CHAPTER 2

Psychic Reflection

2.1. Levels of Investigation of Reflection

The concept of reflection is a fundamental philosophical concept. It also has a fundamental sense for psychological science. Introducing the concept of reflection into psychology as a basic concept laid the foundation for its development on a new Marxist-Leninist theoretical basis. Psychology has developed for 50 years since that time, and its concrete-scientific presentations have developed and changed; the main thing — the approach toward the psyche as a subjective image of objective reality — has remained and is unchangeable.

In speaking of reflection one must first of all emphasize the historical sense of this concept. Of primary importance is the fact that its content is not congealed. On the contrary, in the course of the progress of natural science, of man and society, it is developing and becoming enriched.

Secondly, also very important is the position that ideas of development and ideas of the existence of various levels and forms of reflection be included in the concept of reflection. We are speaking of various levels of those changes in reflecting bodies that arise as a result of actions experienced by them and that are adequate to them. These levels are very different. But all of these levels have a common relation that is displayed in nonliving nature, in the world of animals, and, finally, in man in qualitatively different forms.

In connection with this there arises a problem that has a primary significance for psychology: studying the features and functions of various levels of reflection, and tracing the transitions from its simpler levels and forms to more complex levels and forms.

It is known that Lenin considered reflection as a property already incorporated in the "foundation of the very edifice of material," which at a determined degree of development, and particularly at the level of highly

organized living material, assumes the form of sensing, perception, and in man, also the form of theoretical thought, concept. Such a historical understanding of reflection, in the broad sense of the word, precludes the possibility of treating psychic phenomena as removed from the common system of interaction in a world indivisible in its material aspect. The broader significance of this for science is that the psychic, for which idealism postulated a basic quality, is turned into a problem for scientific investigation; the only postulate that remains is the admission of the independence of existing, objective reality from the cognitive subject. In this lies the idea of Lenin's requirement that we go not from sensing to the internal world but from the internal world toward sensing, from the internal world as primary to subjective psychological phenomena as secondary.' It is self-evident that this requirement also fully covers concrete scientific study of the psyche and psychology.

To investigate sensory phenomena coming from the external world, from things, is to investigate them objectively. As is evident in the experience of the development of psychology, there are many theoretical difficulties in this. They become apparent even in connection with the first concrete achievements in the study of the brain and sensory organs by natural science. The work of physiologists and psychologists, although it enriched scientific psychology with the knowledge of important facts and laws that condition the existence of psychic phenomena, could not, however, disclose directly the essence of these phenomena themselves; the psyche continued to be regarded in its isolation, and the problem of psychological relation to the external world was solved in the spirit of the physiological idealism of I. Muller, the hieroglyphism of G. Helmholtz, the dualistic idealism of W. Wundt, etc. The widest dissemination was given to the parallelistic position that in modem psychology is masked only by a new terminology.

A larger contribution to the problem of reflection was made by the reflex theory, the teaching of I. P. Pavlov, about higher nervous activity. The main emphasis in the research was substantially confused: Reflexive, psychic functions of the brain were presented as a product and condition of real ties between the organism and the environment impinging upon it. This prompted a basically new orientation of research expressed in the approach to brain phenomena from the standpoint of the interaction generating them, manifested in the behavior of the organisms in preparation, formulation, and consolidation. It even seemed that the study of the work of the brain at this level, according to I. P. Pavlov, the "second part of physiology,"' completely departs in perspective from scientific, descriptive psychology.

A principal theoretical difficulty, however, remained; this was expressed in the impossibility of bringing the level of psychological analysis to the level

[1] V. I. Lenin, ***Complete Collected Works,*** Vol. 18, pp. 35, 52.
'I. P. Pavlov, ***Complete Collected Works,*** Vol. III, Book 1, Moscow-Leningrad, 195 1, p. 28.

of physiological analysis, psychological laws, to the laws of brain activity. Now, when psychology as a separate area of knowledge obtained wide acceptance and assumed a practical significance for resolving many problems presented by life, new evidence was found for the position of the nonconvergence of the psychic and the physiological – in the practice of psychological research itself. A sufficiently clear-cut factual difference was formulated between psychic processes on the one hand, and the physiological mechanisms that carry out these processes on the other, a distinction without which it would of course be impossible to resolve even the problems of correlations and connections between them; in addition, a system of objective psychological methods was formulated, particularly methods for borderline psychological–physiological research. Owing to this, concrete study of the nature and mechanisms of psychic processes far exceeded the boundaries set by natural science representations of the activity of the organ of the psyche – the brain. Of course this does not mean that all theoretical questions relating to the problem of the psychological and the physiological were answered. It may be said only that there was a serious movement in this direction. New complex theoretical problems also appeared. One of these was presented by the development of the cybernetic approach to the study of processes of reflection. Under the influence of cybernetics, the analysis of regulating the conditions of living systems by means of ***information*** directed by them held the center of attention. Thus a new step was taken along the path already marked to the study of the interaction of living organisms with the environment that now appeared from a different perspective, the perspective of transfer, processing, and preserving information. In addition there occurred a theoretical narrowing of the approaches to qualitative, different-directed, and self-directed objects, nonliving systems, animals, and man. The very concept of information (one that is fundamental for cybernetics), although it came from the technology of communication, appears to be from its genesis, so to speak, human, physiological, and even psychological; it all began from the study of transfer along technical canals of semantic information from person to person.

As is known, the cybernetic approach was applicable implicitly from the very beginning to psychic activity also.[3] Very soon it appeared indispensable in psychology itself, especially in engineering psychology, investigating "man-machine" systems, which are considered a specific instance of a system of regulation. Now concepts of the type, "reversible connection," "regulation," "information," "model," etc. are widely used even in branches of psychology that have no need to apply formal languages capable of describing processes of regulation taking place in given systems, including technological systems.

'N. Wiener, ***Cybernetics, Moscow, 1968.***

If introduction into psychology of neurophysiological concepts is based on the position of the psyche as a function of the brain, then the use in psychology of the cybernetic approach has a different scientific justification. Psychology is a concrete science dealing with the origin and development of the reflection of reality by man, which takes place in his activity and which by mediating it fulfills a real role in the activity. For its part, cybernetics, studying the processes of intrasystem and intersystem interaction in the sense of information and similarity, allows the introduction of quantitative methods into the study of processes of reflection, and thus enriches the study of reflection as a general property of material. This was indicated in our philosophical literature many times,[4] as was the fact that results in cybernetics have an essential significance for psychological research.[5]

The significance of cybernetics for the study of mechanisms of sensory reflection taken from this aspect appears indisputable. We must not forget, however, that general cybernetics, giving a description of the processes of regulation, turns away from their concrete nature. For this reason in almost every special field there arises a question of the proper application of cybernetics. It is known, for instance, how complicated the question is when social processes are considered. It is also complicated for psychology. The cybernetic approach to psychology, of course, does not consist simply of exchanging psychological terms for cybernetic terms; such an exchange would be as fruitless as the attempt made in its time to replace psychological terms with physiological terms. Incorporating the separate positions and theorems of cybernetics mechanically into psychology is even less allowable.

The concrete-scientific and methodological significance of the ***problem*** of the sensory ***image*** and ***models*** is especially important among the problems that arise in psychology in connection with the development of the cybernetic approach. Notwithstanding that not a few works of philosophers, physiologists, psychologists, and cybemeticists have been dedicated to this problem, it merits further theoretical analysis in the light of the study of the sensory image as a subject of reflection of the world in the consciousness of man.

As is known, the concept of the ***model*** has received very wide acceptance and use in very different meanings. For further consideration of our problem, however, we may use the simplest and least refined, that is to say, its definition. We will call such a system (multitude) a model, the elements of which are found to be similar (homomorphic, isomorphic) to elements of another system (the modeled). It is absolutely evident that under such a broad definition of model the sensory image is, of course, also included. The problem, however, is not whether one can approach the psychological image as a model

[4] V. I. Lenin, *Theory of Reflection and Modem Science, Moscow,* 1961.
[5] See the paper, "Cybernetics," *Philosophical Encyclopedia,* Vol. II, Moscow, 1962.

but whether this approach encompasses its essential specific features, its nature.

The Lenin theory of reflection considers sensory images in human consciousness as prints, photographs of an independently existing reality. This is also what brings psychic reflections close to "related" forms of reflection peculiar also to material that does not have a "clearly expressed capability of sensing."[6] But this forms only one side of the characterization of psychic reflections; the other side consists of the fact that psychic reflection, as distinct from mirror and other forms of passive reflection, is subjective, and this means that it is not passive, not dead, but active, that into its definition enters human life and practice, and that it is characterized by the movement of a constant flow, objective into subjective.

These positions, having primarily a gnosiological sense, are also basic for concrete-scientific psychological investigations. Especially on the psychological level there arises the problem of the specific features of those forms of reflection that are expressed by the presence in man of subjective – sensory and thought – images of reality.

The position that the psychic reflection of reality is its subjective image means that the image belongs to the real subject of life. But the concept of subjectivity of the image in the sense of its belonging to the subject of life includes in itself an indication of its being active. A connection of the image with what is reflected is not a connection of two objects (systems, multitudes) in mutual similar relations one to another – their relationship reproduces a polarization of any living process at one pole of which stands the active ("partial") subject, and at the other, the object "indifferent" to the subject. It is this feature of relation of the subjective image to reflected reality that is not included in the relationship "model-modeled." The latter relationship has the property of symmetry, and accordingly the terms ***model*** and ***modeled*** have relative senses, depending on which of two objects the subject that recognizes them believes theoretically or practically to be the model and which the modeled. The process of modeling (that is, the building by the subject of models of whatever types, or even the recognition by the subject of connections defining such a change of the object that imparts to him characteristics of the model of a certain object) is an altogether different question.

Even so the concept of subjectivity of the image includes the concept of ***partiality*** of the subject. Psychology has for a long time described and studied the dependence of perception, representation, and thought on "what is necessary to man" – on his needs, motives, settings, emotions. It is very important here to stress that such ***partiality*** is itself objectively determined and is expressed not in the inadequacies of the image (although it may be expressed in this) but in that it allows an active penetration into reality. In other words,

[6] V. I. Lenin, *Complete Collected Works,* Vol. 18, p. 40.

subjectivity at the level of sensory reflection must be understood not as its subjectivism but rather as its "subjectness," that is, its belonging to an actingsubject.

The psychic image is the product of living, practical ties and relations of the subject with the object world; these are incomparably wider and richer than any model relationship. For this reason the description of the image reproduced in the language of sensory modalities (in a sensory "code"), the parameters of the object acting on the sense organs of the subject, represents in essence the result of analysis on the physical level. It is exactly on this level that the sensory image discloses itself as poorer in comparison with the possible mathematical or physical model of the object; The situation is different when we consider the image on the psychological level -- as a psychic reflection. In this capacity it appears, on the contrary, in all its riches, as taking into itself that system of objective relations in which only the content reflected by them actually exists. All the more does what has been said refer to the conscious sensory image, to the image at the level of a conscious reflection of the world.

2.2. **The Activity of Psychic Reflection**

In psychology two approaches have been devised, two views of the process of generating the sensory image. One of these reproduces the old sensualistic concept of perception, according to which the image is a direct result of a one-sided act of the objects on the sensory organs.

The second understanding of the process of image formation is different in principle and is attributed to Descartes. In his remarkable "Dioptics," comparing seeing with the perception of objects by the blind who "see as if with their hands," Descartes wrote: "If you consider that the difference between trees, rocks, water, and other similar objects as seen by a blind person with the help of his cane does not seem smaller to him than that which exists between red, yellow, green and any other colors, then whatever the nonconformity between bodies, it appears to be nothing more than just a different way of using a cane or resisting its movement."[7] Subsequently, the ideas about the basic common origins of tactile and visual images were developed, as is known, by Diderot, and particularly by Sechenov.

In modem psychology the position is widely accepted that perception represents an active process that necessarily includes the efferent links. Although the detection and registration of efferent processes presents significant methodical difficulties, so much so that some phenomena seem better evidence for the passive "screen" theory of perception, nevertheless their obligatory participation must be considered established.

[7] R. Descartes, ***Discourse on Method, with*** supplements: ***Dioptics; Meteors; Geometry, Moscow,*** 1953, p. ***71; see also*** p. ***72.***

Particularly important data were obtained in ontogenetic investigations of perception. These investigations have the advantage in that they allow the study of active processes of perception in their, so to speak, unfolded, open, that is, outward-moving, not yet interiorized, unreduced forms. The data obtained are well known and I will not quote but will simply note that it is in just these investigations that the concept ***ofperceptive action*** was introduced.[8]

The role of efferent processes was also studied in the investigation of aural perception, the organ receptor of which is, as distinct from the touching hand and the apparatus of vision, completely without exterior activity. For the hearing of speech it was experimentally demonstrated that "articulation imitation" was necessary,[9] and for hearing sound, a cryptic activity of the voice apparatus.[10]

Now it is almost trite to repeat that for the appearance of an image it is not sufficient to have a one-sided action of the object on the sensory organs of the subject, but that it is necessary to have an active "anticipating" process on the part of the subject also. It is natural that the main direction in the investigation of perception was the study of active perceptive processes, their genesis and structure. Despite all the differences in concrete hypotheses with which researchers approached the study of perceptive activity, they are united in the admission that it is indispensable and in the conviction that particularly in it is realized the process of "translation" of the sensing of external objects acting on the organs into the psychic image. And this means that it is not the sensory organs that receive the image, but man with the help of the sensory organs. Every psychologist knows that the retinal image (the retinal "model") of the object is not the same as its apparent (psychic) image, just as, for example, the so-called afterimages can be called images only by convention since they do not have any constancy, follow the movement of the eye, and are subject to Emmert's law.

There is no need, of course, to discuss the fact that processes of perception are included in the living, practical ties of man with the world, with material objects, and for this reason they are necessarily subjected, directly or indirectly, to the properties of the objects themselves. This also determines the adequacy of the subjective product of perception, the psychic image. Whatever form perceptive activity might assume, whatever degree of reduction or automation it might be subjected to in the course of its formation

[8] A. V. Zaporozhets, L. A. Venger, V. P. Zinchenko, and A. G. Ruzskaya, ***Perception and Action,*** Moscow, 1967.

[9] L. A. Chistovich, V. V. Alyakrinskii, and V. A. Abul'yan, "Temporary pauses for repetition of heard speech," *Problems of Psychology*, No. 1, 1960; L. A. Chistovich, Yu. A. Klaas, and R. 0. Aleksin, "The significance of imitation for recognition of sound sequence," ***Problems of Psychology, No. 5,*** 196 1: ***see also*** A. N. Sokolov, ***Internal Speech and Thought, Moscow, 1968,*** pp. 150-157.

[10] Yu. B. Gippenreiter, A. N. Leont'ev, and 0. V. Ovchinnikova, "Analysis of systemic structure of perception, ***Proceedings of the Academy of Pedagogical Sciences of the*** RSFSR, Moscow, 1957-1959, Communications I-VII.

and development, essentially it is formed in the same way as the activity of the touching hand "photographs" the contours of objects. Like the activity of the touching hand, ***all perceptive activity finds the object there where it really is – in the external world, in objective space and time.*** It is this that constitutes that most important psychological feature of the subjective image that is called its objectivity or, much less fortuitously, its objectivization.

This feature of the sensory psychological image, in its simplest and most elegant form, emerges in conformity with extraceptive, subjective images. An important psychological fact is that in the image we are given not our subjective condition but the object's condition alone. For example, the light effect of a thing ***on*** the eye is received exactly like the thing that is outside the eye. In the act of perception, the subject does not correlate his own image of the thing with the thing itself. For the subject, the image is as if imposed on the thing. Thus the ***directness*** of the ties that exist between sensory consciousness and the external world, which Lenin stressed,[11] is expressed psychologically .

Copying an object in a picture, we must, of course, compare the portrayal (model) of the object with the portrayed (modeled) object, perceiving them as two different things; but we do not determine such a correlation between our subjective image of the object and the object itself, between our own perception of the picture and the picture itself. If the problem of such correlation arises, then it is only secondary – from the reflection of the experience of perception.

For this reason it is not necessary to agree with the conviction that is sometimes expressed that subjectivity of perception is the result of "objectification" of the psychic image, that is, that the effect of the thing at first elicits its sensory image, and then this image is related by the subject to the world, "is projected on the original."[12] Psychologically such a special act of "reverse projection" simply does not exist under ordinary circumstances. The eye affected at the periphery of the retina by an unexpected appearance of a light point on the screen instantly moves to it and the experimental subject at once sees this point localized in objective space; what he does not perceive at all is his confusion with respect to the retina at the moment of the movement of the eye, and changes in the neurodynamic condition of his receptor system. In other words, for the subject there is no structure that might be in turn correlated by him with the external object in the same way in which, for instance, he can compare his own drawing with the original

The fact that objectivity (objectivization) of sensations and perceptions is not something secondary is borne out by many remarkable facts wellknown to psychology. One of these is the so-called problem of probing. The fact is

[11] V. I. Lenin, *Complete Collected Works,* Vol. 18, p. 46.
[12] V. S. Tyukhtin, "Reflection and information," *Problems of Philosophy, No.* 3, 1967.

mat to a surgeon probing a wound, the end of the probe with which he touches the bullet appears to be "sensitive" – that is, his sensing seems to be paradoxically mixed in with the world of external things and not localized at the boundary "probe-hand" but at the boundary "probe-perceived object" (the bullet). The same thing happens in any other analogical situation, for instance, when we perceive the roughness of the paper with the tip of a sharp pen, find a road in the dark with the help of a cane, etc.

The main interest of these facts lies in the fact that in them are "prospected" and often exteriorized relations usually hidden to investigation. One of these is the relation "hand-probe." The effect which the probe has on the receptor apparatus of the hand evokes sensations that are integrated into a complex visual-tactile image of it, and that further fulfill a leading role in the regulation process of holding the probe in the hand. The second relation is the relation "probe-object." This is established as soon as the action of the surgeon brings the probe into contact with the object. But even in this first instant the object, being still undetermined – as "something," as the first point on the line of a future "picture''-image – appears to be related to the external world localized in objective space. In other words, the sensory psychic image exhibits the property of objective relationships already at the moment of its formation. But to carry the analysis of the relation "probe-object" a little further, the localization of the object in space expresses its separateness from the subject; this is "outlining the boundaries" of its existence independent from the subject. These boundaries appear only as the activity of the subject forced to subordinate itself to the object, and this takes place even in that case when the activity leads to the object's division or even destruction. The remarkable feature of the relationship considered consists of the fact that this boundary passes as a boundary between two physical bodies: One of them, the tip of the probe, realizes a cognitive, perceptive activity of the subject, the other is the object of this activity. At the boundary between these two material things are localized the sensations that form the "tissue" of the subjective image of the object: They appear as fitting on the touching point of the probe, the artificial distant receptor that forms an extension of the hand of the acting subject.

If under the conditions of perception described, the guide for the action of the subject is a material object that moves, then in really distant perception the process of spatial localization of the object is reconstructed and extremely complicated. In the case of perception by means of *a* probe, the hand does not actually move, but in visual perception the eye is movable, "selecting" the light rays that the object reflects and that reach its retina. In this case, however, in order that a subjective image might result, it is necessary to observe the conditions that transfer the boundary "subject-object" to the surface of the object itself. These are the same conditions that create

the so-called invariance of the visual object, and particularly the presence of such displacement by the retina of the relatively reflected light stream that creates, as it were, an uninterrupted, subject-controlled "change of feelers," which would appear to be the equivalent of their movement over the surface of the object. Now the sensations of the subject also are fit to the external boundaries of the object, not with an instrument (probe), but along light rays; the subject sees not the retinal, continuously and rapidly changing projection of the object, but an external object in its relative invariance, stability.

It is just this ignoring of the principal characteristic of the sensory image – the relation of our sensations to the external would – that led to the major misunderstanding that prepared the way for the subjective-idealistic conclusions on the principle of specific energy of the sense organs. This misunderstanding consists of the idea that subjectively experienced reactions of sense organs elicited by the action of stimuli were identified by I. Muller with sensations included in the image of the external world. In actuality, of course, nobody takes luminescence resulting from electrical excitation of the eye for real light, and only Munchausen could conceive of the idea of igniting powder on the pan of a gun with sparks from the eye. Usually we say completely correctly: "It's dark to the eye," "It rang in the ears" – to the eyes, in the ears, and not in the room or on the street, etc. In defense of the secondary nature of the subjective picture, we might refer to Zenden, Hebb, and other authors who describe instances of restoration of sight in adults after removal of congenital cataracts: At first they see only the chaos of subjective visual phenomena, which subsequently becomes correlated with objects of the external world, becomes its images. But these are people who have a formulated object perception in another modality, which now simply receives new input from the aspect of sight; for this reason, strictly speaking, we have here not a secondary relation of the image to the external world but an incorporation of a new modality into the external world of elements.

Of course distant perception (visual, aural) represents a process of unusual complexity, and its investigation comes upon many facts that seem to be contradictory and sometimes inexplicable. But psychology, like every other science, cannot develop only as a sum of empirical facts. It cannot escape theory, and the whole problem lies in what kind of theory will guide it.

In the light of the theory of reflection, the scholastic "classical" scheme ***candle → its projection onto the retina of the eye → image of this projection in the brain emitting some kind of "metaphysical light"*** is no more than a superficial, grossly one-sided (and consequently not true) presentation of psychic reflection. This formula leads directly to the admission that our sensory organs, having "specific energies" (which is a fact), are a barrier between the subjective image and the external objective reality. It is understandable that no description of this formula of the process of perception in terms of distribution of nerve excitation, information, model construction, etc., will be able to change its essence.

Another aspect of the problem of the sensory subjective image is the ***question of the role of practice in its formation.*** It is common knowledge that introducing the category of practice into the theory of cognition constitutes the main point of difference between Marxist understanding of cognition and the understanding of cognition in pre-Marxist materialism on the one hand, and in idealistic philosophy on the other. "The point of view of life, of practice, must be the first and basic point of view of the theory of cognition, " says Lenin.[13] As first and basic his point of view is preserved also in the psychology of sensory cognitive processes.

It has already been said here that perception is active, that the subjective image of the external world is the product of the activity of the subject in that world. But this activity cannot be understood as anything other than a realizing of the life of a physical subject, which is principally a practical process. Of course, in psychology it would be a serious mistake to consider all perceptive activity of an individual as taking place directly in the form of practical activity or resulting directly from it. The processes of active visual or aural perception are separated from direct practice to the extent that the human eye and the human ear, according to an expression of Marx, are organ-theorists.[14] Touch alone sustains direct, practical contact of the individual with the external material-objective world. This circumstance is extremely important from the point of view of the problem under consideration, but even this does not settle it completely. The fact of the matter is that the basis for cognitive processes is not the individual practice of the subject, but "the totality of human practice." For this reason not only thought but also man's perception, to a very large degree, surpass in their riches the relative poverty of his personal experience.

In psychology a proper statement of the question of the role that practice plays as a basis and criterion for truth requires investigation of just how practice enters into the perceptive activity of man. It must be said that psychology has already accumulated much concrete-scientific data, which lead directly to the solution of this problem.

As has already been said, psychological investigations make it ever more obvious to us that the efferent links play a decisive role in the processes of perception. In certain cases, particularly when these links have their expression in the motor systems or the micromotor systems, they appear quite distinct. In other cases they appear "hidden," expressed in the dynamics of ongoing internal conditions of the receiving system. But they always exist. Their function appears to be "assimilated" not only in the narrow sense of the word" but also in the broader sense. This also covers the function of including the common experience of the subjective activity of man in the

[13] V. I. Lenin, Complete *Collected Works,* Vol. 18, p. 145.
[14] K. Marx and F. Engels, From *Their Early* Works, p. 592.
[15] A. N. Leont'ev, "The mechanism of sensory reflection," *Problems of Psychology, No.* 2,1959.

process of producing the image. The fact is that such inclusion cannot be accomplished as a result of simple repetition of combinations of sensory elements and actualization of temporary ties between them. It is understood that we are not speaking here about the associative reproduction of lacking elements of sensory complexes but about the adequacy of subjective images produced by the general properties of the real world in which man lives and acts, In other words, we are speaking about the subordination of the process of producing an image to the principle of plausibility.

To illustrate this principle we will turn once again to the old and well-known psychological fact, to the effect of "pseudoscopic" visual perception, the study of which we now have once again begun. As is known, the pseudoscopic effect is produced by looking at objects through binoculars composed of two Dove prisms, which produce an irregular distortion of perception: The closer points of the object seem farther away and vice versa. As a result, for example, a concave plaster mask of a face appears under certain kind of illumination as a convex relief representation, and a relief representation, on the other hand, appears like a mask. But the main interest in pseudoscopic experiments is that the apparent pseudoscopic image results only when it is plausible (the plaster mask of the face is as "plausible" from the point of view of reality as its plaster convex sculptured presentation), or when it is possible by some means to block the inclusion of the apparent pseudoscopic image in the picture of the real world being formed by the subject.

It is known that if the plaster head is replaced by the head of a real man then the pseudoscopic effect completely disappears. Particularly effective are the experiments in which a subject with a pseudoscope sees two objects appear simultaneously in one and the same visual field, both the real head and its convex plaster representation; then the head of the man is seen as usual, and the plaster head is seen pseudoscopically, that is, like a concave mask. Such phenomena are observed only when the pseudoscopic image is plausible. The second feature of the pseudoscopic effect is that it appears more readily if an object is placed against an abstract nonobjective background, that is, outside the system of concrete-objective ties. Finally, this same principle of plausibility is expressed in the completely striking effect of the appearance of such "additions" to the apparent pseudoscopic image as make its existence objectively possible. Thus, if before a surface we place a screen with openings through which parts of the surface may be seen, in pseudoscopic perception we get this picture: The portions of the surface that lie behind the screen seen through its openings are seen by the subject as being closer to him than the screen, that is, as if they were freely hanging before the screen. The situation actually is quite different. Under suitable conditions, just as in pseudoscopic perception, the subject sees parts of the surface that are behind the screen in front of it; they do not, however, "hang" in the air (which is improbable) but are perceived as some kind of three-dimensional physical bodies coming

out through the openings in the screen. In the apparent image side surfaces appear to be added to form boundaries of these physical bodies. And finally, the following: As systematic experiments demonstrated, the processes of emergence of the pseudoscopic image as well as the elimination of its pseudoscopic quality, although they take place instantly, are by no means automatic or self-directed. They appear as the result of perceptive operations carried out by the subject. This is borne out by the fact that the subject may learn to direct both of these processes.

It is not the purpose of the experiments with the pseudoscope to show with the help of special optics that by producing a distorted projection on the retina of the eye it is possible, under given conditions, to obtain aspurious subjective visual image. The actual purpose lies (as in the analogous, classical, "chronic" experiments of Stratton, I. Koler, and others) in the promise these experiments hold for investigating the process of transformation of information such as takes place at the sensory "entry" and is subject to the general properties, connections, and rules of real activity. It is a different, fuller expression of the objectivity of the subjective image that appears now not only in its initial relationship to the object reflected but also in its relationship to the objective world as a whole.

It is understood that man must already have a picture of this world. This picture, however, is accumulated not only directly at the sensory level but also at higher cognitive levels – as a result of the individual's experience with social practice reflected in the form of language in the system of knowledge. In other words, the "operator" of perception is not simply the previously accumulated associations of sensation, and not apperception in the Kantian sense, but social practice.

Early psychology, developed along metaphysical lines, moved in the analysis of perception invariably on a plane of two kinds of abstraction: the abstraction of man from society and the abstraction of the perceived object from its ties with objective reality. A subjective sensory image and its object were treated as two things opposed to each other. But the psychic image is not a thing. In spite of the physicalistic representation, it does not exist in the matter of the brain in the form of a thing, just as there does not exist any kind of a "discoverer" of this thing that may be only a soul, only a spiritual "I." The truth is that the actual and acting man with the help of his brain and his organs perceives external objects; their appearance to him is their sensory image. We will emphasize once more: the appearance of the objects, and not physiological states evoked by them.

In perception there is always an active process of "extracting" from real activity its properties, relationships, etc., their fixation in short-term or long-term states of the receiving systems, and reproduction of these properties in the acts of forming new images, in the acts of recognizing and remembering objects.

Here we again must interrupt our account with a description of a psychological fact that illustrates what we have just said. Everyone knows what puzzle pictures are. In such a picture it is necessary to find a representation of a hidden object indicated in the puzzle (for example, "Where is the hunter?" etc.). A trivial explanation of the process of perception (recognition) in the picture of the hidden object is that it takes place as a result of successive comparisons of the visual image of the given object that the subject has with the separate combinations of elements of the picture; a correspondence of this image to one of the elements in the picture leads to its being "guessed." In other words, this explanation is derived from the idea that there are two comparable things: the image in the head of the subject and its representation in the picture. The difficulty here is an insufficient separability and completeness of the representation of the hidden object in the picture; this requires multiple "comparisons" of the image to it. The psychological implausibility of such an explanation suggested to the author the idea of a simple experiment consisting in no indication being given to the subject of the object hidden in the picture. The subject was told: "Before you are ordinary puzzle pictures for children; try to find the object that is hidden in each of them." Under these conditions the process could not proceed on the basis of comparison of the image of the object that the subject had with its representation contained in the elements of the pictures. Nevertheless, the puzzle pictures were solved by the subjects. They "extracted" the representation of the image from the picture, and the image of an object that was familiar to them became apparent.

We have come now to a new aspect of the problem of the sensory image – to the problem of representation. In psychology, representation is usually the generalized image that is "registered" in the memory. The old substantive understanding of the image as some kind of a thing led also to a substantive understanding of the representation. This is a generalization resulting from a superimposition of one sensory impression on another – in the manner of Galton photography – to which word designations were attached associatively. Although within the limits of such understanding there was the possibility of transformation of representations, just the same, they were thought of as some kind of "ready" representations, stored on the shelves of our memories. It is easy to see that such an understanding of representation agrees well with the formal-logical teaching about concrete ideas but is scandalously contradictory with respect to the dialectical-materialistic understanding of generalization.

Our sensory, generalized images, like our understanding, contain in themselves movement and, it seems, contradiction; they reflect the object in its various connections and its indirectness. This means that no sensory knowledge is a set impression. Although it is preserved in the head of a man, yet it is not a "ready" ***thing,*** but only virtual – in the form of formulated, physiological brain constellations, which are capable of realizing subjective images of the object as it becomes apparent to man in one system or another of objective connections. The representation about the object includes not only ***similarity*** in objects but also its various facets, among them some that cannot be "superimposed" one on another and are not found in relationships of structural or functional similarity.

Not only concepts but also our sensory representations are dialectical. For this reason they are capable of fulfilling a function that cannot be reduced to the role of set standard models corresponding to the effects received by receptors from isolated objects. Like the psychic image, representations exist inseparable from the subject's activity, and they fill it with the riches accumulated in them and make it alive and creative.

The problem of sensory images and representations confronted psychology from the first steps of its development. The question of the nature of our sensations and perceptions could not be bypassed by any psychological trend no matter what its philosophical basis. It is not surprising therefore that a great number of papers, theoretical and experimental, were devoted to this problem. Their number continues to grow rapidly in our time as well. As a result, a series of separate questions seems to have been worked out in unusual detail, and almost unlimited factual material has been collected. Notwithstanding, modem psychology is still far from the possibility of presenting a whole, not an eclectic, concept of perception that would include its various levels and mechanisms. This is particularly applicable to the level of conscious perception.

In relation to this the introduction into psychology of the category of psychic reflection has opened new perspectives. The scientific productivity of the category of psychic reflection no longer requires proof. This category, however, cannot be taken outside its internal connection with other basic Marxist categories. For this reason introducing the category of reflection ***into*** scientific psychology inevitably requires a reconstruction of the whole system of categories. More immediate problems that come up here are, in essence, problems of activity, problems of the psychology of consciousness, and the psychology of personality. Further exposition is dedicated to the theoretical analysis of these problems.