

TOWARDS THE PROBLEM OF THE HISTORICAL NATURE OF PSYCHOLOGICAL PROCESSES¹

ALEXANDER K. LURIA²

Moscow State University, USSR

L'article critique l'idée selon laquelle les processus psychologiques fondamentaux (sensation et perception, attention, mémoire, résolution de problème) seraient indépendants du contexte historique. Après une brève revue des idées de L.S. Vygotskii, l'auteur montre que Vygotskii s'est surtout attaché à comprendre de quelle manière la *structure*, et pas seulement le contenu, des processus psychologiques change au cours du développement individuel. Les interactions, et spécialement les interactions verbales, joueraient un rôle essentiel dans le développement individuel. Le langage, en effet, est un instrument spécifiquement humain à l'aide duquel l'enfant en vient à maîtriser les formes d'activité qui seront exigées de lui en tant qu'adulte. La même ligne de raisonnement mène à l'hypothèse que là où un changement soudain se produit dans le milieu socio-culturel, les processus psychologiques changeront dans le sens d'une cohérence avec les nouvelles exigences de l'environnement. A l'appui de cette thèse, quelques données exploratoires sont fournies et l'auteur discute de l'implication de ces résultats pour la compréhension des processus intellectuels.

INTRODUCTION

Over the course of centuries, classical psychology arrived at the idea that there is a unitary, unchanging structure to human psychological processes. This structure is thought to operate on a series of sharply delimited psychological processes: sensation and perception, attention and memory, association and logical relation, judgement and reasoning. The structure of these processes was said not to depend on social-historical conditions and to remain the same at any particular point in history.

These concepts are accepted by almost any school of classical psychology. While one school might believe that the nature of psychological processes should

¹ This paper was translated from Russian into English by M. Cole.

² This paper includes the first published account of research carried out by Professor Luria during two expeditions to Tadzhikistan and Uzbekistan in the early 1930's. On the basis of early discussions with Professor Luria, my colleagues and I have been able to replicate certain of his observations, particularly those having to do with syllogistic reasoning. This work, carried out in Liberia, replicated in all important respects the work described in Sections 4 and 5 of this paper. (See M. Cole, J. Gay, J. Glick and D. Sharp, *The cultural context of learning and thinking*. New York: Basic Books, 1971). A great many topics investigated by Professor Luria and his colleagues are not reported in this paper, because Professor Luria believes that his thinking on the problems posed by his cross-cultural work is still at preliminary stage of development. (*Translator's note*).

be interpreted as the manifestation of the general category of spiritual life, and another believes that psychological processes are the natural function of brain tissue, an ahistorical conception of the nature of psychological processes is commonly shared.

Although the idea that the structure of fundamental psychological processes is unchanging has been accepted by classical psychology, more and more facts have been gathered in the course of concrete psychological experimentation which clearly indicate that the structure of psychological processes changes as a function of history; consciousness does not have a constant, unchanging structure. As a function of the development of the child and as a result of transitions from one social-historical stage to another, not only the contents of psychological life, but its structure change. In other words, the facts more and more clearly indicate that we must consider the historical nature of man's psychological processes. This position will be the subject of the present article ³.

I

As early as the end of the 1920's, the great Soviet psychologist, L.S. Vygotskii, put forward the view that while such elementary psycho-physiological processes as sensation, movement, elementary forms of attention, and memory, are undoubtedly natural functions of the nervous tissue, the higher psychological functions (voluntary memory, active attention, abstract thought, voluntary memory, active attention, abstract thought, and voluntary movement) cannot be understood as a direct function of the brain. He adopted the position, which was truly significant for that period, that in order to understand the substance of higher psychological processes in man, it is necessary to go beyond the limits of the organism and to search for the roots of these complex processes in the historically formed environment, in the communication of the child with adults, in the objective relations among objects, tools and language which have been laid down in the course of social history. In short, we must seek the roots of such higher psychological functions in the mastery of general, human, historically formed experience.

L.S. Vygotskii was convinced that mastery of socially determined experience changes not only the contents of psychological life (the range of ideas and knowledge), but also creates new forms of psychological processes, which take the form of higher psychological functions, which distinguish men from animals, and which create a more solid structure for the conscious activity of man.

Using the historically laid-down system of language, the mother shows the child an object and names it by the corresponding word; in so doing, she changes the environment perceived by the child, separating out the named object and turning the child's attention to it. This serves as the beginning of a most important evolutionary change in the psychological processes of the child. Initially under the control of the mother's instruction, the child then begins to use speech, naming objects which interest him, separating them from his environ-

³ In the work which we are going to describe, several people in addition to the author participated : L.I. Leventuev, F.I. Shemyakin, A. Bogoutdinov, K.H. Khakhimov, L.S. Zakhrbyants, E. Beinurova, and others.

ment and concentrating his attention on actively tying them to him. The process of communication between two people turns into a new form for organization of psychological processes in the growing individual. The function of calling attention to something, which was shared between two people, and which was initially of a reflex character, turns into internally organized activity; a new category, *higher psychological processes*, is created. These processes are social in their origin, mediated in their structure, and voluntarily directed in their functioning.

The roots of higher psychological processes turn out to lie outside of the organism in social-historical forms of activity. This external source of development which was never seen by classical psychology as of fundamental significance for the formation of psychological processes, becomes decisive for a scientific understanding of higher psychological processes. Psychology can no longer be interpreted in the light of natural science positivism; psychology is becoming a social-historical science.

The greatest value of L.S. Vygotskii's ideas consists of the fact that while preserving the natural laws of the brain's organization and work, he showed the new properties which these laws take on, including a system of social-historical relations. Also important is the fact that he traced the fundamental characteristics of social-historical evolution of man's higher psychological processes which, prior to his time, had either been ignored by natural science and psychology or only described, but never explained, by idealistic psychology which called itself "the psychology of the soul". New phenomena, which had never before been the subject of scientific psychological investigation were introduced into psychology. For example, Vygotskii considered such behavior as certain people's habit of making notches in a branch or tying knots in a rope to serve as a means for organizing attention, codes in language on the basis of which abstraction and generalization occur, and the historical process by which written language and arithmetic were formed. These phenomena began to be looked at, not only as a subject for ethnology and linguistics, but also as a substantial component of psychology.

The work of L.S. Vygotskii using the experience of progressive foreign psychological movements (the French sociological school, investigations of English and German ethnologists), but filtering the data through the prism of a materialist understanding of history, became a starting point for the formation of psychology as an historical science.

II

What kinds of facts can illustrate the productivity of this approach to psychological processes as a product of social-historical development? We will turn our attention first to the problem of the historical development of the processes of speech and thinking which even now continue to be among the most important problems of psychology.

In associationistic psychology (and to some extent in contemporary American behaviorism) one often encounters the opinion that the process of the development of thought can be reduced to a simple accumulation of new ideas, to a quantitative enrichment of the vocabulary, and to a mastery of abstract concepts. Classical psychology cannot deal with such problems as the following : How

does word meaning, which helps the child to direct his own behavior, develop? How does the *structure* of his intellectual processes change during ontogenesis in the deepest sense of that word? There is nothing further from the truth than the position that ontogenesis represents a mere accumulation of new elements.

As early as the 1920's, Soviet psychological science and primarily L.S. Vygotskii demonstrated that the meaning of words which the child uses, and the psychological composition of those ideational operations which he carries out with their help, represent a path of significant development. They demonstrated as well that the structure of these processes is deeply changed during the transition from pre-school to the early school age and from early school age to adolescence. Discovery of the fact that the significance of words develops and that as the child grows, the psychological structure of cognitive processes and interfunctional relations which carry out cognitive functions deeply change, represents one of the most important attainments of Soviet psychology and the results of this discovery are of great significance for the future evolution of this area of science. For this reason, we have to take a brief look at the problem.

The cognitive processes of the child receive a strong boost at the moment when the child masters his first word; they are infinitely enriched and increase in potential when they begin to be based on the system of complex codes which are part of the language. However, it would be deeply in error to think that the mastery of language, which is the most important means of social-historical organization of consciousness, can be understood as the acquisition of new ideas and that underlying the word are simple images or representations evoked with its aid.

It is well known that the semantics of a word are extremely complex and that the word potentially evokes not a single image but a whole system of possible associations. Underlying the word "oak" may be hidden both the image of a powerful tree and the wooded area on which it grows, as well as a sign of hardness (and sometimes a sign of stubbornness, as in the expression "that one -why, he's an oak"), hard material or a bench, etc. Sometimes the word evokes a natural system of abstract ties and "oak" becomes part of the same set as "birtch", "pine", etc. and is included in a general category "tree", which along with the group "shrubby" and "grass" form a category of "growing things", which in turn can be contrasted with another category, "animal".

The work of a developed consciousness consists in choosing from this set of equally probable associations those which are important for a given situation in order to replace the ambiguity of the set of associations as a whole with a definition which increases the probability of ties which are important for the given situation, and which form the basis of thought. The transition to verbal thought, therefore, constitutes a "leap from the sensory to the rational" and it guarantees an infinite variety of possible ties within which thought may move, allowing us to go beyond the limits of our immediately obtained sense data. It is exactly this property of language which led the great linguists of the last century to interpret language as a "weapon of freedom".

There is nothing more mistaken, however, than to assume that the significance of a word which is first mastered by the child immediately introduces into his consciousness the rich system of ties which we have just discussed and that it immediately allows him to complete that "leap from the world of necessity to

the world of freedom". Such a view, and it has often been encountered in psychology, which was not at that time historical science, is incorrect.

Observations of the natural development of speech in a child show that the lack of differentiation among words which appear at early stages of development [*kub* instead of *kuritsa* (chicken), *av* instead of *sobochka* (dog)] to a certain extent does not match in its content with the developed forms of these words. *Kub* indicates only one of several possible *surface features* of "cat" and in one situation may indicate fuzziness or softness and in another pain or scratching, and in a third, the cat itself which fell into a mousetrap. The early words of the child still do not have a strong concrete meaning and indicate that component of a situation (most often emotional) which is noticed by the child in that particular situation. The factor which determines the significance of a word at this stage is the impression of the child. In the early period of mastering speech, the definitional role is played not by the word and its historically determined logical ties, but the child's impressions with respect to the immediate situation. This is why certain psychologists, with good reason, say that at the early stage of the development of language, the subjective idea of the word is dominant over its objective significance. A significant process occupying the two first years of a child's life is the mastery and differentiation of the language system and the transformation of the word into a carrier of the structure of an objective code.

One can observe, as I have had the opportunity to do (see Luria and Yudovitch, 1955) how a diffuse word such as *tpru* begins by meaning in equal measure, a "horse" and "stop" and "let's go", but then acquires a suffix and turns into the word *tprun'ka*. In so doing, it also acquires the clear significance of a *name* and the designation "horse" no longer indicates "stop" or "let's go". The process of mastering the concrete significance of language is one of the most important periods in the psychological development of the child and it is exactly this process which is a stage in the formation of a *stable concrete picture of the world*. The naming of a concrete object by a word separates out its essential quality (watch, wood, store) and perception of the object acquires a stable, constant character. However, it does not follow that this process, which ends around 6 and 7 years of age, leads to the final stage of complete mastery of the developed significance of words.

Experiments which were begun by L.S. Vygotskii and continued by his co-workers, showed that the word mastered and used by a 5-6 year old child first brings to life visual-motor, concrete, situational ties and still to only a small degree leads to inclusion of those abstract relations which stand behind the developed significance of the word. For a long period the word "wood" evokes an idea of a particular tree, a particular area of woods, a bench, or that it floats and does not sink. But the word still does not evoke an idea which is never evoked in that situation such as "palm" or "iron" (according to the principle "organic-inorganic"). The same applies to the word *lavka* in the sense of a store, which evokes a whole complex of visual images and experience (bread, scale, sack, salesperson), but still does not evoke an abstract conception (*factory* - system of production; *store* - system of distribution).

At this stage, the logical system of ties standing behind the word still does not attain a leading character and the significance of the word in many respects still has traces of a visual-motor memory, and does not have ties based on the code

of logical thought. The entire system of speech/thinking in the child continues to be determined by this fundamental fact. It is necessary for the child (now he is already a school-child) to carry out substantial internal work, occupying an entire large period in order to be in a position where the situation is changed and he can respond to the words in terms of the system of logical codes formed in the process of social life. As observations have shown, only in his later periods does the child who defined horse as "she is carrying" (in other words, who replaced an abstract operation of behavior by a concrete situation), begin to give an answer such as "horse" — that is an animal". That is, he begins to replace an immediate visual image by a generally accepted, abstract, logical category.

In the 1920's, L.S. Vygotskii and L.S. Sakharov carried out experiments with geometrical figures (*e.g.*, a flat green triangle and a flat red circle), using children as subjects. Each of the figures was named by an artificial word (*e.g.*, the two figures named above were called *ras*). The subject was given the task of finding what other figures were named in the same way as the two that were shown. At first, the young children select a figure more or less at random or because it belongs to the group according to a single attribute (*e.g.*, one because it is green, another because it is a triangle, a third because it is flat). Only toward late childhood does the child begin the difficult work of discovering the abstract code according to which the group of objects had been formed. Only at this later period does he show ability to use complex word meaning as a basis for an abstract "categorical" kind of thinking⁴.

The importance of this investigation consists also in the fact that it was simultaneously realized that the history of the mastery of the significance of words (which is the fundamental channel for the social formation of individual consciousness) was at the same time a reflection of the historical development of consciousness of the child, the history of the transition from visual-motor thinking directed at immediate impressions and concrete memory to a verbal-logical form of consciousness, during which the leading role is played by the logical codes laid down in the course of social history. Thanks to this series of psychological investigations, the intimate mechanisms of the social formation of individual consciousness became a subject for scientific investigations and the thesis of the social-historical nature of cognitive processes of man received its full recognition.

III

We have shown that psychological processes in childhood do not remain unchanging, but develop, changing their structure and even their nature in this process and that they possess a social-historical character. However, we are able to judge the social-historical character of this development only indirectly according to the decisive role which communication with adults plays and the significance which language plays as means for the formation of psychological processes.

A substantial barrier to a decisive judgement concerning the character of psychological development in ontogenesis derives from the fact that, during this

⁴ Details of this experiment may be found in L.S. Vygotskii, 1962 (*Translator's note*).

process, maturation of the child's brain must be considered as a factor in development. It is necessary, therefore, to carry out the next step and to study a form of development of psychological processes in which maturation no longer is a factor and in which the formation of new types of psychological activity carries an unambiguously social character.

With this purpose, we will move to a consideration of the problem of a comparative study of the formation of psychological processes in different social-historical conditions and we will try to determine what changes are evoked in the structure of psychological processes by mass social-historical events. Two difficulties immediately come to mind when we consider this problem.

A theoretical difficulty consists of the fact that nowhere is the idea of the unchangingness and the unchangeableness of psychological processes so strong as in historical psychology in the narrow sense of the word. If we take as an axiom the position that the laws of perception and memory, speech and thinking, cognitive activity and emotional life are identical in all areas, we have implicitly accepted a position held by all but a few investigators, and it must be stated that in its time, this position played a progressive role in science because it acted against the reactionary position that certain races are biologically inferior and thereby psychologically inferior. Psychological changes, taking place in social history, have usually been viewed as an enrichment in knowledge, as a widening of the circle of ideas, and if we exclude such investigators as Levy-Bruhl, the idea that the process of historical development changes not only the content of consciousness, but its psychological structure was, specific to that still underdeveloped branch of psychology which took as its task the study of wide psychological changes in the course of history.

The second practical barrier consisted in the fact that historical advances which could reflect on the forms of psychological processes ordinarily take place over a very long period of time and this condition made it impossible to introduce psychological investigation using exact experimental methods. Investigation of psychological processes of greatly underdeveloped people was necessarily unable to study the consequence of such rapid changes and turning to the material provided by linguistics and folklore permitted access to these problems only indirectly.

Soviet investigators who approached the problem of the historical formation of psychological processes of man had two advantages over foreign investigators. On the one hand, they had accepted the propositions that — 1) the fundamental categories of conscious life do not have an *a priori*, spiritual character, but are the product of historical development; and — 2) that as a function of the transition from one historical form to another, not only the *contents* of consciousness, but the *structure* of higher mental processes, underlying concrete forms of psychological activity, change. On the other hand, the epoch in which they lived was one in which extraordinarily deep and rapid restructuring of historical forms was occurring, providing a unique opportunity, to trace the restructuring of psychological processes which followed the social, economic and cultural revolution. Changes in exactly the form experienced in the USSR had never occurred before.

These conditions explain why we wanted to trace directly the psychological results of the great social historical changes which occurred in our country in

the 1930's. Consequently, it was decided that a group of Soviet psychologists, including myself and several co-workers would go to Soviet Central Asia. This work was carried out under the direct leadership and with the participation of L.S. Vygotskii. The starting point for our observations was the assumption that separate psychological, and, in particular, cognitive processes (such as perception and memory, abstraction and generalization, reasoning and problem-solving) are not independent and unchanging "abilities" or "functions" of human consciousness; they are processes occurring in concrete, practical activities and are formed within the limits of this activity. Not only the content, but the structure of cognitive processes depends on the activity of which it is a part. Such a conception of the close ties between separate psychological processes and concrete forms of activity calls for a rejection of the non-scientific idea that "psychological functions" are *a priori* data, independent of historical forms; it stands in complete correspondence with the fundamental ideas of Marxist philosophy and with the fundamental pre-suppositions of Soviet psychology.

This initial position forces us to assume that different forms of practical life, which correspond to different historical periods or different social, psychological levels of development, determine the formation of psychological processes which differ according to their structure. Men living in conditions of different historical circumstances are distinguishable not only according to different forms of practical activity and different contents to their consciousness, but also to different structures of their fundamental psychological processes. Our initial position also forces us to assume that significant social-historical advances connected with a change of social-historical forms, and their accompanying fundamental cultural changes, lead also to fundamental changes in the structure of psychological processes along with the fundamental restructuring of activity. This psychological restructuring includes not only the use of new codes, organizations of new kinds of cognitive activity, but also substantial changes in the relation among psychological processes with the aide of which the new forms of cognitive activity begin to exist.

The subjects of our study were the residents of isolated villages in Central Asia whose life during the 1930's experienced a radical change in connection with the rapid socio-economic restructuring (collectivization) and cultural revolution (liquidation of illiteracy) which occurred at that time. The population of these villages live in a rural culture; however, this culture was comprised of a rather narrow social class and did not deeply affect the remaining population of the country. The population of these little villages, in the same manner as population of pre-revolutionary Russian villages, continued to live in conditions of a natural economy and remained completely non-literate. The religious ideas which were formally dominant, in practice had little influence on the ideas and cognitive processes of these people, whose thought rarely went beyond the sphere of practical activity which was determined by the demands of the natural economy. The socio-economic restructuring which began in the 1930's introduced fundamental changes into the life of the people in these areas.

The non-technological economy (gardening, cotton-raising, animal husbandry) was replaced by more complex economic systems; there was a sharp increase in the communication with the cities; new people appeared in the villages; collective economy with joint planning and with joint organization of

production radically changed the previous economic activity; extensive educational and propaganda work intruded on those traditional views which previously had been determined by the simpler life of the village; a large network of schools designed to liquidate illiteracy was introduced to a large portion of the population and, in the course of a few years, the residents of these villages were included in a system of educational institutions and at the same time were introduced to a kind of theoretical activity which had previously not existed in those areas.

It seems unquestionable that a radical restructuring of concepts and a decisive widening of the circle of ideas resulted from this socio-economic and cultural revolution. All of these events placed before psychology a fundamental question. Did these changes lead only to changes in the contents of conscious life or did they change the *forms* of consciousness as well? Was the structure of psychological processes changed and were new kinds of conscious functioning produced by these socio-economic changes? The answers to these questions would define a fundamental position in psychology as an historical science. Let us now turn to the facts we obtained.

IV

Psychologists have long been of the belief that the operation of subordination to a particular category, in other words, the operation of logical generalization and the formation of concepts is not only a fundamental logical process, but also must be understood as a fundamental form of the working of the mind, equivalent in all people independent of the surrounding conditions.

However, such an approach, which we can term an ahistorical approach to logical categories as a fundamental means of thinking, is contrary to our initial assumption. We were much more inclined to believe that abstraction and generalization, the formation of abstract concepts and the relating of an object to a particular category is a product of historical development. These processes become prominent as we know them only at a certain stage of historical development when the leading role of practical life gives way to new forms of theoretical activity and when similar abstract operations begin to make sense in terms of people's activity. Our initial pre-supposition led us to believe that in less complex socio-economic conditions such abstract operations would still not play a leading role and that their role should be played by somewhat different, more concrete forms of cognitive activity, reflecting characteristic kinds of practical life required by the corresponding socio-economic condition.

In order to determine exactly what kinds of ties dominate in consciousness at different stages of historical development, we conducted a simple experiment: subjects were presented four cards on which were drawn representations of objects, three of which were members of well-defined categories (*e.g.*, saw, ax, shovel). The fourth object clearly did not belong to that category (*e.g.*, a piece of wood); the subject was asked to select three cards which depicted "objects that go together" or objects that could be named by a single word (tool, in this case) and to place the fourth card to the side (that is, the card that did not enter into the category). Solution of this task provides no difficulties for subjects for whom the operations of inclusion of concrete objects under abstract category

ries (or logical operation of "categorical thought") constitutes a well-structured, dominant system of logical operations.

The picture was completely different for the residents of these isolated areas who were still at a level of relatively simple socio-economic organization and illiteracy. Not one of these subjects produced an abstract category in response to the task; they did not select the three pictures which belonged to the category of tools, and they did not select the abstract attributes which would relate these objects to an abstract category. Their operations were completely different; they thought of a concrete practical situation in which the three objects could be included, and they placed to the side that object which did not enter into the practical situation. "It is clear", they said, "here's a log, a saw and an ax, they go together"; "it is necessary to fell the tree, then to cut it up, and the shovel does not relate to that, it is just needed in the garden". Attempts to hint at the correct solution were not accepted by our subjects: they were told that it was possible to divide the pictures into a different group, that "one man said that the ax, the saw and the shovel had to be placed together because they are similar to each other"; that it is possible to name them with one word; and that the log was not a tool and therefore did not belong." Our subjects did not accept these solutions, and considered them incorrect, often saying things such as "No, that man was not correct; he does not know his business; he is a fool. Look, the saw and the ax, what could you do with them if you did not have the log? And the shovel? We just don't need it here".

In this way, from all the possible associations evoked during the operation of comparing these pictures, our subjects selected only concrete, practical associations, while the abstract "categorical" associations, if they were evoked (which happened very rarely), were considered insignificant and non-adaptable to practice. In those situations where we used abstraction and generalization, our subjects began by thinking of concrete, practical situations in which the three objects could participate. The leading place in the psychological operation involved in comparison of objects was occupied not by verbal-logical associations (or bonds), but processes of thought involving the concrete situation. The psychological structure of the process turned out to be completely different than we might have expected.

No less significant is the fact that when we introduced a generalizing word into the problem, it did not lead, as a rule, to any change in the process. When we asked the subjects: "Is it true that the objects you selected are similar?", they nodded their heads and said that "of course, they were similar"; their word for "similar" was used in our sense of "suitable for each other". Although the Uzbekh language has a completely different designation (*mos keldi*) which can be used⁵. When we directly introduced the generalizing concept called "tool" (*ashob* in Uzbekh), they formally agreed that it could be used, but they said that it is not important and that in this situation about which we were speaking, the saw, the ax, and the log in equal degree could be designated by the word *ashob*, because "they work together" and that the shovel remains as before,

⁵ The Russian term is difficult to translate in this context, but the term "suitable" is used in the sense of "a person is suitable for the work", "he's the right man for the job" (*Translator's note*).

beside the point. Exactly the same results were obtained in attempts to classify other groups of objects (*e.g.*, a stock of wheat, a flower, a tree, and a sickle or, a plate, a knife, a cup and bread). In all these cases, the subjects from this group related the objects to a particular, practical situation and did not relate them to a well-defined category.

Completely different results were obtained when we studied the behavior of residents of the same village who had gone through a brief literacy course and who had participated as activists in the newly-formed collective farms. None of these people substituted concrete-visual practice for the required abstract operation, and they easily mastered the process of abstract-logical generalization; one-third of these subjects manifested the presence of both kinds of thought (situational and categorical), two-thirds of the subjects completed the abstract operations relating the objects to the known categories without any difficulties. Experiments carried out with young people from the same village who had completed one or two years of school, yielded results which could scarcely be distinguished from those which we had obtained under more technological cultural situations.

These facts lead us to make the following conclusions. Logical operations for finding relations such as "species-genus", the comparison of objects according to logical attributes and generalization of them to well-known logical categories are clearly not universal operations, occupying a leading place in the cognitive activity of people who find themselves at different levels of social-historical development. The cognitive processes of people living in less complex social-historical conditions, are constructed significantly differently than the cognitive activities known to us by our own experience. These differences rest not only in the different content of cognitive processes, but are significantly different according to their structure. Not the abstract significance of words, but concrete-practical ties reproduced from the experience of the subject play a directing role; not abstract thought, but visual-motor recollection determines the course of thinking. All of these facts have nothing in common with the biological features of the people that we have studied. They are a completely social-historical feature of psychological activity; it is only necessary for the social-historical conditions to change in order for these features of cognitive activity to change and disappear.

V

The fact that a fundamental process of cognition — the formation of concepts — is different under different historical conditions, determines other differences in cognitive processes, among which are the operations of drawing conclusions and reasoning. Philosophers, just as psychologists, have never doubted that the operation of forming a syllogism and syllogistic reasoning are of a universal character and identical at all stages of development. They have accepted the position that the relation of the major and minor premises ("precious metals do not rust", "gold is precious metal",...) automatically carry with them the logical conclusion and that the necessity of this conclusion is equivalent at all stages of social-historical development. This position is bound to be completely unwarranted in view of the data from our psychological investigation.

The presence of the two initial parts of the syllogism (the major and minor premises) is said to be necessary and sufficient for the appearance of "a logical feeling" of the incompleteness of the judgement, and for the operation of the logical conclusion at that stage of historical development where the formation of the concept consists of the abstraction of the important attribute and the logical relating of the object to its corresponding category, in other words, at that stage where the thought processes are completed in a verbal-logical way. However, presence of the two first parts of the syllogism is certainly *not* sufficient for the appearance of "a logical feeling of the incompleteness of the judgement" and for the automatic completion of the operation of the logical conclusion at those historical stages when thinking carries a practical, visual-motor character and when the decisive role in reasoning is played, not by logical pre-suppositions, but by the presence of some corresponding practical experience. This is why the presentation of the two first premises of a syllogism to people living in different, simpler, socio-economic conditions, clearly does not lead to an automatic appearance of a logical conclusion. A complete logical conclusion may be made only from immediate practical experience, and cannot be made from the comparison of two verbal-logical parts of the syllogism.

In order to obtain data on this problem, we conducted a special series of experiments. We asked subjects, in our isolated villages, two kinds of unfinished syllogisms: the contents of some were taken from the concrete, practical experience of the villagers; the contents of others bore no relation to familiar, practical life. If the logical conditions of the major and minor premises played a decisive role in the operation of reasoning and were sufficient in order to make the corresponding logical conclusion, in both cases the subjects would give the necessary conclusion from the syllogism with equal ease; if the leading role in the reasoning operation is played not so much by verbal-logical relations as by the immediate practical experience of the subject, then the conclusion in the first kind of syllogism should be clear while conclusion for the second kind should turn out to be impossible. The facts obtained in this investigation completely bore out the latter assumption on our part.

For syllogisms connected with immediate practical life, we provided our subjects with the following sorts of problems: "Cotton grows where it is hot and humid. In the village it is hot and humid. Does cotton grow there or not?" For syllogisms not connected with the immediate experience, we gave such logical problems as "In the north where there is snow all year, the bears are white. Town X is there in the north. Are the bears white in that town or not?" Deciding the first type of syllogism evoked no difficulty in our subjects. They said: "Well, if the village is warm and humid, then cotton certainly must grow there, of course, if there aren't any hills nearby". And they added: "And that's the way it is, I know myself". The characteristic addition, "and I know it myself" uncovers the psychological nature of the way in which the conclusion was made. It shows that while the relation of the major and minor premises plays some role in the conclusion, the fundamental role, nevertheless, is played by the actual practical experience of the subject, and that in the given case we are dealing not so much with a conclusion from the syllogism, as conclusion from the subject's own practical experience.

This assumption is confirmed if we consider the responses to the second kind

of syllogism. One interesting feature of the second kind of syllogism consisted of the fact that the assumptions of the syllogism were often repeated not as a system of logical relations, but as two isolated questions not having a definite content. For example, when they were told about a particular village in the north, where there is snow all year and all the bears are white and when they were given the second premise (such and such a place X is in the north, and there is snow all year), the subject repeated the question by saying: "In the north where there is snow all year, are the bears white or not" or they repeated the problem as: "In such and such a place X, are the bears white or not?" The omissions clearly indicate that the major premise was not accepted by them as an initial, generalizing position and that the real syllogism was not evoked by these conditions. It is therefore completely natural that our subjects, who easily reached a conclusion on the basis of the syllogism that was related to their practical life, refused to make a conclusion from the syllogism which was not connected with their practical experience. To a question formulated after the presentation of the two premises of this problem, they answered: "But I don't know what kind of bears are there. I have not been there and I don't know. Look, why don't you ask old man X, he was there and he knows, he will tell you". Sometimes these same subjects answered: "No, I don't know what kind of bears are there. I have not been there and I don't want to lie".

The refusal to accept the system of logical assumptions and to draw conclusions from them, the idea that to draw a logical conclusion not having experienced the situation oneself, means to "lie", were all typical phenomena for the vast majority of the basic group of subjects whose cognitive processes are determined in infinitely larger degree by personal, practical experience than by a system of verbal-logical ties. Just the opposite occurs in subjects who had completed a small amount of schooling, who were included in the active activity of the collective farm, and who worked along with other people to plan the production of the farm and collectively drew conclusions about the future of their farm's economy. All these people easily accepted the generalized character of the judgement, included in the major premises and without any difficulty related the two premises to obtain the necessary, logical conclusion.

These facts indicate that the operation of reaching a logical conclusion from the syllogism is certainly not of a universal character as one might have thought and that different socio-economic conditions with their corresponding special features of cultural life, create conditions in which the dominant role in cognitive processes is played by personal, practical experience. In such conditions, the necessary belief in logical premises has still not been accepted; a system of verbal-logical relations is not evoked and operations of drawing a conclusion from the syllogism have still not obtained that significance for the acquisition of new knowledge which will be the case in more complex socio-economic conditions, which lead to the development of new kinds of theoretical activity.

CONCLUSION

We have completed a brief review of our material and now we will consider a few of the conclusions.

The idea that the fundamental processes of psychological life are of a universal, ahistorical nature and must be viewed either as a category of the soul or as a natural function of the brain, independent of social-historical conditions turned out during the course of our investigations to be incorrect. Psychological processes, and most of all, higher, specifically human, forms of psychological activity, such as voluntary attention, active memory, and abstract thought, must be understood as a social phenomenon in origin, and as processes formed during the course of mastery of general human experiences. These processes are social-historical in their origin, mediated in their structure, and consciously and wilfully directed in their functioning.

Our position concerning the historical nature of psychological processes is not restricted to the facts of ontogenesis. It has been supported by the investigations of those changes which psychological processes undergo during the transition from one social-historical formation to another. Our facts indicate that the development of psychological processes during social history really cannot be interpreted as the result of more experience or the enrichment of one's circle of ideas. The origin of new forms of practical activity, the transition from visual-motor kinds of practice to complex forms of theoretical activity, is one of the most important facts of historical development, leading to a radical restructuring of cognitive processes and to the appearance of new kinds of psychological activity which did not exist previously. The facts obtained in our investigation show that even such processes as the formation of concepts, logical conclusions and reasoning cannot be understood as an historical category, they are formed in concrete social-historical conditions and are different in principle in conditions of simpler social-historical life where the role of immediate practice dominates.

Our belief that the fundamental categories of psychological processes in man are of an historical character and that psychology must be understood as an historical science is still a new idea and has not been sufficiently well understood. It was first formulated in the philosophy of Marxism, but is only presently being mastered by psychological science. There is every reason to think that it will become an organic part of psychology only in the future and that the coming generation of psychologists will have new and important prospects for the study of fundamental psychological processes in man as a function of his historical development.

REFERENCES

- LEONTIEV, A.N. *Problems in the development of the mind*. Moscow : Publishing House of the Academy of Pedagogical Sciences, 1968.
- LURIA, A.R. On changes in psychological functions during the course of child development. *Problems of Psychology*, 1962, No. 3.
- LURIA, A.R. & YUDOVICH, F.Y. *Speech and development of psychological processes in the child*. Moscow : Publishing House of the Academy of Pedagogical Sciences, 1956.
- VYGOTSKII, L.S. *Selected psychological investigations*. Moscow : Publishing House of the Academy of Pedagogical Sciences, 1956.
- VYGOTSKII, L.S. *The development of higher psychological functions*. Moscow : Publishing House of the Academy of Pedagogical Sciences, 1960.
- VYGOTSKII, L.S. *Thought and language*. Cambridge, Mass. : MIT Press, 1962.
- VYGOTSKII, L.S. & LURIA, A.R. *Studies in the history of behavior*. Moscow : OGIZ, 1930.
- ZAPOROZHETS, A.V. *The development of voluntary movement*. Moscow : Publishing House of the Academy of Pedagogical Sciences, 1959.