and behaviour. It originates in the course of labour and shows in the individual's ability to overcome difficulties on the way towards his goal.

Voluntary and Volitional Acts. Man's activity is a system of interrelated consecutive acts aimed at solving particular tasks. Acts are directed towards achieving a definite result which is or appears to be the desirable goal of particular activity. Thus when planting a tree, i.e., digging a pit to a definite depth, laying fertiliser, driving in a pole in the middle of the pit, spreading the roots of the plant lowered into it, fastening it to the pole, etc., the individual seeking to attain his goal acts according to plan. As the work goes on, this plan unfolds in the form of a sequence of *thoughts* and *representations* and is realised through the agency of *movements* characterised in terms of force, speed, amplitude, coordination and accuracy. Performing definite movements that make up individual actions and accomplishing thinking operations that pertain to the implementation of the general plan, the individual concentrates his attention on the subject of labour, the instruments used and the process itself. At the same time, while performing individual actions, the subject experiences definite *feelings*: annoyance at obstacles and difficulties, joy at successful satisfaction of needs, labour enthusiasm, fatigue, joy of labour, etc.

In contrast to the involuntary action determined directly by the irritant, the volitional action is realised with the help of appropriate means (signs, normative values, etc.), i.e., through mediation. Thus a surgeon first constructs in his mind a mental image of the opera-

tion he is going to perform and only after that gets down to work.

A volitional action is accomplished with the help of *self-regulation*. Its structure includes a goal the subject wishes to attain; a programme of those actions and operations which he must fulfil in order to attain it; establishment of criteria for successful actions and comparing them with the actual results of actions; finally, the adoption of a decision on whether the action is to be regarded as completed or should be continued after appropriate corrections. Hence, self-regulation of a voluntary act presupposes *volitional control* over its planning and execution. In ontogenesis the function of regulation and control is initially performed by adults in the process of joint activity and communication with a child; later on, as a result of the interiorisation of the existing standards and patterns of activity the child learns to control his actions himself.

In a voluntary action man first ascertains that the image of the future result of his action is in agreement with his motive for activity, i.e., with the aim he has set himself, whereupon his action acquires a *personal sense* and comes out as the *goal* of his activity.

In the structure of activity voluntary actions form its higher level, they are characterised by conscious aims and selection of means required for their attainment. Voluntary acts, such as the pondering by a pupil of the plan of a composition, the mental recapitulation of material, etc., may be performed without any outward signs.

Volitional actions represent a peculiar type of voluntary activity. A volitional action preserving all essential features of the voluntary action necessarily implies the *overcoming of difficulties*. In other words, a voluntary action may be classed as volitional only if its accomplishment entails exertion of efforts.

Volitional actions may differ in complexity. Thus a pupil making his first attempt at a vault in the school gym has to overcome his fear of possible fall and injuries. Such volitional actions are called *simple*. A *complex* action includes a number of simple ones. For instance, a young man who has made up his mind to master a difficult trade is bound to overcome a number of inter-

nal and external obstacles and difficulties before he attains his goal. Complex actions, in turn, are incorporated in a system of man's volitional activity directed towards the attainment of consciously set close and remote targets. Such activity reveals the individual's *volitional quality*, his will.

Will as a Form of Activeness. *Will is conscious organisation and self-regulation by the individual of his activity and behaviour directed towards overcoming difficulties in the attainment of set goals.* Will is a specific form of the individual's activeness, a specific type of the organisation of his behaviour determined by voluntarily set goals.

Will originates in the course of labour, when man learns the laws of nature and thus changes it in accordance with his needs.

Will performs two interrelated functions—*motivational and inhibitory*.

The *motivational function* derives from man's *activeness*. In contrast with *reactivity* which accounts for the individual's direct response to a situation (e.g., turning in the direction of a call, returning the ball in a game, taking offence at a rude word, etc.), activeness generates action by virtue of the specificity of the subject's internal states which reveal themselves the moment the action is being accomplished (e.g., an individual needing necessary information hails a colleague or, giving way to a bad temper, becomes rude, etc.).

Unlike *field* behaviour characterised by involuntariness, activeness is characterised by intentionality, i.e., is directed towards a conscious goal. Activeness need not necessarily be awakened by a current situation, by a desire to meet its demands and act within the set limits; it is notable by a *supra-situational* character, i.e., by a transgression of the bounds of the initial goals, by the subject's ability to rise above the level of requirements of a given situation and overstep the limits of the initial task (such is "risk for risk's sake", creative enthusiasm, etc.).

One of the manifestations of man's social activeness, his public spirit is the ability to go beyond the ordinary call of duty, to engage in activity which is not strictly necessary for a given individual (no one can reproach

him if he abstains from it), but which is in accordance with social expectations.

There is yet another feature of volitional processes which comes out as the motivational function of will. If an individual has no immediate need to accomplish an action which is objectively necessary and the individual is aware of this necessity, will creates additional motivation changing the sense of the action and making it more significant by causing the individual to anticipate the results of such an action. Thus in a state of fatigue a school volley-ball team captain may find it difficult to brace himself up and go for training to a gym at the other end of the city, yet the thought that the success of his team and the honour of his school depend on his sporting form causes him to mobilise his will and evolve an additional motive for the difficult action.

The *inhibitory function* of will coming out in unity with the motivational function shows in the inhibition of undesirable expressions of activeness. An individual is generally capable of inhibiting those motives and actions which run counter to his world view, ideals and convictions. Regulation of behaviour would be impossible without inhibition.

Speaking of the style and tenor of interpersonal relations in a collective, Makarenko specially focused on developing the "inhibitory habit". He wrote that the administration of a child institution should constantly develop in the inmates the ability to restrain their motility, garrulity and noisiness. This restraint is beneficial to the child's organism and is in accord with good taste and convenience of the whole collective.

Man's motivation to action represents a *hierarchy of motives* ranging from basic necessities (food, clothes, shelter) to higher imperatives reflecting his ethical, aesthetic and intellectual needs. By exercising his will the individual is capable of inhibiting and restraining his lower motives, including the most vital ones, in favour of higher motives.

Owing to the unity of the motivational and inhibitory functions will enables the individual to overcome difficulties on the way towards his goal.

Determinism and "Freedom of Will". In idealist philosophy and psychology will is understood as a super-

natural, socially unconditioned, i.e., *indeterminate*, force allegedly underlying human capacity to initiate and perform one or another action. In this concept all mental activity is conceived as a function of will, the unconscious ultimate cause of activeness. US psychologist *William James* assigned the leading role in action to a completely free volitional decision. Figuratively speaking, it amounts to asserting that the individual just says to himself "Fiat!" (Let it be so) and the act is there, triggered, as it were, by nothing else than this mysterious ultimate principle.

In reality, man's actions and behaviour are *conditioned objectively*. Motives including volitional actions are a product of external influences which have left their imprints in the individual's mind during his previous activity and interaction with the environment. However, the determinism (causality) of volitional actions does not mean that the individual is preordained to act in one way only, has no freedom of choice and can always absolve himself from responsibility by invoking a fatal character of his actions.

Accomplishing a volitional act, man as a personality assumes all responsibility for it. Marxism regards volitional behaviour as a higher stage of the individual's activeness conditioned by a definite system of social relations and characterised by the individual's ability to make decisions on the basis of knowledge. The individual's activeness and particularly his will assume the form of *deed*, a socially meaningful result of activity in which the individual is responsible for its outcome even if it goes beyond his initial intentions. Helping another person to solve his problems, an individual acts commendably. He may be completely unaware of his role in the other individual's life, yet he deserves credit for the beneficial consequences of his noble deed. Conversely, causing harm to another person without good reason, hampering the satisfaction of his need, an individual commits an evil deed and is answerable for it, if he could and was supposed to foresee its consequences. Performing a deed and bringing about changes in the life, behaviour and consciousness of other people, individual comes out as a bearer of good or evil will and is commended or blamed respectively.

People can be divided into two categories depending on whom they tend to hold responsible for their actions or, using the parlance of psychology, according to a bipolar personality dimension known as "*control localisation*" or "*control locale*". Subjects inclined to refer their behaviour to outer causes (fate, circumstances, chance, etc.) fall under the head "*external localisation of control*", and those tending to ascribe the achieved results to their own efforts or abilities, under the head "*internal localisation of control*".

Schoolchildren belonging under the former category easily attribute their low marks to anything but their own negligence (to mistakes in the sum written on the blackboard, to somebody's incorrect prompting, to visitors who prevented them from doing their homework, to the absence of the necessary rule in the textbook, etc.). Investigations have shown that an inclination to external localisation of control derives from such personality traits as irresponsibility, lack of confidence in one's abilities, anxiety, a tendency to put off the realisation of one's intentions, etc. By contrast, an individual generally assuming responsibility for his actions and ascribing their success or failure to his character, abilities or lack thereof, may be justly credited with a capacity for internal localisation of control. A pupil who got a low mark and is characterised by internal localisation of control will most likely explain it by his lack of interest in the assignment, forgetfulness, distracted attention, and so on. It has been established that individuals with internal localisation of control are notable for a keener sense of responsibility, greater consistence in their pursuits, a tendency towards self-examination, sociability and independence. *The internal and external localisation of control of volitional actions involving both positive and negative social consequences are stable personality traits formed in the process of education and upbringing.*

Will and Risk. Man's behaviour in a risky situation is one of the best indicators of his will-power.

Risk is a situational characteristic of activity notable for uncertainty of the outcome and possible unfavourable consequences in case of failure (punishment, pain, injury, loss of prestige, etc.). The expected detriment in a risky situation depends on the probability of failure and the

degree of loss that may threaten the individual. A question naturally arises: what makes the individual run the risk if the chance of success is low and the punishment for failure is heavy? Psychology distinguishes two inter-related motives for a risky behaviour governed by will as a necessary psychological component of a risky situation.

The first motive for risk and, accordingly, the first type of risk are based on the expectation of success whose magnitude exceeds the amount of possible damage in case of failure (*situational risk*). The aspiration for success overrides the desire to avoid failure. If we take into account the fact that in everyday life this relationship may be reversed (the desire to avoid failure may prove stronger than the aspiration for success), we shall have to admit that risk figures prominently in the process of decision-making and is necessarily involved in volitional decisions.

Psychologists distinguish between *justified* and *unjustified* risk. However problematic the outcome of a risky situation may be, the former, unlike the latter, presupposes a cool evaluation of all pros and cons of a volitional decision, the ideological and ethical integrity of the motive behind the risky behaviour and, consequently, the ultimate advantage of a hazardous choice over a relatively safe one. There may be situations in which the outcome depends on chance ("heads or tails") or, on the contrary, on the individual's personal qualities (abilities, persistence, skills, etc.). It has been established that, other conditions being equal, people show a much higher risk level in situations in which the outcome depends on the individual's abilities, skills and habits rather than in those in which it depends on chance (good luck).

The second motive for a hazardous option and the second type of risk derive from the so-called *supra-situational activeness of the personality*, his ability to rise above the requirements of a given situation, to set himself targets beyond the limits of the initial task. The second type of risk revealed experimentally with the help of a special instrument called "risk-meter" is designated as "suprasituational", "disinterested" or "risk for risk's sake".

The experiments were conducted as follows. A group

of subjects were assigned the task of hitting a target they themselves were to select within a specified experimental area. They were warned, however, that the area contained a dangerous zone and hitting it entailed punishment. It was established that some of the subjects preferred to choose their target in the proximity of the dangerous zone, thus voluntarily taking the risk of punishment, whereas others tried to avoid such a risk selecting their targets far from the prohibited area. Numerous repetitions of the experiment and modifications of its design led the investigators to a conclusion that the first group of subjects had an inherent inclination to disinterested risk.

Subsequent studies established that individuals capable of taking a risk for risk's sake are much more common among builders working high above the ground, motorcycle sportsmen, high-voltage line erection personnel, etc., than among representatives of other professions.

Experiments also showed that persons capable of taking situational risks were prone to risk for risk's sake. Conversely, the subjects who did not demonstrate a capacity for disinterested risk during experiments were normally not inclined to take risks in a situation where the expected gain was counterbalanced by a possible loss. A tendency to disinterested risk which can be revealed by a psychological experiment, i.e., a short-term test, attests to the subject's capacity for volitional actions in a situation fraught with real danger. The risk-meter thus proves instrumental in knocking together a fire-brigade enabling its leader to charge those disinclined to take risks with support jobs rather than to assign them to work in the fire area.

It would be a mistake to identify strong will with a capacity for disinterested risk. Experiments show that if the risky and cautious individuals in a fire brigade exchange their jobs, the former are less successful in the performance of support duties than the latter. Everyday routine, sometimes involving hard and uninteresting drudgery calls for a sustained effort and exercise of will-power; such volitional qualities as persistence, patience, scrupulousness in complying with instructions, etc., different as they are from those needed in face of danger, are no less valuable for society.

IV.12.2. Structure of the Volitional Act

Will, as well as the subject's activeness in general, originates from his needs underlying a broad variety of *motives for acts and actions*.

Motives for a Volitional Act. By motives in psychology are implied three relatively independent types of psychological phenomena, closely interrelated, but not completely identical. They represent, firstly, inducement to activity directed towards satisfactions of an individual's needs. Motives viewed from this angle are indicative of the *source* of the individual's activeness in general and of the *needs* stirring him to activity.

Secondly, motives point to *objects* of activeness and explain the individual's preference for a particular type of behaviour. In this sense motives coincide with reasons for a particular line of behaviour chosen by the subject and, in the aggregate, constitute what is known in psychology as *personality orientation*.

Thirdly, motives emerge as *means of the individual's self-regulation*, i.e., as an instrument of control by the individual of his own behaviour and activity. These means include emotions, wishes, drives, etc. Emotions represent an assessment by the individual of the personal sense of one or another act and, should an act fail to correspond with the final goal of his activity, change its general directionality, restructure his behaviour, bring in additional inducements which reinforce the original ones, etc.

The volitional act (action) represents a unity of all the three types or aspects of its motivation: the source of activeness, its directionality and means of self-regulation.

Components of a Volitional Act. Motives arising from needs cause the individual to perform some actions and abstain from others. Depending on the degree to which the individual is aware of his motives they can be divided into drives and desires.

A *drive* is a motive for activity which represents an undifferentiated need the subject *is not fully aware of*. A drive towards a certain person causes the individual to experience pleasure at the sight of that person or the sound of his or her voice and induces him to seek, often

involuntarily, meetings with the subject of his affection. However, the individual may sometimes be unaware of the cause of his pleasure. Drives are vague and implicit.

Desires as motives for activity are characterised by the individual's *awareness* of his needs that underlie these motives. More often than not the individual is aware not only of the object of his need, but also of the possible ways of satisfying it. Indeed, feeling thirsty on a hot summer day, a person begins to think of shade and cool water.

Motives for activity reflect the conditions of man's life and the degree of his awareness of his needs. At every given moment some motives appear to him more important than others. For instance, a comparatively secondary need to go to the cinema with a friend may for some time override in a teenager a more important need to do his homework. In a *struggle of motives* that often arise from the necessity to make a choice between different inducements, the motives of a higher level, e.g., those prompted by public interests, may come in conflict with motives of a lower level directed towards selfish aims. This struggle may sometimes cause an individual great pain and anxiety, but may also take the form of a peaceful discussion of different alternatives and assessment of pros and cons of each choice. Thus a student may hesitate over a choice between library and theatre in the evening or suffer a real *conflict* between the sense of duty and feelings of friendly attachment while making up his mind to break his relations with a friend because of his dishonest action. In this struggle of motives a decisive role belongs to the sense of duty, world view and moral considerations.

As a result of cool analysis or struggle of motives the individual takes a definite decision, i.e., determines a goal and methods of its attainment. This decision may either be put into effect at once, or its execution may be postponed. In the latter case the decision transforms into a long-term *intention*, such as a youth's plan to make a touring trip after his exams. The intention has a regulating effect on the individual's behaviour during the period between the adoption and execution of the decision. Thus, a would-be tourist starts training long before his trip, studies the geography of the area in interest,

prepares and checks the tourist equipment, etc. Sometimes an intention may be relinquished, a decision reversed, a job left unfinished. Systematic failures to carry out adopted decisions are indicative of the individual's weak will.

The *execution* of a decision is the last stage of a volitional act which shows man's will. The latter should be judged by deeds rather than by lofty motives, resolute decisions and good intentions. Analysis of actions provides a clue to the individual's motives, and the knowledge of motives, in turn, makes it possible to forecast his behaviour under different circumstances.

Volitional Effort. The principal components of the volitional act, i.e., decision-making and execution, often call for what is commonly known as *volitional effort*, a peculiar emotional state. *Volitional effort can be defined as a form of emotional stress which mobilises man's mental resources (memory, thinking, imagination, etc.), creates additional motives for action and is experienced as a state of considerable strain.*

By an effort of will an individual can neutralise the effect of some motives and enhance to a maximum the effect of others. The effort induced by the sense of duty mobilises man's spiritual powers for overcoming external obstacles (in solving a difficult problem, in a state of fatigue, etc.) and internal difficulties (disinclination to stop reading an interesting book, to keep to the daily routine, etc.). Overcoming laziness, fear, fatigue as a result of a volitional effort gives the individual considerable moral satisfaction and is experienced by him as a *victory over himself*.

An external obstacle may call for a volitional effort even if it is experienced only as an internal difficulty, an inner barrier which has to be overcome.

Here is a simple example. If we mark one meter's length on the floor and try to step over this obstacle, the task will be easily fulfilled without entailing any effort of will on our part. However, in an ascent of a mountain a cleft in the ice of the same width is regarded as a very serious obstacle the overcoming of which calls for a considerable effort of will. On the face of it, the movement is the same in both cases, the individual just has to make a long stride. Yet in mountains this stride is preceded by

the struggle of two motives—one for self-preservation, and the other, for fulfilment of duty (e.g., helping a comrade in distress). If the first motive gets the upper hand, the climber will cowardly back from the cleft, if the sense of duty proves stronger, he will surmount the obstacle suppressing his fear.

A volitional effort is an integral part of any heroic deed. The habit to exert will is a necessary prerequisite for the formation of a strong character. The history of any nation is full of heroic exploits and each of them may serve as an example of a volitional act.

IV.12.3. Individual Peculiarities of Will

Will as conscious organisation and regulation by man of his activity is directed towards overcoming internal difficulties and comes out primarily as *self-control*, i.e., control exercised by an individual over his own emotions and actions. It is common knowledge that the capacity for self-control varies from person to person. There is an extremely broad range of individual peculiarities of will, its manifestations changing in intensity from *strength* to *weakness*. An individual possessing strong will is capable of overcoming any difficulties on the way to his goal and reveals such volitional qualities as determination, courage, endurance, etc. By contrast, weak-willed individuals shirk difficulties, show lack of courage, persistence and restraint, are incapable of suppressing momentary desires in favour of higher motives deriving from moral principles.

The range of manifestations of weak will is as broad as the range of qualities characteristic of strong will. The extreme degree of will weakness expressed, for instance, in *abulia* and *apraxia* lies beyond the limits of normal psyche.

Abulia consists in the lack of inducement to activity combined with inability to come to a decision to act due to brain disorders.

Clearly understanding the need to carry out the doctor's prescriptions, a patient suffering from *abulia* is unable to make himself do it. Very illustrative of this state is the so-called *field* behaviour.

Apraxia is inability to perform purposeful actions due to lesions in the motor area of the brain (frontal lobes). It manifests itself in the impairment of voluntary regulation of movements and actions which fall out of the set programme and, consequently, make the execution of a volitional act impossible.

Abulia and apraxia are relatively rare disorders indicative of a seriously impaired brain. Weak will which is a frequent phenomenon in pedagogic practice is usually referable not to a pathological state, but to incorrect education and upbringing; this shortcoming can be corrected by concerted pedagogic efforts within the framework of the personality forming strategy. The most characteristic manifestation of weak will is *laziness*, that is a tendency to avoid difficulties and shirk volitional efforts. Curiously enough, quite a number of individuals generally unwilling to admit their shortcomings seem to be quite ready to acknowledge laziness as the cause of their woes. "You are right, I am lazy," says a young man criticised by his friends and willingly conceding his little faults with a good-natured smile. This easy admission, in fact, masks the individual's high opinion of his own worth and implies the existence of some hidden merits which purportedly do not show only because of his indolence and may yet reveal themselves.

This undertone of the young man's confession is utterly false. Idleness indicates the person's feebleness and flaccidity, his maladjustment and indifference to the common cause. A lazy individual is characterised by external localisation of control and is therefore irresponsible. Idleness, as well as other manifestations of weakness—cowardice, indecision, lack of restraint, etc.—are serious defects of the personality, their correction calls for considerable pedagogic effort and, first and foremost, for rigorous self-education.

Positive qualities of will, the manifestations of its strength are an important prerequisite for successful activity and characterise the individual favourably. These qualities include courage, persistence, determination, self-sufficiency, self-control and many others. *Determination* is a volitional quality which shows in a subject's ability to take independently important decisions and put them into effect. In a man of determined

character struggle of motives does not turn into a protracted process and soon ends in the adoption and execution of a decision. This decision, always *timely* but not necessarily instantaneous, is well grounded and takes into account all circumstances. A hasty decision is often indicative of the individual's desire to relieve the internal strain and put an end to the struggle of motives rather than of the presence of genuine determination thereby testifying to the weakness, and not to the strength of his character. On the other hand, constant procrastination in the adoption or execution of a decision also attests to weak will. Independence of will presupposes due regard for other people's advice and opinions, on the one hand, and a sober attitude to their recommendations, on the other. Both determination and self-containment are mainly indicative of the internal localisation of control in volitional actions. Independent will is the opposite of stubbornness or negativism, on the one hand, and suggestibility or conformity, on the other: a suggestible subject has no opinion of his own and his behaviour depends on circumstances and other people's influence, whereas stubbornness causes the individual to act contrary to dictates of reason and advice of surrounding people making his persistence insensible. In interpersonal relations self-sufficiency or independence of will as a personality trait is expressed in full in collectivist self-determination.

Will cannot be appraised in terms of the strength-weakness scale only. Of crucial, if not definitive significance is the ethical *dimension of will*, its social directionality and maturity. In other words, the assessment of volitional acts in moral terms depends on the motives governing the individual's activity.

Part Five

INDIVIDUAL PSYCHOLOGICAL CHARACTERISTICS OF PERSONALITY

Chapter 13

TEMPERAMENT

V.13.1. General

Definition of Temperament. Individual psychological distinctions include the so-called *dynamic* characteristics which play an important role in the individual's mental make-up. By dynamic characteristics are chiefly meant the degree of intensity and the speed of mental processes. It is common knowledge that with relatively similar motives for activity and behaviour and under the same environmental influences people noticeably differ from one another by impressionability, impulsiveness and energy. Thus one individual is prone to sluggishness and another to haste, one's feelings can be aroused easily, whereas another is characterised by equanimity, one is distinguished by abrupt gestures and expressive mimicry and another, by restrained movements and relatively immobile face. Other conditions being equal, dynamic distinctions show in the general activeness of the individual, his motility and emotionality.

Of course, man's dynamic characteristics largely depend on inculcated attitudes and habits, as well as on situational requirements. Yet there is no doubt that the individual distinctions in question have an innate base. This is vouched for by the fact that they manifest themselves already in early childhood, show a high degree of stability and are observable in different forms of behaviour and most diverse fields of activity.

Dynamic qualities inherent in the individual are inter-related and make a single structure known as temperament. *Temperament is the sum total of naturally conditioned characteristics of the individual's reactive disposition.*

Genesis of the Notion of Temperament. The term "temperament" goes back to ancient views on the nature of individual psychological distinctions. Ancient medical science in the person of its most prominent representative *Hippocrates* (5th century B.C.) believed that the condition of the organism mainly depended on the quantitative proportion (crasis) of "juices" or fluids in the body (blood, lymph, bile). Several centuries later, Roman physicians changed Greek "crasis" to Latin "temperamentum" (a mixing in due proportion) and the term survived till our times. Gradually ancient science came to view mental characteristics of individuals as a function of crasis or temperament, i.e., of the proportion of vital juices in the body. Roman anatomist *Galen* living in the 2nd century B.C. was the first to give a detailed classification of temperaments which included 13 types. Subsequently, their number in ancient medicine was reduced to 4 distinguished by the prevalence of one of the four bodily fluids: blood, lymph, yellow bile, black bile and called, respectively, *sanguinic* (L. sanguineus—blood), *phlegmatic* (Gr. phlegma—slime), *choleric* (Gr. cholera—yellow bile) and *melancholic* (Gr. melancholia—black bile).

The theory of the organic base of temperament advanced by ancient science now holds only historical interest. However, the ancients' idea that all the variety of individual reactive dispositions (structures of dynamic manifestations of the psyche) can be reduced to four basic types has been fully confirmed by the subsequent development of science. The term "temperament" has taken firm root and preserved its meaning till our days.

Numerous hypotheses put forward in later centuries attempted to account for differences between temperaments. The influence of ancient physicians on scientific thought is attested to by the significance attached to the *humoral* (L. humor—moisture, fluid) systems of the organism. For instance, German philosopher *Immanuel Kant* (the late 18th century) believed that temperament

was determined by blood properties. Very close to this view was the theory of Russian pedagogue, anatomist and physician *Pyotr Lesgaft* who wrote (in the late 19th-early 20th centuries) that temperament is a function of blood circulation, particularly the thickness and elasticity of the walls of blood vessels, their inner diameter, the form of the heart, etc. According to this theory, the blood flow rate and pressure determine the individual excitability characteristics of the organism and the duration of its reactions to different stimuli. German psychiatrist *Ernst Kretschmer* contended (starting from the 1920s) that the mental make-up of the individual corresponds to his build, the general bodily constitution. The connection between the type of the constitution and some mental qualities is traceable, according to Kretschmer, to their common base, i.e., the chemical composition of blood and the hormones secreted by glands of the endocrine system. US scientist *Walter Sheldon* (the 1940s) also believed that individual psychological traits are directly related to bodily builds controlled by the hormonal system, i.e., to the relationship between different organism's tissues.

It cannot be said that such views are completely groundless, but they surely point to only one aspect of the problem, and not the principal one at that. All mental phenomena are directly referable to properties of the brain, the main organ of the psyche, and that is the crux of the matter. Though the initial ideas of the significance of the organism's fluids or juices apparently correlate with later views of the important role of humoral factors, the present-day investigations into the natural base of temperament cannot side-step the pivotal fact that *all internal* (and, for that matter, *external*) *factors influencing the dynamics of behaviour must necessarily exert their influence through the brain*. Modern science sees the causes of individual temperamental distinctions in the functional features of the brain (the cerebral cortex and subcortical centres), in the properties of the higher nervous system.

Types of Temperaments. The notions of a subject's temperament are normally based on the knowledge of some of his characteristic psychological traits. Thus a mentally active individual quickly reacting to changes

in the social environment, seeking new impressions, reasonably optimistic, lively, brisk, with expressive mimicry and bodily movements is called a *sanguinic* person. A *phlegmatic* person is distinguished by coolness, stability of wishes and moods, constancy and depth of feelings, composed manners and quiet speech, outward imperturbability and calmness. By contrast, a *choleric* individual is characterised by energy, capacity for a passionate dedication to his work, vigorous actions, dashing forcefulness, inclination to emotional outbursts, abrupt changes of moods and impetuous movements, whereas a *melancholic* person is notable for sensitiveness, vulnerability, depth and stability of emotions with outward impassiveness, slow movements, restrained motility and slow speech. Each type of temperament is characterised by its own correlation of mental qualities, primarily by different degrees of activeness and emotionality, as well as by specific motility, or, in other words, by a definite structure of the individual's reactive disposition.

It stands to reason that this scheme cannot cover all temperamental distinctions. The problem of the diversity of temperaments is still controversial. Yet the above indicated types are generally recognised as the main ones and most people fall under this classification.

Here are characteristic examples of the main types of temperament at the age of 12 and 13 years.

Sanguinic Person. Sergei T. is a very lively, restless boy, never quiet at a lesson, constantly fidgeting and twirling something in his hands, talking with his neighbour and pulling somebody by the sleeve. Rapid jumpy gait, quick speech. Very impressionable and can be easily carried away. Speaks of a film or a book with enthusiasm and excitement, promptly responds at a lesson to every new fact or new task. At the same time his interests and passions are very unstable and changeable flaring up and dying down with equal ease. The boy has a lively, open and expressive face plainly showing all his moods and attitudes to an object or a person. At lessons which are interesting to him displays high capacity for work, at "dull" lessons almost completely ignores the teacher's explanations, yawns, talks to neighbours. His feelings and moods are very changeable, on getting a low mark he is ready to burst into tears and hardly contains him-

self, yet in less than half an hour he completely forgets everything and joyfully gallops along the corridors at the break. Despite the boy's vivacity and restlessness he is not difficult to manage: with an experienced teacher he is very cooperative at a lesson and never makes a nuisance of himself. It is his first year in this school, but he has already got accustomed to the teachers, made many friends and is one of the class activists.

Choleric Person. Alexander P. is notable among classmates for his impetuosity. When carried away by the teacher's story, he gets extremely excited and interrupts the story with different exclamations. Shows readiness to answer any question of the teacher without thinking and therefore often gives irrelevant answers. In his annoyance and disappointment easily loses his temper and starts a fight. He listens to the teacher's explanations very attentively, concentrating on his words. With similar concentration he does his class work and home exercises. During breaks he never sits still, runs along corridors or wrestles with someone. Talks fast and loudly, writes a bold, fast and uneven hand. The face is very expressive. Participates in public activities and sporting competitions with dedication and shows a good deal of persistence. Alexander's interests are rather constant and stable. Difficulties do not upset him, the boy overcomes them with great energy.

Melancholic Person. Nikolai M. sits at lessons quietly without changing his attitude, twirls something in his hands, his moods are liable to change for very slight reasons. The boy is painfully sensitive; when the teacher moved him to another desk, he took offence, pondered the matter for a long time and was upset and depressed the whole day. His feelings are hard to rouse. At a circus performance he sits silent with immobile face for quite a while before he thaws out and begins to smile, laugh and talk with his neighbours. Easily gets upset, the teacher's mildest remark depresses him, his voice becomes dull and soft. Shows great restraint in the expression of his feelings. On getting a low mark he goes to his place without any change in countenance, but at home, on the evidence of his parents, cannot calm down and is for long unable to get down to work. Answers his lessons hesitantly and haltingly, even if he is well pre-

pared. Rates his knowledge and abilities low, though they are in fact somewhat above the average. Difficulties encountered in the fulfilment of an assignment upset the boy and he fails to carry the work through. His movements lack vigour and assurance, he speaks slowly and a little languidly.

Phlegmatic Person. Victor M. is distinguished by unhurried movements and calmness, answers question after a pause and without alacrity even when he knows the material quite well. His characteristic feature is tirelessness, he does not avoid additional mental strain and, however long he may work, never looks tired. Exhibits a tendency towards extended and elaborate logical reasoning, pronounces words in a smooth voice without fear of going astray as if he knew at the beginning of his long passage how he would wind up. Outwardly imperturbable, nothing that happens in class or at the lesson can surprise him, has been fond of mathematics and lessons of physical culture since he entered school and keeps his loyalty to these subjects. Takes part in sporting competitions (gymnastics) without showing, unlike most participants, any signs of strong emotions and excitement. One never sees him fussing, making merry or being upset.

V.13.2. Types of Higher Nervous Activity and Temperament

Pavlov's theory of the *types of nervous system* or, which is the same thing, *nervous activity* (common to man and higher mammals) proved a real turning point in the history of scientific study of temperaments.

Properties of Higher Nervous Activity. Besides the general regularities of the functioning of cerebral hemispheres, Pavlov and his assistants discovered and studied differences in the nervous system referable to the *individuality* of animal specimens (experiments were carried out on dogs). He noticed that specific features in a dog's behaviour (e.g., liveliness and sluggishness, boldness and timidity) regularly correlated with certain features of the main nervous processes—excitation and inhibition. As a result of studies lasting for many years, he discovered

that the individual distinctions he had investigated were based on such physiological characteristics as the *strength* of excitation and inhibition, their *mobility*, i.e., capacity for rapidly changing one another, and *balance* between excitation and inhibition. It is the combination of these properties that underlies this or that type of the higher nervous activity.

The most important characteristic indicative of the vitality of the system is the *strength of nervous processes*. The strength of excitation and inhibition determines the capacity for work of cortex neurons, their endurance. Indeed, the environment exerts a powerful influence on the nervous system in the form of a great number of various stimuli: the individual may have to perform arduous work over a long period, cope with emergency situations, respond to powerful irritants involving tremendous nervous strain, suppress his natural reaction to the effect of some irritants in order to adequately deal with other irritants which are more significant. The load the nervous system can sustain depends on the strength of the processes of excitation and inhibition.

Next in importance is the *mobility of nervous processes* in the cerebral cortex. The environment is subject to constant change and its impacts on the individual may be abrupt and unexpected. The nervous processes must not lag behind. Experiments have shown that the alternate processes of excitation and inhibition in some animals proceed at a higher rate than in others.

Very significant is also the third characteristic of the nervous system, the *balance between the strength of excitation and inhibition*. Sometimes these factors are out of balance, inhibition proves weaker and excitation prevails. The degree of their equilibrium varies from individual to individual.

Types of Higher Nervous Activity. It has been established that individual distinctions of higher nervous activity stem not from one of the characteristics considered above, but always from their combination. The three characteristics (the varying degrees of their manifestation) making one or another type of nervous activity may form different combinations. The findings of numerous laboratory experiments have shown that some

of these combinations occur more often or their manifestations are more conspicuous than others. On the evidence of such experiments Pavlov developed a classification of the main types of higher nervous activity.

Depending on the strength of nervous processes, all dogs were divided into two types—*strong* and *weak*.

Representatives of the *weak* type are characterised by the weakness of both nervous processes (particularly the process of inhibition). Such dogs are fussy, they constantly look back or, on the contrary, stop still and stiffen in a definite posture. The reason for it is that external influences, sometimes quite minor, prove too strong for them. Prolonged or strong stimulation results in their rapid exhaustion. To be sure, weak animals differ among themselves not only by the strength of nervous processes, yet those differences recede against the background of the general weakness of their nervous system.

Strong animals are subdivided into *balanced* and *unbalanced* ones, the latter being usually distinguished by strong excitation and weak inhibition. Since the process of excitation in such dogs is not balanced by that of inhibition, they are liable to nervous breakdowns under a heavy mental strain. Most of them are aggressive overexcitable animals.

Strong balanced dogs are further classified into vivacious and quiet types depending on the rate of change of their nervous processes. Representatives of these types are easily distinguishable from one another already by their behaviour, the former being mobile and excitable, and the latter, slow and difficult to rouse.

Hence, researchers distinguished four basic types of higher nervous activity: (1) strong balanced vivacious, (2) strong balanced quiet, (3) strong unbalanced (impetuous), and (4) weak.

The type of nervous activity is a natural characteristic of the organism. Though essentially hereditary, it is not immutable, responding within certain limits to environmental influences and undergoing a process of development. Experiments have proved, for instance, that the lagging process of inhibition in the strong type with predominant excitation can be invigorated by approp-

riate training. It is also known that the character of nervous processes tends to change with age.

The classification of nervous systems into types based on experiments with animals is fully applicable to human beings.

Correlation between Types of Higher Nervous Activity and Temperaments. The physiological substrates of temperaments are different combinations of strength, balance and lability of nervous processes characterising different types of higher nervous activity. The strong balanced fast type of nervous activity correlates with the sanguinic temperament, the strong balanced slow type with the phlegmatic temperament, the strong unbalanced type with the choleric temperament, and the weak type with the melancholic temperament.

The theory of the types of higher nervous activity as the physiological base of individuals' reactive dispositions (dynamic mental characteristics) has provided a solid scientific foundation for modern research into the age-old problem of temperament.

Modern Investigations of the Nervous System. Soviet psychologists *B. M. Teplov* and *V. D. Nebylitsin* further elaborated and enriched the concept of the type of man's higher nervous activity. Subsequent studies revealed new properties of the nervous system. One of them is *dynamism* which underlies the ease and rate of formation of temporal links in the cerebral cortex. Another is *lability* determining the rate of emergence and cessation of a nervous process in contrast to *mobility* characterising the rate of alternation of nervous processes. It was found out that properties indicative of the type of nervous activity may be of a more general character affecting a broad range of man's mental dynamic qualities, and less general showing in a limited sphere of actions. It was also established that mental activity as a temperamental trait depends directly on an individual's level of *activation*, a specific quality of the nervous system.

The hereditary nature of a number of properties of the nervous system was revealed by the so-called "twin method". The similarity of psychophysiological qualities in twins by itself cannot be regarded as evidence of their innate character, as such similarity might be a result of their common environment. However, there are two

types of twins: monozygous (with absolutely identical heredity) and heterozygous (with different hereditary qualities as in ordinary brothers and sisters). It stands to reason that the similarity of twins in qualities conditioned predominantly by the environment will not depend on whether they are monozygous or heterozygous, whereas similarity in hereditary qualities will be more pronounced in the former, than in the latter. Special studies based on the correlation of properties of the nervous system (inside the pairs) of monozygous and heterozygous twins afforded convincing evidence for the essential role of heredity.

It has been likewise established that every property of the individual's nervous system exerts a certain influence on different sides of his temperament, and that every dynamic characteristic of activeness, emotionality and motility depends not simply on one or another property of his nervous system, but on its type as a whole.

The manifestations of man's temperament bear the hall-mark of the social environment, norms and demands (we shall discuss their influences later in more detail). Besides, every individual has his own type of temperament determined by stable properties of his nervous system. This natural base of man's reactive disposition should not by any means be disregarded.

V.13.3. Role of Temperament in Labour Activity and Studies

The reactive disposition of the psyche reveals itself not only in the individual's manner of behaviour, not only in his movements, but also in his intellectual sphere, in his motives and general capacity for work. It stands to reason that the specifics of temperament influence the person's studies and labour activity.

It is highly significant that *temperamental distinctions relate not to the individual's mental potentialities, but to the manifestations of his psyche*. Every temperament has both positive and negative features which can only be assessed by correlating the type of the nervous system with the corresponding properties of temperament in terms of their significance for man's activity.

Strong and Weak Types in Activity. Special investigations have showed that the weakness of the nervous system is indicative not only of the low strength of the processes of excitation and inhibition, but also of the high sensitivity or reactivity of the individual. It means that the weak type of the nervous system has its own specific advantages. The characteristic features of this type, its potentialities are brought out in many experiments and clearly reveal themselves in everyday life.

In one experiment a group of pupils whose type of the nervous system had been determined beforehand, were asked to do simple sums during the whole lesson. It turned out that the pupils having a weak nervous system did more sums at the initial stages than the pupils having a strong nervous system owing to a greater responsiveness or reactivity to the environment, but they got tired quicker; by contrast, the pupils whose temperament was determined by a strong nervous system required "a shake-down" period, but they could work longer without falling off in efficiency.

In another investigation the experimenters observed the study process of excellent senior pupils whose nervous system strength had been ascertained in laboratory experiments. It turned out that the group included representatives of both the strong and the weak types of the nervous system. Indeed, their manners of working were different in accordance with their temperament. Having divided their independent work in three periods, the preparatory, the executive and the checking ones, the experimenters established that the stronger pupils devoted little time to the preparatory and checking actions (for instance, they corrected and amended their compositions in the process of work), whereas the weaker pupils were notable for lengthy preparation and checking as they introduced most corrections and amendments in the additional self-test period. Another distinction consisted in that the stronger pupils could carry out a number of assignments without special planning and scheduling, whereas the weaker pupils preferred to start a new job only after they have completed the previous one and strove to draw up calendar plans for a day, a week, etc. for long-term assignments. As regards the overall efficiency of work, none of the temperaments could be given preference over others.

It has been found out that in some kinds of monotonous work individuals with a relatively weak nervous system enjoy certain advantages: *their higher sensitivity tends to maintain the needed response level and prevents the onset of drowsiness likely to dull the individual's senses.* On the other hand, in those kinds of activity where an individual has to deal with particularly strong, unexpected or frightening irritants weaker individuals may prove to be unable to cope with current tasks just because of their physiological peculiarities.

Very illustrative are the data obtained in the psychological observation of sports activities. In one particular study the object of interest was the individual distinctions of schoolchildren in the performance at training and in public contests. It was found out that pupils with a stronger nervous system showed higher results in important contests than during training exercises, whereas pupils with a weaker nervous system were notable for higher and more stable achievements at the training stage. This difference in performance is referable to the distinction of their temperaments, i.e., excitability, nervous strength and the effect of greater responsibility and risk.

Hence, individuals with a strong type of the nervous system show better performance in dealing with one kind of problems, and those with a weaker nervous system, in dealing with another kind of problems. Not infrequently individuals differing in the strength of the nervous system have to follow different paths in tackling one and the same task.

Mobile and Inert Types in Activity. The inertness of nervous processes, that is their low mobility consisting in a slow change from one process to another of the opposite valence, as well as their low lability consisting in slow excitation and inhibition may have both negative and positive aspects. On the negative side of inertness is the low rate of nervous processes, on the positive side, their long duration, stability. The corresponding psychological distinctions are mainly referable to the specifics of activity as a process, and not to its efficacy.

Very characteristic in this respect were the distinctions displayed in special experiments by pupils with relatively mobile and inert temperaments at the initial stage of mastering work habits. Investigations showed that the

high rate of fulfilment of various assignments characteristic of mobile pupils went hand in hand with insufficient reliability (omission of some elements of the assignment because of undue haste). Assignments calling for slow movements were carried out better, more uniformly and evenly, by the inert pupils. True, there were some undesirable delays in their work, but on the other hand they did the job very carefully. Most of them made up for their relative slowness with greater attention to the teacher's explanations and to drawings.

Mental Abilities, the Method of Activity and Temperament. Special studies of the possibility of correlation between the level of intellectual abilities and the type of temperament have shown that persons with a high level of intellectual abilities may possess very different temperaments and, conversely, persons with similar temperaments may display very different mental abilities. To be sure, intellectual activity cannot be entirely divorced from temperament, which influences such characteristics as the rate and fluency of mental operations, the stability and lability of attention, the dynamics of the "working" period, the emotional self-regulation in the course of work, the degree of endurable nervous strain and fatigue. However, the features of temperament affecting the manner, the style of activity do not determine the individual's intellectual abilities as such. *The specifics of one or another type of temperament determine the individual's ways and methods of work, but not the level of his achievements. In turn, man's intellectual abilities create the necessary conditions enabling him to compensate for the disadvantages of his temperament.*

A good illustration are the following psychological portraits of two excellent pupils who graduated from the school with a medal.

Arseny is an active and energetic person. He usually takes a great interest in his work and pays no heed to the surrounding people. He can do several jobs simultaneously; complex work and changing circumstances do not weaken his energy. Pavel's activity proceeds in a different manner. It takes him much time to do his home-work as he ponders over any assignment he gets and cannot do without a preparatory stage. Every small obstacle, every unforeseen circumstance becomes with him an object of

prolonged scrutiny. In contrast to Pavel, Arseny who always acts with great vigour needs but a short time for rest. A walk home from school, a brief talk about outside matters and, most importantly, a change of activity are sufficient to restore his strength. As for Pavel, he feels tired at the end of the lessons and needs about two hours of rest before resuming intellectual work.

Very characteristic is the distinction between the youths' attitudes to new material and recapitulation. These distinctions deserve special attention as they clearly show the peculiarities of each individual's mental make-up. Arseny listens to the explanation of new material with tremendous interest. He gets the highest gratification from reading a textbook for the first time; the very difficulty of a new subject is a challenge to his mind which he takes with pleasure; the new envigorates and even excites him. By contrast, recapitulation has little appeal to him and he is inclined to attend to outside matters at review lessons. Pavel's attitudes are entirely different: most of all he likes recapitulation. He accepts new material with interest and is distinguished for thoughtfulness and intellectual curiosity, but he finds it tiresome to follow the teacher's lengthy explanations and is in need of occasional relaxation. Besides, he requires some time to let new material sink home and is rather slow on the uptake. For this reason he sometimes feels uneasy and anxious when trying to grasp the teacher's explanations. A review lesson completely transforms him: he has already got used to the material under survey, knows the basic facts and the conceptual approach, and may surprise listeners with his confidence, precision and maturity of statements.

Arseny and Pavel are also very different from one another by their emotions: the former easily gets angry, whereas the latter is prone to enthusiasm and admiration.

The life histories of the youths and the materials of observation provide sufficient grounds for a conclusion regarding their temperaments. To all appearances, Arseny's nervous system approximates to the strong unbalanced type and he is notable for choleric traits. By contrast, Pavel gravitates towards a weaker type displaying certain features of the melancholic temperament. Significantly, the weakness of the nervous system did not prevent him from becoming one of the best pupils and developing his

intellectual abilities to a high level. In the final count Arseny's superiority over Pavel is relative. Of course, the promptness of reactions and an ability to change easily to a new intellectual task is an extremely valuable quality. However, Arseny throws in, as it were, all his mental powers at once whereas Pavel, groping his way and moving forward slowly and uncertainly (and sometimes bogging down in particulars), is capable of penetrating deeper and deeper into the subject with all its intricacies and grasping ever more details. On the side of quantity, Pavel's intellectual work is characterised by low efficiency, yet on the qualitative side his performance is not inferior to Arseny's. Indeed, Pavel's very difficulty over forming his thoughts which is referable to the specific features of his nervous activity turns into a prerequisite for profoundness.

Such properties of temperament as the level of activeness and the level of mobility may have very different effects on the efficacy of studies. Everything depends on how the individual uses these or those dynamic qualities. For instance, low mental activeness is not infrequently offset by high accuracy and thoroughness. Usually temperamental features of an individual prompt him the best methods of study and determine his style of work. There is no doubt that every type of temperament has its own advantages and opens its own roads to success in studies.

Professional Requirements and Temperament. In some specific fields, however, the properties of temperament affect not only the course of activity, but also its final results. In relation to such fields one can speak of more favourable and less favourable dynamic characteristics of the mind. In those spheres where the rate or intensity of actions are of crucial importance, mental dynamic qualities may become an important factor determining the individual's fitness for work. Indeed, some professions require high dynamic characteristics which necessitate a preliminary selection of candidates. For instance, an individual wishing to become a test pilot, a traffic controller or, say, an acrobat must possess a mobile and strong nervous system. Emotional excitability as a temperamental feature is needed by actors and musicians.

In most occupations, however, temperamental features

affecting the dynamics of the process of activity do not influence its final efficacy. Disadvantages of a given type of temperament may be compensated for by the individual's great interest in his activity, high level of preparation and volitional efforts.

It is common knowledge that in every sphere of creative work, such as science, technology, and art, outstanding successes are achieved by representatives of different types of temperament. The creative personality is always characterised by the individuation of work methods, i.e., by the conscious and sometimes involuntary use of such individual routines and techniques which are best suited to individual temperament.

Individual Style of Activity. Temperament manifests itself, first and foremost, in the specificity of work methods and not in the efficacy of performance. Very instructive in this respect are the results that were obtained in the observation of female weavers' work. It was established that high results in the operation of several looms could be achieved by weavers with both the mobile and inert types of the nervous system (the properties of the weavers' nervous processes were assessed in laboratory experiments). The experimenters revealed that persons with opposite mobility characteristics resort to different tactics in similar labour situations. Thus *mobile* weavers are better at performing urgent operations such as, for instance, correcting a thread break, but only when the fault has already arisen, whereas *inert* ones are more clever on the preparatory stage thereby ruling out the need for urgent actions. Outstanding production results are achieved by those weavers whose methods and style of work correspond to their individual features. Hence, temperament determines the *individual style of activity*.

The findings of the psychologists who have specially concerned themselves with the problem of individual styles show that they do not evolve spontaneously. A style is formed and improved only if the individual actively seeks ways and means for achieving better results in accordance with his temperament. The individual style of activity is a very characteristic quality of foremost workers, outstanding sportsmen, excellent pupils.

Significantly, in joint activity, particularly when a job is being done by two persons, the dynamic features of

their temperament exert a greater influence on the final result of their activity than in those cases when every individual works separately. What is more, joint activity reveals more favourable and less favourable combinations of different types of temperament for a given set of conditions. Thus the activity of a choleric individual proves more effective in those cases when he works together with a phlegmatic or melancholic person than when his partner is a sanguinic or, worse still, a choleric type. Such facts show that the importance of a certain feature of temperament can only be assessed correctly if due regard is taken of their role in joint activity.

The individual starts gaining mastery of his temperament in childhood and learns to compensate for its negative features and develop his individual style of activity in the process of training and education.

V.13.4. Temperament and Problems of Education

Activeness, Emotionality and Motility as Temperamental Features. The individual approach to children based on their psychological traits must take due account of their temperamental distinctions. A short-term contact with a child can only provide fragmentary, more or less vivid impressions of the dynamic side of his psyche which are not sufficient for correct assessment of his temperament. In order to distinguish a pupil's casual manners and habits from basic features of his temperament, the teacher must know the conditions of his development and be able to compare his behaviour and activity under different circumstances. A comparative study of pupils under similar conditions is an important method of establishing the dynamic manifestations of their psyche.

In order to rate a pupil with one or another type of temperament, the teacher should first of all assess his activeness, emotionality and motility.

1. *Activeness.* This feature is evaluated by the strength of the child's urge (thrust) towards the new, by the intensity of his desire to change the environment and overcome obstacles.

2. *Emotionality.* This feature is evaluated by the child's sensitivity to emotional influence, by his inclination to find a cause for an emotional reaction. Very indicative is the motivational power of emotions and the rate of change from one emotional state to another.

3. *Motility.* The specificity of the child's motility shows in the rate, abruptness, rhythm, amplitude and a number of other features of muscular movements (some of them also characterise the vocal motorics). These manifestations of temperament are easier to observe and assess than others.

One should bear in mind that there exist developmental specifics of temperament: in each period of childhood activeness, emotionality and motility are manifested differently. Thus in the junior school age activeness is characterised by the easy arousal of interest, high sensitivity to any external irritants and insufficient capacity for durable concentration of attention which features are referable to a relative weakness and excessive sensitivity of the child's nervous system. To be sure, the emotionality and motility of a junior pupil are very different from these features in an adolescent, not to speak of a youth. The temperamental features of the child should not be divorced from his age as they are always manifested against the developmental background.

Temperamental Features and Education. Each type of temperament can manifest itself in both positive and negative psychological traits. The energy and drive of a choleric person, provided they are directed towards worthy goals, may be valuable qualities, but his emotional and motile imbalance coupled with poor upbringing may express itself in the lack of restraint, rudeness and constant tendency to outbreaks of anger. The vivacity and responsiveness of a sanguinic person are his important advantages, but in the absence of proper education they are likely to lead to a lack of concentration, perfunctoriness and loss of purpose. The quietness, self-control and thoroughness of a phlegmatic person are valuable qualities, but under unfavourable conditions they can turn him into a listless, inert and dull individual. Again, the depth and stability of feelings, the emotional sensitivity of a melancholic person may stand him in good stead, but with lack of a proper educational influence these

valuable qualities may evolve into excessive shyness and give rise to a tendency to withdraw into a world of subjective experiences.

Thus the basic properties of temperament do not pre-determine personality traits and do not evolve by themselves into the individual's good or bad qualities. The educator's task therefore consists not in trying to change one type of temperament into another (such attempts are doomed to failure anyway), but in *fostering the advantages of every type of temperament and simultaneously in helping his pupils to neutralise their disadvantages.*

One should be careful not to ascribe to temperament the results of ill breeding. For instance, the lack of restraint and self-control in behaviour need not necessarily attest to choleric temperament—it may be a result of poor education. Again, the ease with which a person changes his interests and passions, his lack of restraint, indifference to the surrounding people, undue shyness and other negative features inherent in children (and also in adults) may derive not from temperament, but from negative influences: excessive petting and indulgence in some cases, undue rigours and suppression of the slightest attempt at independence, in others. A child within the walls of the school may seem timid, almost helpless, giving an entirely false impression of being an extreme representative of the melancholic type. In fact, however, his behaviour may be a result of his falling behind the class in studies or failing to strike the right key with the collective.

The Individual Approach and Type of Temperament. All that has been said above does not mean that temperamental distinctions may be disregarded. The knowledge of children's temperaments gives the pedagogue a better insight into the peculiarities of his behaviour and enables him to vary the methods of his educational influence.

Special experiments designed to ascertain the effect of low marks on pupils' performance have demonstrated that children with equal interest in studies, but with different types of temperament responded to them differently: those with a strong nervous system were braced up, and those with a weak nervous system were discouraged, lost their self-confidence and became confused and frustrated. Clearly, such different reactions on the part of pupils call for different tactics on the part of the pedagogue.

Teachers know only too well that any change in the school time-table or sequence of lessons hampers the normal work of the class. Some pupils take such changes as a matter of course, whereas others find it difficult to readapt themselves to a new situation. In explaining these facts due account should be taken, besides other factors, of temperamental distinctions. Children with a certain degree of inertness cannot engage in new activity at short notice, it is difficult for them to pass from one topic to another even within the limits of one and the same subject (for instance, to change from listening to the teacher's explanations to writing, etc.). On the other hand, frequent changes from one type of activity to another may often keep highly mobile children in the working mood throughout the lesson.

As a rule, children with choleric and melancholic temperaments call for teachers' special attention: the former must be constantly prevented from violent reactions, taught to restrain themselves and control their actions, trained to work more quietly and steadily, whereas the latter should be reassured, solaced, encouraged and spurred to overcome obstacles. Children with a weak nervous system need a rigid daily routine and a measured pace of work.

A good system of education can develop strong will even in a person with a weak nervous system; conversely, "hot-house" education may devitalise a person with a strong nervous system sapping his energy and undermining self-confidence. Not every choleric person is resolute in his actions and not every sanguine person is responsive. Such qualities are to be developed on the basis of self-control and self-education.

A growing individual must gradually learn to control consciously his behaviour and activity. Individuals with different types of temperament do so differently: a choleric person finds it easier to learn acting promptly and energetically than a person with phlegmatic temperament, whereas the latter has an advantage over the former in developing self-control and coolness. Temperamental distinctions require that in order to develop the necessary mental qualities in his pupils the pedagogue should use different methods with different children.

Characteristically, temperamental features may show differently in different fields (for instance, within the

walls of the school and at home); certain manifestations of temperament may be limited and channelled in a certain direction under the effects of sets and habits being cultivated. In other words, temperament tells on behavioural patterns, but does not predetermine them: of primary importance is the educational influence and the entire system of the growing man's attitudes to the environment.

Temperamental features, i.e., characteristics of the mind's dynamic system are but one of the prerequisites for the development of those crucial qualities that make man's *character*.

Chapter 14

CHARACTER

V.14.1. Concept of Character

Definition. Deriving from Greek where it meant "engraving" and "sign", the term "character" indeed denotes characteristic signs acquired by social man. Just like the individuality of a person manifests itself in the specifics of mental processes (good memory, fertile imagination, quick-wittedness, etc.) and in temperamental features, it also shows in the traits of man's character.

Character can be defined as the sum total of a person's stable individual properties arising and revealing themselves in activity and communication and determining his typical forms of behaviour.

Man's personality is characterised not only by what he does, but also by how he does it. Proceeding from common interests and convictions, aspiring in life for common goals, people may display in their social behaviour and actions very different, sometimes opposite individual traits. They may experience the same difficulties, perform their duties with equal success, like or dislike the same things—and yet be soft and yielding or hard and intolerant, merry or sad, self-confident or timid, accommodating or difficult to deal with. Critical remarks similar in meaning and addressed to pupils are always made mildly, politely and good-naturedly by some pedagogues and rudely and unceremoniously by others. Such ingrained individual traits are typically even more conspicuous in people holding opposite views on life and having different interests, cultural levels and moral principles.

Individual qualities forming man's character relate, first and foremost, to *will* (for instance, resoluteness or indecision, timorousness) and to *feelings* (for instance, cheerfulness or depression), and, in some measure, to

intelligence (for instance, flippancy or thoughtfulness). However, character manifestations are *complex formations* and often do not lend themselves to classification in terms of volitional, emotional or intellectual qualities (for instance, such traits as suspiciousness, magnanimity, generosity, rancour, and others can hardly be included under any of these three heads).

Character and Social Groups. The individual's character is formed in different social groups with different levels of development (in the family, in a company of friends, in a labour or study collective, in an asocial association, etc.). Depending on the individuation of the personality in a reference group and the level of interpersonal relations in it the individual, for instance, a teenager, may develop in one case openness, straightforwardness, courage and firmness, and in another, secretiveness, mendacity, cowardice, conformity and flabbiness. The collective as a group with a high level of development creates the most favourable conditions for the development and consolidation of the best human qualities. This process is conducive to the optimal integration of the personality with the collective and to the further development of the collective itself.

Knowing the individual's character, one can *prédicit* his behaviour under a certain set of conditions and, consequently, guide his actions. Thus a pedagogue charging pupils with social assignments takes into account not only their knowledge and skills, but also their characters. One pupil, for instance, is persistent and industrious, but somewhat slow and overcareful. Another one is energetic and takes the common cause close to heart, but intolerant of opinions even slightly different from his own and therefore likely to be unduly gruff and even rude. Relying on valuable traits of the pupil's character, the pedagogue seeks to consolidate and strengthen them, and to weaken or at least offset the negative ones by developing other socially useful qualities.

The knowledge by the pedagogue of the character and temperament of every child is an important prerequisite for an *individual approach* so important in teaching and education.

V.14.2. Character Structure

Interrelation of Character Traits. Man's character is always multidimensional. Its individual *qualities* or *traits* which can be singled out do not exist in isolation from one another, but make a unitary whole representing a more or less *integral structure*.

The character structure reveals itself in the regular interdependence of its individual traits. If a person is cowardly, there is reason to believe that he lacks initiative (fearing an unfavourable reaction to the proposal or action initiated by him), resoluteness and independence (since decision-making implies personal responsibility), selflessness and generosity (helping others may put him in jeopardy). At the same time a cowardly individual may be expected to display humbleness and servility to the stronger, conformity (for fear of seeming a *rara avis*), avidity (in order to ensure himself against material difficulties in future), readiness to treachery (at least under extreme circumstances threatening his safety), suspiciousness and distrustfulness, etc. To be sure, not every individual whose character is dominated by cowardice will exhibit all these qualities. In different life situations the structure of one's character may be essentially transformed and even include qualities seemingly incompatible with the dominant trait (for instance, cowardice may go hand in hand with impudence). However, a cowardly person is bound to show a general trend towards the stereotype just outlined.

Among numerous individual traits some pose as the leading qualities determining general personality "orientation", the directionality of the individual's character. They exist side by side with secondary qualities which may sometimes be in accord, and sometimes at variance with the main ones. In real life one can meet with people having predominantly unidimensional (*integral*) or multidimensional (*contradictory*) characters. The former can be classified into definite types possessing certain common characteristics. The integrality of one's character does not completely rule out its contradictoriness: kindness often comes in conflict with principledness, the sense of humour with responsibility.

Character traits cannot be identified with convictions,

life views and other features of personality orientation. One good-natured and cheery fellow may be highly moral and decent, whereas another one, also good-natured and cheery, may be a petty operator concerned only with his own welfare and not fastidious about means to achieve his goals.

However, some character traits are determined by general personality orientation. Thus certain qualities may be compatible with definite moral principles and convictions or even necessarily accompany them. In other cases they may run counter to the views, morals and principles prevalent in a given environment. Such is the case, for instance, with *honesty*, an important, actually leading, character trait.

Not infrequently we hear stories of exceptional honesty of one or another individual, as, for instance, the story of a taxi driver who has discovered a handbag with a large sum of money on the back seat of his car, found the woman who had left it and returned it to her. Such manifestations of honesty usually evoke people's respect, but do not strike them as something out of the ordinary. Yet we may also encounter individuals who are genuinely amazed at such acts and even ridicule them. **Character Traits and the Individual's Attitudes.** Character manifesting itself in the subject's actions and deeds, in the activeness of his participation in joint activity depends on the content of activity and on the subject's success in overcoming difficulties, on his immediate and long-range prospects for the attainment of vital goals.

Of special importance for character is the individual's attitude (based on the traits that have formed earlier) to certain objects, events and phenomena, such as his successes and failures, or public opinion. Thus pupils studying in one and the same class or members of a work collective of similar status develop different character traits depending on how they cope with their tasks. Some are inspired by success and begin to work or study even better, others tend to rest on their laurels, some are discouraged by a failure, others are spurred on to activity.

Hence, the formation of one's character largely depends on the *individual's attitudes to the environment*

and to himself as other. These attitudes serve as a basis for classification of principal character traits.

Character shows, firstly, in the individual's *attitude to other people*: his relatives and friends, colleagues and classmates, acquaintances and strangers, and so on. It manifests itself in stable or unstable attachments, adherence to principle or unscrupulousness, sociability or reserve, truthfulness or mendacity, tactfulness or rudeness, and cannot be revealed and understood outside the collective. It is only in the collective, in the process of everyday communication with other people that the individual can display such character traits as broadmindedness or pettiness, belligerence or complaisance, peaceful or quarrelsome disposition.

Secondly, character manifests itself in the individual's *attitude to himself*, that is in pride and self-respect or humility and diffidence. Some people are notable for selfishness and egocentricity (regarding everything in its relation to oneself), others, for subordination of their own interests to those of the collective.

Thirdly, character reveals itself in the individual's *attitude to business*. Thus among the most valuable character traits are such qualities as conscientiousness and business efficiency, seriousness, enthusiasm, the sense of responsibility and commitment. Some individuals, however, display such traits as self-seeking, lightmindedness and formalism.

Fourthly, character reveals itself in the individual's *attitude to things*: not only to public property, but to his own personal belongings, clothes, footwear, books, etc. **Character as Man's "Programme of Behaviour"**. Man's activity, his behaviour are determined, first and foremost, by those goals which he sets himself. The main determinant of his behaviour and activity always remains his *personality's orientation*, that is the sum total of his interests, ideals and convictions. However, two individuals with very similar personality orientations and with identical goals may be essentially different in the ways they choose for attainment of their goals. These differences are referable to character traits. The individual's character contains, as it were, a programme of his typical behaviour under typical circumstances. "Knowing T's character,"

says a pedagogue about his pupil, "I am confident that he will not restrain himself, say a lot of unnecessary things, will probably be rude and unjust and then regret his behaviour walking about repentant and disconsolate for several days, and will finally do everything possible to redress the wrong." Character traits thus possess a certain motive force which reveals itself to the full extent in stressful situations when the individual has to make a decision under an emotional strain in the face of considerable difficulties.

An individual with a determined character often passes from inducement to action without any appreciable struggle of motives. Tactfulness as a character trait accounts for an individual's reticence in communication with other people and causes him to take into consideration a number of circumstances and problems which might be essential to them.

Achievement motivation, too, can be regarded as a character trait; it consists in the subject's need to reach success in various types of activity, especially in competition with other people. This trait is formed in the process of the child's upbringing as a result of regular and personally significant praise for successes and punishment for failures.

According to *David McClelland*, one of the first researchers of this characterological trait, achievement motivation is formed in the preschool age, yet this assertion does not seem to consort with facts of everyday life showing that the evolvment of this and other personality traits is not limited to early childhood. Depending on the history of development of a given individual as a personality, his predominant orientation may be either towards *achieving success* (in which case the individual will take chances, seize at any opportunity to display initiative and competitive activeness, etc.), or towards *avoiding failure* (in which case he will shun risk and responsibility, refrain from displaying initiative, tend to manoeuvre into a position of non-interference in an indeterminate situation, etc.). Achievement motivation identified in a person with the help of special techniques points to a definite behaviour programme and makes it possible to predict the individual's course of actions under typical circumstances.

Accentuation of Character Traits. The number of character traits identified by human experience and registered in language is very large and in any case tops one thousand names. It is therefore not feasible to list and describe all of them, the more so as psychology has not evolved a comprehensive classification table for character traits and contents itself with linking them to one of the above-indicated personality attitudes. The variformity of character traits shows not only in their qualitative diversity and originality, but also in quantitative measure. Indeed, individuals may be more or less suspicious, more or less generous, more or less frank. When the quantitative measure of one or another character trait reaches limit values and approximates the norm border, we speak of the so-called *character accentuation*.

Character accentuations are extreme variants of the norm as a result of exaggeration of certain personality traits. They manifest themselves in selective vulnerability of an individual to certain types of psychogenic stress against the background of emotional stability under other types of stress. The weak link in the individual's character often reveals itself in difficult situations which make particularly high demands on its strength. All other adversities which do not directly affect the vulnerable spots in a given individual's character may be sustained by him without overstrain and disruptions and do not cause any trouble to himself or to the surrounding people. Under extremely unfavourable conditions character accentuation may lead to pathological disorders and changes of personality behaviour, i.e. to *psychopathy* (character pathology hampering the personality's adequate social adaptation and practically irreversible, though, given proper treatment, amenable to certain modification) which, however, should not be viewed as a regular mental disease.

Classification of character accentuations into types involves considerable difficulties and the names of such types vary from researcher to researcher. The authors of this textbook have mainly followed the classifications proposed by *Karl Leonhard* and *Andrei Lichko* whose description of accentuated traits is basically identical and permits selection of apt term from both systems. In doing so, the authors have deliberately attempted to avoid direct

analogies with psychiatric terminology (schizoid traits, epileptic traits, etc.), as the textbook is mainly intended for pedagogues and not psychiatrists, though the problem of accentuation goes back to psychiatry and psychoneurology.

The most important types of character accentuations are as follows:

(1) *intraverted type*, characterised by reticence, aloofness, difficulty in maintaining personal contacts and withdrawal into one's own self;

(2) *extraverted type*, notable for high emotional excitability, thirst for communication and activity, often irrespective of its feasibility and necessity, instability of interests, sometimes boastfulness, perfunctoriness and conformity;

(3) *uncontrollable type*, identified by impulsive behaviour, proneness to conflicts, intolerance of objections and sometimes suspiciousness;

(4) *neurotic type*, characterised in adolescence by frequent indispositions, irritability, undue fatiguability and hypochondria. Annoyance with others and pity for one's own self may lead to transitory bursts of anger, but owing to the rapid exhaustibility of the nervous system anger soon dies down giving way to reconciliation, repentance and tears;

(5) *sensitive type*, distinguished by shyness, reservedness and timidity. Sensitive teenagers avoid large and particularly new companies, do not participate in peers' pranks and risky adventures preferring to play with small children. They are afraid of tests and are often ashamed to answer lessons before the class for fear of being laughed at if they make a mistake or evoking the classmates' envy if their answer is too good. In adolescents the feeling of inferiority accounts for a pronounced reaction of hypercompensation, i.e., a heightened desire to overcome their shortcomings. They seek to assert themselves not in other fields where they can display their abilities, but precisely where they feel their weakness. Girls pretend gaiety, timid and bashful boys put on airs and try to display their energy and willpower. However, if a situation calls for boldness and determination, they immediately give in to difficulties. If one succeeds in winning their confidence and they sense the interlocutor's sympathy and

commiseration, they drop the "devil-may-care" mask and reveal a tender and sensitive soul, unreasonably high demands on one's own self and a life full of self-reproach and self-disparagement. Unexpected concern and solicitude may suddenly change assumed insolence and a show of bravado into a burst of tears;

(6) *demonstrative type*, notable for egocentrism, a pronounced tendency to draw other people's attention and make oneself an object of admiration and sympathy. Mendacity, a tendency to showing off and histrionics (right up to simulated suicide) stem from the desire for exclusiveness, the urge to stand apart from the crowd. For instance, young girl Z., a senior pupil, began to receive anonymous letters containing threats and insinuations. With tears in her eyes she showed these letters to teachers and girl friends begging for help and protection. Investigation soon showed that Z. was writing these letters herself in a bid to attract the whole school's attention, thereby clearly exhibiting the demonstrative character traits.

Proper education may block the manifestation of character accentuations. The pedagogues and parents, knowing the "points of least resistance" in the child's character should protect him against the adverse effects of psychogenic stress. Thus sensitive teenagers are particularly vulnerable to suspicions and accusations which run counter to their self-esteem, normally objective and not exaggerated. Very helpful are educational influences that tend to compensate for sensitive teenagers' timidity, such as drawing them into social activities with a group of class activists where it will be easier for them to overcome touchiness and bashfulness.

V.14.3. Physiological Substratum and Manifestations of Character

Character and Temperament. Character, like temperament, reveals its dependence on the individual's physiological features, primarily on the *type of his nervous system*. Temperamental features leave their mark on character manifestations determining the *dynamic*

peculiarities of their origin and forms. In the final count temperament and character traits merge into a unitary whole determining man's general make-up, the *integral characteristic* of his individuality.

Features of temperament may *assist* or *hamper* the development of definite character traits. A phlegmatic person finds it more difficult to develop initiative and determination than persons with choleric or sanguinic temperament. Overcoming timidity and anxiety is a serious problem for a melancholic person. The collective provides favourable conditions for the formation of character in individuals having different types of temperament as it fosters self-restraint and self-criticism in choleric persons, perseverance in sanguinic persons and activeness in phlegmatic persons.

Natural and Social Prerequisites for the Formation of Character. The nature of character, the possibility to change it and the formation of its traits have been the object of much controversy which has persisted to the present day and often gave rise to categorical statements characteristic of everyday consciousness. An individual attains social maturity after the formation of his character traits. Such formation is not conspicuous and an individual sincerely believes that he has always been what he is now. This common belief that character traits are inborn, implanted by nature is widely spread and shows in such common-sense statements as "he is a coward and a scoundrel by nature", "propensity for lie is his innate quality" or even "that is his hereditary quality—he has taken after his uncle". Indeed, it is not uncommon that two brothers who are brought up in the same family and apparently under the same conditions, who study in the same school and are treated by parents in a practically the same way turn out to possess entirely different character traits thereby lending plausibility to the opinion of the inborn nature of character traits.

How does science account for the fact that life "coins" men's personalities after different models despite similar environments? It must be admitted, first of all, that the "source material" is indeed different with different people.

Man is born with one or another type of higher nervous activity characterised by different functional features

of the brain. These features are not psychological, but physiological by nature, yet they account for the fact that similar influences on children may produce different psychological results. These features determine conditions for the development of the psyche and consciousness representing but the *first* cause of people's characterological distinctions.

One should also bear in mind that "similar conditions" is a very loose notion, even with regard to one and the same family. Indeed, the very fact that the elder brother is used to regard himself as a senior and in some way superior to his younger brother who looks to him for protection or rebels against the firstling's despotic ways creates very dissimilar psychological environments conducive to or militating against the formation of such character traits as arrogance or considerateness, responsibility or indifference, selflessness or envy.

There also exist many other influences in the family which act differently on the brothers. A change in the family's material conditions that may take place during the two or three years between the births of the first and the second child (not infrequently parents are more indulgent towards their junior), changes in the relations between family members, good friends that may come in the way of one brother and bypass the other, difference in the pedagogical talents of their teachers—all these factors tend to form different mental qualities and personality traits in the two individuals.

Even a minor error in basic data used for plotting a spaceship's orbit (direction, initial velocity, etc.) will have fateful consequences—the ship will never reach its destination. So it is with man. An inessential omission in a child's education may reveal itself on the adult's steep ascent to his life orbit in the form of such character traits which will veer him off the course and spoil not only his own, but also his people's lives.

Character is largely a result of self-education. It accumulates the individual's habits. Character manifests itself and is moulded in activity. If a youth or a girl wants to develop such a character trait as self-criticism, they ought to act accordingly. It means that they must be intolerant not only of other people's, but also of their own drawbacks, that is to keep their eyes open and not to slur

over their errors. If we may borrow Soviet psychologist P. P. Blonsky's summary: "One can learn to live only by living accordingly."

Everyday life, relations among family members, not to speak of labour and study, are a school of human characters. Pedagogues and parents are constantly faced with a crucial task: to notice in due time the changes which begin to show in children's characters and take them into account in their behaviour and strategy of education. There is hardly a more serious error in upbringing than reliance upon stereotypes in pedagogical practice. Stereotypes are particularly harmful in those cases when a child needs an individual approach.

In engineer Z.'s family the second child, a boy, was born when his sister was 12 years old. The girl was brought up in an atmosphere of absolute obedience to the parents and had never attempted to balk—not that there was any reason to do so, as the parents' demands were quite sensible. However, the form in which they were made was notable for sternness, severity and intolerance of any objections. The same attitude was adopted by the parents in relation to their son. However, soon it became obvious that what was accepted by the daughter with resignation met with tacit but stubborn resistance on the part of the son. It was indeed difficult to trace the beginning of this attitude to some definite event in the life of the family—the parents themselves dated it from his visit to the grandmother—but the stubborn struggle wearing out both sides started in his early school years. The boy became reticent, rude and suspicious. In the sixth form he ran away from home for the first time, and in the eighth form he ran away for the second time never to come back. In a talk with the psychologist the bewildered parents invoked the example of their daughter: "Here is his sister, you may ask her. Have we treated her differently? No, in the same way, but look what a person she is. We are already nursing our grandchildren. As to him, he brought disgrace upon us!"

"Treated him in the same way!" It was really so in terms of *goals* and *content* of the children's upbringing, and in this respect the parents were irreproachable. Yet the thoughtless application of educational methods which may have been in accord with the daughter's character, in

the upbringing of their son who had an entirely different character was bound to lead to a conflict. The family drama could have been avoided if the parents had made an assessment of their son's character and tried to fit a key to it.

Similar pedagogic techniques may bring about opposite results, if they are applied to people with different individual traits. It is an axiom in educational work.

In order to avoid stereotypes in the formation of a child's personality, it is necessary to adopt a creative approach to the moulding of his character. This may be a thorny path, but a judicious, considered and ingenious solution will always be more fruitful than a pedagogical cliché if one judges its effects not by the results of individual actions ("we've got the child to do this or that"), but by the outcome of the character-moulding process.

Character is not something an individual gets from nature. There is no character which cannot be changed and restructured. All attempts to plead character in excuse of one or another kind of conduct are completely untenable from the psychological viewpoint. Every individual is responsible for all manifestations of his character and every individual is capable of improving it by *self-education*.

If there are no grounds for linking character traits to natural, physiological predispositions (though one must take into account natural prerequisites for character moulding, particularly the type of higher nervous activity, that manifest themselves in temperament), we have even less grounds for asserting their hereditary origin.

Studies of monozygotic twins with identical genetic funds of anatomic and physiological properties have shown complete identity of their temperaments, but not characters. If monozygotic twins are brought up in different families, their characters prove *different*.

Fanciful reports circulated by the mass media about identical tastes, inclinations and character traits allegedly developing in monozygotic twins irrespective of their environmental conditions are nothing else than deliberate falsifications on the part of some psychologists, such as British researcher S. Bert, who went out of his way to prove the biological nature of man's personality. The facts show that different conditions and circumstances

tend to foster not only different, but antipodic character traits despite the identical hereditary base.

Character is thus a life-time gain of a person who, by getting involved in the system of social relations, in joint activity and communication with other people moulds his own individuality.

Chapter 15

ABILITIES

V.15.1. Concept of Abilities

The answers of two pupils at a lesson are approximately the same. Yet the teacher's attitude to them is different: he praises one pupil and is dissatisfied with the other. "They have different abilities," he explains. "The second pupil could have given much better answers." Now, two schoolleavers take entrance examination at a university. One of them passes, the other fails. Does it attest to the former's better abilities? This question cannot be answered until after we find out how much time each of them spent for preparation. Success in the acquisition of knowledge alone is not a sign of abilities.

Abilities come out as the individual's psychological features which enable him to acquire specific knowledge, skills and habits but which cannot be reduced to such knowledge, skills and habits. If it were not so, the mark received by an individual at the examination, a pupil's answer at the blackboard or his test performance would enable the examiner or investigator to give a final verdict on his abilities. In fact, psychological investigations and pedagogic experience show that sometimes a person initially inept and inferior in some kind of activity to others, rapidly begins to master the corresponding skills and habits and soon overtakes all his mates. He displays greater abilities than the others. Showing in the assimilation of knowledge, skills and habits, abilities do not boil down to them, they are not identical with actual knowledge, skills and habits, but come out as their *potentialities*.

Just as the seed is a potentiality in relation to an ear which may grow from it only on condition that the structure, composition and humidity of the soil, the weather, etc. prove favourable, so man's abilities are potentialities

in relation to real knowledge and skills. The actual acquisition of knowledge and skills, the translation of possibility into reality, depends on a multitude of conditions: the interest of the surrounding people (the family, the school, the labour collective) in the individual's mastery of the particular knowledge and skills, the efficacy of the teaching process, the organisation of the labour activity in which these skills and habits will be needed and will become consolidated, etc.

Abilities are a *possibility*, and the required level of skill in one or another field is *reality*. An aptitude for music displayed by a child is not by any means a guarantee that he will be a musician. This possibility can only be translated into reality if the child receives special education, if he and the pedagogue are persistent, if the child's health is good, if he has a musical instrument and the necessary scores, and if there are many other conditions without which his abilities may waste away in embryo.

Psychology *denying the identity* of abilities with such essential components of activity as knowledge, habits and skills underscores their *unity*. *Abilities can only reveal themselves in specific activity which is impossible without them*. Indeed, one can hardly speak of a person's ability to draw if he has not acquired any habits in this fine art. The ability in question can only be ascertained in the process of study: it shows in the ease and speed with which the pupil masters the methods of work, gets a feeling for combination of colours and learns to discern beauty in the surrounding world.

If a pedagogue asserts the absence of abilities in a given schoolboy merely on the grounds that the child lacks the necessary system of skills, habits and methods of work and that his knowledge is not sound, he surely jumps to conclusions and makes a psychological blunder. History knows many examples of talented individuals whose abilities were not recognised by the surrounding people in childhood, but later brought them world fame. Suffice it to mention Albert Einstein who ranked as a mediocre pupil in the secondary school and no one discerned in him any signs of a genius.

Abilities, we recall, reveal themselves not in knowledge, skills and habits as such, but in *the dynamic of their acquisition*, i.e. in the individual's comparative efficiency,

his general performance in mastering the essentials of a given kind of activity. This is where the pedagogue gets his criterion for distinguishing between potentiality and actuality, the two sides of a single process of personality development which merge into a unitary whole.

Abilities can thus be defined as personality traits which serve as a premise for successful accomplishment of a given kind of activity and show in the dynamic of the acquisition by an individual of the necessary knowledge, skills and habits. If a definite set of personal qualities meets the demands of activity an individual masters within a reasonable period defined on the basis of pedagogical criteria, we have good grounds to affirm that he has abilities for this activity. Conversely, if another individual, other conditions being equal, fails to comply with the demands of this activity, there is reason to believe that he lacks the corresponding psychological qualities, that is, the necessary abilities. That does not mean, of course, that the person in question is unable to master the necessary skills and knowledge in principle, but only that his tuition will be longer, the teachers will have to work harder, spend more time and achieve less conspicuous results. Nor does it rule out the possibility that the individual's abilities may eventually develop.

Abilities as individual psychological features must not be contrasted to other personality qualities, that is, properties of the individual's intellect, memory, the traits of his character, emotions, etc., but should be considered together as a single set. If one or several of these qualities meet the requirements of a given kind of activity or are formed under the influence of these requirements, we have every reason to regard a given psychological property as an ability.

V.15.2. Qualitative and Quantitative Aspects of Abilities

A person's abilities are his individual features whereby he is distinguished from another person.

"From each according to his abilities, to each according to his work"—the first part of the formula defines the

measure of socialist society's expectations of every citizen and, at the same time, implies that people cannot be expected to produce similar results as their abilities are different.

In order to characterise this difference in more detail, we may compare abilities in terms of their *qualitative* and *quantitative* characteristics. Indeed, it is equally important for the pedagogue to know both *the kind of activity* for which the pupil has a talent, i.e. the psychological traits as an indispensable condition for its good performance (the qualitative aspect of abilities), and *the degree* to which he can meet the requirements of this specific activity, i.e. his advantages over other pupils in terms of speed and ease of learning the necessary habits and skills, or depth of penetration into the subject (the quantitative aspect).

Qualitative Characteristics of Abilities. Viewed on the side of their qualitative characteristics, abilities come out as a complex set of psychological properties, enabling an individual to achieve success in some specific activity by using different methods in order to attain the same desired goals.

Nikolai B., a 9th-form youth leader, characterised by the teachers as a person of outstanding organisational abilities, is notable for initiative, power of perception, ingenuity, tactfulness, sense of fellowship and consideration combined with exactingness, high sense of responsibility, personal charm, interest in people and a capacity for correct assessment of their characters, interests and possibilities. His talents not only exceed the aptitudes of other organisers, but are essentially different from those of some other youth leaders. Thus Victor D., a pupil of the 8th form in the same school, has a reputation for being an initiator of a number of dubious ventures. He is also an excellent organiser, but of an entirely different type. His talent for organisation derives from a different set of psychological qualities: cruelty, a propensity and ability to play on the weaknesses of every member of his company, enterprise, lust for power, recklessness combined with constant bravado, and so on.

It is highly significant that essentially similar results in one or another kind of activity can be achieved on the basis of a combination of very different abilities. This adds

an important dimension to human abilities: a broad possibility of *compensation* for lacking qualities by other qualities which an individual can purposively develop in himself by hard and persistent labour.

The compensatory potential of human abilities can be illustrated by examples of the education of blind and deaf people.

Soviet pedagogue and psychologist *Ivan Sokolyansky* taught blind-and-deaf Olga Skorokhodova who had lost vision and hearing in early childhood. As a result of tuition, Olga Skorokhodova revealed and developed not only a capacity for academic research, but also a literary talent recognised by Maxim Gorky. The latter corresponded with her and was solicitous for her welfare and future. A correct system of education and persistent efforts enabled Olga Skorokhodova to develop the sensitivity of analysers and attain a high level of tactual, olfactory and vibratory sensations which partly compensated for her lack of other abilities.

Numerous examples show that the absence of such an important musical ability as absolute ear cannot be an obstacle to the development of professional aptitude for music. The testees having no perfect ear succeeded in developing a set of qualities which included timbre hearing, a good memory for musical intervals, etc. and made them capable of pitch distinction, that is, provided a satisfactory substitute for absolute ear.

The compensatory feature allowing man to develop definite qualities by way of substitution for lacking abilities opens practically unlimited possibilities before every individual, expanding the range of his professional options and lifting restrictions towards perfection of professional skill.

On the whole, the qualitative structure of abilities is indicative of the specific kind of labour activity (design, pedagogics, economy, sports, etc.) in which the individual's chances of success are likely to be the highest. Hence, the qualitative aspect of abilities is inseparably linked with the quantitative aspect. Once we have found out what concrete psychological qualities meet the requirements of a given kind of activity, we can ascertain the degree of their development in a given individual as compared with his colleagues or classmates.

Quantitative Characteristics of Abilities. The problem of the *quantitative assessment* of abilities has exercised the minds of psychologists for many decades. As far back as in the late 19th and early 20th centuries, a number of Western psychologists (*R.B. Cattell, L.M. Terman, S. E. Spearman* and others), responding to the need for selection of candidates for mass professions, came out with a proposal to determine the level of the trainees' abilities, that is to rate personalities in terms of their fitness to perform one or another kind of labour activity, to study in universities and colleges, and to hold key posts in industry, the armed forces and social life.

Under the conditions of bourgeois society, the problem of personality measurement has acquired a *dual character* from the very outset. On the one hand, such measurement was aimed at an objective assessment of the real possibilities of a working man and his real fitness for concrete labour activity, without which it was indeed difficult to find a suitable job for him (*professional orientation*) and to select people who would be best suited for a given job (*professional selection*). It was a progressive aspect of the idea of quantitative measurement of personal abilities and an advance on the previous approach when the human factor, i.e. the real individual and his abilities were not taken into account. On the other hand, having arisen in the conditions of capitalist society, this idea was used by bourgeois scientists for psychological justification of the privileged position of representatives of the ruling classes who indeed exhibited a higher level of abilities in specially designed test set-ups. This reactionary tendency in the practical application of personality measurement made the idea in question an instrument of social oppression and discrimination.

The idea of personality measurement assumed the form of *intelligence tests* which carry back to the beginning of the 20th century. These tests are used in a number of countries (the USA, Great Britain, and others) to rate schoolchildren according to their abilities, to fill the officer posts in the armed forces and key positions in industry, and so on. In Great Britain, for instance, the results of intelligence tests provide the basis for selection of pupils for the so-called grammar schools, which are the stepping stone to the university.

On the side of the content, an intelligence test consists of a series of questions or tasks administered to testees; their performance is assessed on a rating scale by the total score, account being taken of the time they needed to prepare the answer. This is how a test of this kind designed to reveal the level of brightness of eleven-year-old children is carried out in an English school. A testee is asked: "Which is the tallest, if Peter is taller than James and Edward is shorter than Peter?" and offered to underline the necessary answer: "1. Peter; 2. Edward; 3. James; 4. I cannot tell". In another test the testee should select one word out of five which is the most dissimilar to all others: "red, green, blue, wet, yellow"; "or, but, if, now, though", and so on. Usually tests are combined in a battery in order of ascending difficulty. Besides verbal assignments, they may also include various "labyrinths", "puzzles", etc.

After the children are through with the whole battery of tests, their answers are assessed by the standard method, that is, by counting the number of points each of them has scored. This technique makes it possible to determine the so-called intelligence quotient (IQ) of every child on the basis of a certain assumption, for instance, that the statistical average score of children aged eleven and a half should approximate 120 or, put another way, that every child who has scored 120 has a mental age of eleven and a half. The intelligence quotient is obtained by dividing the mental age by the chronological age and multiplying by 100:

$$IQ = \frac{MA \times 100}{CA}$$

If, for instance, two children, ten and a half and fourteen years old, get the same score (120) and, consequently, are found to be of the same mental age of eleven and a half, their intelligence quotients will be as follows:

$$IQ \text{ of the first child} = \frac{11.5 \times 100}{10.5} = 109.5;$$

$$IQ \text{ of the second child} = \frac{11.5 \times 100}{14} = 82.1.$$

According to bourgeois psychologists, the intelligence quotient is the quantitative index of abilities or, more precisely, of some invariable and universal mental endowment (general intelligence).

However, scientific psychological analysis shows that the intelligence quotient is nothing but a function. In reality, the procedures described above *cannot bring out man's intelligence and reveal only his store of knowledge and proficiency (skills and habits) in one or another field* which, as has been stressed earlier, should not be confused with abilities. *The tests completely leave out of account the dynamic aspects of the acquisition of knowledge and habits, i.e. the essence of abilities.* Besides, it is quite obvious that the best results are shown by pupils who have been specially trained by teachers, coaches or parents, that is, by those who come from wealthy families. Hence, psychologically unfounded intelligence tests become an instrument of social discrimination in the hands of the ruling classes of capitalist society (it is very significant that English grammar schools are mainly filled up with pupils coming from privileged strata).

All that, of course, does not mean that the quantitative assessment and measurement of an individual's abilities are impossible and that various diagnostic procedures, tests and checks are of no practical value. The problem of measuring the level of abilities remains as topical as ever when it is necessary to identify children who are not capable of studying in the normal school owing to congenital developmental defects of the brain or on the contrary, those who possess a talent for mathematics and should go to a special school, when selecting future pilots and cosmonauts, and so on. In such cases no objections can be raised either to the brevity of the tests, or to attempts at expressing their results in quantitative terms. What is objectionable is the excessive claims of the advocates of intelligence measuring techniques. Tests aimed at quantitative assessment of man's abilities could only be validated if they acquired a scientific character and, first and foremost, if the investigators were really concerned with *abilities* and not knowledge, habits and skills.

Criticising the unwarrantable use of intelligence tests, outstanding Soviet psychologist *Lev Vygotsky* pointed out that a child's failure to solve one or another problem is by

no means indicative of the level of his abilities; it may only attest, for instance, to the absence of appropriate knowledge and skills. The mental development of a child is not a spontaneous process, it is a result of teaching, i.e. constant communication with the adults. What a child is still unable to do independently, he can do with the help of an adult. Hence, he can do independently tomorrow what he cannot do today. Proceeding from this consideration, *Vygotsky* proposed that the investigator should base his conclusion not on one, but on *two* tests, the first revealing the child's independent performance, and the second, his performance with the help of an adult. The general assessment of the child's abilities should be based, in his opinion, not on the child's independent solution of a test problem, but on *the difference between his independent performance and the performance with the adult's cues.* The level of the child's abilities should be assessed as inadequate only if he fails to solve a problem his age mates cope with either independently or when assisted by adults. This ability assessment technique was designated by *Vygotsky* as a method of determining *the nearest zone of development.*

Abilities do not exist apart from the individual's specific activity and are shaped in the process of teaching and education. Hence, *the best way of ascertaining the child's abilities is to reveal the dynamic of his successes in the process of teaching.* One can correctly assess a child's abilities not only by his progress in the acquisition of new knowledge and skills under the guidance of adults, but also by his response to their help (some children are apt to miss their cue, others, by contrast, are very quick on the uptake). Psychological tests could indeed be very helpful in practical work if they were designed in accordance with strict scientific requirements and took into account the essential conditions of the individual's mental development and the dynamics of his acquisition of knowledge and skills. Even in that case, however, tests should always be used in combination with *other personality research methods.*

V.15.3. Structure of Abilities

Any activity, be it labour, study, sports, etc., makes high demands on the individual's psychological qualities

(his intellect, emotional-volitional sphere, sensory motility). These demands are never limited to any single faculty, however high the level of its development may be. The opinion that any single mental property can ensure high productiveness of activity and substitute for all abilities is absolutely untenable. *Abilities are the sum total of mental qualities possessed by a given individual and constituting a very complex structure.*

Abilities and Activity. The structure of a definite set of mental properties manifested as abilities is determined by the specificity of activity and varies from one kind of activity to another.

Thus the structure of abilities for mathematics includes, according to available data, a number of specific powers: to generalise mathematical material, to reduce the process of mathematical reasoning and to cut down the number of the corresponding mathematical operations (the multi-link sequence of discourse) to a much shorter series down to an almost direct link between the perception of a task and its solution, a power to reverse the train of thought, that is, to pass easily from direct to reverse reasoning, the flexibility of thinking processes in the solution of mathematical problems, etc. The structure of literary abilities presupposes a highly developed sense of beauty, vivid imagery, a sense of language, rich imagination, profound interest in the psychology of people, the need for self-expression, etc. Very specific are also the structures of abilities for music, teaching, design, medicine, etc. However broad the compensation of mental functions may be, the knowledge of the specific structures of professional and artistic abilities is extremely important for a pedagogue who ought to rely on them in his work and, should they be absent or underdeveloped, form other qualities of the child's personality to make up for the deficiency.

The qualities and traits of personality constituting the structure of specific abilities include *leading* and *auxiliary* ones. Thus in the structure of pedagogical abilities the leading qualities will be pedagogical tactfulness, keenness of observation and love of children combined with high exactingness, a need for sharing knowledge with others, a set of organisational abilities as a separate *substructure*, and so on. Auxiliary qualities include artistry, rhetorical

makings, etc. Understandably, both the leading and auxiliary components of pedagogical abilities make a unitary whole characteristic of a given individual as a capable pedagogue and original personality with a unique set of individual qualities.

General and Specific Abilities. Analysing various abilities on the side of their specific psychological characteristics, we may distinguish *general qualities* which meet the needs of not one, but several kinds of activity, and *specific qualities* required only for one kind of activity. Some individuals are distinguished by very pronounced general qualities in the structure of their abilities and are commonly referred to as people with *versatile abilities*, with a *general capacity* for a broad range of professions and trades. Such general abilities or qualities should not be contrasted with specific abilities or qualities in the manner of some bourgeois psychologists who seek to single out "general intelligence" as a mystic factor which can only be revealed with the help of intelligence tests.

Abilities and Typology of People. General abilities or general qualities of personality are concrete psychological phenomena which lend themselves to experimental investigation. Such general qualities which can manifest themselves as abilities in specific kinds of activity include individual psychological properties characteristic of one of the three types of people. In Pavlov's works these types were denoted as "artistic", "intellectual" and "medium" types. This typology is connected with the theory of *two signalling systems* regulating man's higher nervous activity: the first signalling system, perceiving the environment as sensations and responsible for images and emotions, and the second signalling system, representing such images and emotions in the form of word—the signal of signals.

The relative prevalence of signals from the first signalling system in man's mental activity is characteristic of the artistic type, that of the second signalling system, of the intellectual type, and their balance of the medium type.

The artistic type of personality is distinguished by vivid imagery resulting from direct contact with the environment, graphic impressions and prompt emotional response, whereas the intellectual type is notable for the preval-

ence of abstractions, logical constructs and a penchant for conceptualisation. To be sure, the artistic type of personality does not by any means foredoom an individual belonging to it to become an artist or a painter. A representative of this type will merely find it easier to become proficient in the kind of activity which calls for fertile imagination and a high degree of impressionability and emotionality. It is not fortuitous therefore that the overwhelming majority of individuals in artistic professions (painters, sculptors, musicians, actors, and so on) exhibit more or less pronounced features of the artistic type. The qualities characteristic of the intellectual type create favourable conditions for engagement in activity involving the use of abstractions, concepts, mathematical constructs, etc. These qualities, as one can easily perceive, are essential prerequisites for success in many specific fields (mathematics, philosophy, physics, linguistics, etc.).

It should be mentioned that people of the artistic type are not in any way mentally deficient. Ranking an individual with the artistic type implies only the *relative prevalence* of imagery over ideation in his mind.

Generally speaking, *Homo sapiens* is characterised by the absolute prevalence of the second signalling system, since language and thinking play the definitive role in man's labour activity and the processes of his reflection of the surroundings are mediated by verbalised thought.

The absolute prevalence of the first signalling system in a human being can perhaps be met with only in disorderly dreams with their wild emotions and chaotic images that do not lend themselves to any rational control.

Now, what is the difference between *relative* and *absolute prevalence* of one of the signalling systems? Designating the second signalling system as S_2 and the first signalling system as S_1 , we shall have the following notation for absolute prevalence of the second signalling system: $S_2 > S_1$. The *relative prevalence of the first signalling system* over the second one (the artistic type) can be expressed as $S_2 > S_1 + m$ (where m denotes the structural specificity of the comprehension of the world in terms of emotions and images characteristic of the given type of personality). Conversely, the intellectual type can be presented as $S_2 + n > S_1$ (where n denotes the structural specificity of theoretical or abstracting attitude to the

world whereby the representatives of this type are distinguished from all others).

These mathematical relationships clearly demonstrate that relative prevalence of one signalling system over the other is not identical with its absolute prevalence and that the individuals belonging, for instance, to the "artistic type" are not inferior intellectually to representatives of the two other types, though their mental abilities have certain specific features.

In summary, the structure of every concrete ability understood as the individual's readiness for a given kind of activity is characterised by considerable complexity and consists of a hierarchy of leading and auxiliary, general and specific qualities.

V.15.4. Talent, Its Origin and Structure

Socio-Historical Nature of Talent. *Talent is the highest level of the development of abilities.* It can be defined as *a combination of abilities enabling an individual to work independently and achieve success in some complex type of labour activity owing to superior skill and ingenuity.*

Like abilities, talent is but a *possibility* of acquiring high proficiency and attaining success in creative work. In the final count creative achievements depend on socio-historical conditions. If society needs talented people and creates conditions for their development, they are likely to appear.

It would not be correct to identify talent as a possibility of achievements in science, art and social life with the actualisation of this possibility in products of material and spiritual culture of society. The history of social formations based on the exploitation of man by man testifies to the fact that countless numbers of talents have withered without blossoming out because of the absence of necessary socio-economic conditions. Capitalist society, like feudal and slave-owning societies before it, bars all roads before the overwhelming majority of talented representatives of oppressed classes.

The awakening of talents is a socially conditioned process. The needs of the epoch and the specific tasks facing society determine in each particular case, which of the

talents laying dormant will receive the most favourable conditions for their development. War periods witness the rise of talented generals, peace time calls for and produces talented engineers, designers, etc.

Structure of Talent. As already noted, talent is a combination of abilities, their sum total. *A separate, isolated ability cannot be regarded as a talent even if it has reached a very high level of development and is quite conspicuous.* This is clearly attested to, for instance, by the results of the examination of people possessing phenomenal memory (tenacious memory and its prodigious capacity are often equated by laymen with a real talent). Between the middle of the 1920s and the late 1950s a group of Moscow psychologists carried out experiments with S.Sh. who was distinguished by extraordinary memory. His unique mnemonic abilities were not called in question by anybody, but they could not be utilised for any practical purpose (except demonstration on the stage). It is not to be wondered at, however, as memory in man's creative activity is but one of the factors contributing to its success and making it meaningful. No less important is the flexibility of the mind, rich imagination, strong will, profound interests and other psychological qualities. S.Sh. failed to develop any other abilities besides the capacity of his memory and therefore did not achieve any appreciable successes in creative activity that could have measured up to his rare gift.

Of course, well developed memory is an important ability required in different kinds of activity. Many outstanding writers, painters, composers and politicians, including Pushkin, Levitan, Sergei Rachmaninoff, Suvorov, Gustave Dore, Mozart and others were distinguished by remarkable memory. However, one can quote a many times greater number of no less famous and talented individuals whose memory was in no way remarkable. Ordinary volumes of memory and average powers of retention appear to be quite sufficient for socially useful creative activity bearing the hallmark of ingenuity and talent.

Talent is a far too complex combination of different mental qualities in a person to be affected by some single ability, be it even such a highly valuable ability as extraordinary memory. Psychological investigations show that the absence or, more precisely, insufficient development

of any single quality can be successfully compensated for by intensive development of other qualities making up the ensemble.

In the final analysis, *the structure of talent is determined by the character of demands made on an individual by a given type of activity* (in the sphere of politics, science, art, industry, sports, military service, etc.). Therefore individual abilities merged in talent will be very different in individuals occupied in different fields—for instance, in a talented composer and a talented aircraft designer. As is known, psychologists distinguish between *predominantly general* and *predominantly specific* qualities. Psychological analysis of talent makes it possible, in turn, to identify general structures of abilities. They come out as the most characteristic sets of mental powers ensuring the highest level of performance in many kinds of activity. Such analysis was carried out in the Research Institute of General and Pedagogic Psychology of the USSR Academy of Pedagogical Sciences when studying children with natural gifts for different kinds of mental activity (in this context the notion "gift" is synonymous with "talent", but more accurate in relation to children. Indeed, in view of the child's age his activity can only conventionally be characterised as successful, independent and ingenious). The group of subjects under investigation included Sasha K. a 5th form pupil, who joined the 4th form at the age of seven and not only showed brilliant performance at school, but also managed to compile a book with a systematic description of birds living in the Soviet Union; the book contained 314 pages and had an enormous number of illustrations.

As a result of the study of a number of gifted children the investigators identified some essential abilities which make up the structure of mental endowments. The most conspicuous quality characteristic of such children is attentiveness, concentration and constant readiness for arduous work. At a reading lesson a gifted pupil is intent, never allows his attention to wander, misses nothing and is always ready for an answer. He is fully absorbed in what interests him. The second feature of the personality of a gifted child, inseparably linked with the first one, consists in that his readiness for labour grows into disposition to labour, diligence and insatiable thirst for work.

The third group of features directly related to intellectual activity includes the *peculiarities of thinking, the speed of thinking processes, the orderliness of intellect, a heightened capacity for analysis and generalisation, and high productiveness of mental activity.*

On the evidence of numerous psychological observations of gifted children the above-indicated abilities constituting the structure of high intellectual powers manifest themselves in the overwhelming majority of such children and differ only in the degree of each of these abilities taken separately. As regards the specific *distinctions* of talent, they reveal themselves mainly in the *directionality of interests*, their general orientation. After a certain period of search one child decides in favour of mathematics, another concentrates on biology, a third one opts for literature, a fourth one, for history and archaeology, etc. Henceforth, the abilities of each of these children develop further in concrete activity which in turn is impossible without the corresponding mental capacity.

Therefore, the structure of a *specific talent*, besides the above-indicated ensemble of qualities, includes a number of other abilities *meeting the requirements of a given kind of concrete activity.* It has been established, for instance, that a gift for mathematics is characterised by the presence of specific qualities including a capacity for formalised perception of mathematical material, that is, the ability to grasp quickly the conditions of a given problem and to express their formal structure (in this perception the concrete content of the problem fades away, as it were, leaving only a bare skeleton in the form of disembodied mathematical relationships); a capacity for generalising mathematical objects, relations and operations, that is, an ability to discern general principles behind particulars and to grasp the essence of the problem; a capacity for reduction of a complex structure of propositions, a series of consecutive steps into a concrete sequence of mathematical operations.

Talent and Craftsmanship. Talent as a unity of general and specific qualities, we recall, is nothing more than a possibility of successful creative activity, it is only a *prerequisite for craftsmanship*, but not craftsmanship itself. In order to become an expert in some kind of professional activity (e.g. as a pedagogue, doctor, pilot, writer,

gymnast, chess-player, and so on), one must work hard. Talent does not exempt a gifted person from labour—on the contrary, it calls for arduous efforts to be materialised. People whose talent was recognised by all humanity were all, without any exception, titans of labour. It is only thanks to labour that they succeeded in achieving the highest level of perfection and world renown.

In the process of labour an individual accumulates life experience, skills and habits without which creative activity in any field is simply impossible.

An important role in creative activity belongs to *inspiration*, a state of enthusiasm and upsurge of mental powers. Inspiration is traditionally regarded as an inseparable component of talent. However, there is no reason to counterpose inspiration in creative activity to labour as its foundation. Inspiration is not something in the nature of a revelation, it is only a moment of creative activity resulting from intense preliminary work. Inspiration is characterised by supreme concentration of attention, mobilisation of memory, imagination and intellectual powers for solving some major problem in science, art or engineering.

In contrast with talent which is a possibility, craftsmanship is the possibility that has become reality. True craftsmanship is a manifestation of talent in activity. It shows not only in the sum total of certain skills and habits, but also in *psychological readiness for the accomplishment of any labour operations which may prove necessary for the creative solution of a task.* The definition of craftsmanship as a unity of “what” and “how” aptly conveys its essence as the elimination of a gap between the realisation of the essence of a creative problem and the identification of methods for its solution.

V.15.5. Natural Prerequisites for Abilities and Talent

Untenability of the Fatalistic Concept of Abilities. In order to understand the nature of human abilities, we must first establish their relation to *the brain*, the substrate of all mental processes, states, qualities and peculiarities.

Like all individual mental qualities of personality, abilities *are not acquired by an individual in a ready state* as something innate, granted by nature, but *are formed* in activity. Man is born without mental properties, but only with a general possibility of their acquisition. It is only in activity, in interaction with the surroundings that the human brain begins to reflect the outer objects, revealing its individual psychological qualities and features, including abilities. This is a crucial fact which accounts for the *rejection by scientific psychology of the theory of innate nature of abilities*.

The refutation of this idealistic theory is absolutely essential for scientific approach to the problem of man's personality in general and his abilities in particular. The idea of the inborn character of human abilities goes back to Plato who contended that abilities were inborn and all knowledge available to man was nothing else but his soul's reminiscences of the ideal world of "absolute knowledge" to which it had originally belonged. This theory of innate abilities was adopted by the church as a component part of its dogmata and figured prominently in the works of French philosopher *Rene Descartes* (the 17th century). The conception of the inborn character of human abilities backed up by the authority of the church was used to justify social, legal and political inequality of people and substantiate the fatalistic belief in the futility of the education of lower classes. This reactionary and scientifically unfounded doctrine, which is closely linked with idealistic notions of incorporeal and immortal soul allegedly received by man at his birth with all its ready qualities and properties, has been unequivocally discarded by scientific psychology.

The widely spread erroneous opinion that man is born with his abilities owes its origin not so much to reactionary psychological and pedagogical theories, as to psychological and pedagogical ignorance. Sometimes it serves as a cover for pedagogical passiveness and helplessness of some teachers. This convenient "psychological hypothesis" of abilities as a ready gift of nature in fact relieves a pedagogue of the necessity to look into the causes of poor performance of one or another pupil and take effective measures to eliminate them.

Rejecting the conception of innate abilities, scientific

psychology declares against the fatalistic notion of immutable natural factors which are allegedly responsible for these mental endowments.

Propensities as Natural Prerequisites for Abilities. The denial of the inborn character of abilities *is not absolute*. Rejecting inborn abilities, psychology still recognises the hereditary nature of certain peculiarities inherent in the brain structure which may serve as prerequisites for an individual's success in some types of activity (usually some professions, trades, occupations, and so on). These *morphological and functional features of the brain structure, sense organs and motor areas which come out as natural prerequisites for the development of abilities are called propensities*.

The relationship between abilities and propensities can best be illustrated by taking a specific example of olfaction or the sense of smell. An unusually keen sense of smell, that is, extremely high sensitivity of the olfactory analyser is among inborn propensities. Is it an ability? Certainly not, because every ability relates *to a definite object, to some concrete human activity or several kinds of activity*. If it were not so, the very word "ability" would become senseless. Hence, such a peculiarity of man's nervous-mental organisation is a general propensity. Indeed, the peculiarity of the brain structure accounting for the keen sensitivity of an individual's olfactory organ is in no way related to historically conditioned trades and professions that would demand an exceptionally keen sense of smell. Nor can the structure of the individual's brain envisage the field of activity he will select, not to speak of the conditions for the development of his propensities he may find. However, if society develops a need for professions which call for a particularly keen sense of smell, and if a given concrete individual has the corresponding natural propensities, he will find it easier than anyone else to develop corresponding abilities. For instance, the main task of perfumers belonging to a rare and highly valued profession is to develop original aromas by combining different smells so as to enable quantity production of new sorts of scents. Though the professional abilities of these people result from the development of natural propensities inherent in the structure and functioning of the olfactory analyser, none of them can be

described as an "inborn perfumer" unless in the figurative sense. Indeed, their brain has nothing in it to predetermine their course of life, the choice of profession and the development of the corresponding abilities.

Propensities are multipotential. One and the same propensity can develop into different abilities depending on the character of demands made on the individual by his activity.

Research into the nature and mechanism of propensities is still in the cradle and the scanty material available in this field has predominantly a negative value, relating more to the deficit of propensities than to their structure and productive manifestation. A number of serious brain anomalies, both inborn and acquired at an early age (oligophrenia), spell an almost unrecoverable loss of propensities and practically rule out the development of abilities.

The positive data available to psychologists today do not go beyond hypotheses on the essence of natural prerequisites for the development of propensities. Such hypotheses can only be assessed on the criterion of their productiveness. Investigations have not confirmed the supposition of Austrian doctor *Franz Gall* that anatomic features of the brain correlate with definite abilities. Though Gall's idea that the seats of intellectual qualities, talents and abilities are strictly localised in the brain hemispheres has long since been rejected by science and is only of interest to historians, the belief in the dependence of man's intelligence on the size of his brain still holds a firm grip on the mind of the man in the street. Indeed, in interpersonal relations an individual with a large forehead is typically credited with high intelligence and expected to talk wisely and give good counsel—much to the disappointment of his listeners if their expectations do not come true. Conversely, an individual with a low brow does not inspire confidence in his mental abilities, though people's scepticism as a rule proves unfounded.

The doctrine of localisation, assigning such complex psychological phenomena as abilities to particular places in the cerebral cortex, reflected the early stage of physiological and psychological knowledge and proved completely untenable.

Contemporary physiology holds that the brain cortex is

the seat of numerous mental functions. For instance, the centre of vocal movements is presumably located in the rear part of the third frontal gyrus of the left hemisphere, whereas the centre of speech understanding is located in another place—in the rear third section of the superior temporal gyrus of the same left hemisphere. Since human speech is a result of complex interaction of a number of brain departments, there is no reason to believe that man's abilities connected with speech activity can be referred to a particular brain section.

Life has also disproved the hypothesis about the dependence of propensities on the size of the brain, its mass. The average weight of the adult's brain is 1,400 g. Turgenev's brain weighed 2,012 g., Byron's brain was slightly lighter—1,800 g.; very similar were the results of weighing the brains of a number of other outstanding people. However, the brain of famous chemist Justus Liebig weighed only 1,362 g., and that of writer Anatole France, only 1,017 g. Soon it was found out that the largest and heaviest brain belonged to a man who not only lacked outstanding intellectual abilities, but was mentally deficient. The same fate was shared by the hypothesis that man's propensities are determined by the number of brain convolutions.

The most promising among contemporary hypotheses are those which link propensities to the *microstructure of the brain and sense organs*. There is reason to believe that in-depth study of the structure of the brain cell will reveal morphological and functional features characteristic of the nervous tissue of a gifted individual. Considerable interest also attaches to hypotheses *connecting propensities to certain variables of nervous processes* (their strength, balance and mobility) and, consequently, to the types of higher nervous activity. Soviet psychologist *Boris Teplov*, who studied the influence of the type of higher nervous activity on the qualitative aspects of the structure of abilities, has shown that the weakness of the nervous processes is not only a negative quality of the nervous system as was commonly believed, but also a positive one as it stems from its high responsiveness.

Under certain conditions, high sensitivity of the nervous system, i.e. its weakness, may come out as a propen-

sity for such kinds of labour activity which predominantly call for receptivity, compassion and warmheartedness.

This is the sphere where the specificity of human personality stands out with utmost clarity. Unlike the animal which is doomed in the ruthless struggle for existence if its nervous system proves to be weak, man with a similar characteristic is normally not handicapped, as his socio-historical environment is very different from the natural environment of the animal. Moreover, abilities developing on this physiological base may prove instrumental in creating very favourable conditions for his life and development.

The above-indicated propensities are related to certain general manifestations of the higher nervous activity. Even more plausible are hypotheses linking natural prerequisites for abilities to the so-called *partial features of the nervous system*, i.e. to specific typological properties of vision, audition and motility. It stands to reason that typological distinctions in the strength, balance and mobility of nervous processes manifesting themselves, for instance, in motility will meet the requirements of one or another kind of sports in different degrees and so come out as prerequisites for the development of the corresponding abilities.

Abilities and Heredity. The fact that propensities or natural prerequisites for abilities correlate with the structure and functioning of the nervous system lends credence to a supposition that they, like all other morphological and physiological qualities, are subject to general laws of heredity. However, *the hypothesis of the hereditary nature of propensities should not be identified with the idea of the hereditary nature of abilities.*

The problem in question goes back to the 19th century. In 1869, English anthropologist and psychologist *Francis Galton* published a book called *Hereditary Genius*. The author, who had studied the ties of relationship of many hundreds of outstanding people, came to the conclusion that talents are inherited either from the father, or from the mother. However, Galton's findings had no scientific value. Indeed, he could not cite any convincing evidence for inheritability of judicial, political and military talents. The only conclusion suggested by Galton's research consists in that the families of wealthy, noble and educated

people provide favourable conditions for the development of qualities needed for intellectual pursuits. Not a single unbiased investigator basing himself on Galton's data would hazard a theory about the existence of a hereditary predisposition to one or another profession.

True, along with dubious evidence for hereditary talents allegedly handed down from generation to generation in the families of judges, writers, military leaders, and so on, Galton pointed to a number of facts which cannot but give food for thought. For instance, the talent for music in the Bachs' family revealed itself for the first time in 1550, reached its peak in great composer Johann Sebastian Bach (1685-1750) and died down after Regina Susannah who was alive in 1800. The Bachs' family had about sixty musicians, including twenty outstanding ones. Galton also cites other facts: the Bendas family of violinists included nine prominent musicians, the Mozart's family, five, the Haydns' family, two.

These data apparently reflect certain regularities. In the overwhelming majority of cases investigation into the family trees of outstanding personalities attest not to biological heredity, but to the inheritance of the conditions of life, i.e. *those social conditions which are conducive to the development of abilities.* Indeed, if the family's interests centre upon music, if the entire way of life imprints on the child the need to study it, if the highest merit is seen in devotion to music, it is not surprising that the family is notable for musical talents. The example of the Bachs' family also gives grounds for a supposition that musical propensities are indeed inherited to a certain extent. Certain peculiarities in the structure and functioning of the aural analyser (i.e., *partial typological features*) may have been handed down in that family from generation to generation. On the evidence of Galton, the descent of musical propensities in the Bachs' was solely through the male line.

Life gives many examples of families whose members, generation after generation, keep loyalty to one and the same trade or profession and develop the necessary abilities. Indeed, there are whole dynasties of theatre and circus actors, researchers, seamen, steelmakers, wood carvers and other highly skilled craftsmen. In such families it is natural for a son to follow in the footsteps

of his father and grandfather and keep up the family tradition. Yet the number of outstanding individuals whose children and grandchildren do not succeed to their parents' abilities and do not follow their track is truly innumerable.

There is no scientific statistics to prove that abilities and talents can be inherited. *The idea of the hereditary character of abilities also runs counter to scientific theory.* Science has proved beyond doubt that the evolution of modern man and the development of his abilities over the past one hundred thousand years, i.e. since the Cro-Magnon type of Homo sapiens made its appearance, has been governed not by natural selection and inheritance of changes in his natural organisation, but by *the laws of social development as a historical process.*

V.15.6. Formation of Abilities

Development of Abilities by Teaching. The analysis of the difference between propensities and abilities clearly shows that *the latter* are not so much a gift of nature as a *product of human history*—for all their dependence on natural prerequisites which vary from individual to individual. In contrast with animals, which pass on the achievements of one generation to another in the form of hereditary morphological changes of the organism, human beings hand down their legacy in the form of instruments of labour, language, works of art, etc. Succeeding to the riches amassed by the previous generation, every individual is to master the instruments of labour of his predecessors, to learn their language, to enjoy the works of art, etc. Mastering the world of historical achievements, people form their abilities. *The degree to which an individual can display his abilities depends directly on the efficacy of concrete methods used to help him assimilate his forefathers' knowledge and skills,* which were amassed by his forefathers in the course of past history as they tried to meet the needs of society.

This is a strategic issue with far-reaching implications. Today, for instance, no one will call in question a statement that every normal child aged five to seven can learn to read and write. However, about two hundred years

ago it was commonly believed that such a feat could only be accomplished by children with outstanding abilities. As regards the rest of them (approximately two-thirds), they were assigned from the outset to the category of those incapable of penetrating into the mysteries of literacy. This attitude reflected quite real difficulties of teaching, as the then existing methods hampered the formation of habits. Subsequent improvement of the didactic techniques made it possible to solve the problem of the "hereditary grammatical abilities". Practice showed that the art of reading and writing could be mastered by all children without any exception.

There is good reason to believe that the formation of abilities for a given kind of activity almost entirely depends on *the methods of teaching.* Significantly, the old arguments for the innate nature of abilities are adduced each time the system of teaching does not work and the pedagogues have to admit their failure... Progress in teaching techniques will inevitably cut down the number of the so-called innate abilities and it may well be presumed that poetic, musical, artistic, pedagogical, organisational and other talents will eventually come to be ranked on a par with "gifts" for grammar or mathematics. In recent years abilities have become an object of increasing interest in research. Incidents are on record where psychologists succeeded in developing an ear for music in allegedly completely tone-deaf children, that is, those qualified as devoid of any musical propensities. Success in developing the ability which was hitherto regarded as a classical example of innate qualities was achieved with the help of a system of individual exercises (listening to a tune and simultaneously imitating it).

Similar results were achieved in experiments carried out in one of Moscow schools where a group of psychologists and pedagogues had been engaged for a number of years in forming mathematical abilities in all pupils; under their direction junior form pupils succeeded in mastering abstract notions, though the basics of algebra were generally believed to be accessible only to pupils of the fifth-sixth forms.

The formation of abilities and talents is an important task of the state and Soviet society as a whole. It presupposes the all-round development of abilities in all children

and the development of special talents in particularly gifted individuals. Very characteristic in this respect is the experience of G. Gusarskaya, a schoolteacher in Kazan.

Many of her pupils have become talented mathematicians. Receiving assignments of increasing difficulty in accordance with their abilities, knowledge and progress, all of them mastered the mathematics syllabus remarkably well and actually disproved the current opinion that some children are absolutely incapable of mathematical studies. The overwhelming majority of Gusarskaya's pupils joined technical colleges and physico-mathematical faculties of universities. Ten of them are mathematicians and theoretical physicists working now at the Kazan University. They owe their success to the skilful pedagogue who has revealed, formed and cherished their mathematical talent.

There exist a number of special schools in the Soviet Union whose principal task is to develop mathematical abilities in their pupils.

Abilities and Interests. *Stable special interests* play a crucial part in the development of the individual's abilities, as they focus on a definite field of human activity and grow into an inclination to engage in it professionally. Arising on the basis of general cognitive interest, special interests induce the individual to actively assimilate the methods and techniques employed in a given field.

It has been noted that the awakening of interest in study or some kind of labour activity marks the starting point of the development of the corresponding abilities. A child's stable interest is an indicator of his incipient abilities, a signal which should alert the surrounding people to new possibilities.

Such interests in a teenager, it will be remembered, show in the form of short-lived, though strong attractions. Various and not infrequently transient interests characteristic of an adolescent play an important role in the consolidation of the personality's evolving abilities. From the pedagogical viewpoint, it is essential that the adults' attitude to such interests stimulate the deepening and expansion of the teenagers' or youths' cognitive needs. The pedagogue, however, should be wise not to show his dissatisfaction at the transient character of the adolescent's attractions.

If a schoolchild is very lucky, he develops a stable special interest at an early age and, with the adults' assistance, builds up the corresponding abilities which enable him to identify his true calling. That is, regrettably, far from being the case with everybody. Yet even if a youth leaves the school without any enduring interest in any occupation (but with the necessary store of knowledge and psychologically prepared for labour), he stands a better chance of success in life than a school-leaver hastily making his or her choice in favour of deceptively glamorous professions (theatrical art, diplomatic service, journalism, etc.).

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Toll Free 800-345-2665

Psychology