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## Psychology

Leont'ev's definition<sup>1</sup>—the science of the generation and functioning of the image. This is psychology as a whole, that is, including animal psychology, or, more accurately perhaps—a definition that in its general form applies precisely and only to this kind of psychology.

The psychology of man. Maybe the question turns on how we define the concrete-specific determination of the image in man.

Surely, it lies in universality. In the ability to “generate” an image of *any* thing—*any* image. From an image of perception of the simplest geometrical form to an image of “substance,” of a logical category, a moral law, “beauty,” and so on. And science, and art—all these are images (representations, represented—and executed in one or another sensorially perceptible material—forms of existence and motion) of the external world. Without this, materialism is an empty word.

The secret of “the image in general” must probably be sought in analysis of the simplest image, the simplest psychic phenomenon,

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the simplest product of psychic activity in which such activity first “appears.”

It is the same here as with value.

To understand what value is *in general* does not mean to create an abstraction within which all differences would be extinguished between a frock coat and sackcloth, between a commodity and money, between value in general and surplus value in all its special kinds (profit, rent, interest, etc.).

It is necessary to analyze the *simple* (historically and logically first) form of value, its first kind equal to genus.

Where is it—this “concreteness reduced to the simplest determination” of the image, product, and form of flowing of the process that creates this image?

It is absurd to look for “the general” between the image of perception and of fantasy, between the image of representation and the image of concept. Complex (developed, concrete) images must not exist for us at this stage of analysis; they still remain to be “drawn out”—that is, understood.

We shall do as Marx did. We shall not go back into the depths of history, into an investigation of animal forms of the psyche (and of the image), for abstract characteristics are preserved (reproduced) in the ontogenesis of the *human* psyche, as the first stages of its development, briefly repeating phylogenesis.

Zoopsychic prerequisites are here too reproduced as its product, in their “purged” form, as truly necessary *conditions* of the emergence of the specially human psyche.

The first prerequisite—it would seem that this is obvious—is the ability to move about actively in space, in search of food, water, and so on. To speak of the psyche of a plant is—obviously—incorrect.

“In search of” or “aimed at” a definite object—an object of desire, initially an object of organic “need.”

It is as an organic need—as a requirement for a definite object, biochemically coded in the organism, as a cyclically self-renewing exchange of substances—that we must evidently see the first (and still nonspecific) prerequisite of the psyche. /Nonspecific inasmuch

as a plant also possesses it in full measure./<sup>\*</sup> Thus, exchange of substances as such, very well able to renew its cycles without any sort of psyche and in no way presupposing the latter.

/But at the highest levels it appears as a “consequence” of the psyche, as a result of psychic activity = search activity—the active motion of the organism among bodies of the external world, among the “obstacles” that impede “self-closure” of the cycle of exchange./

That is, the active exchange of substances between the organism and its external environment is an absolute—nonspecific—precondition of the psyche. In the plant this exchange proceeds in a state of immobility, and if components of the external environment are separated in space and time from the organism, if it does not have direct contact with the external conditions for continuation of the cycle, then it perishes. Dissimilation without assimilation is death.

Not so the animal. It overcomes the gap by means of its own motion toward it, “is drawn toward feed by the lash of necessity”<sup>2</sup> and closes the cycle. It is compelled to search—that is, to move about in space in the direction toward the missing component of the cycle, toward the object of organic need (food, water).

The newborn baby is here still wholly like the plant. He lives for so long as the “external” conditions of the exchange of substances “come to him themselves”—the mother. He is not yet an animal—and there is no need here for the psyche.

The first element of the psyche can arise only where there is the beginning of his organism’s *own* “self-motion” toward food—toward the mother’s breast. The embryonic form—the baby—“is drawn” in the direction toward the mother’s breast, toward milk.

In the animal this psyche is innate. In man it is not, it must still take form—the baby does not display any attempts, even the clumsi-

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<sup>\*</sup>The text marked by slashes mainly serves illustrative purposes. Ilyenkov distinguishes it by slashes to avoid disturbing the logic of the argument. Only in a few instances was this text added later, when Ilyenkov was reviewing his essay attempting to complete it for publication. Most of the insertions have been made in the initial writing of the text.—Ed.

est, to move in a particular direction. /Fichte described this well, as a fact: vegetative “instinct” in the absence of *animal* instinct—that is, of the morphologically innate schema of motion in space that is necessary for the elimination of the spatial “obstacle.”/ Of the ability by means of organized actions to overcome the gap between his own body and the external condition of its existence

The emergence of psychic functions (= the image) is inextricably connected precisely with the presence of this—animal—“instinct,” although it is not an “instinct” at all—see Gal’perin’s<sup>3</sup> article—but a formation that arises after birth.

If this is not an “instinct” but a highly complex formation that arises after birth and requires ontogenetic development of a corresponding “functional organ,” then the problem of the emergence of the psyche coincides with—and does not stand in opposition to—the problem of ontogenesis of the corresponding zones of the brain. But the organ here is created by the function, and not the other way round, not the function by the organ, by a “structure” that exists prior to it.

Unconditioned reflexes here constitute a prehistorical prerequisite for the emergence of the psyche that, like the first stage of a rocket, is discarded as superfluous and no longer reproduced in the subsequent functioning of the psyche, no longer appearing as an internal-necessary component of the latter.

The “organs of the psyche” therefore include (as an internal condition of its functioning) only those nervous mechanisms that are not only a *condition* but also a *consequence* of “psychic” activity—activity of the organism in external space, activity with external objects that are distinct from the organism’s own body and exist outside it (and independently of it).

Only here, properly speaking, does need arise in a separate *subjective image* of the external object. A need becomes a *requirement* of the body only together with the appearance within activity of an *object* corresponding to the need, and not before.

A requirement (“orientation”) in a person becomes a *goal*, and it is as a component of goal-oriented activity that the *image* comes into being.

The baby possesses neither image nor psyche for the simple

reason that while he possesses an organic need (for his mother's milk) he does not possess a *requirement* for it—just like a plant. He is not a *subject* but only an *object* of feeding.

/He is a subject only in the act of sucking, swallowing, and digesting, which are purely vegetative—and in no way psychic—functions of the organism./

The only “trigger effect” here comes from that component of the exchange of substances that has already, independently of any active action on his part, entered within his body—at least the mouth, the lips. His mother's milk may be just half a meter away from his mouth—and he will still perish, unless this half-meter distance is overcome by his mother. He will not execute an action of his own (as a puppy or kitten will a mere half-hour after birth).

And only after half a year will he begin to *stretch out* toward the breast—here arises the first form of *psychically shaped* actions. Only an intention of the *direction* of actions, and not yet the actions themselves.

The actions of motion in space in the direction toward the mother's breast are not innate; they are formed. And it is precisely because the mother cannot constantly hold the baby to her breast that he traverses the path—at first passively, “stretching out” toward her with his whole body. He learns to move for himself—first on four and then also on two extremities. Even more precisely—he is *taught*.

He masters the psyche at the moment when he learns to move *himself*. This is the first image of “the self” (*das Selbst*).

When he learns to control *his extremities* (he controls his lips from the first day). The arms and legs—these are the first organ of *psychic* activity. The mode—the image—of their actions is the first *image*, within which the form of the path and the actively traversed trajectory of this path are *one and the same*. This is a geometric figure that has become a figure or schema of actions. The form of the thing is outside the thing, in the body of the subject, as the schema of his active motion. It is not therefore “in the brain”—only the nervous mechanism that guides the motion of the body is in the brain. The brain is part of the body, and not the “thinking body” that it may seem to be when psychic activity has been developed

to its refined forms—to the ability to construct in advance, prior to real action, an *ideal* image or *schema* of forthcoming actions, as though playing that schema through “subjectively” *before* performing the action.

(“Slow-response action” in Sechenov.)\* It is absurd to call the act of *sucking* “psychic.” It is performed without any preliminary “measuring” of actions—like swallowing, or peristalsis of the esophagus. Or the absorption of a solution by a plant. Sucking is often performed on idle or on a pacifier. There is not even a trace of any element of *psyche* here. This is merely a physiological prerequisite, merely a prehistoric *condition* of the psyche.

It is another matter when we consider actions of moving about in space that have the “goal” of restoring broken contact between one’s body and an object of organic need, of closing the cycle of exchange of substances *through one’s own actions*. Here it is no longer possible to manage without the *image*. Moreover, the image must invariably be given through the action of *distant* receptors (if only of smell—this is seen more clearly in the blind).\*\*

The brain is made an organ of the psyche only to the extent that it becomes an organ for guiding the self-motion of the body in a space filled with external objects, some of which are potential objects of need while others are obstacles “impeding” performance of the act of satisfying the need. The organism must learn to distinguish objects of one type from objects of the other, and to do so *at a distance*—that is, before making physical contact with them. This explains the extraordinary slowness (or even complete paralysis) of the process of formation of the psychic functions of the brain in deaf-blind children, in whom the sole receptor capable of taking a “photograph” of the form of an object (that is, creating an image

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\*Here Ilyenkov refers to one of the ideas of the Russian physiologist Ivan Mikhailovoch Sechenov (1829–1905) formulated in his classic work *Refleksy golovnogo mozga* [Reflexes of the Brain], published in 1863 (*Meditsinskii vestnik*, pp. 47–48).—Ed.

\*\*Here and below Ilyenkov relies on A.I. Meshcheriakov’s research on psychological development of the blind and deaf-blind children. He uses findings of this research in support of his own conception of psyche and its emergence.—Ed.

of it) is *touch* [*osiazanie*]. (More precisely, the motor action of which touch as a “receptor” is a component. In general, a receptor becomes an organ of the psyche only insofar as it becomes an auxiliary organ of an *effector*. “In itself” it is no organ of the psyche, but merely a necessary prerequisite of such an organ that also has a fully physiological nature and origin.)

It is precisely here that it is necessary to analyze the establishment of the function of touch. It will be more accurate to say “groping” [*oshchupyvanie*], because it is precisely groping that appears here as the action that is immediately “reflected” within the organism in the course of its execution, as an aggregate of “sensations” that are not chaotic but *organized by the action*. Not chaos, not a “flow,” but precisely an organized system of sensations—an *image*.

It is precisely here that Kant’s question is resolved: what organizes the “chaos of sensations” into an *image*, and how and why is this done? According to Kant, an a priori *schema*. Kant brilliantly demonstrated that without such a schema the very emergence of the *image* is impossible.<sup>4</sup>

The schema does indeed precede the *image*—not, however, as a “transcendental schema” but as a fully real—object-conditioned—schema of the work of the *organs of object-oriented action*—above all, of the *hand*, which, as it were, slides around the contour of the thing, and by its motion copies this contour, the immediately “sensed” (perceived) *external contour*. The image of the geometry of the external body, of the world of bodies—namely, of *obstacles* on the path of active action: here and nowhere else is the rational kernel of Fichte’s psychology.

The action is *reflected* onto itself—onto the body of the acting organism—and whatever was not present in the *action will also not be present in the feelings*.

“There is nothing in the intellect that would not be in the feelings”<sup>5</sup>—but “there is nothing in the feelings that would not be in *organized* action.” Idealism expresses this truth in its own language as follows: “besides the intellect itself,” for it ascribes the *schema* of organization of external action to the *intellect*, to a principle that enters “into action” and is given *prior to* action, to the “*soul*” as an incorporeal substance.

However, the “soul”—including the “soul” (psyche) of the *animal*—is the aggregate of the body’s *schemas of external action*, the schema of their organization into a series of successive operations, and unfolding as a chain of such “operations.”

Yes, activity undergoes successive differentiation (branching out), but is not “gathered together” from its supposedly previously given components. Unity is given from the start by the composition of the simplest—*universal*—“operation–action.”

The simple—isolated, spontaneous—form of activity is the action–operation of the organism, directed toward attaining in space an object of organic-inbuilt need. [For instance,] the mother’s milk. It is not written in the baby’s brain where and how to search for it, what kinds of obstacles must be avoided, and how this should be done. And it is not he who searches. It is his mother’s breast that searches for his lips—her breast, not his lips, that acts here as the organ of the *subject*, for a baby’s organism is simply not a subject.

It is when the baby begins to *stretch out* toward her—to “search” for her with his body—that there appears the first rudiment of *psychic* activity, in which, besides the brain, the whole of his little body takes part, actively stretching out toward the object of organic need, and thereby turning the need into a *requirement*, and the external object that is capable of satisfying the need (but that at the given moment does *not* do so, inasmuch as it is still far from his lips) into an *object of requirement*, into a component of a *psychic act* (action–operation)—or of *activity in general*, as a form that is not yet differentiated and therefore universal, capable of “branching out.”

What interests us here is not how the baby himself “experiences” this as his own “internal state,” but the objective composition of this “internal state.”

And this is the “ideal” presence of an object that is absent in reality, given through the real presence of a schema of the actions necessary for attaining it. A schema of actions, given *simultaneously* as a current state that unavoidably unfolds itself in a real succession of actions in time—this *is* the *image* of the action (contour or trajectory of the action up to the point of its real completion = geometry

of the external path around the form of the thing, the form of the thing as traced out by the motion of the organism in space).

As a schema–image it is given to the subject momentarily, outside of time, prior to and outside of its real unfolding in space–time.

It is therefore possible to draw a quite clear dividing line between the physiological and the psychic act.

Sucking is a purely physiological, inbuilt act.

But the smallest movement—even if just its “beginning” (the baby “stretches toward,” “is drawn toward feed by the lash of necessity”)—is already a psychic act, in no way inbuilt, formed only in the course of executing the action itself, stimulated from within but in no way shaped “from within.”

There is a connection between this “stretching toward” and the very simple phenomenon discussed by V.P. Zinchenko—*inclination* [*vlechenie*], the “*requiring*” state (and no longer a vague “need” unrelated to any object).

The sensation of need—an internal state—is also a purely physiological act (phenomenon). Sensation of the self is not therefore the first “psychic” phenomenon, given in introspection. Here only an internal physiological state is given in introspection.

But when this state turns into a requirement, it grows into a “complex of sensations” that constitute an *image* of the action and of its *object*—or, more precisely, an image of the object of need together with an image of the *space* that separates it from the body (and therefore of the “obstacles” that fill that space and of the paths and zigzags for avoiding them). Here then *arises* (and functions) the *image*. As the image of the *external thing* and of the *mode of action with it*, with respect to it, where the thing appears as an external goal and actions as means for attaining it.

The goal is the subjectively perceived form of the thing–goal, while the means are the geometrically defined trajectory for *avoiding* “obstacles” and, consequently, the contour of these obstacles, which in themselves—from a purely physiological point of view—are absolutely bionneutral.

The direct sensing of these *external* contours of things as the goal as well as of the means–obstacles on the path to its attainment, *is the image*, and is the cellular form of psychic activity, its

simple abstract schema. The schema is then *actualized* in the perceptual image, and here Kant, Fichte, and Schelling were right—it becomes the schema of the actually executed act of perception of the external form.

“The brain stores not the image but the *mode of construction of the image*” (Fichte), and there is profound truth in this. The image “exists” only in the course of and during its active *construction* of an—albeit very rapidly, almost instantaneously, in microseconds—executed action.

In fact, the brain stores an automated schema of image construction, and if this schema “works” with lightning speed, encountering no “obstacles” from sensations that “do not fit it,” then the *image* is constructed quite automatically, without the participation of *psychic* work. And the psychic work consists solely in the act of *correcting* the ready-made (physiologically recorded) schema of action at the very moment of its transformation into the “image,” into the finished “picture-copy” of the thing.

If the schema “works” without running into serious obstacles, then its transformation into the image proceeds painlessly.

(But here there arises a problem—what is important and what is not. [See] Fichte on the difference in the perception of one and the same object—a plant—by a child and by a naturalist.)

An analogy with an autopilot’s work may help. It holds to the *direction* given by the compass and gyroscope, and therefore the human pilot relies wholly on it in a space that contains no *obstacles*. If a mountain or a storm cloud appears in the flight path and the direction schema no longer suffices, it is necessary to activate another schema for avoiding the obstacle and make corrections to it during the diversion, taking into account newly encountered variations in the contours of the obstacle. It is here that the *psyche* comes into action—in the given case, the psyche of the human pilot.

But for so long as the schema is “actualized” smoothly and does not run into an obstacle, it is not compelled to “transform itself” into an image, to “bend itself” in conformity with the contour-schema of an external object-obstacle. . . . The image is a schema of external action to which individual corrections have been made each time, a schema that has been changed in accordance with an

individually unrepeatable (and so incapable of being envisioned in and by the schema) concurrence of circumstances—obstacles on the path toward the goal.

Therefore the psyche is present where and only where there is an individually variable schema of action, where there is correction of the schema by unique circumstances that automated systems are quite incapable of foreseeing—where the material schema of the body's motion is corrected by *unexpected* (for the schema) obstacles, by the necessity of taking them into account.

And the pilot allows the autopilot to steer through an ordinary cloud, but not a storm cloud.

And a person “sees” *a cat*—*any* cat—where the “schema” of the cat is not wrecked by unexpected “indicators,” even though he is unable to give a verbally precise “definition” of a cat in general, for the naturalist is also unable to do so—and distinguishes a cat from a dog (Schelling).

This happens precisely in the act of *perception*, in the act of transformation of *the schema into the image*. And prior to and outside of the act of perception—at the very moment of its occurrence—there is no “image.” And from this it is already possible also to understand the act of fantasy (dreaming).

Physiologically recorded in the brain, “schemas” of work begin to unfold, encountering no external obstacles, distorting them in such a way that they cease to be “obstacles.”

The image is the result of the “encounter” of the active “schema” of actions, physiologically recorded in the nerves, with actual sensations that correct the act of its actualization. The schema becomes an “image.”

Only the “orientation” [*ustanovka*] (strictly speaking, a purely physiological concept) acts otherwise. Then the result is illusion, dream, and also all forms of insanity and *idées fixes*.

Here too there are sensations, but only of an interoceptive character, coming from interoceptors, because the exteroceptors are silent or because the brain either simply ignores their messages or treats them as clay, turning them into passive material for actualization of the schema, without transforming the schema into an image.

Thus, the entire notorious sphere of the “subconscious” (the

unconscious in the psyche) is simply a system of actions and images that were once executed in a fully *conscious-psychic* manner but have been transferred to the level of automatic functioning—the level of schemas of actions recorded in a purely physiological manner.

This sphere is *secondary* in relation to *consciousness*, and by no means primordial, as Schopenhauer, Freud, and others, up to and including Uznadze and Bassin,\* have claimed.

/This is seen very clearly in light of the experiments of Harlow<sup>6</sup> with “motherless mothers.”/

The “subconscious” cannot therefore be placed alongside *consciousness* as two equally important components of the psyche. The general category is *consciousness*, while the subconscious is a special, derivative form of consciousness, and no more.

Nevertheless, psychology remains the science “of consciousness” and of its transformed forms, and does not become the science of the psyche, as a sphere that consists a priori of a “conscious will” and an “unconscious will” as two independent components, for this immediately returns us to Cartesianism.

The question of the “localization” of images, which also occupies Pribram<sup>7</sup>—that is, the question of by what kind of miracle we see *the form of a thing outside of the eye*, and do not simply feel irritation of the retina and of the tip of the optic nerve.

/Hence—pain in the toe of an amputated foot<sup>8</sup> and so on./

“Images form the brain, but why do we localize objects precisely thus and not otherwise?” (K. Pribram, *Iazyki mozga* [Moscow: Progress, 1975], p. 192).\*\*

“The light reflected off the external object creates an image on the retina. Sensations exist only inside our body, although we localize the image on the other side of the eye.” This is a quotation [in Pribram] from Békésy<sup>9</sup>; further on he describes an experiment

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\*Dmitrii Uznadze and Filipp Veniaminovich Bassin are known for their contributions to the development of a theory of the unconscious that represents the convergence of set theory and neurophysiology.—Ed.

\*\*Here and below all quotations from works originally published in English and German are translated from Russian.—Trans.

to localize tactile irritations. Vibratory flicks given at the tips of two fingers spread apart are perceived as an “event” taking place somewhere in the space between the fingers—exactly as occurs in the stereophonic reproduction of sound—if given simultaneously. If given not simultaneously but at an interval of 3–4 microseconds, then different sensations are felt at the tips of the two fingers. When the interval was reduced to 1 microsecond, “the two series of flicks merged into one,” and the sensation of vibration was localized in a single finger—“in the one that was stimulated first.”

“What is interesting in this experiment is that in the absence of an interval the vibrations are localized somewhere in the space between the fingers” (p. 193).

“By varying the time interval, it is possible to relocate the sensation correspondingly in the free space between the fingers.”

This “mode of external projection” is well known—the stick of the blind person, the probe of the surgeon, the screwdriver in the hand of the fitter.

This, as they say, is so commonplace that people “do not realize how peculiar it is.” The *image* is clearly regarded here as an event in the world “within us” and not in the “world outside of us”—as an *illusion*, as “*the ghost in the machine*” of the brain.

“In the 1960s behavioral psychology denounced the basic idea of gestalt psychology that subjectively experienced consciousness is such an important component of the biological and social world and that it cannot be ignored in the study of behavior” (p. 120).

“The ‘behaviorist’ jargon does not allow us to give a complete picture even of ‘behavior.’ Hence the resort to the terms of ‘subjective psychology’”—Gilbert Ryle, “Ghosts in the Machine” [Prizraki v mashine].<sup>10</sup>

“Images and feelings are ghosts that populate my own subjective world, as they do the subjective world of my patients. . . . And although these ghosts are locked into the machine that is called the brain, we are as yet unable to define them precisely. But if we ignore them, we shall only find ourselves facing a soulless behavioral machine. I am interested in the ghosts—the psychological functions—and not this machine–brain itself or the regulation of behavior that it effects” (p. 121).

Pribram cites a passage from Sherrington.<sup>11</sup>

Instrumental behavior and consciousness of it often (!) oppose one another: the more effective the actions performed, the less conscious we are of them. Sherrington expressed this antagonism in the following brief thesis: “Between reflex action and consciousness there exists, apparently, a real opposition. Reflex action and consciousness exclude one another, as it were—the greater the extent to which a reflex is an [instinctive] reflex, the less the extent to which it is conscious.”

/And here, of course, it does not matter whether the “reflex” is innate or acquired, whether it is considered as conditioned or unconditioned. The only important point is that it is an immediately present schema of automatic functioning./ “Habit is second nature”—here too this is important.

Whether this “nature” is first or “second” does not make any difference. The only important point is that consciousness (the psyche) in general begins where habit (a reflex, a schema of action that is encoded in a reflex) leads the organism into a conflictual relationship with the conditions of action, with the environment.

It is only here—in the hiatus of conflict, in the grip of conflict—that there arises and exists the *psyche*—the special activity of correction of a reflex.

In general, the psyche exists where the organism experiences the “resistance” of the object—to a schema of action that is being executed by a reflex.

The action is reflected back, and it is this resistance of the object that causes the schema of action to be “refracted” within itself. The action reflected off the object back into itself = the schema refracted through its own embodiment as an object; tension–contradiction within the schema appears “subjectively” as contradiction of the schema to itself, within it, as the “self-feeling” of the schema as it is actively inserted into the object.

A very simple case—motion in a straight line. Action along the straight line “gets stuck,” making motion impossible—resistance also along the straight line—and the more intensive the action, the stronger the “resistance” of the obstacle. There is a splendid discussion of this in Fichte.

Well, either the action is “broken” or the obstacle—whichever is the stronger. Either the schema of action or the form of the object of action—and here the form of the object is “represented” in the organism as the impossibility of actualizing the schema—reflex in the object, as a clash between the schema and the conditions of its actualization (the fly knocks against a pane of glass, the fool crashes into a wall).

In man: “before us is a wall; a rotten wall—poke at it and it will collapse.” That is, both the “schema” and the object—form that confronts it are alike represented in the fact of consciousness—object as that which *stands against* (*Gegenstand*). If the schema exerts no pressure, then there is no counterpressure, no “subjective feeling” of this counterpressure, and if the schematized action proceeds to completion unimpeded, then there is no *image*.

In this case, the schema is “imprinted” in the material but the material is not “imprinted” in the subject. A knife passes through butter but hits a stone and is blunted, and the stone imprints its form as a notch on the blade. The collision between “subject” and “object”—between the schema—reflex—instinct and the obstacle on the path of its actualization—can end in either of two ways: either the form of the action is imprinted in the material or vice versa, up to and including complete destruction of the schema or of the form of the material.

If the schema is nonetheless actualized after being corrected by counteraction, then *this* process is the sole process in the course of which there “exists” (arises, emerges) the *psyche*, “consciousness,” as the representation of the form of the thing—in living action reflected off the object—to itself.

It is necessary to portray this quite graphically. The object “arises” in consciousness as something that *stands against* the action, as *Gegenstand*. In this lies the meaning of Sherrington’s tirade. Fichte!

The *image* is the *schema*, corrected by the form of the obstacle to its actualization. The representation of the form of the object in the form of the action, its reflection. When the object renders no resistance to the action, to actualization of the schema, it is not “imprinted” in it either.

The fly hitting against the glass. Instinct is motion in a straight line; consciousness is a trajectory bent in conformity with the form of an obstacle.

Let us consider the “tortoise” of Grey Walter,<sup>12</sup> which models this situation. The mechanism here is an effector–receptor: *simultaneous* counteraction to the action, tension arising within this system.

The mechanical image of the “conscious will” in Fichte is the image of the *spring*. For so long as it unwinds in a vacuum, no tension arises within it. On the contrary, its “inner tension” diminishes—this is the “feeling of liberation.” The feeling of counteraction to its “free” unwinding is the feeling of an obstacle.

The form of the object is imprinted in the subject = in the “bending” of the trajectory of its motion. Water *flowing around* a stone. The river bed contour is the contour of obstacles that the flow of water cannot overcome.

An *image* is not a “ghost,” not a “subjective [psychological] state,” introspectively recorded by the brain within itself. An image is the form of a thing that has been imprinted in the subject’s body, as that “bending” *that* the *object* has imposed upon the trajectory of the motion of the subject’s body. It is a representation of the form of the object in the form of the trajectory of the subject’s motion, subjectively experienced by him as “forced”—“unfree”—change in the schema of reflex-executed motion.

In Pribram, this is a “ghost” simply because the *image* is immediately registered as a “state of the brain,” while this is merely the method of coding the “image” in the “language of the brain” and by no means the image itself.

An *image* exists in the real body of a real subject. It is there that it is “localized”—first as an event “on the boundary” between receptor and object—but the mediating object really appears as part of the subject’s body, not as part of the object’s body—the stick in the blind person’s hand, the probe in the surgeon’s hand—inasmuch as it actualizes the schema of the subject’s action and is really—in the action—“on this side of the subject” and not “on that.”

This is why the “sensation” of the obstacle *shifts* to the tip of the stick—the “image” is traced by the tip of the stick and not on its handle. Here the brain controls the motion of the *tip* of the stick

(brush, pencil, screwdriver), for it is precisely the tip and not the handle that traces the *contour of the object*.

This is why an *image* is the contour or geometric form of the object of reception itself, endowed with “self-feeling,” and not the contour of the motion of the hand that holds the stick or probe—and certainly not “a spatial drawing of an event inside the brain” or “in the nervous system.”

Precisely for this reason, an *image* is the subjectively given form of a thing, *not* an internal state of my body that is delusively attributed to a thing, falsely experienced as the *form of an external thing*. An image is the form of an *external* thing, copied by the action of a receptor–effector and therefore “experienced” precisely where this image exists (“arises”).

The *image* is not “localized” by the brain at the point of physical contact between the receptor and the surface of the object, but *arises* (and exists) there from the very start, and it is there that the brain “experiences” it.

It arises at the point of contact between the “tip” of the receptor and the surface of the object to which it pertains—and is experienced precisely as the fact of the resistance of the surface to the motion of the tip of the subject’s body. It is there. And “there” it is experienced. At precisely the place where it exists.

What “experiences” the real resistance of the surface is not the brain but the “*brain-receptor*” system, the “brain–hand” system, or, if the hand holds its own artificial extension, then there, at the end of the probe. It is precisely the end of the probe and not the handle that directly traces out the form of the thing, the contour of its surface—as the contour of its own trajectory around the form of the object.

Nor is it the brain that “senses,” but the tip of the receptor. The image is precisely the form of the thing, actively reproduced by the action of the “tip” of the receptor at the very moment of its action, of its motion as it “slides” around the external contour.

For this reason, there is not and cannot be an “image” of empty space. Empty space does not exert resistance and is therefore not sensed; what is “sensed” is merely the “freedom of action itself,” of the absence of obstacles.

Whether “I” am moving about in empty space or remaining at rest—for “self-feeling” or introspection this is an unresolvable question.

But “free” movement is also not sensed, and “freedom” is given only in the form of the *overcoming* of obstacles, and not in the act of unimpeded movement.

In this lies the whole of Fichte, the entire wisdom of his image of the wound spring, of its inner “tension.”

When all the energy of the wound spring has been spent, it also ceases to “sense” the *obstacle*, the inert force of counteraction to the obstacle—as self-movement that has impacted on the object and been reflected back onto itself.

/Compare the Fichtean interpretation of “value” in Backhaus<sup>13</sup>—as the inert force of the “resistance” of the entire mass of the inert social “reflexes” of customary social stereotypes, which set in advance limits—boundaries to the unfolding of human labor activeness./

The more strongly I “press” upon the object, the more strongly “it” presses upon me. The more actively I—the more actively the object imprints itself in me, and I attribute this “to the object,” to its activeness as a primordial power.

It is not the world that imprints itself “in me,” but I who actively grope my way in it with the aid of my fully corporeal organs—above all, with my hand and with the tips of my fingers. In them lies the “formative power,” the form-shaping capability—the *image*—and precisely in its original meaning as *eidōs*, as “idea,” as *schema*, in conformity with which the “chaos of sensations” is organized.

This is why Fichte—strangely at first glance—considers Kant the direct heir of *Plato*. Between them he sees no intermediary; in the interval between Plato and Kant “all is gloom,” that same gloom as “from the creation of the world to Plato.”

Indeed, how can the schema of “the triangle in general” arise? By abstracting what is invariant from the set of all possible triangles? In that case, the “schema” is only a schematized *image* or, more precisely, the common element “in all images.”

But we do not need to run through “all” the single cases of actualization of a “schema” in order to acquire a “schema.” Just as we do not need “inductive generalization” from all the endless cases

of a “triangle”—it suffices for us to have *one* triangle in order to extract from it a schema that we shall then easily be able to use to construct the *image* of any other triangle.

“Schemas” are therefore transcendental and a priori in relation to their “embodiment” in the material of sensations, in material that is external in relation to them. Compare the reasoning of Schelling.

Fichte: “Now imagine the one who thinks this thing.” Here the conception of “the I” is immediately presupposed in the form in which this “I” is directly “given” to itself—in the act of “introspection.”

The same in Mach:

“The establishment of boundaries between the I and the world is no easy task, nor is it free of arbitrariness. We shall regard as the I the aggregate of interconnected conceptions, that is, those that directly exist only for themselves. In that case, our I consists of memories of our experiences together with associations conditioned by them” (E. Makh, *Poznanie i zabluzhdenie* [Moscow: Skirmunta, 1909], p. 73).

That is, the I “is thought” in advance as something quite separate from and counterposed to the world. And then there begin to be “linked up” to it those things with which this I is indeed inextricably connected and without which it was impossible to “think” it—the brain, “the whole body,” and so on, and as a result also “the whole given,” but now as “component parts of the I.” Thus, the following schema becomes possible—“the I” counterposes itself (the I) to everything else (the not-I), and “the whole world” is made = “the not-I.”

Spinoza’s reasoning moves in the directly opposite direction, proceeding not from “the I” but from the world and leading to the I as a “component part” of this world. The movement goes along the same thread—chain of connections, but starts from its other end.

## Notes

1. The reference is to the definition of the object of psychology given by Leont’ev in his celebrated (now translated into twelve languages) *Activity. Consciousness. Personality* [Deiatel’nost’. Soznanie. Lichnost’] (Moscow, 2004),

p. 12. Ilyenkov made use of the first edition of the book (1975), but he was of course well aware that its chapters had already been published as articles in the journals *Voprosy psikhologii* and *Voprosy filosofii*. It is appropriate here to mention certain circumstances of Ilyenkov's own life. Those circumstances were very harsh and hard for him to bear during the last years of his life. Finding himself at the Institute of Philosophy the target of a campaign of open baiting unleashed by its director B.S. Ukraintsev, Ilyenkov even considered "going over to Davydov" and "occupying himself with Spinoza," but he hung on in the hope of change for the better. In the second half of the 1970s, Davydov, as director of the Scientific Research Institute of General and Educational Psychology of the USSR Academy of Pedagogical Sciences, saved the "methodological group" of F.T. Mikhailov from ideological and bureaucratic persecution and inevitable defeat (which became possible only after the retirement of V.N. Stoletov as president of the USSR Academy of Pedagogical Sciences). Davydov gave Mikhailov the opportunity to organize and head first the Laboratory of Theoretical Problems of the Psychology of Activity, and then also the Theoretical Department of the institute. Leont'ev's death in January 1979 had a very grave impact on Ilyenkov. It caused him great pain, at times even torment—right up to the last days of his life. Leont'ev had always evoked his admiration, not only as a great man and a great scholar but also as a great conversationalist—perhaps the only one who sensitively felt and understood the entire range of Ilyenkov's philosophical-psychological strivings. He constituted that unfathomable part of his *personal world* and brought him that natural joy which Eval'd Vasil'evich effectively conveyed to us in his article—testament "What Is the Personality?" [Chto zhe takoe lichnost'?).

2. *Heraclitus*. See *Fragmenty proizvedenii i vyskazyvaniia drevnegrecheskogo filosa Geraklita*, translated from the ancient Greek by M.A. Dynnik.

3. P.Ia. Gal'perin (1902–1986)—Soviet psychologist, very prominent specialist on children's psychology. Ilyenkov is referring to the article: P.Ia. Gal'perin, "K voprosu ob instinktakh u cheloveka," *Voprosy psikhologii*, 1976, no. 1.

4. I. Kant, *Soch. v shesti tomakh* (Moscow, 1964), vol. 3, pp. 220–27.

5. G. Leibniz, *New Essays on Human Understanding*, ed. and trans. Peter Remnant and Jonathan Bennett (Cambridge University Press, 1981).

6. Ilyenkov is referring to the research group of American ethologists consisting of H.F. Harlow, M.K. Harlow, and S.J. Suomi. At one of the methodological seminars at the Scientific Research Institute of General and Educational Psychology, Ilyenkov drew attention to the outstanding (in his words) results of the investigations of Harlow and his colleagues. In 1975 the journal *Nauka i zhizn'* (no. 2) published material about these investigations under the heading "From Meditation to Treatment" [Ot razmyshleniia k lecheniiu]. The article presented the main findings of the original multiyear ethological study of the psyche of monkeys. Ilyenkov showed enormous interest in the article—especially in that part in which the authors set out the strictly factual aspect of their observations on the partial (three-month) and complete (twelve-month) "social" isolation of monkeys. The isolation of the young anthropoid apes, deprived from the moment of birth of the possibility of any "communication," consistently led to the gravest consequences: in the behavior of these animals there did not form or *manifest itself genetically* any sort of requirement for orientational-exploratory activity;

and in the “motherless mothers” (that is, in accordance with the conditions of the experiment, in second-generation artificial mothers) even the notorious “sexual” requirement was completely absent, not revealing itself in any way! Not to mention the conjectured “maternal instinct”—the “motherless mothers” showed no interest of any kind in their own newborn young. The monkeys that had grown up in isolation felt no need for even the simplest form of the play characteristic of their peers in the control group. The complete absence of “communication” with others of their kind had as its consequence only terror, anxiety, and trembling. Sometimes all this gave way to complete apathy, especially in experimentally created situations where the “Robinsons” were expected to display at least elementary self-protection (a desire to stand up for themselves, so to say) if not aggressiveness. They felt no requirement for “communication”—either positive or negative. A typical situation was for “normal” peers at first to try to play with them (they usually played in their own circle), to get in response no reaction apart from alarm and anxiety, and then to start to push and hit the “Robinsons” and soon literally to tear them into pieces. This experiment had to be terminated in the tenth week.

7. *Karl Pribram* (1919)—American scientist, specialist in the field of experimental and comparative psychology, psychophysiology, neuropsychology, and psychoanalysis, physician and neurosurgeon. Professor at Yale and Stanford Universities. Together with G. Miller, E. Galanter, and others, studied problems of the interrelations among the brain, behavior, and consciousness. Proposed a new approach to the analysis of human and animal behavior—the so-called conception of “languages of the brain,” based on cybernetic ideas of information processing by means of “images” and “plans.” Author of *Plans and the Structure of Behavior* (together with Miller and Galanter, 1960), *Languages of the Brain: Experimental Paradoxes and Principles in Neuropsychology* (1971), *Psychophysiology of the Frontal Lobes* (1973), and other books. Ilyenkov’s library contains a quite impressive range of sources on psychophysiology, neuropsychology, and neurocybernetics, including the main books of Pribram that have appeared in Russian.

8. A standard example given by Descartes; see his *Metaphysical Meditations*.

9. *Georg von Békésy* (1899–1972)—Hungarian-American physicist. From 1939 he was a professor in the Department of Experimental Physics at Budapest University, where he engaged in the modeling of sound perception. In 1946 he emigrated to Sweden, and from 1947 he worked in the United States, where in a laboratory at Harvard University he successfully built a mechanical model of the inner ear and at the end of the 1950s fully reconstructed a picture of biomechanics in the cochlea, thereby opening up the possibility for ear surgeons to implant artificial eardrums. In 1961 he received the Nobel Prize in Physiology and Medicine “for discovery of physical mechanisms of stimulation in the cochlea.” In the last years of his life, he worked at the University of Hawaii. He was an honorary doctor of the Universities of Munster and Bern. Besides the Nobel Prize, he was awarded the Denker Prize in Otolaryngology (1931), the Shambaugh Prize in Otolaryngology (1950), the Leibnitz Medal of the Berlin Academy of Sciences (1937), the Academy Award of the Budapest Academy of Science (1946), the Howard Crosby Warren Medal of the Society of Experimental Psychologists (1955), and

the Gold Medals of the American Otological Society (1957) and the Acoustical Society of America (1961).

10. *Gilbert Ryle* (1900–1976)—British philosopher. In 1925 he was a member of the council and from 1945 professor emeritus at Christ Church College, Oxford University. During World War II he served in counterintelligence. Together with J.L. Austin, he was a leading representative of linguistic philosophy. In 1949 his book *The Concept of Mind* appeared, with a critique of Cartesian metaphysics from the positions of linguistic philosophy. The Cartesian conception of man, as Ryle understands it, is based on an incorrect interpretation of the term “mental series”; this unavoidably leads to dogmatic recognition of “the ghost in the machine.” Man is not a dualistic being but a rational animal whose “mental series” is transparent, inasmuch as it is fully revealed in actions, judgments, and the dispositions of language. According to Ryle, linguistic analysis of “mentalistic” terms goes beyond the bounds of introspective psychology and exhaustively reveals the pseudomysterious nature of mind. Ryle’s works *Systematically Misleading Expressions* (1931) and *Categories* (1938), as well as *The Concept of Mind*, exerted great influence on the development of the philosophy of mind in contemporary Anglo-American philosophy. Ryle’s conception is also represented in such works as *A Rational Animal* (1962), *Plato’s Progress* (1966), and *The Thinking of Thoughts* (1968).

11. *Charles Scott Sherrington* (1857–1952)—British physiologist. In 1932 he received the Nobel Prize in physiology and medicine for his investigation into the functions of neurons. He formulated the general principles of the action of the central nervous system, created the concept of receptive fields, and revealed the role of special nerve endings (proprioceptors) in the coordination of movements. He elaborated the concept of the synapse—the field of contact of neurons with one another—and established the existence of so-called antagonistic reflexes. From 1913 to 1936 Sherrington was professor of physiology at Oxford University. The development of experimental and clinical neurology is associated with his name. He created a major scientific school of neurophysiology in Britain and the United States. He was an honorary member of the Academies of Sciences of many countries; in the 1920s, he was president of the Royal Society of London. One of Sherrington’s classical works is *The Integrative Action of the Nervous System* (1906).

12. *William Grey Walter* (1910)—British neurophysiologist. Graduated from Cambridge University in 1931, he was one of the founders of electroencephalography and a pioneer in robotics. He discovered delta waves, alpha waves, and the theta waves that accompany emotional reactions, and created models of the nerve and of the central nervous system. He invented the first very simple cybernetic self-learning models and the first biomorphic robots, which he began to create in the late 1940s and early 1950s (“Walter’s tortoises”). These were self-propelled electromechanical and light-sensitive trolleys, in their external appearance and slowness of action reminiscent of tortoises, that could not only act in accordance with a rigidly preset program but also take into account very simple conditions of the environment or external circumstances. Two of Walter’s works have been translated into Russian: his article “Electrical Activity of the Brain” [Elektricheskaiia aktivnost’ golovnogo mozga] (*Fizika i khimiia zhizni*,

Moscow: IIL, 1960) and his monograph *The Living Brain* [Zhivoi mozg] (Moscow: Mir, 1966) [originally published in New York (by Norton) and London (by Duckworth) in 1953—Trans.].

13. *Hans-Georg Backhaus*—West German economist. Ilyenkov showed a special interest in his work. Preserved in his archive is his own translation into Russian of Backhaus's article "Toward the Dialectic of the Value Form" [K dialektike formy stoimosti].