EXPERIMENTAL ABNORMAL PSYCHOLOGY

MONOGRAPHS IN PSYCHOLOGY
An International Series

EXPERIMENTAL ABNORMAL PSYCHOLOGY
B. V. Zeigarnik • 1972

FUNDAMENTAL PROPERTIES OF THE HUMAN NERVOUS SYSTEM
V. D. Nebylitsyn • 1972

INNER SPEECH AND THOUGHT
A. N. Sokolov • 1972

In preparation:

PROBLEMS OF PSYCHOLOGY OF MEMORY
A. A. Smirnov

EXPERIMENTAL ABNORMAL PSYCHOLOGY

B. V. Zeigarnik
Moscow State University
Moscow, USSR

Translated by Timothy C. Brock
Psychology Department
The Ohio State University
Columbus, Ohio

PLENUM PRESS • NEW YORK—LONDON • 1972

Blyuma Vul'fovna Zeigarnik is Professor of Psychology at Moscow State University. She was graduated in 1927 from the University of Berlin. For many years Professor Zeigarnik has been the director of the Psychological Laboratory of the Moscow Institute of Psychiatry of the Ministry of Public Health of the RSFSR. She lectures on general and abnormal psychology. Her recent research has been concerned with the pathology of thought and personality.

The original Russian text, published by Moscow University Press in Moscow in 1969, has been revised and corrected by the author for the present edition. The English translation is published under an agreement with Mezhdunarodnaya Kniga, the Soviet book Export Agency.

Зейгарник Блюма Вульфовна

VVEDENIE V PATOPSIKHOLOGIYU

ВВЕДЕНИЕ В ПАТОПСИХОЛОГИЮ

Library of Congress Catalog Card Number 70-167678

ISBN 978-1-4684-7423-7 ISBN 978-1-4684-7421-3 (eBook)
DOI 10.1007/978-1-4684-7421-3

A Division of Plenum Publishing Corporation
227 West 17th Street, New York, N.Y. 10011

United Kingdom edition published by Plenum Press, London
A Division of Plenum Publishing Company, Ltd.
Davis House (4th Floor), 8 Scrubs Lane, Harlesden, NW10 6SE, London, England

Foreword

In recent years psychology has considerably expanded and enriched its relations with medical practice, first and foremost with psychiatry. This orientation toward experimental abnormal psychology has been closely tied to the practical tasks of psychiatry: differential diagnosis, establishment of the structure and extent of impairment, and the dynamics of mental disorders as affected by treatment, etc.

Experimental abnormal psychology has been no less important for the theoretical problems of psychology and psychiatry. The study of pathological changes in mental processes helps in dealing with questions about the structure and formation of mental activity. The research findings of abnormal psychology also have important implications for overcoming biologizing tendencies in the interpretation of human psychology.

The present book does not try to provide an exhaustive exposition of all divisions of abnormal psychology. It introduces the reader only to those problems which at the present time seem to be best worked out experimentally: the breakdown of intellectual capacity, thought disorders, the methodology of setting up an experiment in the psychiatric clinic, and certain questions relating to motivational disturbances and psychological growth and decay.

Some rewritten sections from the author's earlier book, "The Pathology of Thinking," have been included.

The present volume is intended for psychology students, for psychologists, and for physicians working in psychiatry.

Research in experimental psychology by the author and her colleagues constitutes the factual basis for the book's theses. This research was carried out in the Laboratory of Experimental Abnormal Psychology of the Moscow Institute of Psychiatry, which for many years has been the core program of the School of Psychology at Moscow State University.

I am sincerely grateful to the staff of the Institute and especially to my colleagues at the Laboratory. I would also like to express my gratitude to the physicians and psychologists at the Gannushkin Psychoneurological Hospital Number 4 for their unceasing assistance.

B. V. Z.

Contents

Chapter 1

Subject Matter and Tasks of Abnormal Psychology

The subject matter of abnormal psychology is mental disturbances resulting from brain disease. Whereas general psychology deals with the characteristics of mental structure and development, abnormal psychology studies the structure and mechanisms of different forms of mental deterioration. Thus, for example, if general psychology studies the principles according to which thinking is shaped and takes place, then abnormal psychology deals with the principles and forms of disturbances in thinking.

As a division of general psychology, abnormal psychology proceeds from its theoretical assumptions and deals with the solution of problems posed in clinical psychiatric practice.

Abnormal psychology is located at the juncture of two sciences: psychiatry and psychology. Hence, the findings of abnormal psychology are significant for the theoretical and practical questions of both disciplines.

The study of psychological change is one of the important means for analyzing the structure of normal mental activity and for developing a general psychological theory. The research findings of abnormal psychology are just as important for the theoretical and practical problems of psychiatry.

It should be noted that familiarization with the ideas and findings of modern psychology is necessary for every physician no matter what his specialty. The physician deals not only with the

sick organism but also with the sick man who is reacting continually to the situation caused by his illness. The physician must know how to thoroughly understand the patient's personality, the peculiarities of his character, experiences, and needs, and, by doing so, choose the appropriate strategy in relating to him. He must know how to mobilize the personality of the patient in the struggle with disease and to get the patient to relate adequately to his own illness. Excessive overanxiousness about his health as well as a careless attitude by the patient towards his illness must be skillfully corrected by the physician. The effectiveness of the treatment depends to a great extent on the attitudes of the patient himself.

The findings of psychology are necessary too for the development of medicine as a science. Different branches of psychology can be taken advantage of depending upon the particular clinical field. For example, in pediatrics, the findings of child psychology are applicable, such as assumptions about the principal activity of the child at various developmental stages (the works of A. V. Zaporozhets, D. V. Él'konin, L. I. Bozhovich, and the research of J. Piaget); the oculist can benefit from information about the properties of visual activity (works of A. A. Yarbus); the therapist can use findings from work on interoception, such as data on subliminal sensation (B. G. Anan'ev, G. V. Gershuni, A. N. Leont'ev) and so forth.

In 1966 the Ministry of Public Health of the USSR introduced the teaching of medical psychology into the medical schools because knowledge of psychology was considered necessary for every medical specialization.

Psychology has an especially great significance for psychiatry and neurology. The findings of psychology are essential for analyzing the origin and course of mental illness and the structure of psychopathological symptoms. In investigating different psychological disorders, psychiatry has always used psychological concepts and naturally these concepts have continued to be those of the current empirical, or so-called, functional psychology.

Soviet psychologists (L. S. Vygotskii, P. Ya. Gal'perin, A. V. Zaporozhets, A. N. Leont'ev, A. R. Luriya, S. L. Rubinshtein) proceed from different methodological assumptions in their research. On the basis of the general propositions of the Marxist-Leninist

theory of reflection and the Sechenov-Pavlov teachings on the reflex nature of the mind, Soviet psychologists rejected division of the mind into separate innate functions and maintained that different forms of mental activity develop in the course of life as a function of upbringing and training. A child is not born with "little functions" of thought and memory, which expand during growth and decline with brain disease; thought and memory are in fact different forms of activity that are shaped during ontogenesis.

These principles, founded on concrete research, may provide the basic explanation of many abnormal symptoms and syndromes. However, one must distinguish the subject matter of abnormal psychology from that of general psychopathology as a division of psychiatry. Although these topics may coincide in some respects, nevertheless, we think that their present stage of development allows a certain demarcation.

General psychopathology, as a division of medicine, studies the most typical symptoms and syndromes of disease conditions. General psychopathology, which covers both the genesis and etiology of mental illness, is broader than abnormal psychology, which investigates the structure of a particular form of mental disorder and compares the mechanisms of deterioration with the norm. The latter must assess psychopathological phenomena in terms of contemporary psychological concepts.

As a division of psychology, abnormal psychology proceeds from its basic premises: the principle of determinism and the principle of growth. What do these principles require? Rather than binding us to the study of an individual's isolated responses to a stimulus, they require qualitative examination of the content of his mental activity, i.e., an analysis of changes in his actions, behavior, and cognitions. As S. L. Rubinshtein showed, the correct philosophical definition of determinism means that an external cause does not directly determine a person's responses; it acts through internal conditions. "An external influence," as stated in his book "Being and Consciousness," "has a given psychological effect only as it is reflected through the subject's psychological state, through his system of accumulated thoughts and feelings" (page 226). Applying this to concrete research in abnormal psychology means that it is necessary to proceed from studying the breakdown of separate functions to the study of changes of

different forms of the patient's activity, including changes of personality orientation and motives.

The tenets of Soviet materialist psychology concerning the genesis of mental processes lead to the same conclusion. The very formation of these processes is impossible without the contribution of motivational ingredients. A. N. Leont'ev, in showing that mental processes are formed during the course of life, emphasized that this formation takes place in the process of mastering a world of objects and phenomena created by man. He shows that biologically inherited properties constitute only one (albeit a very important one) of the formative conditions of mental functions. The basic formative condition is indeed the mastery of the world of objects and phenomena created by mankind. In addition, Leont'ev emphasizes that this learning is an active process; to open the world of objects to a child the child must actively work with these objects and phenomena. This learning takes place in interaction with other people. The child is "brought into this world by the people around him and they guide him in this world."

Therefore the most important condition for learning to master the environment is the availability of relations with other people. Complex mental activity is socially conditioned from the very beginning; it forms in the course of mastering the environment in interaction with other people with whom the child has definite relationships. These relationships are determined by concrete historical conditions but, once established, they themselves determine the person's behavior and actions. The social needs, motives and interests which arise in the process of mastering the environment form the child's personality. With the development of human society, ways of satisfying these needs are, as Karl Marx put it, "more and more humanized." New, more sophisticated, needs appear while the old ones undergo differentiation and transformation.

In destroying the mental behavior of the person, disease frequently changes the peronality component of that behavior – a fact well known to psychiatrists. All psychiatric texts and monographs include detailed and exceptionally faithful and vivid descriptions of personality disorders typical for patients with different nosologies. However, psychopathological analysis still treats the symptom as basically a disturbance of a mental function or the symptom is even explained by positing disorder of physiological processes.

Meanwhile, it is clear from the aforementioned theoretical principles of materialist psychology that analysis of a psychopathological phenomenon must take into account the patient's personality disturbance and changes in his attitudes, needs, and interests. Therefore investigation of personality disorders is worthwhile, both practically and methodologically. The correct solution of this problem will be possible only when it is based on the principles of determinism and growth in the dialectical-materialistic sense. The fact that abnormal psychology is oriented towards studying personality disorders changes the formulation of certain specific research questions. These questions will be discussed in future chapters.

A further problem of great promise confronting the comparatively young borderline field of abnormal psychology is the development of adequate techniques which might insure objective interpretation and analysis of psychopathological phenomena in the scientific terms of materialist psychology. The refinement of procedures and the standardization of individual techniques constitute the subject matter of concrete research in abnormal psychology. Further development of this division of abnormal psychology goes beyond questions about procedural rules; it acquires a certain methodological significance, opening new possibilities for the analysis of the qualitative structure of psychopathological symptoms and syndromes.

The practical uses of the psychology experiment in the psychiatric clinic are quite varied. The experiment must not be carried out in isolation from clinical tasks and it must be geared to the concrete questions of clinical practice.

What then are the sorts of problems that can be posed to psychological research?

1. In the first place, the psychology experiment can be used for differential diagnostic purposes.

It is self-evident that diagnosis cannot be established on the basis of some laboratory studies; rather it must be based on comprehensive clinical inquiry. However, psychology laboratories have accumulated experimental facts characterizing disorder of mental processes in different kinds of illness. Therefore the findings of experimental psychology can serve as supplementary material in the establishment of a diagnosis. So, for example, in

the clinical analysis of a patient's condition, it is sometimes necessary to separate an asthenic condition of organic nature from schizophrenic inertia. The discovery of retarded mental processes, with poor memory and recall for stimuli, and the demonstration of a relationship between these disorders and exhaustion testifies to the existence of organic disease, while, at the same time, unproductive thinking in the absence of asthenia and with good memory is more often observed in schizophrenia.

2. The analysis of the structure of a defect, independently of differential diagnosis, may be a problem for psychological experimentation. Such an analysis of the structure of disturbed mental processes can turn out to be extremely important in describing new forms of disease or ones that have been little studied.

3. A further task for experimental psychology is the establishment of degrees of mental impairment. This problem acquires special urgency in the analysis of disease processes, for example, in following up on the effectiveness of a course of treatment.

The establishment of the degree and dynamics of mental impairment is also necessary in the work of expert consultants in the industrial, forensic, and military fitness areas.

The enumerated tasks are not the only ones for research in experimental psychology. In the process of clinical work other specific questions can also arise which require a competent psychologist (experimental analysis of individual psychopathological phenomena, for example, hallucinations, delirium, and the characteristic reactions during pharmacological testing). Here we have only touched upon the most essential tasks.

Chapter 2

Historical Outline

At the close of the 19th century, psychology gradually lost its character as a speculative science and the experimental method began to penetrate its investigations. It is customary to consider Wundt's laboratory of physiological psychology, organized in 1879 in Leipzig, as the first laboratory of experimental psychology. The experimental methods of Wundt and his students also penetrated clinical psychiatry (the psychiatric clinic of Kraepelin); at the same time experimental psychology laboratories were also opened in the psychiatric clinics of Russia.

The history of experimental psychology is linked with the development of psychiatry and neurology. Even in the last century the "Medical Psychology" of R. Lotze (1852) and the "Medical Psychology" of D. T'yuk (1892) had already been published. However these works, as N. S. Lebedinskii and V. N. Myasishchev rightly noted, were no more than "sketches of the psychiatry of the authors' era."

During the 1920's works appeared on medical psychology by well-known foreign psychiatrists: E. Krechmer's "Medical Psychology" treated problems of breakdown and growth from a constitutional position that is unacceptable to us; P. Janet's "Medical Psychology" dwelt on the problems of psychotherapy.

The development of medical psychology in the Soviet Union was distinguished by the presence of a solid natural science tradition. Laboratories of experimental psychology existed in major psychoneurological institutions, even in the prerevolutionary period. In his day Sechenov attached great significance to the rap-

prochement of psychology and psychiatry. In his letter to M. A. Bokova in 1876, he indicated that he was setting about the creation of medical psychology, which he called his "Swan Song." Writing of psychology, he said that "it is that science which has clearly become the basis of psychiatry just as physiology is the basis of pathology of the body."[1]

Russia's first clinical laboratory of experimental psychology was opened by Bechterev in 1885 in Kazan. Subsequently similar laboratories were opened in psychoneurological clinics in Petersburg, Moscow, Kharkov, Yur'ev and other cities. Among the first experimental investigators were M. K. Valitskaya, V. P. Vorotynskii, L. S. Krainskii, P. V. Zaborskii, V. F. Chizh, and others. The research orientation of psychology laboratories in psychiatric clinics withstood the idealistic trend of psychological science at that time.

It was no accident that professors of psychiatry took part in discussions at the end of 1894 at the meetings of the Moscow Psychological Association and in the journal "Problems of Philosophy and Psychology" (1894, November). Countering a proposal of N. N. Lange's about the desirability of opening psychological laboratories at some Russian universities, the professors of psychiatry S. S. Korsakov and V. F. Chizh reported that such laboratories already existed and spoke out against the underestimation and hushing up of laboratories of "empirical psychology" in medical institutions.

A large amount of experimental psychology research was carried out in the clinic of mental and neural disease of the Military-Medical Academy under the direction of V. M. Bekhterev. His collaborators and students did experimental studies of the properties of association, concentration (attention), and intellectual efficiency in various mental illnesses (schizophrenia, manic-depressive psychosis, progressive paralysis, epilepsy, etc.).

In stating certain fundamental views about the techniques of experimental psychology, Bekhterev emphasized that experimental study of patients is a necessary supplement to and extension of clinical observations.

---

[1]Cited in the book by Kaganov "Philosophy of I. M. Sechenov," Moscow, 1948, page 101.

Bekhterev and F. D. Vladychko specially devised a number of fundamental recommendations and concrete procedural techniques for objective investigation of the mentally ill. Among the huge number of methods used by the Bekhterev school, the most widely employed were the word association experiment, the technique of defining and comparing concepts, the proof reading test for the study of attention, calculating tasks for recording the dynamics of patients' capacity for work, etc. Among the experimental investigations of the Bekhterev school, those of major importance were M. I. Astvatsaturov's studies of speech, K. N. Povarnin's work on attention, and V. V. Abramov's research on creativity in the mentally ill.

Bekhterev considered it absolutely necessary to try out clinical methods beforehand on a large number of mentally normal subjects of varying education and age. And so, almost all of the experimental investigations of the Bekhterev school studied groups of normal and mentally ill subjects with comparatively homogeneous educational backgrounds. Thus, for example, L. S. Pavlovska compared the free associations, judgments, and reasoning of healthy subjects and those suffering from paralytic imbecility; she also compared the reasoning ability of normals, idiots (oligophrenia), and schizophrenics. Another of Bekhterev's students, L. S. Gutman, compared the properties of the association process, attention span, and curves of intellectual work capacity in normals and mentally ill during different phases of manic-depressive psychosis.

An observation of Bekhterev's deserves special attention: experimentation enabled him to penetrate more deeply into the qualitative features of the intellectual activity of the mentally ill, and to sometimes discover lawful relationships which could not be revealed by mere clinical observation. So, for example, the speed of word association in patients suffering from manic agitation turns out to be, for the most part, slowed down in comparison with the norm and not accelerated at all. In both phases of the illness, manic and depressive, which are so contrasting, experimentation revealed many common features.

A. F. Lazurskii, also a student of Bekhterev's, played a prominent role in shaping the direction of Russian experimental psychology. He was convinced that psychology must be just like natural sciences in that all its conclusions must be based on the study

of concrete facts. The psychology laboratory set up by Lazurskii in the Psychoneurological Institute founded by Bekhterev, turned into one of the most important centers of Russian scientific psychology.

Lazurskii was an innovator in experimental procedure: he expanded the boundaries of experimentation in psychology by applying it to the normal conditions of everyday life; and he made concrete forms of activity and complex personality manifestations the topics of experimental study. In his foreword to Lazurskii's book, "General Experimental Psychology," L. S. Vygotskii wrote that Lazurskii belongs to those researchers who embarked upon the transformation of empirical psychology into a science.

Lazurskii proposed a system of experimental procedures which was labeled "naturalistic experimentation" and which occupies, as it were, an intermediate position between observation and experiment. In the beginning his techniques were applied to children but later they were carried over into clinical psychiatry.

The essential condition of the naturalistic experiment, distinguishing it from the laboratory experiment, is that the subject must not suspect that he is being experimented upon. This avoids the premeditation of responses which often hampers the determination of individual differences in the laboratory experiment. In the naturalistic experiment, just as in any experiment, it is possible to confront the subject with certain previously studied conditions which elicit a given process or reaction. It is this possibility to arbitrarily elicit mental processes and to direct them one way or another, that constitutes a big step forward in comparison with ordinary observation.

In research with the naturalistic experiment, influence is exerted by conditions under which the focal activity takes place just the same as it is observed naturally. For example, it is established beforehand in what kind of play a particular character trait of a child is especially striking. Then, with the aim of studying the manifestation of this trait in different children, the latter are involved in similar play. During the play activity the investigator watches for the appearance of just this character trait in the children. The path of research led from simple observation, through the discrimination of typical traits and individual manifestations thereof, to the creation of an experimental situation, an experimental lesson or game.

The psychiatric clinic of S. S. Korsakov in Moscow was a second center for the development of clinical psychology. In 1886 the second psychology laboratory in Russia was set up in this clinic under the leadership of A. A. Tokarskii. Like all exponents of progressive trends in psychiatry, Korsakov believed that knowledge of the fundamentals of psychology provides the groundwork for correct understanding of mental breakdowns; it was no accident that he began to teach his course on psychiatry with an account of the fundamentals of psychology. The followers of Korsakov, V. P. Serbskii, A. N. Bernshtein, and others, adhered to similar traditions.

Without dissociating mental activity from physiological processes, but also without reducing it to the latter, Korsakov proceeded in his lectures from the materialist viewpoint of I. M. Sechenov; he propounded the idea that "the neural mechanism, constituting the substrate of a mental phenomenon, functions as a type of reflex act."

The publications which issued from Korsakov's clinic made a valuable contribution to psychological science. Among such studies one must include first and foremost the writings of Korsakov himself. Of his writings, "Psychology of Microcephaly" and "Medical-Psychological Studies of One Form of Memory Disorder" included interesting analyses of the structure of imbecility. The clinical observations and views in these writings summed up to the idea that disturbances of intellectual activity are not reducable to the breakdown of separate abilities but that the question properly concerns complex forms of disturbance of all rational goal-directed activity.

The works of A. A. Tokarskii constituted another valuable contribution to psychology. In his work "On Stupidity," Tokarskii analyzed dementia and imbecility.

A. M. Bernshtein's book describing procedures in experimental psychology appeared in 1911; in the same year F. G. Rybakov published his excellently designed "Atlas of Psychological Research on Personality." Interest in experimental psychology was also shown by the fact that a number of meetings of the Moscow Association of Psychiatrists were devoted to familiarization with research techniques. Articles on the experimental study of patients appeared in a journal called "Neuropathology and Psychiatry."

Thus, on the eve of the Great October Revolution, abnormal psychology had achieved indisputable success in Russia and had begun to assume the character of an experimental discipline – experimental abnormal psychology. A network of psychology laboratories was created in the clinics and experimental techniques for studying pathological conditions were worked out; the leading psychiatrists and neuropathologists (V. M. Bekhterev, S. S. Korsakov, V. P. Serbskii, G. I. Rossolimo, and V. A. Gilyarovskii) worked in close cooperation with psychologists.

The development of abnormal psychology after the Great October Revolution went hand in hand with the general development of psychology as a science founded on Marxism-Leninism. That the struggle with idealism affected research in abnormal psychology too was evident in attempts to analyze abnormal states from a materialist point of view and to develop and perfect objective research techniques.

The ideas of the eminent Soviet psychologist L. S. Vygotskii played a major role in establishing abnormal psychology as a distinct discipline. His ideas, which were developed later on in general psychology by his pupils and coworkers (A. N. Leont'ev, A. R. Luriya, and P. Ya. Gal'perin), were the following: 1) the human brain is equipped with principles of functional organization that are different from those of the animal brain; 2) the development of higher mental processes is not predetermined solely by the morphological structure of the brain; mental processes do not come into existence only with the maturation of brain structure; they take shape in the course of life as a result of training and upbringing and the acquisition of human experience; 3) lesions in some areas of the cortex have different implications at different stages of mental growth. These propositions determined to a great extent the direction of research in abnormal and neuropsychology.

Vygotskii himself pioneered the study of thought deterioration with his own experimental investigations. Studies of cognitive disorder and speech deterioration constitute one of the most extensively developed branches of abnormal psychology, both here and abroad.

Intensive research in experimental psychology has been carried out for several decades at Leningrad's Bekhterev Brain Insti-

tute under the leadership of V. N. Myasishchev. Following in the Bekhterev tradition, Myasishchev strove to combine psychiatry and psychology and to introduce objective methods of studying patients into the psychiatric clinics. His students and coworkers attempted to develop methods for objectively recording emotional components of human mental activity. As an objective indicator they used the individual's electrodermal characteristics (EKG) as registered by a galvanometer; studies with EKG were conducted on various kinds of mental activity in different groups of mentally ill.

A number of studies, done in the psychology branch of the Leningrad Brain Institute, investigated emotional-volitional processes in patients with various illnesses (manic-depressive psychosis, progressive paralysis, hysteria, etc.). These studies utilized topics from Kurt Lewin's school: the effect of success on level of aspiration in hysterics; recall for finished and unfinished tasks in schizophrenics, manic-depressives and others. In these studies an operational principle was found for overcoming Lewin's formalism. The studies were aimed at analyzing the structure of the patients' work activity, that is, how the patients' attitude toward work affected their competence. On the basis of these studies, Myasishchev proposed that disturbance in the ability to work must be regarded as a basic manifestation of mental illness and that a work-fitness indicator can serve as one of the criteria of the patient's mental condition. The writings of the Leningrad School of abnormal psychologists of that period still retain their topicality and their substantive and methodological significance.

At the same period, a series of major studies was carried out in the psychology laboratory of the Central Research Institute for Performance Assessment, an institute founded for the first time in the world in the USSR. Besides dealing with general questions of fitness evaluation and the placement of patients suffering from somatic illness, staff members of that laboratory took part in evaluating the work capacity and the job placement of the mentally ill. The publications of this laboratory dealt with the properties of intellectual activity in patients with brain trauma and the characteristics of mental activity and work capacity in epileptics and schizophrenics. The significance of this series of studies transcends the narrow scope of fitness assessment. While ana-

lyzing disturbances in work capacity the staff members of the assessment center devoted much attention to studying different forms of mental activity (V. M. Kogan, Ė. A. Korobkova). Kogan's conclusion is of special interest since it was based on a large body of factual material. He concluded that in some organic brain diseases the basic mental disorder, which reduces the patient's ability to work, is a narrowing of his scope of attention, his inability to take into account several changing environmental influences occurring at one time.

During World War II abnormal psychologists took part in rehabilitation work in neurosurgical hospitals. The subject matter of abnormal psychology became mental disorders occasioned by brain injury. A number of studies dealt with the rehabilitation of motor and speech impairment and the restoration of ability to work in disabled veterans.

In the following years scientific research and practical work in abnormal psychology began to be curtailed. This happened notwithstanding the indisputably fruitful influence which the session of the two academies in 1950 exerted on the development of psychiatric and psychological ideas. The curtailment was due to the successive consistent adoption of the reflex principle to explain mental events, first in the session itself and then, in the subsequent years errors were made in interpreting the subject matter of psychology. Owing to the erroneous interpretation of certain statements of I. P. Pavlov, the view was disseminated that psychology was supposedly concerned with the description of subjective phenomena and that for causal explanation, it was necessary to look only to the physiology of higher nervous activity. As a result of these false views, psychological research in psychiatry began to be replaced by physiological research.

As we know, these views were criticized at the 1962 All-Union Conference on Philosophical Issues in the Physiology of Higher Nervous Activity and Psychology. This conference, which was convened by the Academy of Sciences of the USSR, the Academy of Medicine of the USSR, and the Academy of Pedagogical Sciences of the RSFSR, resolved to condemn biologizing tendencies in the science of man.

The resolution noted that, after the 1950 session, "the wide dissemination of a negative attitude toward psychology entailed

practical harm and methodological error as some scholars tried to reduce the subject matter of psychology to the physiology of higher nervous activity." Measures for the development of medical psychology were discussed at this conference together with other problems. Decisions were taken to expand the network of abnormal psychology laboratories and to introduce the teaching of medical psychology into the medical schools. Abnormal psychology laboratories conducting intensive research were reopened in many research institutes of psychiatry and in institutions offering psychoneurological services.

One of the chief problems in abnormal psychology is disintegration of thinking. Work on this problem is being pursued in various directions: the laboratory of the Moscow Institute of Psychiatry is studying personality changes in the structure of thought disorders; the laboratory of the Institute of Psychiatry of the Academy of Medicine is working on a connection between thought disorder and the process of converting knowledge into action. Another line of research (pursued by the laboratory of the Moscow Institute of Psychiatry under the Ministry of Public Health of the RSFSR) is directed at the classification and psychological analysis of personality disturbances observed in clinical psychiatry. These studies are being pursued in various directions: experimental investigations of personality reactions; the psychological analysis of clinical accounts of personality deterioration; and the analysis of so-called "internal evidence of disease" in various mental illnesses. Studies of the deterioration of skills in older mental patients are being performed within the framework of continued study of the issue raised by Vygotskii concerning the relationship between mental growth and decay.

Research in abnormal psychology has made noteworthy progress in the psychiatric clinics of Tiflis. Using D. I. Uznadze's theory, a number of Georgian psychologists and psychiatrists are studying disorders of set in different mental illnesses.

Research in abnormal psychology recently expanded considerably in the professional practice of forensic psychiatrists and industrial experts.

Utilization of the methods and findings of experimental abnormal psychology has made special progress in the psychoneurological institutions for children. Methods are being devised to facili-

tate early diagnosis of mental retardation; the complexities of childhood imbecility and dementia are being analyzed to find additional diagnostic signs and symptoms; Vygotskii's principle about the "next developmental area" is being used to work out procedures for the "teaching experiment" so as to reveal important predictors of training readiness in children.

Along with the research done by the abnormal psychologists themselves, the number of comprehensive studies in clinical psychology is increasing. At the same time too there is a vigorous effort to develop and standardize the research procedures which have been published in a number of methodological writings and texts. In 1956 the Moscow Institute of Psychiatry published a statement on methodology entitled "Experimental Psychological Research on Patients in Psychoneurological Institutions." This statement set forth the tasks and theoretical premises of psychological experimentation in the clinic. In 1958 another methodological statement was published by I. N. Dukel'skaya and É. A. Korobkova: "Appraisal of Industrial Disease and Job Placement of Schizophrenics." This statement summarizes the findings of clinical research on the industrial performance of patients. It is shown that with the right attitude toward work and with a certain critical review of his condition, the patient could be placed. Industrial adjustment depends on the totality of clinical-industrial factors, the most significant of which is the extent to which favorable mutual relations have been established in the work group. An especially important factor in the patient's adjustment is thought to be the realization that he is playing a meaningful role in the work group, his positive "social self-concept."

In recent years the number of publications describing methods of experimental abnormal psychology has increased. M. N. Kononova's "Guide to Psychological Research on Mentally Ill Children" came out in 1961. In 1962 S. Ya. Rubinshtein's text was published which described applied techniques in detail and interpreted experimental findings.

The rapid growth of research and practice in experimental abnormal psychology is evident too in the fact that the professional associations, psychologists as well as psychiatrists and neuropathologists, have divisions which coordinate research in abnormal psychology. At the All-Union Psychology Conventions in 1959 and 1963, reports by abnormal psychologists were widely

represented. They focused on the following problems: 1) the implications of psychology for medical practice; 2) the problem of adjustment; and 3) the pathology of thinking. A similar program took place at the All-Union Convention of Neuropathologists and Psychiatrists in 1963.

A special symposium, "Abnormal psychology and psychological processes" was organized for the 18th World Congress of Psychology held in 1966 in Moscow. The reports given at the symposium showed the relevance of research on mental pathology for the theoretical issues of general psychology.

The growth of a young corps of professional workers in experimental abnormal psychology has become especially noticeable recently. This development is facilitated by the decision of a portion of the students at the School of Psychology at the Moscow and Leningrad State Universities to specialize in abnormal psychology. These students complete course work and diploma theses with a clinical psychiatric foundation, while also becoming proficient in the procedures of experimental research with the mentally ill. Upon graduating, psychologists with this speciality are sent to work in psychiatric hospitals where they conduct independent research. Young physician-psychiatrists and defectologists monitor psychological experimentation in the individual psychoneurological institutions.

The network of experimental abnormal psychology laboratories is growing not only in scientific institutions but also in service establishments – in hospitals and health centers.

To raise the qualifications of abnormal psychologists, the Moscow Research Institute of Psychiatry under the Ministry of Public Health of the RSFSR, in cooperation with the School of Psychology of Moscow University, recently undertook a series of organizational measures. During 1960-65 two seminars for abnormal psychologists were set up, one for examining methods, and the other for exchanging experiences with young staff members working in the outlying districts. Some of the most prominent psychiatrists and psychologists of the country participated in these lectures. Thus, experimental abnormal psychology is now developing in our country as a field of knowledge with its own subject matter, its own practical applications, its own methods, and its own personnel.

Chapter 3

Fundamentals of Experimental Design in Abnormal Psychology

The basic method of abnormal psychology, like that of any other area in psychology, is the experiment. Since the methods of research in abnormal psychology are derived from the basic theoretical principles of general psychology, the selection of specific techniques is a technical problem that involves the principles of methodology as well. Therefore, to understand the special features of experimentation in abnormal psychology, a few words about the research methods of general psychology would be in order.

The experimental method is not the only avenue to knowledge in psychology, but it has become the dominant one as psychology developed into an exact science and it has come to be associated with the general theoretical propositions of psychology.

As is known, rationalist psychologists tended to discriminate separate abilities of the human mind, where each one processes external information in its own way. Formerly psychology was little more than a speculative description of the functions of these abilities.

Speculative description of the individual's internal world was characteristic of the rationalist psychologists: even today this approach is typical of the proponents of the so-called "verstehen" psychology (Spranger and Dielthei). While denying the breakdown of the mind into separate processes or functions but accepting the indivisible unity of mental life, representatives of this school be-

lieve that even though natural events must be explained, mental events can only be understood. The views of "verstehen" psychology are reflected in the notions of existentialist psychologists. In practice, this means that psychologists must confine themselves solely to observing and recording the patient's behavior, utterances, and his self-examination; they renounce experimentation and hence the possibility of manipulating the conditions and activities which determine the course of a given process. In sum, existentialist psychologists may describe a phenomenon but not penetrate to its essential nature.

Empirical psychology, which replaced rationalism, brought with it a different conception of research methods. With the development of empirical psychology, the experimental method (Wundt, Ebbinghaus, Titchener) began to establish itself and was then used by neurologists and psychiatrists. Psychology laboratories were opened in the major clinics of V. M. Bekhterev in Leningrad, E. Kraepelin in Germany, and S. S. Korsakov in Moscow. Various procedural principles were used in the laboratories: let us examine them briefly.

Quantitative measurement of mental processes, a method based on Wundtian psychology, prevailed in the clinics for a long time. The view that mental processes are innate functions which change only quantitatively during development resulted in consideration of the feasibility of a "measurement" psychology. Experimental research on mental processes was reduced to establishing the quantitative features of separate mental acts.

Quantitative measurement of ability was the foundation of the methodology of psychological research in psychiatric and neurological clinics. The study of deterioration of any function consisted in determining its quantitative deviation from the "norm."

In 1910 one of the most prominent neural pathologists, G. I. Rossolimo, developed an experimental method which, in his view, made it possible to establish the level of separate mental functions, a sort of psychological profile. Rossolimo thought that various pathological states of the brain evoked specific typical "profiles of psychodynamic change." This method was predicated upon the empiricist assumption concerning the existence of innate, isolated abilities. This was an erroneous theory and, just like the simplistic quantitative analysis of mental disturbances, it could not be

adopted in clinical practice. But the attempt itself, to bring psychology closer to the solution of clinical problems, was progressive for that period.

Quantitative measurement of individual mental functions found its most extreme expression in the Binet-Simon test researches which were focused at first on ascertaining intellectual level. These tests were predicated on the assumption that the intellectual capacities of the child are predetermined by hereditary factors and are little influenced by training and upbringing. Each child has his own predetermined, more or less constant, age-related intellectual coefficient (I.Q.).

The problems set to children required definite knowledge and skills for their solution but, at best, they made it possible to assess the quantity of acquired knowledge and not the structure or the qualitative features of intellectual activity.

Research based on such tests does not permit prediction of the child's future development. Meanwhile, such tests have been used in some countries, to "stream" children into those who are supposedly gifted from birth and others in whom retardation of intellectual development is declared to be equally dependent on innate factors. We in this country also used tests in the so-called pedagogical studies of school children. But they were justifiably condemned as pseudoscientific in a resolution of the Central Committee of the All-Union Communist Party (Bolsheviks) on July 4, 1936.

Test techniques continued to dominate the work of foreign clinical psychologists. In numerous recent monographs and articles on the experimental study of patients, just such tests have been mentioned, including those aimed at estimating I.Q. (the Wechsler-Bellevue and others).

Research on patients by means of tests does not allow taking into account the individual features of intellectual activity, the qualitative aspects of disturbance, or the possibility, so vital to the solution of clinical problems, of compensation.

Test research produces only end-results, while the work processes of the subject, his relationship to the task, the motives inducing him to choose this or that course of action, his personality orientations, his desires – in short, all the multifarious qualitative properties of his activities – remain hidden.

Along with this purely quantitative approach, there is a tendency noticeable in foreign abnormal psychology to use techniques directed only at manifestations of the patient's emotional experiences. Exponents of this approach use the so-called "projective" techniques in their research. The tasks do not envisage any particular means of solution. In contrast to tests, which require completion of the task according to definite specifications, the projective technique uses any particular problem only as an occasion for the subject to exhibit his feelings and the peculiarities of his personality and character. In a specific application, the subject must describe pictures that are sometimes realistic ("thematic apperception test," abbreviated as TAT) and sometimes devoid of meaningful content. An example of the latter is the so-called "ink-blot" test of Rorschach, which consists of various symmetrically arranged configurations of quite fantastic shapes. The realistic pictures consist of depictions of activity or poses of figures. The subject has to describe the picture and relate everything that comes to mind (what the pictures remind him of, what he thinks of them, what he is feeling). The experimenter records his utterances.

Thus, the projective technique appears to be essentially the opposite of testing because, in terms of the author's intent, it appears to facilitate qualitative assessment of the subject's behavior. Testing only permits judgment about the results of task performance, while the projective technique, by its nature, excludes the whole problem of right and wrong answers. The investigator using the projective technique is not concerned with errors or correct answers, but rather with the personality-responses of the subject and with the nature of the associations that are elicited by the test. The authors feel that in projective testing, a certain identification of the subject with the depicted figures occurs. According to the French psychologist Ombredane, "personality is reflected with this technique, as an object on a screen" (hence, the name "projective"). The technique is frequently called "the clinical approach to the mind of the healthy individual."

However if we analyze the kinds of personal experiences and orientations in question, then it turns out that the investigators are frequently trying to use this technique to uncover the "unconscious-latent" motives and desires of the patient. Individual features of the patient's perception (for example, does he see the ob-

jects as moving or stationary, in describing Rorschach tables; does he pay attention to the broad features of the drawings or to minor details, etc.) are taken to be indicators of personality traits. Thus, this technique, in contrast to quantitative measurement of separate functions, is thought to afford qualitative analysis of the personality as a whole. The rational element, contained in the projective approach, must be made use of. But some of the schemes suggested so far for interpreting the subject's responses seem suppositious and ill-founded.

The principles of experimental research are quite different in Soviet psychology. The doctrine of materialist psychology, that mental processes do not consist of innate abilities but of the kinds of activities which take shape in the course of life, implies that psychological experimentation must study mental disorders as disturbances of activity. Experimentation must be directed at qualitative analysis of different forms of mental impairment and at the discovery of the underlying mechanisms. If we are talking about cognitive disturbances then the experimental techniques should show how certain cognitive processes, which took shape in the patient during his everyday life, break down and how his acquisition of new associations is being modified and in what way his using the system of old associations and past experience is being distorted. Since any mental process has a certain movement and direction, one should construct experimental research in a way which reflects disturbances of these parameters. Therefore, experimental data should characterize mental deterioration not only quantitatively but qualitatively as well.

Of course it goes without saying that the experimental findings must be reliable and that statistical treatment must be used where appropriate, but quantitative analysis should not replace, either partially or wholly, qualitative characterization of the data. Quantitative analysis presupposes thorough psychological description of the facts. Before embarking on measurement, one must establish what is being measured.

One should agree with A. N. Leont'ev's remark (in his article "Some long-term problems of Soviet psychology") that there is no need to force a convergence between scientifically valid experiments "which facilitate qualitative assessment and the so-called tests of intellectual giftedness whose use was justifiably condemned

not only here but in many other countries as well."[1] Consequently the basic principle of constructing a psychology experiment is qualitative analysis of the characteristics of the patient's mental processes rather than isolated quantitative measurement. It is important not only with what difficulty or to what extent the patient comprehends and completes the task but also how he comprehended it and what caused his errors and difficulties (it must be emphasized that the analysis of mistakes made by the patient while completing experimental tasks, is exceedingly interesting and indicative in evaluating his mental activity).

In other words, research in the clinic can be compared to a "functional probe," the technique widely used in medicine whereby the activity of any organ is tested. The role of a "functional probe" in the psychology experiment can be played by experimental tasks that can actualize the intellectual operations used by the individual in his everyday life. The abnormal psychology experiment must be a model of the everyday situation which can actualize not only the patient's mental functions but also his attitudes, orientations, and the goals on which specific motives are based. In other words, the experimental situation must facilitate the study of the activity of the sick individual.

One must examine another feature of the abnormal psychology experiment: its design must help to discover not only structural changes but also forms of mental activity which have remained intact. This type of approach is especially pertinent to the rehabilitation of impaired functions.

By 1948 A. R. Luriya had expressed the view that successful restoration of complex mental functions depends on the extent to which the rehabilitation can rely upon intact components. He emphasized that the restoration of disturbed forms of mental activity must attempt to rebuild functional systems. The work of many Soviet authors proved the fruitfulness of such an approach. Research on rehabilitation mechanisms in motor impairment arising from gunshot wounds in World War II indicated that a decisive role is played during rehabilitative work therapy by the mobilization of functioning orientations which have remained intact (S. G. Geller-

[1]A. N. Leont'ev, "Some long-term problems of Soviet psychology," Problems of Psychology, 1967, Vol. 6, p. 14.

shtein, A. V. Zaporozhets, A. N. Leont'ev, S. Ya. Rubinshtein). Psychologists who worked with speech disorders came to a similar conclusion.

É. S. Baine, in his monograph "Aphasia and Ways of Overcoming It," writes that recovery from aphasic disturbances hinges on actuating the intact components, developing them, and gradually "building up their capacity" for replacing the defective functions (page 223). Rebuilding of a defective function goes hand in hand with the development of an intact function. V. M. Kogan has put this problem in even wider perspective: in his monograph "Restoration of Speech in Aphasia," he convincingly shows that restoration must be based on the resuscitation of skills that have remained intact. The author is completely right in emphasizing that rehabilitation (here, speech rehabilitation) must actualize an entire system of associations and personal attitudes, even though pathologically affected. Hence, Kogan proposes that rehabilitation elicit the conscious attitude on the part of the patient to the semantic content of a world in its relation to an object. His views concern the restoration of functions which can be said to be rather circumscribed – speech and praxis. But these views can be applied with even greater justification to the rehabilitation of more complicated forms of mental activity, to the rehabilitation of lost intellectual efficiency (the patient's singlemindedness and energy). In these cases the question concerning preserved potentialities becomes especially acute (for example, in deciding about the patient's fitness for work and the feasibility of continued study, etc.).

For an experiment to be able to answer these complicated questions, for it to be able to show what components of the patient's mental activity are preserved, it must not be directed solely at revealing and analyzing the end products of behavior. Experimental design must allow us to take into account how the patient looks for solutions. Most of all it must enable the experimenter to intervene in the strategy of the experiment to discover how the patient perceives his "help," whether or not he can take advantage of it. But designing experiments according to rigidly standardized tests does not let us detect preserved components.

It is necessary to mention again a number of features which distinguish the clinical experiment from one using healthy individuals, that is, addressed to issues in general psychology. The

basic distinction here is that we must always take into account the patient's unique adjustment as determined by his pathological condition. The presence of delirium, agitation, or inhibition may require an experimenter to design his experiment differently and occasionally to change it while it is going on. For all their individual differences, healthy subjects try to carry out instructions, they "accept" the task, whereas the mentally ill sometimes not only do not try to complete the task, but incorrectly interpret it or resist the instructions. For example, in doing a verbal association experiment with a healthy individual, the experimenter tells him beforehand that he must listen to words as they are pronounced and the subject actively cooperates. However in carrying out the same experiment with a negativistic patient an opposite effect often occurs: he actively refuses to listen. In such instances the experimenter has to run the experiment in a roundabout way: he pronounces the words quite incidentally and records the patient's reactions. Frequently one has to experiment with a patient who interprets the test situation in a delusional fashion, for example, he believes that the experimenter is using hypnosis or rays on him. Of course, when the patient has such an attitude toward the experimenter it affects the way he carries out the task; he frequently does it wrong on purpose, delays answering, and so on. In such instances, the design of the experiment must also be modified.

There is still another feature which distinguishes experimental design in the clinic from the usual psychology experiment: the diversity and multiplicity of techniques employed. This can be explained as follows: mental deterioration is a process that never affects just one level but always several. In actuality, it doesn't happen that one patient's processes of synthesis and analysis are the only ones disturbed while in another, purposefulness of personality is the impaired function. The execution of any experimental task permits assessing different kinds of mental impairment. Nevertheless, not every technique can insure determination of a given kind or of the degree of impairment with equal clarity and reliability.

Very often a change in the instructions, or any situational nuance whatsoever, alters the nature of the experimental evidence. For example, when an experimenter stresses the importance of his own evaluation in an experiment on verbal recall and repro-

duction, the results are more likely to reflect the subject's concern about his performance than about his mnemonic processes. One has to compare the results from different variations of an experiment since in work with a sick individual frequent alterations are often introduced throughout the test (if only because of the changing condition of the patient). There are additional reasons for such a comparison. In carrying out a given task, the patient not only does it correctly or incorrectly but work on the task frequently makes him aware of his deficiency and he strives to find a way of compensating for it and to find reliable guidelines for correction. Opportunities for doing this vary with the task. Frequently it so happens that a patient who can tackle a more difficult task correctly, fails to solve an easier one. An understanding of the nature of such a phenomenon can be gained only by comparing data from different tasks.

Finally, in conclusion: the patient's mental disturbance is often unstable. Amelioration of his condition is accompanied by the disappearance of certain peculiarities of his cognitive behavior, while others persist. Thus the nature of the observed disturbances can change artifactually. Therefore, comparing the results from different variations of a given method which is used repeatedly, provides the basis for judgment about the nature, quality, and dynamics of cognitive impairment. Hence the reasonableness and justification behind the stipulation that research on mental deterioration not be limited to any single procedure but employ a variety of techniques.

In the study of defective children it is especially important to focus experimental techniques on uncovering the qualitative characteristics of mental disturbance. Any degree of psychological underdevelopment or disease is always attended by further, albeit retarded or distorted, development. The psychology experiment must not be limited to establishing the structure of a single level of the young patient's mental processes; it should primarily be aimed at ascertaining his potential condition.

It is well known that this was first advocated in the 1930's by L. S. Vygotskii in his doctrine on the "area of developmental readiness." In his book "The Problem of Training and Intellectual Growth During School Years," he writes "the capacity of the child for intellectual growth can be determined at the very least

by explaining two of his levels: the level of actual development and the area of developmental readiness." Vygotskii means those potentialities of the child, which do not appear independently as the effects of certain conditions, but which can be realized with adult assistance. The child's skill at transferring problem-solving techniques acquired with adult assistance to independent activity is the chief mark of intellectual growth. Hence the child's mental growth is characterized less by his actual level and more by his level of developmental readiness. The decisive factor is "the discrepancy between the level of problem-solving attainable with guidance (with adult aid) and the level attainable independently" (page 477).

We have discussed Vygotskii's well-known doctrine in some detail because it defines a principle of experimental design that is applicable to defective children. Test research done by foreign psychologists can, at best, reveal only the "actual" (Vygotskii's terminology) level of the child's mental growth and that only quantitatively, while the child's potentiality remains hidden. But without such prognostication of the child's future development, many problems, for example, choosing a special training school, can't be effectively solved. Experimental research into the psychoneurology of children must be conducted with due regard for Vygotskii's position and it must be designed along the lines of a training experiment.

This type of research is used by A. Ya. Ivanova, who gives children problems which they have not hitherto encountered. As the children carry out these tasks, the experimenter extends them different kinds of help in a strictly standardized fashion. How the child takes to this assistance is recorded and, in this way, the assistance itself is included in the structure of the experiment. To achieve standardized assistance, Ivanova modified several generally accepted procedures of abnormal psychology research such as object classification, Koos's method, the classification of geometric figures, and a series of successive pictures. The stages of assistance are carefully regulated and recorded by the author, and both quantitative gradations and qualitative characteristics are taken into account. Ivanova's use of the training experiment has enabled her to differentiate between different kinds of abnormal development. The training-experiment technique was also used by N. I. Nepomnyashchaya, who studied the development of

counting skill in intellectually retarded children. Nepomnyashchaya proceeded from P. Ya. Gal'perin's theoretical views on the stepwise formation of intellectual activity; he showed that retarded children experienced difficulty in short-cutting primitively developed behavior: it has to be overcome with special effort and over a long period. If attainment of short-cut mechanisms could be managed through special training, then it was possible, within certain limits, to overcome the defect in such children.

A system of measured prompting was used by P. G. Natadze to form aesthetic concepts in healthy children. By means of an elaborate procedure, Natadze was able to reveal different developmental levels. The training experiment, based on Vygotskii's thesis on the "area of developmental readiness," reveals the child's potentialities and, in so doing, serves as a device for studying the structure and degree of mental loss in abnormal children, which is most helpful when these children have to be assigned to special schools.

Chapter 4

Disturbances in Intellectual Capacity

Psychological disorders in the mentally ill are diverse in nature. As a rule psychological research has examined cognitive disorganization (mainly of thought processes), while only a few studies dealt with disturbances associated with personality changes. It must be said, however, that mental disorders cannot be fully analyzed in terms of cognitive and personality parameters. It is a mistake to reduce the entire diversity of mental disorders to alterations in the organization of intellectual operations or to motivational disturbances.

Psychology experiments have failed to show how conceptual organization is affected in a number of mental cases: the patients comprehended the task, which required synthesis and generalization; their associations were adequate; and even their relationship to the experimental situation was unaffected. But at the same time their inability to maintain a correct behavioral approach to concrete tasks led to mistakes. In such cases, we are faced with disturbed mental work capacity.

This problem has been studied more extensively by research psychologists at the Institute for Performance Assessment; they have shown the diversity of fundamental determinants of disturbed capacity for work in mental patients. As long ago as 1936 V. M. Kogan stated that the chief cause of reduced fitness in many mental patients is a shrinkage of the scope of attention, that is, an inability to respond to several environmental influences simultaneously. Performance assessment led to the identification of those functional difficulties which preserved the basic habits and skills necessary for short-term mental operations; this group of

psychologists was accordingly encouraged to seek out special experimental research techniques.

The problem of disturbed work capacity was investigated by E. A. Korobkova. In her presentation at the 18th World Congress of Psychology she defined work capacity as "the ability to engage in long-term systematic activity of a socially useful nature" (page 163). She classified disorders of work capacity according to whether the disorder affected purposefulness, volition, control and regulation of effort, or behavioral dynamics.

In the present chapter we intend to sidestep disturbances in work capacity in the wide sense in order to discuss disorders of mental efficiency which seem to result from exhaustion (fatigability). According to E. A. Korobkova's scheme, these disorders are most akin to dynamic disturbances in the affective-volitional area. Intellectual operations based on habits acquired in earlier activity often remain intact while in the meantime the patient is unable to execute a number of intellectual functions demanding long-term steady exertion.

Several manifestations of the exhaustion of such patients often make it seem as if separate processes have been disturbed. The exhaustion can be manifested as a memory disturbance and as in-

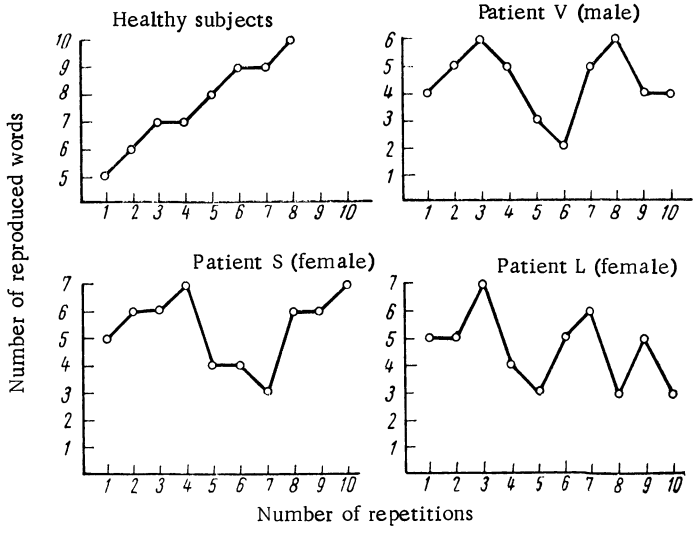


Fig. 1

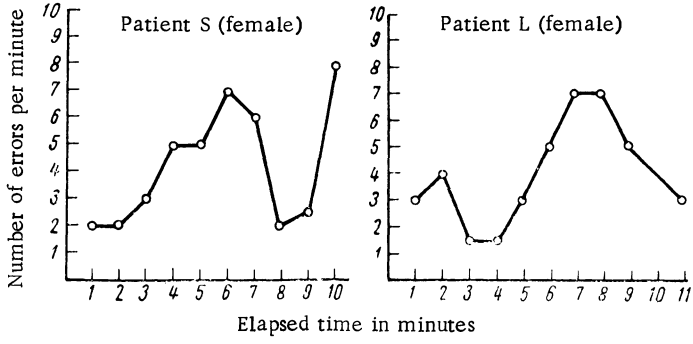


Fig. 2

stability of attention. If such patients have to learn 10 words by heart and we draw a curve depicting the quantity of reproduced words we find that the curve looks broken (Fig. 1).

Similar results were obtained in studying patients with Kraepelin's test. The technique consists of printing a pair of numbers to be added on a blank sheet. The experimenter tabulates the number of additions done in a minute and the number of errors.[1] The curve which depicts the number of errors is similarly broken, evidence for discontinuity and lability in the patient's performance (Fig. 2).

Similar instability was observed both in complex kinds of mental activity and in elementary phenomena, for example, in the timing of sensory-motor responses. The timing characteristics of sensory-motor responses were obtained using Shulte's technique, "locating numbers in tables." The patient was successively exposed to five tables (60 × 60 centimeters) on which the numbers from 1 to 25 were located haphazardly. The patient had to indicate and name the numbers in order. This technique shows the rapidity of the eye's orienting and seeking movements.

In a dissertation at the Psychology Laboratory of the Moscow Institute of Psychiatry, V. I. Vasil'eva established the following facts in a study of mental disturbances in vascular patients. Total time for finding all the numbers on the tables was clearly retarded

[1]For more detailed description of this as well as subsequent techniques see S. Ya. Rubinshtein, "Techniques of Experimental Abnormal Psychology," Moscow, 1962.

in the vascular patients in comparison with a group of healthy subjects. However, detailed analysis of the time for each separate seeking response shows that the overall retardation is explainable by the occurrence of isolated seeking responses that were excessively long, together with others of normal speed.

As a rule, while the patients are trying to find numbers at normal speed, they loose track of order, that is, they look at a number but don't see it. And they sometimes declare that a particular number isn't even in the table. In other words, the overall delay in completing the task turns out to be due to extreme heterogeneity in the timing of individual responses. Vasil'yeva suggests that this heterogeneity in seeking responses may be due to a temporary inhibitory state arising in the cerebral cortex when the visual analyzer is under stress.

In addition, data obtained in studies of patient's visual-motor coordination yielded an equally sensitive indicator of changes in their sensory-motor responses. These studies were conducted by our colleague, S. Ya. Rubinshtein, who used her own technique: the subject has to learn to figure out how to press on a rubber bulb with such finesse that a preassigned movement is carried out under visual control. An ink-record of the movement was obtained on a kymograph tape.[2] It was found that the data curve looked jerky and irregular for patients whose clinical characteristics showed disturbances due to arteriosclerosis. These patients correctly accomplished the assigned movement with respect to force and speed, but their pressing was incorrect.

The writer has shown that disturbance of afferent neural connections of the cerebral cortex evidently causes the obtained desensitization in the correction mechanism. Rubinshtein is persuaded that the irregular jerky character of the curve is essentially due to the fact that the correcting impulses are incorrectly delayed and that their strength is disproportionate to external conditions.

This discontinuity of mental processes and dynamic instability are linked, it seems, with fluctuating cortical tonus. This often leads to the disturbance of higher forms of intellectual activity; it

[2]A detailed description of this method is given in S. Ya. Rubinshtein's "Techniques of Experimental Abnormal Psychology."

can lead to judgmental inconsistency. The characteristic feature of this disturbance was instability in completing tasks. The generalization level was not essentially impaired, the patients correctly grasped the instructions; they did a good job of analyzing and synthesizing the material; and they understood the metaphorical meaning of proverbs and metaphors. However, the patients could not maintain adequate reasoning. While they carried out the experimental task, the patients could not maintain the correct approach over a long time period; correct ways of carrying out the task were mixed with incorrect ones.

Let us discuss in somewhat more detail the tactics used by these patients while working on a "classification of objects" problem. In this task the subject is shown a number of objects (things, cards) which he has to sort into separate groups on the basis of some general attribute. This method was first used by K. Goldstein in his work on aphasia: the patient had to sort real objects according to what they were made of. The psychological difficulty here is that a "general" classification rule (the kind of material a thing is made of) was often contradictory to the customary concrete associations between the objects (for example, according to the role of material composition, a pen might be grouped with a spoon; but the functional connection between pen and book interferred with such a grouping). Consequently, to classify in terms of a general attribute, concrete links between objects have to be suppressed and classification according to an abstract principle has to prevail. Later on the technique was modified (L. S. Vygotskii, G. V. Birenbaum, B. V. Zeigarnik); instead of real objects themselves, drawings were shown to the subjects on cards. Apart from purely technical ease, this method makes possible a large variety of sorting rules; the objects can have unusual shades of color; they can take on usual shapes, etc.

One of the variations of this technique consists in presenting the subject with a set of 70 cards with drawings of a wide variety of objects: domestic animals, wild animals, instruments, people from different occupations, furniture of various kinds, fruits, vegetables, trees, etc. The instructions require allocating the cards into several groups so that each group contains cards that are similar according to the defining attribute.

The selection of cards permits several kinds of classification (according to the material composition, or the function of the ob-

ject: furniture, instruments, etc.). Without going into a rundown of all possible types of classification, suffice it to say that whatever may be the substantive distinctions among groups, the task itself requires comparing and detecting only elementary similarities and differences between objects as well as the ability to deduce the general attribute which underlines their heterogeneity. This task accordingly provides a means of showing the level of the generalization process and of learning whether the subject constructs groups only on the basis of partial concrete associations or whether he rises to the level of abstract generalization (and is influenced by this level throughout the entire experiment). The experiment that has been described also permits assessment of task-completion tactics. Does the patient group objects initially on the basis of partial attributes, while rising only gradually to higher degrees of generalization (for example, does he initially group just birds together, then birds and animals, and only at the end group these objects with persons, thus constructing the class "living beings")? Or does he immediately construct the class according to the more general attribute ("living beings," "plants," "inanimate nature")? Does he manage the task independently or rely on the help of the experimenter?

The design of this experiment is loose and "dynamic"; the experimenter not only observes which associations the subjects use in forming groups, but he actively intervenes, helping or "hindering" the subject by eliciting correct solutions from him, or "provoking" errors. If the experiment is properly conducted it reveals not only the subject's level of generalization but also his attitude toward his mistakes. The experiment shows whether the subject notices errors, whether he corrects them, or whether, in spite of the experimenter's indications, he persists in making incorrect classifications.

Different kinds of mental fluctuations were revealed with this method: the abstract nature of task performance was interrupted by responses to situational order. So, for example, a certain patient working on "object classification" separates out the right group of persons (blacksmith, physician, child), then he begins to isolate a group of plants and here he separates out flowers to which he adds a beetle, with the justification that "a beetle is always found on flowers." In exactly the same fashion, having isolated a class for furniture, he adds a bottle and a glass, saying "they

are in the cupboard." When the experimenter says "think that over," he takes the glass away from the furniture group, saying "it is dishware," and then, without prompting, takes the beetle away from the flower group, adding it to the animal group, and explains "fish and birds can go here too for they are all living things." This example shows that cognitive fluctuations in patients were manifested as alternations of abstract and situational solutions. Task completion at an abstract level did not appear to be a persistent work mode.

In other patients erroneous solutions were due to forgetfulness. Thus, having isolated a class correctly according to a general attribute, these patients began to isolate an analogous class. For example, patient K separated out a "plant" group of vegetables, flowers, and fruits, but then he began to isolate still another group for plants. Such designation of groups of the same kind are extremely typical. Similar erroneous acts and judgments occasionally occur in carrying out other tactical maneuvers, for example, in establishing analogies.

Often the correct and adequate execution of a task is interrupted suddenly by the onset of affective fluctuations. A little mistake, together with an ill-advised comment about it by the experimenter, can disorganize correct completion of the task.

Fluctuations in mental work capacity led to incorrect solutions and to incorrect judgments. However, the latter arose only periodically and did not show that the patient's intellectual processes were permanently impaired or that synthesizing functions had been destroyed. Other errors in the patient's thinking occurred because individual correct judgments were not pursued to the proper conclusion; they were broken up, separate stages were forgotten and never consolidated into one orderly chain of reasoning. Such disturbances cannot be explained as disorders of the conceptual system for they have a dynamic quality: the patients correctly plan the course of reasoning and, for a while, the sequence is completed within the limits of the previously established program; however, the patient is unable to maintain the program, despite adequate planning, and it is easily disrupted.

One should note that fluctuations in the intellectual performance of patients are not found in all experimental tasks. They can fail to occur even in complex tasks that involve single acts.

However they have been found most of all in the solution of multi-event problems which require reasoning and the retention of several attributes. The findings of V. M. Kogan's research certainly show this. Kogan found that in cerebrovascular diseases, perceptual capacity was constricted and this led to difficulties when several attributes had to be combined.

When the illness is of mild severity such judgmental inconsistencies can be corrected. Frequently it is enough for the experimenter to ask the patient what he is doing or simply to express surprise at his behavior, that is, to draw the patient's attention to his mistakes so that he corrects them, easily and by himself.

It should be noted that fluctuations in the patient's performance occurred as a result of the slightest changes in conditions of work. This is illustrated by the following findings from research using the technique "matching phrases and proverbs." A number of patients who had correctly determined the metaphorical meaning of proverbs made glaring mistakes when they had to match them with appropriate phrases (we showed this in our article especially concerned with the understanding of metaphorical meaning). For example, one of the patients who understood and correctly explained the proverb "all that glitters is not gold" matched it with an inappropriate phrase "gold is heavier than iron," but then he immediately corrected his mistake and was embarrassed that he made it. Another patient, having correctly explained the proverb "you can't back out once you've begun," matched it with the phrase "things must not be put off till tomorrow."

Especially sharp fluctuations of performance level have been observed in tasks requiring that the trend of thought be maintained for a long time together with constant inhibition of irrelevant associations. These fluctuations in intellectual performance of our patients, which could be observed during one and the same experiment, reached a peak toward the end of the experiment. In some instances, where the patient's condition improved, these fluctuations disappeared.

In analyzing the nature of fluctuations in the level of intellectual performance, the original question was their dependence upon task complexity. However, our findings show that the irregularity of patient's intellectual performance was due neither to the com-

plexity of the material nor to difficulties in organizing it. As we said above, the obtained fluctuations were often observed even during execution of the most elementary tasks such as retention and reproduction of ten words or finding numbers in Shulte's tables.

All these findings demonstrate that intellectual instability does not depend on how complicated the tasks are. Any kind of activity can be within reach of a patient for any length of time and for a while it will be done with more or less difficulty. One and the same experiment can sometimes elicit a high level of performance from the patient, in which his reasoning is sustained in a logical fashion, and sometimes judgmental inconsistency will be obtained.

It seems to us that these facts have fundamental importance. They indicate that intellectual instability in the performance of very diverse tasks constitutes a manifestation of a more general disturbance – instability in intellectual work capacity. The instability in intellectual work capacity causes the same patients to appear sometimes as integrated persons, who think and behave satisfactorily, and sometimes as individuals bereft of purpose. Such disturbances are most frequently encountered in patients suffering from the early phases of cerebrovascular disease.

Such fluctuations are evidently the main manifestation of the quick onset of neural exhaustion. This propensity to exhaustion is unique; it must be distinguished from the usual exhaustion observable in the healthy individual. In the latter, slowdown of work tempo and rise in the number of errors comes toward the end of the experiment; this is indicated in experiments with healthy subjects (adults and children). Hence, if the subject is tired, he will do classification of objects more slowly, but he will do it adequately. But the propensity to neural exhaustion of our patients leads to a temporary change in the quality itself of their cognitive performance.

We may assume that a process of defensive inhibition lies at the basis of such neural fatigability. I. P. Pavlov repeatedly wrote that conditioning required that neural processes have a definite strength. Brain diseases lead to a functional weakening in cortical dynamics and to a reduction in cortical tone which is manifested in the spreading inhibition labeled "defensive" by Pavlov. This inhibited state has a functional character; it appears to be tran-

sient, but, all the same, it leads to a temporary weakening of cerebral work capacity, which, as we have already said, makes it look like separate functions have been disturbed.

A number of clinical symptoms which look like disturbances of separate mental processes are in fact differently formed manifestations of disorders in work capacity. Thus, when patients complain that they forget what they have read or to do their errands, it often looks like a memory disorder; when patients notice that incidental, insignificant stimuli (a nearby conversation, a softly playing radio) interfere with their work, it looks like their attention is scattered. In reality, all these symptoms reflect one disorder, namely, that exhaustion of cortical neural dynamics sets in too easily and affects intellectual competence.

Work capacity can be disturbed by rapid satiation which, in appearance, is close to exhaustion, but which has quite a different psychological structure. This notion was introduced by the German psychologist Kurt Lewin to indicate a condition in which the individual's desire to continue an action that he has begun is exhausted while, at the same time, the situation forces him to keep on. In these conditions, according to the findings of Lewin's coworker A. Karsten, changes occur in the activity of the subject: "variations" arise. Thus, if the subject had to carry out a monotonous task, for example, line tracing, this action was interrupted by "behavioral variations." The subjects were distracted from the objective; they did other things, some totally irrelevant (they began to whistle or to sing; the external aspects of their activity changed – the lines were drawn too large or too small, and their configuration was changed). Karsten regarded these variations as symptoms indicating that satiation was setting in, that is, they constituted a force interfering with the purposefulness of the behavior.

Satiation is unrelated to fatigue. Much has been written concerning the relationships between susceptibility to fatigue, work capacity, and illness. The first to address this question was Kraepelin, who established the significance of such factors as trainability and susceptibility to fatigue in assessing personality competence. Kraepelin and his followers showed that any work can be divided into several phases: getting oriented to the task, ability to practice, and fatigability. Satiation symptoms cannot be reduced however to Kraepelin's factors. As the early works of

V. N. Myasishchev and his colleagues, E. E. Plotnikov and R. I. Meyerovich, have shown, the exhaustion effect belongs to those mental phenomena which stem from the individual's attitude toward work that still has to be done. Karsten herself showed this. When the meaning of the task was changed (for example, if there were new instructions to the effect that the experiment was about the subject's stamina), the "behavioral variation" disappeared. Karsten's research showed that exhaustion symptoms ("variations," concurrent actions) did not arise immediately in healthy subjects. They only appeared after a more or less prolonged time interval.

In certain forms of illness the exhaustion syndrome set in rather quickly as shown by É. A. Korobkova's research on neurotics, R. I. Meyerovich's on progressive paralytics, and our own studies of asthenics with diverse etiologies.

We will return again in Chapter 6 to the problems of satiation and personality relationships. Here we only wish to indicate that the onset of satiation should be included among the factors which disrupt human work capacity.

Fluctuations of intellectual work capacity can arise due to a disturbance of quite a different function, namely, the tendency to extreme use of mediation. Actually there was no personality impairment in patients who displayed reduced intellectual competence. They noticed their mistakes and tried to compensate for them. But there sometimes arose an excessive urge to behave and act in a mediated or indirect fashion. This was especially clear in an experiment on mediated memory using the "pictogram technique": the patients had to remember words with the help of conventional symbols. The patients are excessively concerned with finding the conventional symbol; they show all kinds of fear that the "drawn symbol would not remind them of the word"; and the verbal reproduction itself turned out to be incomplete and undifferentiated (with healthy individuals such mediation via symbols improves verbal reproduction).

The mediation of any action is, in itself, an adequate feature of behavior in a healthy individual. Even though the active mediation diverts some of the subject's effort, mediation does not impair either the integrity of his learning nor the logical flow of judgments and conclusions. But the efforts of our patients are so

sharply concentrated on compensatory techniques and on the constant search for "crutches" that perceptual integrity and the harmonious flow of intellectual process are disturbed. Increased striving by the patient to mediate and correct his behavior hampers the completion of intellectual work and gives it a discontinuous flavor.

The question of work-capacity disorder is very important for solving practical problems, both clinical and pedagogical. Frequently the child's lack of progress or productivity is explicable not in terms of a poor level of knowledge or loss of skill or lack of dedication, but simply in terms of an alteration in cortical neural dynamics that causes a reduction in competence (work capacity can be restored by therapeutic or corrective-pedagogical intervention). Behavioral adequacy is disturbed due to the transitory onset of fluctuations in tonic activity. This problem also has definite theoretical relevance. A more detailed analysis of alterations in work capacity will facilitate getting at the especially complex problems of the relationship between cortical activity and the structure of action and of the relationship between mental activity and the regulation of behavior.

Chapter 5

Disturbances of Thinking

Disturbances of thinking constitute some of the most frequently encountered symptoms of mental diseases. Clinical manifestations of thinking disorders are extremely diverse; some of them are considered typical for a given kind of disease. In diagnosing a disease, clinicians are frequently influenced by the presence of a particular kind of thinking disturbance. Therefore, in all psychiatric texts and monographs, dealing with the most diverse clinical problems, we find statements about thought disorder; many articles on the disorganization of cognitive activity are to be found as well in the psychological literature. However, there is no single principle to determine the basis for analyzing these disorders; this comes about because, in describing and analyzing disturbances of thinking, researchers proceeded from different psychological theories of thinking and with different methodological biases.

The study of thinking is one of the most developed areas in psychological science; it was always a central problem and, indeed, it is here that the various original theoretical positions of investigators are most clearly revealed. If the 1930's and 1940's saw interest in the problem of thinking and consciousness decline somewhat due to the distraction of depth psychology, then, in subsequent years, studies of the psychology of thought have been on the increase again. In line with technical advances, psychology has been trying out the cybernetic approach. Even though this approach to thinking enriched psychology considerably, it brought with it incorrect views regarding the nature of human thinking. A number of foreign scholars (Newell, Shaw, et al.) made statements according to which thinking can be reduced to elementary information

processes, to symbol manipulations. A computer program for problem solution began to be promulgated as a theory of thinking. Hence, a new problem arises today, namely, how to bring out the specifically human element in guiding research on problem solving.

O. K. Tikhomirov has studied creative thinking in humans; his research, based on a large amount of experimental evidence, showed that not only is it "impossible to regard a machine program as a theory of human thought, but it is also impossible to cast the real nature of human thinking in terms of a system of cybernetic concepts."[1]

Study of the specifically human element in the thinking process has become the paramount task. Analysis of different kinds of thought pathology has led to a very rich collection of data which justifies acknowledging the unique nature of human thinking. The findings of experimental psychology convincingly show that thinking should be approached as one kind of activity (L. S. Vygotskii, P. Ya. Gal'perin, A. N. Leont'ev, S. L. Rubinshtein). As already noted, the analysis of thought disorder has been carried out in terms of the prevailing conceptions of contemporary psychology. The Würzburg school made the problem of thinking an object of psychological study early in the 1920's. The associationist psychology, which had prevailed until that time, did not deal with the problem of analyzing cognitive activity. Thinking was reduced to specification of associations. Only sensations and their copies (ideas, images) were thought to be real.

Psychological analysis of thinking consisted in classifying the laws of association, whereby complex ideas or images are created out of elementary ones. One of the founders of associationist psychology, A. Baine, assigned to associations the fundamental role in thinking. Wundt's introduction of the experimental method to psychology was undoubtedly an advance in the history of psychology. However, the research done by Wundt and his followers was based on associationist principles. G. Ebbinghaus, G. Muller, T. Zigen, the major exponents of the experimental psychology of that era, thought that the laws of association were universal. Thus,

---

[1]O. K. Tikhomirov, The cognitive value of simulating creative thinking in a computer, "Contributions to the Polish-Soviet Symposium," Moscow, Izd. Akad. Nauk SSSR, 1967, page 50.

concepts, judgments, and conclusions were characterized as associations of ideas. "A judgment," said Zigen, "is a higher degree of development of an object-association" (page 273). Other proponents of experimental associationist psychology felt that thinking was reduceable to the actualization of associations.

The problem of the reproduction of ideas became the cornerstone of the associationist theory of thinking. Thinking itself began to be labeled reproduction. Thinking was frequently construed as a derivation from other mental functions: memory and attention. Such conceptions were the basis for the research done in the psychology laboratory at the psychiatric clinic of the important German psychiatrist, E. Kraepelin.

To a great extent, the views of associationism determined the course of research on the psychopathology of thinking. Disturbances of thinking were inferred from disturbances of other functions. An attempt was made to show that at the basis of thought disorder was disorder of the so-called intellectual prerequisites: memory and attention. For example, disturbances in the cognitive activity of epileptics was explained as the disturbance of combinations of basic abilities (E. Kraepelin, K. Heilbronner, M. Ya. Sereiskii). Other writers thought that intellectual activity of epileptics was impaired due to extreme instability of attention (V. P. Osipov). A number of investigators mentioned memory impairment as the cause of disordered thinking in epileptics (G. I. Bershtein).

To explain the nature of cognitive disorder in senile patients, writers pointed to disturbance in the ability to retain what has been perceived. The nature of thinking disturbances here was reduced to disorder of memory (V. A. Gilyarovskii, M. O. Gurevich, C. G. Zhislin, et al.). To explain cognitive disturbance in connection with brain trauma, a number of writers (P. Ya. Golant, M. O. Gurevich, V. A. Gilyarovskii, R. S. Povitskaya) were inclined to believe that intellectual disturbances set in because attention has been disrupted.

The views of the Würzburg school also exerted a major influence on the study of psychopathological thinking. As is known, the representatives of the Würzburg school (Kulpe, Ach, Salz, et al.) stated that thinking is not reduceable to associative processes, that it has its own special characteristics and that these characteris-

tics cannot be reduced to the graphic content of sensations and perception. The chief mechanism of thought is the determining tendency; it stems from conceptual representations of goals and it is not consciously perceived by the person himself. In this fashion the Würzburg psychologists were the first to enunciate concepts regarding goals and tasks; however, the mechanism of thinking, the determining tendency, is contrasted with knowledge via sensations. Thinking is proclaimed an act of "pure" thought, unconnected with prior experience or knowledge. Relying on the views of Brentano and Husserl regarding intention, the Würzburg psychologists divorced thinking from sense knowledge.

As a result a number of German psychiatrists thought that an insufficiency in the "primary endowment of mental structure" caused schizophrenia. According to Berze, who exposited this theory most clearly, such a primary structure is the "tone of consciousness" (the activeness of the "ego") and, in schizophrenia, "tone" turns out to be disturbed ("hypotonia of consciousness"). "Hypotonia of consciousness" is thought of not only as an intuitive construct; it determines all psychopathological symptoms, including thought disturbances.

The views of Gruhle are close to this characterization. He defines thought disturbance in schizophrenia as a disturbance of "intensity," with disturbance of personality strength as the underlying factor. Beringer agreed with this view and stated his view that weakness of "the intentional arc" is the cause of thought disorder in schizophrenia; Stranskii attributed it to "intrapsychic ataxia."

Thus thought disorders were treated as secondary, as the manifestations of disturbances of a particular strength and intensity of the mind. In his article on the psychology of schizophrenia (in the 9th volume of Bumke's "Handbook"), Gruhle metaphorically stated a position which determined the course of research on schizophrenic thinking for a long time: The machine remains intact in the schizophrenic and his memory and attention are unimpaired; however he cannot synthesize separate conclusions, each of which is correct.

A similar interpretation of thinking as a special kind of "spiritual activity" was expressed especially by Jaspers: intellect was contrasted with thinking. At the same time as thinking

was defined by him as a manifestation of intrapsychic activity, intellect was regarded as an aggregate of abilities: memory, attention, and speech entered in as the "prerequisites of intellect." This subdividing has penetrated even our own psychology. For example, in Gurevich and Sereiskii's textbook of psychiatry, we read: "the thinking processes, functionally speaking, are closely related to the nature of the intellect; nevertheless these two concepts are not identical. When the intellect is undisturbed, as pathology shows, marked disturbances of thinking may nevertheless exist. Thinking represents intellect in action, a manifestation of intrapsychic activity; by using the intellectual powers, the thinking processes embrace the active components of intention, attention, affective tendency, and purposive orientation. Hence, in contrast to intellect, which is stable within certain limits and capable of only slow variation (in the direction of development or impoverishment), the thinking processes are dynamic: they change in accordance with various factors even in normal conditions, and show especially marked, but not irreparable disturbance during pathological states. These changes in either direction (disintegration or reintegration) may take place suddenly, or in steps" (pages 39-40). Many investigators have noted the simultaneous existence in a patient of an intact intellect and impaired thought processes.

This distinction between intellect and thinking resulted in attempts of investigators to seek a separate genesis for the disturbances of thinking in gross forms of organic disease and in schizophrenia. The disturbance of the cognitive processes arising in severe organic disease – for example, after trauma – were defined as disturbances of the intellect, or of the "prerequisites of the intellect"; the disturbances of the higher cognitive processes in schizophrenia, on the other hand, were interpreted as disturbances of "real" thinking.

The notion of a distinction between intellect and thinking, and the reduction of the latter to some special essence, were widely employed to characterize the mental activity of schizophrenics. Investigators of schizophrenia began to isolate a certain "basic disturbance" (Grundstörung) from which all peculiarities of mental changes were derived. In so doing, they pointed out that the incomprehensibility and oddity of the thought and behavior of these patients cannot be explained. These views were based on the no-

tions of the "verstehen" psychology of Dielthei and Spranger, according to which, as we have already noted, mental processes cannot be explained.

The view was particularly widely held that the "basic disturbance" of the schizophrenic patient was his autism, which was held to be responsible for the disintegration of his intellectual activity. The problem of autistic intelligence was raised by the German psychiatrist E. Bleuler. We shall now discuss in some detail his monograph, which is specifically concerned with autistic thinking.

Bleuler contrasted concrete thought, which reflects the outside world, with autistic thinking, which depends neither on the outside world nor on logical principles, but which is determined instead by "affective demands." "Affective demands" were defined as the seeking of satisfaction and the avoidance of unpleasant experience.

Bleuler expressed this contrast in the following words: "logical thought, corresponding to reality, is the intellectual reproduction of the associations which reality presents to us." Autistic thought, however, is controlled by desires and has nothing to do with logic or with reality. Bleuler contrasts logical and autistic thought in accordance with their genesis. He writes: "The weakening of the logical thought processes leads to the predominance of the autistic; this is all the more understandable since logical thought, which operates with the aid of memory images, must be acquired by means of experience, whereas autistic thought processes operate solely by inborn mechanisms."

The conceptualization of Bleuler has a certain historical value: in contrast to the formal intellectualistic psychology and psychopathology of his time, he stressed the affective basis of thought processes or, more precisely, the fact that the direction of thought is dependent on human needs. The fact that Bleuler stressed the role of affective desires in thinking, and the fact that he associated the intellect with needs and desires (even though he confined his examination to one need, and to its biological level at that), constitute, in our opinion, an achievement rather than a failing of his book. Our principle objection to his concept of autistic thought is that it unjustifiably divides the real from the affectively based thought processes. Although he correctly points out that the former reflect the outside world and are regulated by it, he isolates this principal form of thought from emotions, desires, and needs.

Bleuler's attempt to subdivide the single process of rational cognition into two genetically and structurally different forms of intellectual activity and to introduce to psychopathological terminology, the concept of autistic thinking (intelligence, independent of the outside world) seems false.

The writings of Gestalt psychology exerted a major influence on the study of thinking. In the works of W. Köhler, M. Wertheimer, and K. Dunker, thinking is thought of as a sudden "understanding" of the situation, unprepared by previous experience and knowledge. The activity of thinking consists in restructuring separate parts (configurations) of the problem situation; a new "whole," a "new Gestalt," is formed. The separate elements of the problem situation are perceived in new relationships to one another, depending on the new "Gestalt." The restructuring itself occurs thanks to a suddenly grasped "insight."

In spite of the fact that Gestalt psychologists such as Dunker and Maier raised the issue about the productivity of thinking, they could not discover its specific mechanisms; they analyzed thinking either by means of principles borrowed from perception or deduced this mechanism from the phenomena of consciousness; an object outside of consciousness did not exist for the Gestalt psychologists.

It is necessary to state that the principles of Gestalt psychology, as applied to thinking, have had little influence on research in abnormal psychology. Only particular problems, of a more methodological nature, were useful.

Soviet psychology succeeded in overcoming the conceptualization of thinking either as an innately (imminently) formed process or as an act arising from the linking up of associations. One of the fundamental theses of Soviet psychology (L. S. Vygotskii, P. Ya. Gal'perin, A. P. Leont'ev, S. L. Rubinshtein) is that thought is the process whereby the person masters a system of functions and knowledges that are the products of sociohistorical development.

Soviet psychology defines thinking as the generalized and mediated reflection of reality, intimately connected with sensory perception of the world and with practical human activity.

In describing the dialectical way of perceiving the objective world, V. I. Lenin wrote: "The dialectical road to the recognition of truth, to the recognition of objective reality, runs from living

contemplation to abstract thought, and from these to practical activity."[1]

Rational cognition is not limited to the reflection of the unique or the particular, but it also reflects the most essential interrelationships of reality. The process of cognition is characterized not only by the transfer from the sensory to the rational, but also by the fact that it must revert once again to practical activity.

This process, which reflects the outside world most completely, becomes possible only through the existence of language, which, in Marx' words, is the "very essence of thought."[2]

These general principles of Marxist-Leninist theory form the basis of the views of Soviet psychologists on the nature of mental processes, including thinking. Thinking is a special form of human behavior which developes in the course of practical experience, as man is faced with the necessity of solving problems.

To understand the nature of the processes involved in thinking, it is very important to investigate their genesis. Mental properties are formed in the course of ontogenetic development. Vygotskii's investigations aimed to refute the view that mental processes, including thinking, are internal mental properties or self-contained mental functions. He repeatedly postulated that mental processes arise during group behavior and during social intercourse. He said that activity which is at the outset shared by two people, becomes a part of the individual's behavior repertory.

The view that mental activity is formed from external activity was developed most logically by A. N. Leont'ev and P. Ya. Gal'perin. In his writings, Gal'perin points out that any process of assimilation begins with a concrete action with objects. Later on there is less external action with objects and the operation is carried over into external speech, and, finally, into speech "to oneself," "mentally." Thanks to this it is abstracted from concrete objective conditions and it acquires a more generalized character. There occurs, in the words of the author, a specific "contraction of the process," so that it becomes automatized and changed into a dynamic stereotype.

---

[1] V. I. Lenin, "Complete Collected Works," Vol. 29, pages 152-153.

[2] See K. Marx and F. Engels, "Collected Works," Vol. 3, page 448.

Leont'ev calls this factor the factor of formation of the mechanism of the corresponding mental function, and goes on to say that many links of the process become unnecessary, are not reinforced, become inhibited, and disappear. Together with this contraction of the process, a reinforcement of the corresponding reflex connections of the "reduced system" takes place. A. V. Zaporozhets cites this point of view on the basis of the experimental study of the formation of voluntary movements in the child.

It should be noted that the understanding of mental processes as processes developing from external activity is also found in the writings of a number of progressive psychologists outside the Soviet Union (J. Piaget, A. Wallon).

The views developed by Soviet psychologists – namely, that theoretical activity develops from external activity, and that mental properties, both general and special, are the product of ontogenetic development – are based on the doctrines of I. M. Sechenov and I. P. Pavlov on the reflex nature of mental activity. In his "Elements of Thought," Sechenov states that thought begins with the formation of ideas about an object and then passes directly into the "extrasensory region." Sechenov shows that abstract concepts are formed under the influence of real transactions. In his book "Elements of Thought" he states: "The transfer of thought from the experimental region to the extrasensory takes place by means of prolonged analysis, prolonged synthesis, and prolonged generalization. In this sense, it is the natural continuation of the preceding phase of development, using the same methods and, consequently, the same intellectual processes" (pages 251-252).

The view held by Soviet psychologists that thinking is an activity which develops from practical experience and arises in the course of the life of an individual, rests on the teaching of Pavlov. Thinking is based upon conditioned-reflex activity and develops as a result of individual experience. Hence, by postulating the reflex nature of thinking, Soviet psychologists reject the principles of idealistic, empirical psychology, which regards thinking as an inborn faculty or function, which only increases quantitatively in the course of development.

The psychological investigation of the origin and development of thinking, as S. L. Rubinshtein point out, consists of the discovery of its principles as an analytic synthetic activity.

The discovery of the reflex nature of all these processes, even in the most elementary acts, revealed their multistage structure. In Sechenov's words, "the idea of a mental act as a process must be held as fundamental" (page 252). Even the most elementary human mental processes, such as feeling and perception, are processes in the sense that they take place in time and possess somewhat variable dynamics. All human intellectual activity is characterized by such processes.

Intellectual activity consists not only of the ability to perceive and be aware of surrounding events, but also the ability to act in conformity with a set purpose. Thinking is an active, goal-directed process, directed toward the solution of a definite problem.

The findings of Soviet psychology have shown that thinking is an activity that depends on a system of concepts, is directed at problem solving, and is subordinated to the goal of assessing the conditions under which a task can be accomplished. To carry out the task successfully it is necessary to keep the goal constantly in mind, to realize a program of operations, and to check task execution against the expected results. This checking permits correction of all these operations.

These views of Soviet psychology on the structure of thinking must form the basis for analyzing different kinds of thought pathology. The thought disturbances, encountered in psychiatric practice, are diverse in nature: it is difficult to fit them into a strict classificatory scheme. However, we can talk about certain parameters which may serve as rubrics for the different variations of thought distortions observed in the mentally ill.

On the basis of numerous studies accumulated in the Psychology Laboratory of the Moscow Institute of Psychiatry, it is possible to differentiate three kinds of pathology and thinking: (1) operational disorders, (2) dynamic disruptions, and (3) disturbances in purposiveness.

The cognitive properties of each individual patient rarely fall into definite categories representing one type (or subtype) of intellectual disturbance. Complex combinations of different types of disturbance are often observed in the structure of the pathologically affected thinking of the individual patient. For example, in some cases, a disturbance of generalization is combined with a

disturbance of purposiveness, while in others it may be found together with various subtypes of disturbances of generalization.

1. OPERATIONAL DISORDERS

Thinking, as a generalized and indirect reflection of the outside world, is manifested in practical life as the assimilation and utilization of knowledge, as the acquisition and application of new methods of intellectual activity. This assimilation is accomplished not as the simple accumulation of facts, but rather as a process of synthesis, generalization, and abstraction. Thought depends on a certain system of concepts which makes it possible to reflect action in generalizations and abstractions.

S. L. Rubinshtein correctly indicated in his book "Thinking and Ways to Study It" that generalization stems from an analysis which reveals basic relationships. Intellectual operations with concepts must imply a different attitude toward an object, one in which the opportunity is allowed of establishing different relationships between objects. It must be possible to establish connections between the concepts as well. Meanwhile, the systems of connections established and generalized in previous experience are not now annulled, for the formation of a generalization proceeds not only by means of the newly created generalization of single objects, but also by means of the generalization of previous generalizations. Vygotskii often returned to this point, that is, the principle of Lenin which stated that intellectual operations with concepts enabled man to take a long view of the impressions and ideas directly received by the sense organs so that, when he reverts to practical activity, he obtains an even fuller and more detailed reflection of objective reality.

Generalization is cast in a language system that transmits mankind's experience and facilitates extrapolation from individual impressions. In certain pathological mental conditions (for example, intellectual retardedness and some kinds of organic dementia) patients lose the ability to engage in generalization and abstraction.

Investigations of the intellectual operations of patients with different brain diseases have shown that disturbances of the operational side of thinking may assume various forms. Notwithstanding their great variety, they may be grouped into two types: (a) a lowering of the level of generalization; and (b) a distortion of the

process of generalization. We shall describe the most general characteristics of this disturbance, illustrating them with typical examples.

Lowering of the Level of Generalization

The ability to work with general attributes is characteristic of analytic and synthesizing thought.

The lowering of the level of generalization implies that the patient's judgments are dominated by direct ideas of objects and phenomena; operations with general signs are replaced by the establishment of concrete connections between objects. During the performance of an experimental task such patients are unable to select from the full assortment of signs those which disclose the concept most fully. Hence, in tests where these intellectual operations are clearly involved, concrete-situational intrusions are most frequently observed. This kind of thought pathology shows up especially well in the object-classification test, a short description of which was given in Chapter 4.

In that experiment one such patient refused to place a cat and dog in the same group "because they fight." Another patient would not group together a fox and a beetle because "the fox lives in the forest while the beetle flies." The special signs "lives in the forest" and "flies" determine the patient's reasoning to a greater degree than did the general sign "animals."

With a well-marked lowering of the level of generalization, the patients were generally incapable of performing the classification test. It seemed to them that the objects differed so much in accordance with their concrete properties that they could not be grouped together. Even the table and chair could not be grouped together because "you sit on a chair but you work and eat on a table." One patient refused to group together a key and a pair of scissors, because they are different: "this is a key and these are scissors; what can they possibly have in common?" In some cases the patients formed a large number of small groups on the basis of an extremely concrete link between them, for example: key and lock, pen and pen holder, thread and needle, exercise book and pencil. Sometimes the subjects grouped together objects as elements of a theme (telling some story about the objects), but produced no classification. One such grouping, for example, con-

sisted of an egg, a spoon, and a knife; another, an exercise book, a pen, and a pencil; a third, a key, a lock and a cupboard; a fourth, a tie, a glove, a thread, and a needle, etc. The subject explained his choices as follows: "He came home from work, ate an egg with the spoon, cut a slice of bread, and then did some work, took an exercise book, pen, and pencil, . . ." Erroneous solutions of this type are called concrete-situation combinations.

Such solutions were found principally in oligophrenics (95% of these patients) and in epileptic patients who have had the condition since childhood (86%). Solutions of this type are also observed in a high proportion (70%) of patients with severe forms of encephalitis.

As a rule, the mental states of these patients showed no psychotic symptoms (delusions, hallucination, disturbances of consciousness, etc.); a general intellectual deterioration merely predominated.

These patients could perform a simple task correctly if its conditions were firmly delineated in advance. Subsequent changes in the conditions evoked confusion and erroneous behavior. Although they readily followed the hospital routine, performed relief duties, and generally aided the staff, they often came into conflict with their surroundings, did not understand jokes, and engaged in arguments with other mentally defective patients.

Sometimes the objects were sorted in such a way that only the two nearest objects were grouped together. For example, a table was grouped with a sofa ("you have to sit at the table"), exercise book ("perhaps to write something"), pencil ("you write with a pencil or a pen and there isn't a pen here"). The patients made no attempts at classification.

All these examples indicate that the operation of classification, which is based both on the detection of the dominant property of an object and an abstraction from a large number of other concrete properties and attributes of objects, gives rise to difficulty, forcing many types of mental patients to resort to grouping on the basis of concrete situations.

Similar results were obtained in this group of patients when they performed the test using the technique "exclusion of objects" which is also used to study generalization strategies and consists in the following.

The subject is given cards on each of which are drawn four objects, chosen so that three of them are related to each other while the fourth does not match the rest. The subject is asked to say which of the four is superfluous. For example, he may be shown a card with pictures of a protractor, scales, a clock, and spectacles, in which case the spectacles must be the exception because the first three articles are measuring devices.

The psychological essence of this method is that the subject must first understand the conditions governing the entire operation. Only when the subject has found the principle of generalization joining the three objects can he exclude the fourth.

This method also demonstrates whether or not the subject can find the correct work formula to justify his chosen principle of selection. It also allows one to note if and when the subject changes from one method of solution to another. Here are some examples of how that task is carried out. Patient K, when shown as objects, a thermometer, a watch, scales, and a pair of spectacles, exclaimed that the thermometer ought to be excluded because "only a sick person needs it." A patient from the same group suggested grouping together the watch, the thermometer, and the spectacles, because "if a man is nearsighted, he will look at the thermometer and the watch through his spectacles."

When presented with four objects of which three bore some relation to sources of artificial light (a kerosene lamp, a candle, and an electric flashlight) and one to natural light (the sun), the patients often chose the kerosene lamp as superfluous, explaining that nowadays it is no longer necessary, for "even in the most remote places electricity is available." Other patients excluded the candle for the same reason.

Typical examples of responses of this type are given in Table 1. We may see that the patients employed properties of the object and formed associations between them which were valueless for performance of the test.

Sometimes, immediately upon attaining an understanding of the instructions, the patients would protest: "There is nothing superfluous here, all the objects are necessary." For example, patient D when shown pictures of a boot, a slipper, a shoe, and a foot exclaimed: "Excuse me, nothing is superfluous here. This

Table 1. Typical Replies of Patients with Lowered Levels of Generalization in the Exclusion-of-the-Superfluous-Object Test

Pictures presented	Patient	Patient's responses
Kerosene lamp, candle, electric flashlight, sun	K (oligophrenia)	You must take away the candle. You don't need it if you have a flashlight.
	D (epilepsy)	You don't need the candle, it soon burns down so that it is useless, you may fall asleep, and then it may flare up again.
	S (epilepsy)	You don't need the kerosene lamp, for electricity is available everywhere now. You can take away the candle, too. No, you had better keep the candle in case the electricity supply breaks down. This often happens where I live, and so we keep a stock of candles.
	K-n (epilepsy)	If it is daytime you must take away the sun, for it is light without it, but if it is night, then . . . (the patient is lost in thought).
		In any case there is no sun at night . . .
		No, that is wrong, in the daytime you must take away the candle and leave the sun, but at night you don't need the sun.
Scales, watch, thermometer, spectacles	K-n (epilepsy)	The thermometer is unnecessary. There isn't a doctor here, or a hospital. The scales are superfluous. They are needed in a shop when things have to be weighed.
	S-v (oligophrenia)	Take away the thermometer; it is only needed in the hospital.
	R-v (epilepsy)	I don't know, everything is necessary – the watch for the time, the thermometer for measuring the temperature. Perhaps the spectacles, if the man can see well, but if he is nearsighted, he will need them. Scales are not always necessary, but they are useful in business.

is a man's foot, and you can put a slipper, a boot, a shoe, or a sock on it . . . of course there is no sock here . . . if it had been a woman's foot, the slipper would have fitted . . . and perhaps if her foot had been lame, the boot . . . . I think the shoe would fit a

man's foot." When the experimenter suggested eliminating the foot, since it is a part of the body while the other three objects are articles of footwear, the patient burst out laughing: "You must be joking, how on earth can you take away the foot? If a man had no feet, why would he need footwear."

The patients approached the pictures of the objects from the point of view of their practical utility, and they could not perform the theoretical operation which the test required.

The impossibility of performing the test on the level of generalization and the inability to abstract from the individual concrete properties of objects were due to the fact that the patients could not grasp the conventions of the test. This inability to understand the conventions was particularly prominent during the test requiring the interpretation of proverbs and metaphors.

As we know, proverbs constitute a type of folklore in which a generalization or conclusion is transmitted through the image of an individual fact, or event, a concrete situation. The true meaning of the problem becomes clear only if a person can abstract from the concrete facts mentioned in the proverb, and when the concrete, isolated events acquire the character of a generalization. It is only by the satisfaction of this condition that the gist of the proverb can be transferred to similar situations. This transfer is similar in its mechanism to the transfer of the method of solving one problem to another, as is seen especially clearly when phrases are matched with proverbs. In discussing the problem of transfer, S. L. Rubinshtein remarks that "at the basis of transfer lies generalization, and generalization results from analysis, coupled with synthesis" (page 75).

We now consider two variations of this technique.

Variant A. Explanation of Proverbs and Metaphors. The subject is given proverbs and metaphors and is asked to explain them. The proverbs chosen are common and not too complicated. In addition, the subject is asked to think, either of some examples of everyday life to which the particular saying applies, or to point out the similarity or difference between two other proverbs. If the subject's interpretation of a proverb is not clear to the experimenter, he is asked to write a short story to illustrate its meaning. The experiment proceeds in the form of a conversa-

tion, in which the experimenter plays a very active role. By asking appropriate questions he can verify the accuracy and depth of the patient's comprehension of the metaphorical meaning and elucidate the difficulties which may arise. For this reason the questions must be put carefully to the subject.

The severest disturbance of intellectual activity which this test may reveal is the complete inability to understand the metaphorical meaning, in which case the subject renders a literal interpretation of the proverb or metaphor. However, the ability to correctly interpret proverbs does not necessarily indicate the subject's level of generalization. Some proverbs may be so familiar to the subject that a correct interpretation of them means no more than that the subject already knows their meaning; in these cases no generalization of new material has taken place. A far more demonstrative method is that which requires the matching of phrases and proverbs.

Variant B. Matching Phrases and Proverbs. The subject is given a series of proverbs written in tabular form and cards on which certain phrases are written; some of these phrases may have nothing to do with the meanings of the proverbs, but may contain words reminiscent of the proverbs. The subject is asked to arrange the phrases and proverbs by meaning, so that each proverb is matched by only one phrase. Several series of proverbs and phrases are presented, graded in difficulty. By way of illustration we show the first and easiest of the series. Proverbs: 1) You cannot hide an awl in a sack; 2) Strike the iron while it is hot; 3) All that glitters is not gold; 4) Take care of the pennies and the pounds will take care of themselves; 5) As the ale is drawn so it must be drunk. Phrases: 1) Gold is heavier than iron; 2) The cobbler mended the boots with an awl; 3) Everything that looks good isn't good; 4) What goes up must come down; 5) The blacksmith worked all day today; 6) By combined efforts all difficulties can be overcome; 7) The truth cannot be concealed; 8) Don't put things off until tomorrow.

This variant of the method differs in certain respects from Variant A. The understanding of the metaphorical meaning of a proverb is facilitated by the fact that although the subject may have only a confused understanding of the meaning, the phrase acts as a prompting device. The phrases provoke a difficulty of another sort,

however. The chances of slipping into an approximately similar meaning are increased, for some words duplicated in the phrases and proverbs may easily provoke uncritical matching in cases where the metaphorical meaning is not completely clear. Thus the critical factor here is not the ability to understand the abstraction, but rather the ability to inhibit what does not correspond to the meaning of the proverbs. The implementation of both variants will thus reveal not only the subject's general level of abstraction, but also the extent of its stability.

Both Soviet and foreign authors have investigated the understanding of metaphors. The work of Piaget and Vygotskii demonstrated the connection between the understanding of metaphors and the level of conceptual development.

Difficulty in understanding the metaphorical meaning of expressions depends not only on the lowered level of generalization but on such other possible factors as a negativistic attitude of the patient and possible changes in the dynamics of his thinking, and it may depend on the content of his knowledge. All these factors will be discussed in the following chapters; at this stage we shall merely mention that the patients who could not distinguish a generic sign in an experiment on the classification of objects frequently could not understand the metaphorical meaning of proverbs. "Strike the iron while it is hot" means, according to one patient, that "iron must not be forged when it is cold." Another patient said: "There is no such thing as an iron hand. If you mean an artificial limb, that is made of wood and not of iron." Another patient, given the proverb, "Sit on your own sledge" ("Know where you belong"), said: "Why should I sit on somebody else's sledge? Why should I, it is unpleasant to sit on a strange sledge." The experimenter tried to explain that this proverb can apply to other situations than those concerning sledges. The patient disagreed: "How did it come about that somebody sat on a strange sledge? Was he perhaps deep in thought, thus absentmindedly setting off with the wrong sledge?" Experimenter: "Now, if a man was doing something that wasn't his own affair, could you use this proverb?" Patient: "No, you couldn't, in one case it is 'affair' and in the other it is 'sledge'." Only with great difficulty could the metaphorical meaning in some cases be explained to the patient; however, when the next problem was presented to the same patient he again refused to consider anything other than its literal meaning.

Lowering of the level of generalization is also found in research on patients' processes of secondary generalization or mediation. This technique is called the "pictogram task."

The subject is required to remember fourteen words. As an aid to memorization he is instructed to think of something which will help him to reproduce the required words in the future, and to draw it on paper. He is forbidden to take notes or to jot down letters as mnemonic devices. The subject is told that the quality of the drawing is immaterial. There is no time limit for the test.

The method was first suggested by Luria for investigating the use of drawings as aids in memorization. It was later used with slight variations to study intellectual processes. The experiment is conducted in such a way that while the subject assumes that it is only memory that is being investigated, the experiment is in fact mainly concerned with studying the general nature of his intellectual processes.

The task of creating a conditioned connection during the memorization of words itself gives rise to considerable difficulty, since it is not always possible to reflect the whole range of meaning of a particular word by means of a drawing. The choice of what to draw thus requires a considerable degree of intellectual freedom.

G. V. Birenbaum, who used this method to investigate the disturbance of ideas in mental patients, delineates this fundamental difficulty: the range of meanings of the group of words is wider than can be represented by a single drawing, while the meaning of the drawing is wider than the meaning of each individual word; the meanings of the picture and of each word can thus only partially coincide. It is this ability to detect what is common to the drawing and to each word which is the fundamental mechanism of the act of formation of the conditioned meaning. Although this intellectual operation takes place relatively easily in a person of normal intelligence, even in an adolescent, in the presence of pathological changes of thinking the formation of these associations becomes difficult.

The pictogram task may be conducted in two ways. In the first of these the picture is a conventional representation of the concept included in the word. For example, to memorize the word "development" any small and large figures (squares, circles) may be drawn; to memorize the word "doubt" a question mark may be

used. This method is satisfactory with a subject who has achieved an adequate level of education. In the second method the drawing consists of a less general concept than the given word; the first must serve as the conditioned stimulus for the second. For example, the same word "development" may evoke such associations as "development of industry," "mental development," and "physical development." The drawing of any object associated with such a less general concept (a factory, a book, some article connected with sport) may then act as a stimulus for the concept of "development."

Hence, this test requires the ability to coordinate the concept denoted by a word with a more concrete concept; this is possible only when the subject is able to abstract from the whole range of concrete concepts contained in the given word, and when he can inhibit all the special associations connected with this word. The performance of this test is possible only when the subject has attained a definite level of generalization and abstraction.

This pictogram method provides the means of judging the degree of generalization and relevance of the associations formed by the subject. As a rule, healthy subjects, even if they have not completed their high-school education (ninth or tenth grades), can easily perform the test. If the subject encounters difficulty in understanding the task, as soon as he is shown how the test should be performed, he will thereafter solve the problem correctly.

An experimental method similar to that just described is that suggested by A. N. Leont'ev and known in the literature as the method of the indirect memorization of words. We shall now describe one of the variants of this method.

The subject is asked to commit 15 words to memory. To facilitate memorizing he has to choose a suitable picture to correspond to each word from among 30 pictures which have been placed in front of him. After choosing the pictures, the subject must explain what association he made between each word and the object in its corresponding picture. The subject is then shown the pictures and asked to recall the corresponding words.

The chief advantage of this method over that of the pictograms is that here the experiment can be carried out with subjects with both little education and little or no drawing ability. The method

also gives an idea of how fully and differentially the subject reproduces the material, to what extent the relationships that he has formed are appropriate.

Considerable attention was given by Vygotskii to the problem of secondary generalization. He approached the process of development of the mind historically, considering that human mental processes develop from external activity, and repeatedly emphasized the secondary character of mental processes. Human behavior and mental development find their origin in human relationships, which develop during material enterprise. In discussing the role of the use of tools in mental development, Vygotskii attached particular importance to language. He saw speech as a phenomenon of objective activity which arises in the process of social practice. It is used initially as a form of communication, and subsequently develops into a means of organization of human actions. Speech almost by definition implies the possibility of executive power, that of initiating and controlling action. Speech is a system of relationships and associations of social experience; it is always nothing more than the generalization of social experience.

In his own experience the individual masters the meaning of words by generalizing object connections and relationships. This generalization process occurs during social intercourse. Speech is both a means of social intercourse and a means of generalization and, in its development, it unifies the two.

Our research showed that this experimental task (indirect memorization) caused considerable difficulty for a number of patients. For instance, when required to find a picture for memorizing the word "development," patient K said: "What sort of development – there are different sorts – muscular development, mental development. Which do you want?" The same patient could not think of a picture for memorizing the words "heavy work." "What do you call heavy work? I found it hard to solve problems in school, and you may be weak and would find it hard to do physical work. I don't understand what I should draw."

Some patients try to reflect the situation almost photographically. When asked, for example, to memorize the expression "happy holiday," the patient says: "What am I to draw? There must be an accordion, a dance, and also, perhaps, a table with a

cloth, a bottle, and food. How am I to draw all this? I am not an artist, and you would need an artist to draw it properly."

In her investigations of patients with severe brain lesions, G. V. Birenbaum observed that the difficulties in performing the pictogram task are so great that sometimes patients are unable to choose a drawing, for none seems to convey with sufficient precision and comprehensiveness the concrete significance of the words. We obtained similar results with our patients.

Let us consider typical examples of pictograms of patients with epilepsy.

Patient A. A happy holiday – "How can I draw this? You can be happy in different ways. One person likes to go to a movie on his holiday: that is happiness for him. Another likes to go out drinking . . . . This is bad, of course . . . . But some people I know do it all the same . . . . Others are happy when they go for a walk with their family, or when they take the children to the circus. How am I to draw all this? Of course, you can look at it from a different point of view, from that of society. We have national holidays, for everybody. May Day, for example. I could draw a demonstration with lots of flags. (The patient draws a flag, but still is not satisfied.) One flag isn't enough, there ought to be lots of flags and a crowd, but I don't know how to draw them . . . ."

Patient M'va. Heavy work – "It is absolutely impossible to draw anything the least like heavy work. For some, mathematics is hard. I never liked it and never had to do any. Others don't take to literature and, of course, for a weak person physical work is heavy . . . anything can be heavy. I shall draw a stone; it is hard work piling stones. Now, of course, they have cranes to lift heavy loads . . . No, I cannot draw stones, but I shall draw a hammer, like the one a blacksmith uses. But there, again, there are no more hammers nowadays, it is all done by machines. I don't know, doctor, what . . . . Oh, well, it can be a stone and a hammer."

Hence, an analysis of the data obtained by different methods (classification of objects, method of exclusion, explanation of proverbs, and a pictogram task) reveal disturbances of the processes of generalization in a number of patients (epilepsy and oligophrenia): their judgments were of the concrete situation type and they did not understand metaphors and conventions.

These experimental results show that these patients are unable to distinguish the essential properties of objects or to discover the semantic relationships between them.

A lowering of the level of generalization and of the supporting processes, analysis and synthesis, means that the problem situation itself, an aspect of every experiment, remains poorly understood. It is generally accepted that the thinking process has its beginning in the problem situation. S. L. Rubinshtein correctly points out that this situation comprises unknown elements. The situation becomes problematic precisely because elements are involved which are inappropriate to the very relationships in which they occur at a given moment. The problem situation itself has to be analyzed; only then will the correct formulation occur to the individual.

The patients we have described cannot analyze the problem situation confronting them; they reason in connection with each element in the situation; the requirements of the theoretical problem do not occur to them. Thinking uses and applies acquired knowledge and tactics of problem solution, but this must be preceded by a correct analysis of the task's requirements. New tactics must be employed if the old ones are unrealistic. Our patients are extremely limited in their abilities; their affected thinking incompletely reflects reality; they can function correctly only in rigidly predetermined conditions. A. A. Tokarskii wrote about this even in his time. In contrast to many contemporary Wundtian psychologists, Tokarskii felt that correct thinking means to realize that task conditions have changed, to make the appropriate response and be capable of doubting one's own conclusions. In his article "On Stupidity," published in 1896, Tokarskii gives an example of impaired thinking ("stupidity" in his terminology). A fool saw a fire, began to dance, and was beaten. At home his mother admonished him and advised him that water should be poured on a fire. He left and again saw a fire – a pig was being roasted – took a pail and began to pour it over the fire. Again, he was beaten.

Tokarskii analyzed this case as follows: this stupid individual understood the instructions after the first incident; there was no memory impairment. He concluded that if there is a fire, it must be extinguished, but he goofed because he couldn't distinguish between two situations, a real fire and a pig roast. He dealt with the

new situation as he should have dealt with the first. According to Tokarskii he grasped an insufficient number of attributes, which means, he did not fully perceive reality.

The fundamental characteristic of foolishness, according to Tokarskii,is the "failure of action to correspond to the demands of the actual situation." Tokarskii believes that the cause of stupidity in such an individual is that his "mind is disturbed in those fundamental wellsprings from which all our mental resources flow, and especially in the ability to perceive the immediate realities. The stupid individual perceives only a small part of his environment" (page 689). Tokarskii characterizes such individuals as persons who often use clichés improperly, who cannot find new relationships and use them in novel ways, and who do not question their own judgments.

The stupid individual "absorbs little of what is going on around him, remembers little of what he has perceived, and, finally, he cannot understand to which prior situation a particular recollection belongs. His chief trait is a sharp lack of correspondence between his ideas and concepts, on the one hand, and reality, on the other" (page 692).

This statement of Tokarskii's makes it clear that he understood thinking as an activity, requiring analysis, synthesis, and generalization. For the inability to distinguish two situations having an attribute in common and the insufficiently complete perception of situational requirements, are, in fact, manifestations of inadequate analytic and synthesizing activity. Use of an inappropriate cliché, that is, an incorrect transfer of meaning, implies erroneous generalization.

Authors discussing the psychology of the mentally retarded child cite experimental findings that show that such children cannot discover the common element from among a variety of single phenomena. During the 1930's, L. S. Vygotskii and Zh. I. Shif found that the mentally retarded child who has learned to work with visual systems of associations is unable to systematize his experience through generalization and abstraction.

To recapitulate, it can be said that the intellectual activity of such patients represents an imperfect reflection of objects, phenomena, and their interrelationships. A perfect process of reflec-

tion of the objective properties and principles which underlie material objects always assumes the ability to abstract from concrete details. In discussing the sensory-abstract-practical nature of thinking, Lenin stressed that the act of generalization is a deviation from concreteness. "The approach of the [human] mind to an individual object, and the acquisition of an impression [an idea] from it is not a simple, direct, rigid act, but a complex bifurcating zigzag-shaped act allowing for the flight of fantasy from life."[1]

In our patients this "flight" from single associations was extremely difficult. A reflection of the objective features and principles of things assumes the ability, which was impaired in our patients, to abstract from concrete details.

Distortion of the Process of Generalization

Disturbances in the functions of abstraction and generalization can be of a different nature, apparently even the antithesis of those just described.

Whereas the judgments of the patients described above did not go beyond the bounds of single, individual associations, in the patients who we will now discuss the "flight" from concrete associations assumes a grossly exaggerated form. In their judgments these patients reflect only random aspects of phenomena, and not the essential relationships between objects.

Solution of experimental tasks actualizes these chance associations, taken from the patient's concrete experience. The patient relies upon relationships which reflect neither the content of real phenomena nor the cognitive relations between them. For example, when asked to classify objects, these patients are guided by excessively general signs and respond inadequately to the real relationships between objects. Patient M, for example, grouped together a fork, a table, and a shovel in accordance with the principle of "solidity"; and a mushroom, a horse, and a pencil in accordance with the "principle of joining the organic to the inorganic."

We designate such disturbances of cognitive activity as distortion of the process of generalization. They are found most frequently in patients with schizophrenia (in 67% of the patients whom we examined), mainly with the hallucinatory, paranoid form of the

[1] V. I. Lenin, "Complete Collected Works," Vol. 29, page 330.

disease, but they can be observed as well in other forms of the disease.

Such patients live in a world of their own hallucinations and have little interest in the real situation. They attempt to approach unimportant, commonplace events "from theoretical standpoints." In conversation they can discuss matters of a general character, but often they cannot give a simple answer to a concrete question. Their language is flowery. For example, when talking about a cupboard, one such patient called it "a circumscribed part of space," and when discussing a friend, whom he described as a good man, he said: "What is good and evil? This definition is relative – positive and negative, like the problem of electrons and the universe. If something is bad, this is a qualitative aspect, and it means that something else must be good. But bad may be taken for good, and the two are not opposite."

Some of the more demonstrative examples of how such patients perform tests on the classification of objects are shown in Table 2. They either make use of signs which are so general (hardness,

Table 2. Performance in the Object-Classification Test Using Formal and Illogical Associations

Objects classified in the same group	Patient	Explanation
Cupboard, saucepan	M (schizophrenia, paranoid type)	"Both have an opening."
Automobile, spoon, cart	G-n (schizophrenia, paranoid type)	"A spoon also moves, toward the mouth."
Beetle, spade	G-n (schizophrenia, paranoid type)	"You dig the earth with a spade, a beetle also digs the earth."
Flower, spoon, shovel	D-n (schizophrenia)	"All these objects are long."
Goose, pig	K-v (psychopathy)	"The goose and pig aren't friendly."
Shovel, horse	E-n (schizophrenia, paranoid type)	"They both begin (in Russian) with the letter 'L'."
Clock, bicycle	M (schizophrenia)	"A clock measures time, and if you are riding a bicycle, it also measures space."

movement) that they go far beyond the essential significance of the phenomena, or they work on purely external, immaterial signs (an opening).

The illogical, aimless character of the judgments of the patients of this category is particularly obvious when they attempt to compose pictograms. One such patient, for example, in order to memorize the words "teplyi veter" (a warm wind), drew two triangles (treugol'niki), and to memorize the expression "veselyi uzhin" (a jolly supper), two circles (kruzhki). Another patient of this group, to memorize the word "somnenie" (doubt), drew a catfish (som), and to memorize the word "razluka," drew an onion (luk).

Patients with a lowered level of generalization ability have difficulty in composing pictograms because they cannot form abstractions when presented with individual concrete word meanings. Another group of patients could perform it very easily, since they produced any associations at random which bore no particular logical relation to the problem. The drawings were interpreted so widely and unobjectively that the result bore no logical relationship to the word or words. Without thinking, the patients permit themselves to suggest any scheme whatsoever for identifying words.

In Table 3 we show the most typical examples of performance on this task in which illogical and formal associations are used.

Tables 4 and 5 contain examples of how schizophrenics carry out these tasks.

In this fashion, while carrying out the experimental tasks, the patients put together any and all relationships between objects and phenomena even if they are inappropriate to the concrete facts of the situation. In fact, actual differences and similarities between objects are not taken into account by the patients; in no way do they serve to control or check his judgments and behavior. The logic of a stream of thought is not checked by experience. It is interesting to note that in these patients speech does not facilitate performance of the task, but rather adds to the difficulty: the words pronounced by the patients evoked new, often random associations, which they do not inhibit. Having completed a task correctly in real life, the patients may then proceed to conduct an absurd discussion about their performance.

Table 3. Examples of Performance of Pictogram Tests Using Formal, Illogical Associations

Words given for memorizing	Patient	Drawings and explanations
Development	M-v (schizophrenia)	Two arrows
Development	Od-ov (schizophrenia)	A rope. "It can develop."
Razluka (separation)	M-v (schizophrenia)	Onion (luk)
Somnenie (doubt)	E-n (schizophrenia)	Catfish (som)
Somnenie (doubt)	Sim-v (schizophrenia)	A clay ball (in Russian "kom gliny"). "Glinka wrote a novel 'Somnenie,' let it be 'gling' (clay)."
Devochke kholodno (the girl is cold)	L-na (schizophrenia)	$\pi D^2/4$. "They both have a letter D."
Devochke kholodno (the girl is cold)	R-v (schizophrenia)	Two squares. "You said two words."
Devochke kholodno (the girl is cold)	K-v (schizophrenia)	Some dots and a triangle. "The dots are snow, let the triangle be the girl."
Pechal' (grief)	K-v (schizophrenia)	To print (pechat'). "It begins with pech."
Pechal' (grief)	L-na (schizophrenia)	Stove (pechka). "It begins with P."

Table 4. Examples of Definition of Ideas by Patients with Distortion of the Process of Generalization

Words to be defined	Patient	Definitions
Clock	O-v (schizophrenia)	"A mechanical object, a form of objectiveness, or an object of logic."
Clock	Z-na (schizophrenia)	"A measure of a definite property of matter, what do they call it in philosophy? An attribute, isn't it?"
Cupboard	M-v (schizophrenia)	"This is an object belonging to inanimate nature; it has practical application for the preservation of other material particles."

Table 5. Examples of Comparison of Concepts by Patients with Distortion of the Process of Generalization

Words for comparison	Patient	Patients' statements
Rain and snow	A-v (schizophrenia)	"Objects of humidity, distinguished by the displacement of certain substances in relation to the circumference of the earth."
River and lake	A-v (schizophrenia)	"River is long. Lake, an ellipse, sometimes a circle. From a geometrical point of view."
Sledge and cart	A-v (schizophrenia)	"From the grammatical point of view both these words are nouns but 'sani' [the word for sledge] does not exist in the singular."

Disturbances of intellectual activity in schizophrenic patients were described by Vygotskii. He postulated from his experimental findings that in such patients the function of concept formation has disintegrated; concepts had degenerated to the level of complexes, or concrete meaning-patterns. This phenomenon was based on changes in the meaning of words.

While we may agree with Vygotskii that patients with schizophrenia often show changes in word meaning, we cannot agree that in these cases concepts are degraded to the level of complexes. (A complex as Vygotskii understands the term, involves a generalization of phenomena on the basis of concrete associations or concrete ideas.) As our experiment showed, "concrete" associations take place in only a very small proportion of schizophrenics. In most cases the process of generalization is disturbed not because the patients operate with concrete association but rather because their intellectual activity is dominated by associations which are inappropriate to the concrete relationships of this situation. Even when their judgments are concrete, they reflect not only the real authentic relationships between phenomena or objects but also, and perhaps to a greater degree, their random, incidental characteristics. This phenomena occurs not because the conceptual level has been disturbed but because these patients have lost their ability to be guided by the objective meaning of phenomena and objects.

Hence their thinking seems unconventional and affected. Many authors have described this "uncommonness" in the thinking of schizophrenics. Some of them, such as N. Cameron, D. Chapman, and R. Payne, attempt to explain alternations in schizophrenic thinking in terms of the use of an excessively large number of object features, including ones that do not carry relevant information about the objects. Other authors, such as T. Vekovich, Yu. F. Polyakov, and T. K. Meleshko, attribute thinking disorder in schizophrenia to the actualization of insignificant bits of knowledge from past experience. In this regard the writings of Polyakov and Meleshko are especially interesting: they worked out a number of techniques (modified variations of the method of exclusions and comparison of concepts) for studying schizophrenic thinking. They showed that nonstandard properties of objects are used in concept analysis two and a half times more frequently by patients than by healthy subjects. Hence, from the studies of many investigators, it may be concluded that information selectivity is disturbed which, in turn, leads to the increased influence of latent and insignificant information.

Moreover, research supports the theses stated above that schizophrenic thought (especially distortion of the process of generalization) does not reflect the real relationships between objects and phenomena. Analysis of this aspect of thought pathology may be accomplished if thinking is approached as a motivated activity, whose structure also includes a personality component. Only by taking this component of cognitive activity into account will it be possible to some extent to illuminate many kinds of thought pathology.

2. DISTURBANCE OF THE DYNAMICS OF COGNITIVE ACTIVITY

Acceptance of the reflex nature of mental life implies acknowledging that it is a process. I. M. Sechenov even wrote that "the concept of the mental act as a process, as an event having a definite beginning, middle, and end, must be maintained as fundamental" (page 252).

We cannot adequately understand the internal mechanisms of thought, we cannot study the structure of cognitive operations whereby the objective properties of objects are reflected, if we

do not analyze the process aspects of cognitive activity. The use of generalization to solve problems and the actualization of appropriate cognitions about objects requires not only the preservation of intellectual operations but also the dynamics of thinking. S. L. Rubinshtein repeatedly emphasized that reducing thought to its operations and ignoring its process means doing away with thinking altogether.

Any definition of thinking should be regarded as a process, and this applies not only to the general theoretical characteristics of thinking but also to every particular human thought. Even the elementary mental acts of a person, such as feelings and perceptions, are processes in the sense that they occur in time, possess a certain variable dynamic pattern, and take place as an active human function. The discovery of the reflex basis of even these most elementary acts reveals very distinctly that they are processes carried out in many different stages. This "process" type of structure is manifested to a maximal degree in every act of human thinking.

The successful execution of an intellectual act requires separating out appropriate systems of interrelationships, getting rid of the incidental elements, and evaluating each cognitive operation as it is being carried out. The performance properties of such a complicated many-staged activity constitute its dynamic character.

One of the special features of thinking as a higher form of cognition is its systematic nature. Of course, this systemization comes about only as a result of the correct structuring of ideas. The cognition of facts hidden from direct perception is possible only when man is capable of generalizing and analyzing from the facts he perceives. This systemization involves the transition from one group of judgments to another and the formation of a long chain of conclusions. The chain of conclusions, transformed into reasoning, is a true manifestation of thinking as a process. Therefore in studying the formation and disturbances of thinking, it is not enough simply to analyze the formation and disturbances of ideas, or simply to describe the characteristics of intellectual operations. Our investigations show that the disturbance of the process of generalization, although the most common, is not the only type of thinking disturbance. Moreover, the simple disintegration of ideas does not represent the most common disturbance

of thinking. It is the various pathological states of the brain which most frequently lead to dynamic disturbances of thinking.

Little research has been done on disturbance of the dynamics of thinking. Although in many psychiatric investigations mention is made of the dynamic character of certain disturbances of thinking, their reversibility is taken for granted.

In the chapter on the disturbance of intellectual work capacity we described the judgmental inconsistency of our patients. It was shown that, for a number of our patients (for example, patients with vascular diseases of the brain), fluctuations of mental work capacity led to incorrect problem solving. The fluctuations did not depend upon the complexity of the task that had to be carried out but on the propensity to fatigue in these patients' cortical neural dynamics. These disturbances of cognitive activity can be defined as judgmental inconsistency.

Judgmental Inconsistency

A characteristic feature of this disturbance is the inability to maintain a stable method of task performance. The general level of generalization was not lowered; the patients correctly grasped the instructions, analyzed and integrated the material well, and understood the figurative meaning of proverbs and metaphors. However, the patients' reasoning was not always adequate, as we have already noted.

We will examine in some detail these patients' patterns of behavior in performing the object-classification test. They had no difficulty in grasping the instructions, they used a method adequate to the solution of the problem, and they began to sort the cards in accordance with generic signs; but after a short time they abandoned the correct method of solution. Having in some cases attained a high level of generalization, the patients periodically wandered off into incorrect, random associations. There were several types of variations.

1. Very often the principle of classification alternated between that of generalization and that of concrete situations. A few examples may be given.

Patient M-v (closed brain injury) began to sort the cards in accordance with a generic sign, forming groups of plants, animals,

etc., and then suddenly began to have doubts about where to put a toadstool: "It is harmful; let us leave it alone." In the same way, he could not decide where to place a beetle: "Put it with the textbook and the exercise book; they study it at school." After the experimenter had asked the patient to pay more attention to the work, he replied somewhat confusedly: "Wait, here I have dishes, furniture, and plants . . . . Of course, and the fungus belongs here, regardless of whether it is poisonous or not; the beetle should go with the animals." Eventually the patient obtained the following groups: people, animals, plants, dishes, furniture, school articles, housekeeping equipment. The experimenter asked the patient to combine several groups. The patient replied: "People with animals, perhaps? Plants . . . and then what? Surely the rest cannot be put together: how can you combine things used in a house and things used in an office?" The patient was obviously tiring; he developed a mild tremor of the hands and began to perspire. The experimenter began to talk about something unrelated to the test. Five minutes later, at the experimenter's request, the patient resumed the work and at once produced without help a correct, generalized solution.

Patient Sh. (cerebral arteriosclerosis), having correctly separated a group of tools (saw, broom, spade), included a blacksmith in this group, "because he is drawn with a hammer in his hand, and he works with different tools." When the experimenter asked: "And what have you in this group?" (charwoman, sailor, child, doctor) the patient replied: "These are people," and she then transferred the blacksmith to the group of people of her own accord.

These examples show that the fluctuations in the mental activity of these patients took the form of vacillation between generalizations and concrete situations as a basis for their decisions. The solution of problems by these patients at the level of generalized decisions had not become a stable modus operandi.

2. The mistakes made by another group of patients were the result of the replacement of logical associations by random combinations. For instance, they spoiled their performance in an object classification test by combining objects inattentively into one group. They frequently noticed their mistakes and corrected them themselves.

3. The mistakes made by patients took the form of combining objects into similar groups: they often selected objects in accordance with the correct general attribute, and then immediately began to form another almost identical group. So, for example a patient might isolate a group of people including a doctor, a fisherman, and a maid, and immediately would sort out still another similar group where seaman and skier are included.

Hence, comparison of the results of experiments using different methods (classification of objects, exclusion of objects, establishment of analogies) revealed this instability in the appropriate mode of solution of a problem.

The instability displayed by some patients in completing tasks sometimes reaches extremely exaggerated proportions. The patient not only cannot keep his thoughts on the right track but he begins to respond to any stimulus whether it is meant for him or not. For example, having heard that another patient says that he had sausage for breakfast the patient, having told a little story about how a jackdaw had changed its color and flew into a pigeon house, says "and the pigeons treated her to sausage."

The phenomenon of hyperresponsiveness was manifested especially clearly in an association experiment. As responses we obtained the names of random objects which happened to be located within the subject's range of vision ("a sort of interweaving"): in response to the word "singing," one patient gave the word "table"; in response to the word "wheel," the word "spectacles," etc. This tendency was sometimes observed in other groups of patients, although it disappeared as soon as the experimenter pointed out the error. In the case of hyperresponsive patients, however, verbal correction could only curb this tendency for a very short time; even after a short interval the patients again began to name any objects which fell in their field of vision.

The hyperresponsive patients also exhibited this tendency in a variant of the association experiment in which the instructions stipulated an added qualification to the responses, for instance, when the subject was told to name a number of objects of a particular color (for example, red or green). This task can sometimes give rise to considerable difficulty in healthy subjects since it requires the active discarding of words which do not correspond to the meaning of the instruction. In such cases the subjects use

various methods as aids in recalling the required words (such as observing the surrounding objects), but they do not use them in their answers if they do not correspond to the instructions (that is, they will not name the surrounding objects if not of the required color). The experimenter's instructions acquire the value of the determinant stimulus; the responses of a normal person in the experimental situation depend on the condition of the task and the demands of the experimenter.

On the other hand, in this experiment the hyperresponsive patients at times named objects which were in their field of vision but which were not necessarily of the required color. The experimenter's instruction evoked purposive behavior only for a limited time. The relationship between the direction of our patient's associations and the conditions of the problem was extremely unstable. Any object observed or once overheard would distort the course of their reasoning. We attributed their absurd thoughts and actions to the syndrome we have described as hyperresponsiveness.

It is possible that our patients' characteristic fluctuating disorientation in time and space was also closely associated with this hyperresponsiveness. For instance, one of them at first said that he was in a restaurant and then immediately declared he was in a watchmaker's shop instead. (As it happened, someone had just set a clock in the patient's presence.) Five minutes later he correctly stated that he was in the hospital.

It may be suggested that the pathological resuscitation of orientating responses destroys the stable system of appropriate connections that had previously been formed in these patients; now their thinking is subordinated to the flow of chance associations. Each new stimulus destroys the purposive character of their reasoning. Hence, experimental research on patients with different forms of illness has supported the notion that fatigability plays a major role in the genesis of cognitive disturbance in patients with organic impairment of the brain. At the same time these studies have shown that dynamic thought disorders are not only manifestations of fatigability but that their nature is considerably more complicated or, alternatively, considerably more mixed up. Some of them are due to pathologically affected motility of neural processes. We will consider here only a few of those, the ones frequently encountered in clinical practice: the so-called "flights of

ideas" of the manic patient and the "sluggishness of thinking" of the epileptic.

Cognitive Lability

The term "flight of ideas," widely used in psychiatry, denotes a peculiarity of thinking observed in patients in the manic phase of a manic-depressive psychosis. This phase is characterized by euphoria and psychomotor excitation. The patients speak loudly and without stopping, they laugh, joke, and accompany their speech with lively, expressive gesticulations and facial movements; they are extremely distractible. Every new impression, be it a spoken word or a perceived object, directs their thoughts and ideas, which replace one another so rapidly that the patients cannot register them in their speech. They cannot finish one thought before going on to the next; sometimes they shout only a single word. Characteristically, despite their extreme distractibility and scattering of attention, manic patients actively observe what is going on around them, and they frequently elicit surprise by their quick wit and pointed remarks.

As a rule, experiments cannot be performed on manic patients because of their extreme distractibility, which prevents them from fixing their attention on the experimental situation. Such patients can be investigated experimentally only when at various levels of a hypomanic state, in which certain pathological changes in their intellectual activity may be observed.

These patients have retained the capacity for analysis and synthesis in the appraisal of a situation, although during the performance of any experimental problem their superficiality of judgment is readily apparent. The patients pay little attention to thinking over the problem presented to them and they fail to grasp the meaning of the task. For example, when comparing ideas, they often remark on their similarity and difference in accordance with external signs. When asked to explain the similarity and difference between the concepts of "table" and "chair," one patient (with a high-school education) replied: "They have in common the fact that both the chair and the stool have four legs; the difference is that the chair has a back while the table has none." The same patient gave the correct, generalized reply when he was guided and prompted in solving the problem. When required to arrange pictures in consec-

utive order, although these patients immediately understand their theme, they proceed to arrange the pictures in any random order. In the proverb-and-phrase test, hypomanic patients often choose phrases according to similarities between words rather than from their individual meanings, although they are capable of the latter. If the patient's attention is drawn to the incorrectness of his answers, he easily corrects his mistakes.

The intellectual activity of patients in a hypomanic state is characterized not only by a superficiality of the judgment, but also by a lack of inhibition of many random and chaotic associations. Individual words evoke new thoughts, which the patients immediately put into words; their speech reflects a multitude of ideas and emotional experiences. In cases of extreme hypomania, the patients can concentrate on an experimental problem only for a very short time. Although they may understand the meaning of a proverb perfectly, they fail to explain it. Often one particular word in the proverb will evoke a whole chain of associations. Instead of explaining the proverb, a patient may cite a relevant example from his own life; this will in turn remind him of something else, and his thoughts then begin to run haphazard directions. For example, a hypomanic patient explained the proverb, "All that glitters is not gold," as follows: "Gold – that is the beautiful gold watch my brother gave me; he and I get on well together. When we were at school we used to quarrel, but since then we have lived in peace. My brother is very fond of the theater, and I went with him to see a play . . . ," and so on. The chaotic character of his associations prevented him from giving the correct explanation of the proverb, and the word "gold" immediately led to a complete chain of reminiscences. However, other variants are possible, in which patients may omit a link in the course of their explanation. Another patient, for example, immediately understood the meaning of this proverb, and as an example, in the course of his subsequent explanation, he wanted to describe the case of an apple, which although good on the outside, was bad inside. This however, was not what the patient said, for he at once began: "Apples, of course, are sometimes wormy. There are some sorts of apple, for example, which you would never suspect . . . . Our neighbors had some Michurin apples. Naturally the development of Michurin's theory is very important . . . ." He then went on to give various reminiscences of friends of his who were trained in Michurin's ideas.

The disturbance of the logical course of thinking in patients of this group is also manifested during their performance on the object-classification test. They immediately understood the instructions and begin to sort the pictures correctly into groups, often in accordance with a general sign, but any chance association which may arise turns the course of their thinking into another direction. One such patient, for example, having formed a group of live objects, including several human beings (i.e., having performed the task on the correct level of generalizations), suddenly exclaimed when he saw the picture of the blacksmith: "We are blacksmiths and our friend is the hammer . . . I love . . . the old revolutionary songs . . . A song . . . is our friend. And is art in general to be found among these cards reminding me of a song? The pictures aren't drawn particularly well: who drew them, a "khudozhnik" (an artist)? From the word "khudo" (bad)." The patient laughed, held a picture in his hand, and did not carry out the test. When the experimenter asked him to turn to the problem, the patient continued to sort the pictures without returning to the previous principle of solution, but began with new associations which had arisen: "Where can I put the smith, surely there is no smith here?" When he saw a horse, the patient said: "Let us shoe it." Experimenter: "You have begun to arrange them differently." The patient replied: "Yes, I wanted to separate people from animals," and continued to arrange them in accordance with the generic sign.

The patient had grasped the meaning of the problem and, what is more, he could solve it at the generalized level, but any stimulus (a word spoken by himself or by the experimenter, something which he saw, etc.) evoked random associations and often led him away from the immediate problem. If the experimenter gave him guidance, he would eventually correctly sort the cards and define the ideas, but the independent path of his reasoning proved inadequate or incorrect.

Cognitive Sluggishness

This clinical manifestation represents the antithesis of the type of disturbance we have just described. Patients characterized by "sluggishness" of thinking cannot change their mode of work or their opinions, or switch from one type of activity to an-

other. Such disturbances are often found in epileptics and in patients with late consequences of severe brain injuries.

Sometimes these patients are able to work, but then only with frequent interruptions, loss of their former skills, and difficulty in acquiring and applying new skills. They usually arrive at the mental hospital after having failed to compensate for their defects, often having become addicted to alcohol. Their case histories show that these patients can work, read newspapers, and often show an interest in ward affairs; at the same time, their mental production is of a low caliber and they can work only very slowly.

Experimental psychological investigation further reveals a slowness and sluggishness of their intellectual processes. Although they may both comprehend the instructions and exhibit ample capacity for generalization in the classification experiment, they are unable to adjust to modifications in the experimental procedure. A change in the conditions impairs their standard of performance.

This sluggishness of intellectual processes so impairs the patients that they cannot cope even with the most elementary problems if a change in conditions is required. So, for example, one patient in the pictogram task (where he had to mediate his recollection and reproduction of words with the help of drawings) was quite able to invent conventional signs for the classification of words if he was allowed to draw "a man" but he could not do so if he was forbidden to draw "a man."

Such patients are also characterized by a lack of flexibility. In experiments on mediated recollection (according to the technique of A. N. Leont'ev), having chosen a particular picture to aid in memorizing a particular word, the patients are then unable to choose another picture for this word when asked to do so. Thus, the patients can solve the problem only if it can be done by one particular method. Even in experimental tasks requiring the classification of colored pictures – which required no complex analysis and synthesis – they cannot switch to another attribute from one that they have already distinguished. Having grouped the pictures by their color, they cannot then categorize them in accordance with their form.

This type of disturbance can be described by "inertia of the associations of the previous experience." It appears to be a dis-

turbance of cognitive dynamics leading to a reduction in the ability to generalize and abstract. While doing object classification, these patients not only would not group together wild and domestic animals, but they regarded each domestic animal as a single specimen. As a result the object classification task itself cannot be done even at a concrete level. For the sorting process itself requires the inhibition of some elements and a comparison of others (that is, it requires some degree of flexibility of operation, of switching from one to another).

One patient, for example, distinguished many small groups by a concrete, yet generic attribute: domestic animals, wild animals, furniture, transport. He formed the pictures of people into two groups: people engaged in physical work and those doing mental work (he included a skier among the latter).

The experimenter suggested certain groupings, such as domestic and wild animals, people in various occupations, etc. The patient agreed and started to sort the pictures afresh, but having already accomplished the task by the previous method, he gave up: "Let it be like that." Although he had understood the principle of classification suggested by the experimenter, and although he had even begun to act accordingly, he could not switch over to a different method of work.

The same difficulty was also revealed in an experiment involving the exclusion method. One patient, for example, when shown a card on which a table, a chair, a sofa, and a table lamp were drawn, exclaimed: "Of course, this is all furniture, exactly, but the lamp is not furniture. But surely there must be a lamp on the table if it is night, or even twilight. . . . In winter it grows dark early, and then it is better to remove the sofa. . . . If there is a chair, you can do without the sofa." When the experimenter said: "But you yourself said that the lamp is not furniture," the patient replied: "Of course, that is right, you must pick out the furniture, but the lamp is a table lamp, it stands on the table. I suggest we take out the sofa." Despite the fact that the experimenter tried several times to guide the patient into the proper direction; despite the fact that the patient himself not only understood but also mentioned the principle of generalization (furniture); in the actual test – sorting the objects – he returned again and again to the property he had picked out: "The lamp is a table lamp; it must stand on the table." The patient could not switch from the decision he had made.

The concrete associations with previous experience inertly dominate the intellectual activity of the patients and determine the entire subsequent course of their reasoning. They frequently cannot discard a single detail during the test, or let a single property of the objects escape, so that they cannot achieve even elementary generalization. This attempt to be precise and to exhaust all the various factual relationships when solving any problem, results in the ratiocination characteristic of the epileptic. Such attention to superfluous detail is known generally in clinical practice as "tenacity" of thinking.

This inertia of the associations of previous experience stands out especially clearly during tests demanding a fuller explanation – the definition of concepts. To illustrate this statement two typical examples of patients' attempts at the definition of simple concepts are given below.

Patient B-n (epilepsy). Cupboard. – "This is an object in which things are kept. . . . However, dishes are also kept in a sideboard – food, too, and clothes can be kept in a cupboard, although food is often kept in a cupboard. If the room is small and a sideboard will not fit inside, or if there simply isn't a sideboard, the dishes will be kept in a cupboard. We have a cupboard; on the right side there is a large empty space, and on the left four shelves; that is where the dishes and food are kept. This is bad management, of course, because the bread often smells of naphthalene from the mothballs. Again, there are cupboards for books, but they aren't deep. They have shelves, lots of shelves. Cupboards now are sunk into the walls, but still they are cupboards."

These illustrations show that the patients began correctly to define the concept of "cupboard" or "table" but then at once made all sorts of deviations from their definitions, going into detail over all the possible alternatives. As a result of these clarifications and descriptions the patients were unable to arrive at a single, clear definition. The patients themselves, however, were unsatisfied with their explanations, because they felt they were insufficiently complete.

Inertia of the concrete associations of previous experience also was exhibited in a variant of the association experiment: "Answer with the first word that comes into your head." The results show that the latency period was fairly long, its average

during being 6.5 sec and at times in individual patients it reached 20-30 sec.

A noteworthy feature was the large number of delayed reactions (31.4%); the patients replied, not to the word presented, but to the one before. For example, when replying to the stimulus "song" with the word "silence," in response to the next stimulus "wheel" he gave the reply "stillness"; having responded to the word "deceit" with "trust," he responded to the next stimulus "head" with the word "lie." In some patients delayed reactions were observed in 7 or 8 of 20 response reactions.

The delayed reactions in our patients are an important deviation from the normal course of the process of association. They demonstrate that the subsequent stimulus is of greater signal value than the original stimulus. To clarify the mechanism of these phenomena it is necessary to turn once again to the analysis of the structure of the association experiment.

The word with which the subject reacts to the stimulus is not the only association which arises. However, the fact that he reacts with only one word is explained by the experimenter's instruction to give only one word, and that which first springs to the subject's mind. The other associations arising under these circumstances are inhibited. The presentation of another word stimulus evokes new associations. In other words, the patient's response reaction was prompted each time by the actual stimulus. The current action of the stimulus is dependent on the problem set – the instruction given.

Soviet psychologists have studied the relationship between the formation of associations and the conditions and meaning of an activity. A. N. Leont'ev and T. F. Rozanova showed that following a change in the meaning of a task (instruction), the same stimuli evoke different associations. The consolidation and reproduction of associations must take place in relation to the instructions given.

As applied to our experimental situation, this must mean that only the words spoken at a given moment could evoke associations, and that only then could they be the signals for the response reaction. The associations evoked by stimulus words spoken previously, on the other hand, could not be made to apply at the current time;

and previous stimuli must remain neutral and must lose their signal value.

In our patients, however, the presented stimulus did not acquire the necessary value. Because of the inertia of their nervous processes, our patients responded to the echo of a previous word stimulus. Comparison of the results of our experiments with clinical observations suggests that in this case we have to deal with a disturbance of the mobility of the cortical neurodynamics with a tendency toward inertia. Pavlov characterizes the loss of mobility of the nervous processes, tending toward inertia, as an inability to yield quickly to the demands of the external conditions and to give preference to one stimulus over another. The delayed reactions and the subjection to the aftereffect of the stimulus may in fact be evidence of the inability to keep up with the newly applied stimuli.

Pavlov repeatedly stressed that mobility is one of the fundamental characteristics of the neurodynamics of the healthy cortex. Many researches by Soviet physiologists and psychiatrists have been devoted to this problem. C. O. Kaminskii and V. I. Savchuk, for example, discovered a disturbance of the mobility of the nervous processes in patients with essential hypertension. E. E. Melekhov and V. M. Kamenskaya found similar disturbances in brain injuries, as did A. S. Remezova and M. I. Seredina in epilepsy.

In an experimental situation, as in any situation in life, new aspects of objects are constantly revealed, and the conditions of the environment change constantly. In order to understand these different relationships correctly and to act in accordance with the changing conditions, man must be able to change over from one mode of action to another, he must not be chained to a fixed, automatic mode of behavior.

The perfection of intellectual activity is determined not only by the fact that a person is able to perform a particular intellectual operation, to analyze and integrate material, and to distinguish that which is essential, but also by the fact that this capacity for correct operations has established itself as a stable method of behavior.

To adequately reflect objective reality, thinking must preserve not only its operational aspects but also its dynamics.

3. DISTURBANCES OF GOAL-DIRECTED THINKING

Thinking is a complex self-regulated form of activity. It is determined by the goals of a particular task. The crucial phase in cognitive activity is the comparison of the obtained conclusions with the requirements of the task and the expected outcomes. In order for that comparison to be carried out human thought must be actively focused on objective reality. Without its purposiveness, thinking remains superficial and incomplete and ceases to regulate human actions.

The view of thinking as a regulator of action should not, of course, be understood as implying that thinking may be regarded as the source or the moving force of behavior. Engels said "People have been accustomed to explain their actions by their thoughts, instead of explaining them by their needs (which are, of course, reflected in their brains, in their consciousnesses), and hence in the course of time the idealistic doctrine has developed which has dominated men's minds, especially since the end of antiquity."[1]

Consequently, the source of human actions lies in the emergence into consciousness of man's needs which arises as a result of social intercourse and work. The needs he recognizes present him with a number of concrete goals and problems in life. Man's real activity, which is directed toward the achievement of these goals and the solution of these problems, is regulated and corrected by thinking. First aroused by need, thought becomes a regulator of action; and in order to regulate behavior, thinking must be purposive, critical, and motivationally involving.

Thus, thinking cannot exist apart from needs, desires, expectations, and feelings, that is, apart from the human personality as a whole. S. L. Rubinshtein writes about that in his book "On Thought and Ways of Studying It": "The issue concerning motives, concerning the impetus to analyze and synthesize cognitions in general – this, in essence, is a question concerning the origins of a given cognitive process" (page 87). Rubinshtein constantly emphasizes that the stages of thinking are closely connected with personality components.

[1] K. Marx and F. Engels, "Collected Works," Vol. 20, page 139.

In the cognitive activity of the healthy individual, whether adult or child, all these factors are inseparably linked and hence we frequently are not able to analyze them. The study of various forms of pathology allow us to do this.

The symptoms of disturbance in purposive thinking and the connection of this impairment with personality change, are observed in different forms of mental illness. In analyzing that kind of pathology of thinking which we labeled "distortion of the level of generalization" we already were able to cite personality disorders. We already noted that patients who have this disorder depend in their reasoning on attributes and properties of objects which do not reflect the real relationships between them; the thinking of the patients was not based on the concrete meaningful properties of objects; instead, it reflected extremely abstract logical relationships.

These disturbances came to light with special clarity in certain experimental tests which required isolating and selecting attributes, on the basis of which it would be possible to synthesize and make generalizations (for example, in various variations of the classification-of-objects task). We have mentioned the modes of classification of these patients: for example, spoon could be grouped with automobile "according to the principle of movement," a cupboard could be grouped with a saucepan because "both were openings." Frequently objects were grouped on the basis of their color, location in space, or the manner in which they were drawn. Other investigators have also observed such an increased facilitation of formal associations and inappropriate bonding. Yu. F. Polyakov and T. K. Meleshko give the example of a patient who, in discerning a similarity between pencil and boot, says that "both leave marks." Describing similar phenomena, they explain them in terms of a disturbance in the reliability of evaluating past experience. According to their data, chance, improbable connections occur to patients with the same frequency as ordinary ones. This position is correct. It is necessary however to understand more fully what psychological significance the concepts "essential," "ordinary," "meaningful," have, as opposed to chance attributes and the real properties of objects.

What is meaningful and essential for the typical human being is what has acquired meaning in his everyday activity. It is not the frequency of manifestation of this or that attribute or property

of an object which makes it meaningful or essential but rather the significance of the role which this attribute has played in the life of the individual. The importance of an attribute or property and the significance of an object or phenomena depend on what role they have played in the activity of the individual, on what meaning they have acquired for him. Phenomena, objects, and events can acquire different meanings in different life situations, although knowledge about them remains the same. Leont'ev pointed out that a phenomenon is changed so that it makes sense for the individual.

At the same time the meaning of things and our accumulated knowledge about them remain stable. Even though personality tendencies and the content of motives can turn out to be diverse, basic practical activity determines the reliability of the objective significance of things.

Our perception of the world always includes both a cognitive relationship to it and its objective significance. Under certain circumstances one or the other aspect prevails but both are united in a harmonic unity.

Of course, emotional changes and strong affects can make objects or their properties begin to take on a somewhat changed meaning and this can happen even in the healthy individual. However, in the neutral situation which always prevails in the experiment, objects have their univocal meaning. Dishes are always seen as dishes and furniture as furniture. Regardless of all the individual differences, differences in education, regardless of the heterogeneity of modes of interest, the healthy individual who has to classify objects approaches a spoon as a spoon and not as a movable object. Classification can be carried out in a more generalized way (spoon and cupboard can be classified as inanimate objects) but the objective significance or meaning of an object, in terms of which the individual carries out a given operation, remains stable. Hence the attributes, on the basis of which the operation of classification is carried out, and the actualization of associations have a certain standard character and equilibrium. For a number of schizophrenics this stability of the objective significance of things has been disturbed.

Of course, even these patients accord meanings to things and phenomena which have something in common with our own. Their

representation of the world corresponds basically to our own. With respect to carrying out intellectual tasks, such as object classification, this means that patients can set aside a spoon or can match a spoon to the category dishes, or cupboard to furniture, but, at the same time as they do this, spoon can appear as an object of "movement." Two things happen: first, properties of attributes and relationships between the objects and phenomena are actualized that have been conditioned and formed in previous everyday experience. At the same time, inappropriate (from the point of view of our representation of the world) relationships and bonds are generated which have acquired meaning only as a result of the changed orientation and motives of the patients. The meaning of things and the patient's cognitive relationships to that meaning, which were included in a harmonious unity, become lost due to changes in his motives and attitudes. Personality disturbance in thinking was even more obvious in that cognitive disorder which we described as "multilevel thinking."

Multilevel Thinking

The disturbance of that type of intellectual activity which we described as "multilevel thinking" is one in which the patient's judgments take place on different levels. Despite the fact that he may grasp the instructions, and that such mental operations as comparison and distinction and generalization and abstraction are not disturbed, he does not bring the task properly to fruition: his judgments follow devious routes.

We do not refer to that faculty of comprehensive, exhaustive analysis that characterizes the thinking of the normal person – the act of approaching the problem from various aspects, in the course of which his actions and judgments are purposively determined both by the conditions of the task and by the orientation of the personality.

We also do not refer to those fluctuations in the level of judgment which arise as a result of altered work capacity. As already stated in Chapter 3, when work capacity is disturbed the patients are unable to reason adequately and correctly for a certain period of time; however, they have not lost the purposiveness of intellectual activity as such. For example, if, while performing the object-classification task, a patient in whom fluctuations of the ac-

Table 6. Performance on an Object-Classification Test by Patients with Multilevel Thinking

Objects placed in same group by patient	Patient's explanation
Elephant, horse, bear, butterfly, beetle, and other animals	"Animals."
Aeroplane, butterfly	"A group of flying objects" (the patient has taken the butterfly from the group of animals).
Spade, bed, spoon	"Ironwork."
Automobile, airplane, ship	"Objects indicating the strength of the human intellect" (the airplane has been taken from the group of flying objects).
Flower, saucepan, bed, charwoman, saw, cherry	"Objects painted red and blue."
Elephant, skier	"Object for a circus. People want bread and circuses; the ancient Romans knew that."
Cupboard, table, bookcase	"Furniture."
Charwoman, spade	"A group of things for sweeping what is bad out of life. The spade is an emblem of work, and work is incompatible with corruption."
Flower, bushes, trees, vegetables, fruits	"Plants."
Tumbler, cup, saucepan	"Dishes."

tivity of the cerebral cortex have been noted, ceases temporarily to be guided by the generic criterion, his actions nevertheless remain adequate for the purpose and for the conditions set by the experimenter. If the patient in these instances begins to group objects on the basis of a concrete attribute, nevertheless his behavior is carried out in terms of the classification instruction; he groups objects on the basis of properties, on the basis of attributes, of these same objects.

With multilevel thinking the basis of classification looses its unified character. In the course of carrying out one and the same task, patients group objects sometimes on the basis of properties of the object and sometimes on the basis of personal tastes and orientations. The process of classification in these patients fol-

lows devious routes (Table 6). We consider some examples of this in Patient G-n (schizophrenia, paranoid type).

From this table it is evident that patient G-n distinguished groups at times on the basis of a generic sign (animals, dishes, furniture), and at others on the basis of material (ironwork) or color (objects painted red and blue). However, other objects were grouped together on the basis of the patient's moral outlook and general world view (a group "for sweeping what is bad out of life," a group "bearing witness to the power of the human intellect," etc.).

Some patients were guided in their performance of the test by personal tastes or by fragmentary reminiscences. Patient S-V (schizophrenic, paranoid type), for instance attempted in the object-classification test at first to form groups of animals and plants, but then added at once: "But if I approach it from the point of view of my personal taste, I don't like mushrooms, and I shall reject this card. Once I was poisoned by mushrooms and even had to be admitted to the hospital . . . . No, not mushrooms . . . . And I don't like this dress either, it isn't smart and I shall put it aside. But I like the sailor and I shall acknowledge sport." He then placed the sailor and the skier in the same group.

So that this patient, too, had lost the point of the task, not because he was exhausted but because he did the classification from the point of view of personal taste, basing it on his recollection that he had been poisoned by mushrooms.

Another patient, K-N (schizophrenia) whom we described jointly with P. Ya. Gal'perin, could not agree in the same test that the dog should be placed in the group of domestic animals: "I am not going to eat dog meat." His actions were no longer governed by objective reality, and his judgments clearly assumed a multilevel character. This multilevel thinking was also observed by us when the task "exclusion of objects" was carried out.

To illustrate consider some examples from a schizophrenic (simple type) in Table 7.

As is evident from the table the patient was able to generalize. She excluded the sun as a natural source of light but at the same time excluded spectacles on the basis of personal taste (she didn't like them and not because they did not belong with measurement instruments). She excluded umbrella for the same reason. Appro-

Table 7. Performance of Patients with "Multilevel" Thinking in the Exclusion-of-the-Superfluous-Object Test

Pictures presented	Patient's responses
Kerosene lamp, candle, electric flashlight, sun	"You have to take away the sun because it's a natural light while the others are artificial."
Scales, watch, thermometer, spectacles	"I take away the spectacles and don't like spectacles. I like pince-nez. Why not wear them? Chekov did."
Drum, revolver, service cap, umbrella	"The umbrella is not necessary. Now people use raincoats. An umbrella is old-fashioned, I'm for modern things."

priate, logically constructed reasoning "coexisted" with utterances based on random associations.

As a result of the simultaneous coexistence and the interweaving of all these various aspects of the patient's reasoning, his definitions and conclusions are not directed at carrying out the task according to plan. His cognitive activity is interspersed with random associations, fragments of ideas, elements of reminiscences, and desires.

Similar disturbances of thinking were observed by Birenbaum during an investigation of schizophrenics. She showed that the thinking of these patients "apparently runs in different streams simultaneously." Birenbaum defined this symptom as "the eluding of the essential," in which the patients tend to reveal their subjective attitude to the problem instead of solving it.

This simultaneous coexistence of different aspects in the form which we have described here is a manifestation of a profound disturbance of intellectual activity.

Of course, any phenomenon or object also represents various values and meanings to the normal person. Normal people also tend to approach their work and their judgments from a variety of aspects, although the objective significance of reality remains consistent throughout. In the comparatively affect-free situation of the psychology experiment and also in ordinary everyday activity, things normally have a unitary objective meaning.

In the patients we are describing, this objective significance was lost. In performing any very simple task, patients were guided not by the concrete situation, but rather by abnormal attitudes, modified orientations toward life, and delirious ideas, although in these circumstances there was no immediate application of the psychopathological symptoms to the experimental situation (for example, the patient did not interweave the elements of delirium into the performance of the task). However, together with appropriate associations, connections were activated which in some fashion reflected the pathological orientations of the patients and which entered whimsically into a given concrete situation. The objective meaning of things became, in one and the same cognitive situation, unstable and at times even contradictory.[1]

Such an inappropriate association between things bearing no relationship to each other occurred because the patient tended to regard the simplest most commonplace objects from aspects totally irrelevant to the situation. Our findings correspond to most clinical evidence.

Analysis of the disease histories of these patients and observations of their behavior both in and outside the hospital revealed how inappropriate were their everyday orientations and how paradoxical were their motives and emotional responses. Behavior of the patients deviated from conventional norms. The early interests and views of these patients were replaced by inappropriate and pathological orientations. One patient would not care at all about his family and relatives but he would manifest a heightened concern about the kind of food that his cat was getting; another patient left the profession for which he was qualified and, dooming his family to hardship, became occupied for whole days with putting things in front of photo lenses, since, according to his view, "seeing things at different optical foreshortenings helps to widen the intellectual scope."

The paradoxical orientation of these patients and their cognitive confusion led to serious changes in the structure of any activity, whether practical or intellectual. Whatever corresponded to

[1] The thought processes of a certain group of schizophrenic patients were characterized by multilevel thinking in conjunction with symbolism. As a result of multilevel thinking and emotional saturation, commonplace occurrences began to assume the form of symbols.

their changed paradoxical orientations seemed essential to the patient. In carrying out experimental tasks requiring comparison and selection of attributes, this cognitive confusion led to operational insufficiency. The patient who saw the meaning of life in placing objects in front of photo objectives thought that the location of objects in pictures was a meaningful principle for classifying them.

In those cases where the patient is in the grip of delirium multilevel thinking occurs clearly in his conversation. In such situations which are affectively neutral, multilevel thinking occurs in a simple rudimentary form. However, it can occur just as clearly in the experimental setting requiring a definite direction in the patient's reasoning. In these situations cognitive confusion leads to the actualization of nonessential, insignificant, "latent" (L. S. Rubinshtein) attributes, which coexist with appropriate associations. During intellectual performance the patients begin to be guided simultaneously by the objective meaning of things as well as by a meaning that is distorted, frequently by elements of desires, and fragments of recollections and delirious interpretations. Such thinking is deprived of purposiveness.

In his report at the 18th International Congress of Psychology in Moscow in 1966, "Needs, motives, and consciousness," A. I. Leont'ev indicated that the cognitive attainments of an individual can be more or less narrow, more or less appropriate, but they always preserve their objectivizing and, as it were, "suprapersonal character" (page 9). Evidently, in our patients this "suprapersonal" character of meaning was lost.

Ratiocination

The disturbance of the personality component of cognitive activity, leading to a loss in its purposiveness, can be observed in still another variant of thinking disturbance. This variant occurs as a symptom which has been called ratiocination in the clinic and which is defined by many clinical psychologists as an inclination to futile philosophizing. The studies of our colleague T. I. Tepenitsyna have shown that this kind of thinking disorder, which used to be thought of as a manifestation of empty associations or simply as a speech "push," is not really due to a change in the operational aspect of thinking. The crucial factor has turned out to be the relationship of the patient to his environment and his inappropriate

self-evaluation. This is expressed in affective inadequacy in connection with discerning what point is at issue. It is also shown in the way the patient's relationship to an insignificant object or discussion can be full of pretentions and specious evaluations. Tepenitsyna was completely right in concluding that the disturbance of the personality component is not just the background for the patient's judgmental impairment, but that it directly determines the very structure of this cognitive disorder. Even the grammatical structure of the speech of these patients reflects the emotional peculiarities of ratiocination. The grammar of the patients is unique; it uses inversions and parenthetical expressions, etc. In her article "Concerning the psychological structure of ratiocination," Tepenitsyna gives examples of such statements. While searching in mediated memory for a link to the word "riches," the patient draws a book, justifying this by saying: "A book – this is the riches of the intellect! A book of human experience! What can be greater than that. I think that nothing is greater than that." In order to mediate the word "happiness" another patient reasons as follows: "Riches, happiness, separation, grief! I would like to draw some flowers, I love flowers. Happiness! You can't depict it on paper nor can you draw it. No one can draw why he is fully happy (he draws an envelope). Happiness of a man is composed of such things. It happens for example that you receive a letter; that is a small joy. It is from such small joys that human happiness is built up!"

Another patient compares the concepts "elephant" and "fly": "A fly – that is an insect, what I have in mind is that it is a harmful insect. Elephant – that is an animal. Then a fly can . . . there are different kinds of flies. Consider that in the tropical countries there are other flies. The main thing is the size of the fly. It's a fact that a fly is not bigger than a fingernail. However it is true that in tropical countries there are bigger flies. And an elephant weighs a lot too. Flies live all over. There are differences in where they are found. If you are only talking about flies living here in the central region, there are flies which live in the tropics. Flies are different and the climate is different. Even a fly living in the tropics is a thousand times, more than a thousand times, smaller than an elephant. It is all so, do you see?"

Tepenitsyna shows that such random philosophizing utterances occur in most experimental situations where it has been possible

to set up the conditions for showing an increased level of aspiration and self-evaluation and where distortion of the relational system can be easily actualized. The evidence that we have presented shows that the loss of purposiveness occurs due to distortion of the personality orientations of the patient and to changes in the structure of his motives and intentions.

Disturbances of the Critical Aspect of Thinking

Disturbances in the purposiveness of the patient's thinking can arise because constant control over his actions, and correction of the mistakes he commits, drop out. Isolated elements of this pathological phenomenon have already been seen by us in the structure of cognitive changes which we labeled "multilevel thinking," "distortion of the level of generalization," "ratiocination," and others. Disturbance in purposiveness occurs in extremely clearcut fashion where there has been destruction of the frontal lobes of the brain. This kind of thought disturbance can be characterized as a disturbance in the critical aspects of thinking.

The problem of the critical aspect of thinking has been decided in psychology only on the general plane. S. L. Rubinshtein stresses that it is only in the process of thinking, when the subject more or less consciously relates the results of the thinking process to the objective data, that a mistake is possible, and that the possibility of recognizing the mistake is the privilege of thought. In characterizing the properties of the mind, B. M. Teplov mentions the critical faculty and assesses it as the ability to evaluate strictly the work of thought, to weigh carefully all the arguments for and against suggested hypotheses, and to subject these hypotheses to comprehensive testing.

The problem of the critical aspect of thinking becomes particularly acute in the analysis of various psychopathological phenomena. In all the textbooks and monographs dealing with dementia, disturbance of the critical faculty is given a foremost place (V. A. Gilyarovskii, M. O. Gurevich and M. Ya. Sereiskii, S. S. Korsakov, E. Kraepelin, V. P. Osipov and G. E. Sukhareva). The concept of critical appraisal is fundamental in psychopathological analysis. The evaluation of the patient's condition and the diagnosis of the disease are often based chiefly on the presence or the absence of the critical aspect of thinking.

The concept of critical appraisal does not always refer to the same phenomenon in psychopathology. For instance, it also often implies a critical attitude on the part of the patient toward delirium, hallucinations, and other abnormal experiences. However, we propose to analyze that form of critical attitude which consists of the ability to act deliberately – to check and correct one's actions in relation to the objective conditions.

In carrying out the experimental tasks, a special category of mistakes was found which can be characterized as the thoughtless manipulation of objects. For example, in an object classification experiment, the patients glance quickly over the cards and immediately begin to sort the objects into groups, without any form of check. For example, one such patient began to put in the same group cards which lay side by side: "bear," "thermometer," "spade," and "cupboard"; in another group were included cards found around the edges: "fungus," "bird," and "bicycle."

It is clear that the patients had no real comprehension of the nature of the test. When the experimenter repeated the instructions, emphasizing the rational principles involved in the classification procedure, the above-mentioned patients sorted the cards correctly and selected the groups by generic signs (animals, furniture, people, plants).

The disease patterns in these patients showed an absence of acute psychotic symptoms. In fact, they appeared to be relatively normal upon superficial observation. They understood and responded to questions, were oriented in time and place, they took part in social and work activities, carried out various assignments, read books and remembered what they had read, and listened to the radio. Closer observation revealed, however, the inadequacy of their behavior. In conversation with their families, for instance, although they might reply correctly to questions, they themselves never asked questions, showed no interest in the lives of their friends and relatives, and never spoke of their plans for the future. Having begun to read a book, they would quickly put it down to take another – whichever happened to catch the eye.

This indifferent attitude toward their errors at times reached particularly absurd degrees. One patient, for example, although still capable of calculating, made such a gross blunder in calculating his daughter's age that she turned out to be only two years younger than he. When the experimenter drew the patient's atten-

tion to the absurdity of his answer, he replied, without a sign of embarrassment: "anything can happen."

These patients readily concurred with any judgment proffered, however ridiculous, and they readily and unthinkingly obeyed any suggestion made by another person. (One of these patients, for example, willingly agreed on the day before a serious operation to the suggestion of a fellow-patient that he leave the surgical ward and go out into the cold, rainy weather for a swim in the lake.) They never noticed any defects or disturbances in their own mental capacities, they never complained about anything, they were not put out by having to stay in the hospital, and they did not ask to be discharged. For the most part, they remained in good spirits and gave no thought whatsoever of their futures.

This thoughtless behavior was particularly noticeable in their performance in psychological experiments. As already mentioned, the patients started to work immediately without really taking a good look at the material. For example, a patient who was shown a series of pictures of wolves attacking a boy walking to school replied after hardly having glanced at them: "The boy is climbing a tree; he probably wants to pick an apple." – Experimenter: "Look more carefully," – Patient: "The boy is saving himself from the wolves." Another patient scarcely listened to the experimenter's request to explain the proverb, "Strike the iron while it is hot," replying instead: "Yes, of course the iron must be hot; otherwise it couldn't be shaped." However, he immediately followed this with the correct explanation: "Things must not be put off until later."

The patients could grasp the theme of a fable, the conventional meanings of instructions, and the metaphorical meanings of proverbs. Although they could pick out generic signs, they persistently made the most glaring mistakes, acted contrary to the instructions, and matched phrases and proverbs wrongly. Thus, although they usually possessed an adequate understanding of the conditions of a test, they frequently acted contrary to this understanding.

In simple tasks which required that they check their performance not merely at the end of the operation, but after each successive stage, patients made many obvious and seemingly inexplicable errors. This type of behavior was illustrated in an inves-

tigation carried out as part of her diploma program by V. I. Urusova-Belozertseva under our direction at the Department of Psychology, Moscow State University. We now present some of the results of the investigation.

A group of patients was given short stories from which individual words had been omitted; they were instructed to fill in the blanks (a variant of Ebbinghaus' method). The following stories were given:

1. A lion had become . . . and could not go out. . . . He decided to live on his wits: he lay in his lair and pretended to be. . . . Thereupon the other wild animals began to come near the sick... to see what was happening. But when they were within range he pounced on them and. . . . A fox came up, but did not go into the lair, and stopped at the. . . . The lion asked it: "Why don't you come inside to see me?" But the . . . replied: "I can see many tracks leading into your. . . but I can't see. . . coming out again."

2. A man ordered some fine . . . from a spinner. The spinner spun some fine thread, but the man said that it was. . . and that he must have it thinner. The spinner said: "If this is not thin enough for you, here is some which may do," and pointed to. . . place. The man said he could see nothing. "Of course, you can't see it, because it is so thin. I can't see it myself." The stupid man was content with this, ordered some. . . like it, and paid the spinner his money.

Only four of the patients read through the complete story initially; the remaining fourteen immediately inserted words into each gap as they went along, without paying attention to the subsequent phrases. Control experiments, using as subjects patients with depressed levels of generalization, revealed a different picture: even those patients who achieved poor levels of performance always read the whole story first and then filled in the gaps with words which at least were in context, even if they were not correct.

We now present examples of the performance of these tests by patients of this group.[1]

Patient T. A man ordered some fine h a n d s (thread) from a spinner. The spinner spun some fine thread, but the man said that it was n o t (thick) and that he must have it thinner. The spinner said: "If this is not thin enough for you, here is some which may do," and pointed to a n o t h e r (an empty) place. The man said he could see nothing. "Of course, you can't see it, because it is so thin. I can't see

[1]The words which should have been inserted are given in parentheses.

it myself." The stupid man was content with this, ordered some h a n d s (thread) like it, and paid the spinner his money.

P a t i e n t Ch. A man ordered some fine s o c k s from a spinner. The spinner spun some fine thread, but the man said that it was t h i n and that he must have it thinner. The spinner said: "If this is not thin enough for you, here is some which may do," and pointed to t h e t h r e a d s place. The man said he could see nothing. "Of course, you can't see it, because it is so thin. I can't see it myself." The stupid man was content with this, ordered some t h r e a d like it, and paid the spinner his money.

P a t i e n t T. A lion had become a g r o w l e r (old) and could not go out h u n t i n g. He decided to live on his wits: he lay in his lair and pretended to be a s l e e p (ill). Thereupon the other wild animals began to come near the sick d e e r (lion) to see what was happening. But when they were within range he pounced on them and a t e t h e m . . . .

Urusova-Belozertseva differentiated the incorrect inserted words as follows: (a) those which make sense in the immediate context – the surrounding words or phrases – but which make no sense in the larger context; (b) those selected arbitrarily, at random; (c) those taken from other stories.

As in other situations in which they have made numerous mistakes during the performance of tasks, the patients fail to notice the inconsistencies in their versions of the stories and make no attempts to analyze the material. If they do notice the inconsistencies or contradictions, they make no effort to understand the real meanings and to isolate and correct their mistakes. When the experimenter pointed out their mistakes, patients replied: "Something different was needed here, yes, here it is not so." But they did not correct their mistakes. In these patients it was impossible to elicit an orientation toward the correct completion of the test, toward an appropriate relationship to the endproduct of their work.

This fact was the topic of a special inquiry made by S. Ya. Rubinshtein. In her dissertation, "The rehabilitation of work capacity after wartime brain injury," (1944) Rubinshtein carried out a psychological analysis of the work capacity of patients with different kinds of brain disorder. The author convincingly showed that even patients with considerable damage to the brain mastered the necessary skills for acquiring a new profession. As Rubinshtein correctly notes, these patients had an appropriate attitude toward work; they correctly realized that the knowledge acquired by them would be useful later on.

The mastery of new habits in patients with damage to the frontal lobes was completely different. Rubinshtein shows that there was no special difficulty for these patients in mastering separate work techniques – they easily mastered technical operations. There was none of the fatigability for them which lowered the competence of other patients. At the same time it was just this group of patients, namely those with trauma to the frontal lobes, who could not acquire the necessary skills. In analyzing the reason for the failure of an attempt to train patients with obstruction of the frontal lobes, Rubinshtein indicated that these patients did not have a stable attitude toward the endproduct of their activity; and they had no orientation toward self-criticism; and, as the author correctly notes, their behavior was not subject to internalized control.

This fact was noted too under laboratory training conditions. In order to study the structure of behavior in the process of training we selected a group of seven patients with massive injuries of the left frontal lobe and also a number of patients with massive destruction of the posterior portions of the left hemisphere (temporal and parietal-occipital areas). For two weeks all these patients carried out systematic exercises in the course of which they learned poetry, built mosaics according to a specified pattern, and sorted materials.

Although the patients with destruction of the posterior (gnostic) parts of the brain experienced noticeable difficulty during training, nevertheless, while they were doing the systematic exercises, they achieved significant success.

On the other hand, patients with massive damage to the frontal system behaved completely differently. Not only were they unable to apply any of the active tactics which might have helped them in rationally mastering the task set before them but they could not maintain those techniques which were shown to them. And so, for example, they put the mosaic together without any plan. They did not consider the basic lines of the pattern that they were supposed to follow and passively slipped into repetition of lines that were incorrect and haphazardly set out. They did not learn work techniques which had been given to them and, after the lesson, they began the next lesson without any improvement. It was the same with the learning of poetry and the other tasks. The patients lacked

stable and consciously-perceived motivation and it was just this which destroyed the purposiveness of their behavior and reasoning.

It was found, however, that if the experimenter frequently asked control questions and aided the patient in external organization of his work, he could understand even complicated problems. The errors of these patients were obviously caused chiefly by an absence of self-control and an indifferent attitude toward the material. To illustrate these points we present case-history extracts together with the results of the experimental psychological examination of two patients.

Patient M, male, born 1890. Diagnosis: progressive paresis. His development was normal. He graduated from the medical faculty and worked as a surgeon. At the age of 26 he contracted syphilis. At the age of 47 the first signs of mental illness appeared: while performing an operation he made a gross blunder (he anastomosed the large intestine to the stomach) which cost the patient her life. Psychiatric examination in connection with the criminal proceedings established a diagnosis of general paresis. After treatment, he attempted without success to resume his work as a doctor.

Mental State. The patient was properly oriented, accessible, talkative, and inclined to gossip with the patients. He realized he was suffering from general paresis, but regarded the matter with considerable levity. He constantly repeated that he had "residual manifestations following progressive paresis," but "they were negligible," a "trifle" which would not prevent his return to work as a surgeon. When reminded of his lamentable surgical blunder, he said with a smile, quite casually, that he had "made a slight mistake, but we all have accidents." He now considers that he is well ("as fit as a bull" in his own words). He is confident that he will be able to work as a surgeon and to be the medical chief of a hospital. At the same time, he gives the most inept advice to the patients in the department. Without any embarassment he told them he had met his wife in a saloon and that at that time she was a prostitute.

In performing the simplest tasks, the patient made gross mistakes and did not try to correct them. For example, he understood correctly the meaning of a proverb, but then matched it with an unsuitable phrase: "I have made a slight mistake, now what shall I do?" The object-classification test was started without listening to the complete instruction. He exclaimed: "Why, this is like dominoes," and tried to begin the test as if playing at dominoes. He then asked: "Now tell me, which one shall I play? We can't play for money, because I haven't any." Having heard the instructions for a second time, he performed the test correctly.

In the course of the test on "establishing the sequence of events" he first tried to explain each picture, and then to invent

the theme which was not evident from the material on the cards. Having glanced at picture No. 2, he said: "Here somebody has gone for a walk. He has gone to meet somebody . . . . Where could he have gone? Evidently he is waiting for somebody, probably a woman . . . . Or perhaps it is a business meeting, and here (picture No. 5) the uncle has gone away. This one is left alone; he is expecting somebody, of course, but whom? Perhaps the one he was hurrying to meet? What have we here? The wheel has broken? That is bad management."

The experimenter interrupted the patient's reasoning and asked him to arrange the pictures in the proper order of the development of the theme. The patient did the test correctly. When matching phrases and proverbs the patient correctly explained the proverbs, "All that glitters is not gold" and "Measure seven times, cut once," but matched them with the wrong phrases: "Gold is heavier than iron," and "If it is cut wrongly, it is no use blaming the scissors."

An experiment involving mediated memorization with the aid of pictograms gave the following results: The patient did not listen to the instructions for the test: "You want me to put your words into a picture? I'm not an artist, you know." The experimenter again explained the meaning of the test and asked the patient to listen carefully to the instructions. The patient replied: "Oh, is that what has to be done, just draw a sketch? That's easy." He formed associations of a fairly general order: to signify the expression "a happy holiday" he drew a flag; for the words "a dark night," a shaded square; and to signify the expression of "a starving man," he drew a very lean man. The patient constantly let himself be distracted from his task and tried to start a conversation with the doctor on a completely extraneous topic.

Although the experimenter continued to stress that the problem was being given in order to test his memory, the patient was not in the least surprised when the experimenter, having apparently finished the experiment, excused himself from the patient without asking him to reproduce the suggested words. Neither was the patient embarrassed when, in the next test, it turned out that he had memorized only an insignificant number of words (only 5 of 14). When the experimenter remarked that he had not remembered many, the patient replied with a smile: "Next time I shall remember more."

Patient K. (hospital case No. 3120), male, born 1922, developed normally, and completed 4 classes at a rural school, after which he trained as a crane operator; he subsequently practiced this occupation in a factory. On March 23, 1943, he received a perforating bullet wound of both frontal lobes. Some loss of brain substance at the entry and exit wounds was observed. The day after he was wounded an operation was performed to remove the numerous splinters of bone embedded in the brain substance of the left frontal pole. Postoperative recovery was smooth. The neurological findings six weeks after the operation were as follows: disturbance of convergence, especially on the left side, spontaneous nystagmus during divergence of the eyes, and obliteration of the right nasolabial fold. The tendon reflexes were increased on the right side, but no pathological reflexes were present. All forms of sensation were within normal limits. Coordination was normal.

Mental State. The patient was oriented in space and time, and fully recognized his environmental situation. He was able to recall the events of his past life and was aware that he had been wounded, but he thought that the wound was slight and was unaware of any of the defects in his physical or mental condition. He assumed that he would return to his military unit. He was accessible, talkative, and serenely happy. He obeyed the hospital rules without protest, but if his fellow patients suggested he do something that infringed upon the rules, he followed their suggestion equally unprotestingly. At their request, for example, he would often play the balalaika and sing, but if left to himself, he would sit inactively and silently for long periods.

At the doctor's suggestion the patient began working in the occupational therapy workshops. He proved so eager to undertake any form of work, even the heaviest jobs, that he had to be watched constantly, frequently prevented from doing some types of work, and told when the work therapy period was over. However, when performing some task at the instructor's request, patient K was never interested in the result of the work as a whole or concerned with the quality of his work. Often, having started a job, he would go outside for a smoke, and then forget to go back to the workshops. Every now and then he would spoil the material or damage the tools, not because he did not know how to use them, but because of his unthinking, irresponsible attitude toward the work; he never became angry or embarrassed when the instructor or his fellow patients remonstrated with him because of his behavior. One day, he used a sewing machine to stitch the front of a garment to the back; when this was pointed out to him he merely laughed and said: "It will do!"

After examination by a medical board, the patient was discharged from the armed forces and graded as a category 3 disabled person; he was about to leave to stay with his uncle when he decided to visit one of his former neighbors in the ward. He was then asked to stay in the hospital and to work as an orderly, to which he agreed without hesitation. From the time of his discharge from the hospital the irregularity of his behavior became quite obvious. When he had been subjected to the rigid code of conduct of the hospital routine, he did not stand out among his fellows. Now his behavior appeared grossly inadequate to his new situation. Whereas wounded patients on the day of their discharge from the hospital almost invariably display an active concern about their plans for the future, K remained completely indifferent.

K's duties as an orderly involved assisting others to move patients from one hospital area to another. He performed these duties competently and tirelessly under supervision, but as soon as something happened to distract his attention or someone called him, he would put the stretcher down "for a minute," go away, and not return. He was transferred to the job of stoker, but on his first day of his new job he went out to the movies at the invitation of a fellow patient, returned to the hospital, and went to sleep, leaving the work undone. For several months he worked satisfactorily while under supervision, arousing the sympathy of those around him by his invariably good-natured, willing behavior. When allowed the slightest independence, however, he became irresponsible and behaved incorrectly, adversely affecting both his own and his comrades' work; he forgot to collect the invoices, he stored things in the wrong boxes, and he would leave his work during working hours to do some absurd errand for a mental patient. When in the company and under the observation of his family, however, his behavior was comparatively normal.

We now present some of the results of an experimental examination of this patient. In the classification experiment, K began to sort the cards into neat piles and to examine them even before he had heard the end of the instructions. However, he did perform the test correctly after the instructions had been emphatically repeated several times. The peculiarities of his behavior were particularly evident in tests involving the determination of the chronological order of events. In one such test K was presented with a series of pictures representing the breaking and the repair of a cartwheel. The patient described the first picture that came into his hand and then arranged the cards in random order; when the experimenter admonished him to be more attentive to his work, however, he performed the test correctly within a relatively short period of time. If the patient's attention could be directed toward the problem he could solve it, even if it required fairly complex analysis and synthesis (the patient understood the metaphorical meaning of proverbs, could establish analogy of associations, etc.).

The patient also made mistakes when putting Link's cube together. The nature of this test is as follows: the subject has to assemble a large wooden cube from 27 cubes by arranging them in three layers, each of nine cubes. The sides of each small cube are painted yellow, red, or green. The large cube must be constructed in such a way that all sides are painted red. The color combinations determine the place of each small cube in the large cube. This test requires planning of actions, careful and constant checking, and immediate correction of any mistakes made. Our patient was unable to perform the test. Although he grasped the meaning of the instructions, he chose the small bricks to give the correct

color only on the sides of the large cube facing him and did not bother about the other sides.

The findings of research and clinical investigations of these patients reveals unified characteristics in the disturbances of their mental activity. The gross mistakes and random, arbitrary answers which characterized their performance during the tests; their inability to utilize their past experience and their capabilities in the experiments; and their unthinking behavior both in the hospital and in work situations – in fact the complete absence of any self-appraisal of their work: all these factors demonstrate that the actions of these patients are neither regulated by their intellect nor guided by personal interests. Neither was their behavior influenced by adequate social attitudes. In sum, their behavior was completely random in character.

We observed the patients in the clinic and in the workshops, and frequently engaged them in conversation; we were everywhere struck by absence of a personal attitude to the situation of the moment. For instance, it did not seem strange to them that, although they understood the instructions of a psychological investigation, they could not solve the problem; it never struck them as odd that, "being able to sew," they nevertheless were unable to do the simplest job in the sewing room; although they knew how to calculate, they could not solve the simplest arithmetical problem. They were not upset by the fact that they could not remember errands on which they had been sent.

This abnormal attitude radically transformed their patterns of behavior, primarily by depriving it of purposiveness. They thus continued to work at obviously purposeless tasks, stopping work at the slightest distraction. They could not become skilled in work operations, not because they were unable to understand the explanation of the investigator or instructor, but because they could not fix their attention on their work, because they had no definite attitude toward it, and could not grasp its purpose.

This disturbance of their attitude toward their environment and toward their own "egos" not only caused a change in their behavior but also seemed to effect a fundamental character transformation. Their carelessness, light-heartedness, and indifference were manifestations of a gross "flattening" of their personality. This absence of attitudes had the result, for example, that

patient K could leave a patient on a stretcher in the snow simply to go after some almost total stranger who beckoned to him. This absence of attitudes also explains why the patients were neither upset by their own deficiences nor concerned over the quality of their work and never bothered to verify and check their behavior.

The thinking of the patients was not directed at a specific target; there was no development of interest in solving the task or in how the experimenter evaluated their behavior. They had no doubt about the correctness of their behavior. The mistakes made by the patients during the solving of mental problems, the superficial, random character of their judgments, and their lack of control over their behavior and inability to evaluate it – all these factors demonstrate the uncritical nature of the thinking of this group of patients.

Chapter 6

Personality Disturbances in the Mentally Ill and Relevant Research Techniques

Analysis of any manifestation of mental disorder requires taking into account the personality peculiarities of the patient. This approach is dictated by the fundamental principles of contemporary materialist psychology. In "Being and Consciousness," S. L. Rubinshtein stated on page 308 that "in the explanation of any mental phenomena personality is involved as an aggregate of internal conditions which are bound together and through which all external influences are reflected."

In studying mental change it is necessary to take personality into account for still another reason, namely, that mental illness frequently affects the entire personality by affecting need systems and emotional-voluntary components. In the meantime, research in abnormal psychology has been basically concerned with disorders of cognitive activity. The experimental techniques for studying personality changes have been insufficiently developed. This is partially attributable to the insufficient development of the problem of personality structure in general psychology.

One must acknowledge that foreign psychologists have devoted much effort to the problem of personality and its pathology. However this research has been carried out mainly by psychologists with a psychoanalytic inclination and psychologists adhering in some way or another to "verstehen psychology" or to the philosophy of existentialism.

Soviet psychologists (A. N. Leont'ev, S. L. Rubinshtein) believe that personality is a product of historical development, of the de-

velopment of relationships between the individual and society, of relationships "between the subject and the world of man" (Leont'ev) Leont'ev emphasizes that in personality formation, it is not the processes of adaptation to the environment which are important, but the processes of mastering human experience.

While studying personality formation in children, L. I. Bozhovich dwelt on its tendency to have a specific direction which forms the basis for the lifelong development of a reliable and stable motivational system. In the personality formation process, the dominant role is played by the child's awareness of the place which he occupies in a system of social relationships, his "internal" position.

It is already evident from these basic tenets of theoretical psychology how complex the psychological structure of personality is. It is bound up with the individual's needs and goals, with his emotional and volitional peculiarities. Regardless of the fact that the latter properties are thought by psychologists to be processes, in essence, they are components of personality. The individual's personality is formed and manifested in his activity, deeds, and behavior. His needs, both material and spiritual, reflect his relationship with the surrounding environment and people. We evaluate an individual personality mainly by characterizing the interests which compose it and the content of its desires and needs. We judge an individual according to the motives behind his acts and by those phenomena of life to which he is indifferent. What makes him glad and what are his thinking and desires aimed at?

The following indicate impending changes in personality: the interests of a patient decline under the influence of disease; his needs diminish; he becomes indifferent to previous sources of excitement; his behavior is deprived of purposiveness; his actions become senseless; he stops controlling his behavior, and he is no longer able to appropriately evaluate his opportunities.

From everything we have said so far, it follows that research on personality, and its formation and change, is exceedingly complex and manysided; it may be carried out in various modes and directions. Hence, first and foremost, it is important to look at those areas of personality research which at present are most developed in a general theoretical sense. Among the most theoretically well-developed problems are the questions of motives, attitudes, and personality goals.

Without going into detail on the problem of the structure of needs and motives, one must note that in the writings of Soviet psychologists (A. N. Leont'ev, S. L. Rubinshtein) the social nature of personality needs has been emphasized. It is thought that these needs find their satisfaction in activity, that the development of needs occurs via the development of production, and that any activity in itself generates needs. In our study of personality disturbances we try to proceed from these basic positions as developed by Soviet psychology.

On the other hand, we propose that the study of the pathology of personality can turn out to be helpful in analyzing the structure of normal personality. The personality changes observable in psychiatric practice are multifarious and all of this has been admirably described in the textbooks of psychiatry. For the sake of illustration we will briefly discuss several such descriptions.

In these volumes we find very colorful descriptions of epileptics and the changes in the emotional-volitional areas which are characterized by pronounced inertness and rigidity. The patients constantly turned to one and the same emotion, one and the same notion; they concentrate on insignificant phenomena. This emotional rigidity is expressed in the pedantic behavior of these patients; the patients are unable to accept any changes in the lifestyle that they have established. Pedantic in their work, they are inclined to carry out only one type of activity which they do with special thoroughness. This emotional inertness in epileptics is associated with the quick onset of irascibleness as well as an inclination to affective discharges and mood changes. As a result, the patients behave inappropriately and sometimes inflict harm on other people. Egocentrism and narrowness of interests characterize epileptics. At the same time they can have an exaggerated politeness, an obsequiousness bordering on hypocrisy. (This type of patient was depicted by Dostoevski in his character Smerdyakov.)

These characterological features are determined to a large extent by the patient's response to his inferiority. This has been shown by A. P. Osipov in his "Handbook of Psychiatry."

In the psychiatric clinic we find another kind of personality disturbance manifested as increased lability of emotional reactions, lack of self-criticism with respect to one's actions, and a weakening in cognitive regulation akin to that found in chronic al-

coholism. The patients become self-confident, boastful, inclined to stupid jokes, and their behavior is bereft of purposiveness while their actions are unmotivated and unjustified.

The absence of self-criticism has been described by many psychiatrists in analyzing the personality of patients with progressive paralysis. The patients display a sort of excited complacency, they declare that they are in wonderful health and that they have unusual abilities. Their excited mood easily changes into one that is capricious and irritated; these patients can cry at a trifle but all at once they become calm.

The suggestibility of these patients has been described in great detail: they easily succumb to persuasion and they do frivolous things. E. A. Gilyarovskii used to bring such a patient into his lectures. This man broke a window in front of everybody and took a vase that he didn't need merely because it was pleasing to him; another patient bought a set of dishes for his wife, using up all the money he had and leaving his whole family without any money for food.

Sometimes patients' ethical sensitivity is blunted; they are indifferent to their neighbors; the grief of their friends does not touch them nor are they affected by their own unhappinesses; they are careless and indifferent both to themselves and to others. Their behavior is bereft of purposiveness and self-direction.

Psychiatrists have devoted much attention to the kinds of personality disturbance which are observed in different forms of schizophrenia. The feelings of schizophrenics lose the quality of belonging to a particular "ego." These patients have a special relationship to the world around them that includes an autistic alienation from people. The patients live in the world of their own illusionary experiences without taking an interest in real relationships around them. They incorrectly interpret the environment. Their emotional reactions are distorted, their development dull. People who used to be delicate and modest become crude, shameless, and unrestrained. The frigidity and coldness of their feelings is noticeable; the patients can laugh even while telling about the death of persons who were close to them and when they receive a visit from relatives they don't ask about anything. They are indifferent to life and to people. Emotional dullness forms the background for the patient's negativism. This consists in negative re-

action to stimulation; when he is greeted he hides his hands behind his back and does not reply to questions. The poses and gestures of the patient frequently suffer from paradoxicalness and whimsicality. Sometimes the behavior of the patient becomes impulsive; without justification he begins to whistle or to make grimaces during a conversation. The patients interpret the environment in a peculiar way; any event can acquire a special meaning for them: "if someone on the ward picked up a newspaper, this means that that person must be killed."

It is evident from this rather sketchy description, that the personality changes which are observed in the clinic are extremely diverse. It is very difficult to qualify these changes in terms of scientific psychology because the psychology of personality is insufficiently developed on the theoretical level. There are two few concepts and techniques for personality research. Therefore it seems advisable in our further discussion to dwell on experimental approaches to personality and on those findings which have been brought to light with these techniques.

One way of studying pathology of personality is to observe the behavior of the patient during an experiment. Even when the patient has "accepted" the task, or its instructions, it is possible to observe the adequacy or inadequacy of his personality. Any experiment in psychology can serve as an indicator of the emotional-volitional properties of personality.

Every investigation must take attitudes and motives into account. This point of view was enunciated in the 1930's by V. N. Myasishchev. He pointed out that attitudes exist at two levels; attitudes generated by the experimenter and attitudes elicited by the task itself.

Many patients have an attitude toward the experimental situation. Some perceive the experimental situation as some kind of test of their intellectual capacity. Frequently patients consider that the results of the research will affect how long they have to stay in the hospital or what treatment will be selected for them or to which group of patients they will be assigned. Therefore the experimental situation itself promotes the actualization of a certain attitude. So, for example, some patients, fearing that their bad memories will be discovered, declare that "they always remembered things poorly." In other instances, the requirement to

do calculations elicits the comment that they "could never do arithmetic." Any task, even an easy one, can provoke a personality reaction in the experimental situation.

In some of our patients (for example, during diagnosis) an orientation toward illness develops in which the patient tries to express his intellectual incapacity, i.e., he does not do the task. This motive, of course, is in conflict with the appropriate motive as stimulated by the task itself. As a result the intellectual behavior of the patient turns out to be complex, to have two forces working, but, all the same, it is structurally intact. The patients customarily solve the problem correctly to themselves, but then they deliberately distort the answer given to the experimenter (findings of S. Ya. Rubinshtein).

In other instances the attitude generated by the task itself predominates. The task contains an intrinsic instigation to self-criticism and self-control; that is, the task makes sense for the patient. Here the task addresses itself, as it were, to the individual's self-esteem and his level of personality aspiration; it seems as if the drive to solve the problem is justified and objectified for the individual. This motivational push, which mobilizes the intellectual resources of the individual, makes the experimental method fundamentally dependable.

Hence, it can happen that, for some patients, who are intact, but who are suffering from asthenia and exhaustion, the conditions of the experiment can stimulate activity and afford partial relief from the exhaustion. As a result these patients appeared to be more normal in the experiment than in real life. Such effects were observed in patients with vascular diseases of the brain who displayed better intellectual production during the experiment than in nonexperimental situations.

Experience in our laboratory has shown that observation of patients who are doing the most simplified tasks can be used for evaluating their attitudes. For example, in building "Links cubes" (the technique focused on the study of combinatorial operations), it turned out that schizophrenics and psychopaths reacted in different ways. Patients with simple schizophrenia evinced no emotional reactions while they worked on the cube; they worked on the task itself, rather passively, and their mistakes did not cue any emotiona

reactions. They did not react to the comments of the experimenter when he pointed out their mistakes.

The psychopaths' behavior was completely different. At the beginning of this experiment, the ways they acted and worked were analogous to the behavior of normal individuals. However, this behavior changed sharply when mistakes occurred: the patients became irritable, frequently interrupted their work, and did not carry it to completion.

We had the opportunity to observe similar behavior in patients with symptoms of irritable weakness and asthenia. However, in these patients, the affective reaction was not so strongly expressed. However, in children with serious asthenia, difficulties in carrying out a task frequently caused depression and tears.

Observing the behavior of the subject during an experiment makes it possible to evaluate his critical ability and his capacity for self-control. Patients frequently point out that it is interesting to check on how well they can remember. It even frequently happens that a patient, while working on a task, is the first to recognize that he has an intellectual insufficiency and he reacts to it in an appropriate manner. It follows that the behavior and utterances of the patient and his reaction to the experimental situation, can serve as material for analyzing his personality dispositions and the extent to which a healthy personality has been preserved.

Another methodological approach to the study of personality change is the mediated manifestation of change with the help of techniques directed at studying cognitive processes. This tactic seems fully correct and justified, for cognitive processes do not exist divorced from personality orientations and from the patient's needs and emotions. In treating motives and the instigation of thinking, S. L. Rubinshtein, in his book "Concerning Thought and Ways of Studying It," noted that "the basic question concerns the sources from which a given cognitive process stems" (page 87).

As we already said in Chapter 5, research on abnormal thinking has shown that some kinds of disturbances are essentially expressions of the cognitive confusion which is characteristic for such patients. We showed that the actualization of inappropriate cognitions is in no way a self-contained process independent from the structure and properties of personality, but, rather, a mani-

festation of altered orientations, attitudes, and needs, that is, a reflection of changed "internal conditions."

We tried to exposit this view in Chapter 5 when we were analyzing that form of cognitive disturbance which has been labeled "ratiocination." As proof we cited the findings of T. I. Tepenitsyna in which it was shown that it is not disorder of intellectual operations but change in a personality component which plays the dominant role in the structure of "ratiocination." Here we only wish to discuss two kinds of facts coming from the research of Tepenitsyna. The author has shown the following: 1) The structure of ratiocination is diverse and depends on the nature of the personality disorders. In patients with organic diseases of the brain ratiocination appears as an unsuccessful compensation for intellectual inadequacy. In epileptics, ratiocinative reasoning is marked by the actualization of inert connections with past experience. In other words the structure of personality change affects the structure of the cognitive disorder. 2) Ratiocination is manifested most readily in those experimental situations which form and "provoke" a heightened level of aspiration; when experimental tactics are applied which stimulate the activity of the patient, and which provide an occasion for him to demonstrate his attitude. It follows, and these examples show it, that the strategy itself of thinking is determined to a considerable degree by the attitude of the individual. The attitude of the individual is included in the structure of cognitive activity. This notion is supported, moreover, by research on uncritical thinking in which the thoughtless judgments and incorrect behavior of the patients are caused, not by a lowered level of generalization, but by an indifferent and inactive attitude toward the consequences of their activity.

A similar type of patient, for example a patient with frontal-lobe injury, cannot manage certain simple tasks in spite of the fact that his intellectual functions are relatively intact. For example, while these patients understand the metaphorical meaning of proverbs and the conditions of the instructions, they are unable to put a series of pictures depicting a simple theme into a consistent order.

Any simple task which requires choosing and planning cannot be carried out by this type of patient and, on the other hand, more complex tasks, which do not require adherence to such conditions,

can be carried out by them rather easily. In such fashion, erroneous solutions of problems appear not due to a disorder of logical structure of thinking, but are the result of a thoughtless orientation. Changes and alterations which crop up in the area of cognitive activity appear to be due to personality modifications.

This is demonstrated by the studies of Soviet psychologists working in the area of pedagogical psychology. Thus the studies of L. I. Bozhovich and L. S. Slavina showed that the failure of many students to advance in school was caused not by cognitive disturbance but rather by attitudinal changes in the children and their changed position in the collective.

To recapitulate, it can be said that analysis of cognitive strategies will be incomplete if we do not take into account the personality goals of the cognizing subject. For, in the words of L. S. Vygotskii: "If we divorce thinking from life and needs we prevent ourselves from finding any ways of showing and explaining the properties and the chief significance of thinking, namely, to define the manner of life and behavior and to change our behavior."[1] Therefore it is right to expect that the execution of any experimental task which was apparently directed at the study of cognitive activity, could, in principle, provide information about the personality orientations of the patient. More importantly, the modeling of the individual's cognitive activity must include modeling of his personality.

Methods for indirect evaluation of personality are unlimited. In principle, any experimental technique can be a convenient way to do this since the construction of any model of human activity (and the techniques of experimental psychology are such models) presupposes the attitudes of the individual.

We will limit ourselves to a few examples.

Performance on even the most rudimentary tasks includes an emotional component. The studies of É. A. Evlakhova have shown that even such simple tasks, as the description of an uncomplicated subject of a picture, depend on the emotional status of the subject. It was found that children, with frontal lobe damage, had an inade-

[1] L. S. Vygotskii, "Selected Psychological Investigations," Moscow, Izd. APN, RSFSR, 1957, page 476.

quate reaction to the emotional content of pictures. It seemed appropriate that disturbances of emotional orientations should be especially marked when pictures had to be described whose comprehension depended chiefly on the physical appearance of the figures. The pictures used for this purpose belonged to the so-called projective techniques. As we have already pointed out in Chapter 3, the essence of this method is that the task does not presuppose any definite way of doing it; it is intended to reveal the emotions, peculiarities of personality and the character of the subject. The subject's performance is not assessable since, in projective techniques, the problem of right and wrong answers does not arise.

Projective techniques are used in other countries with a dual purpose: to establish individual differences and to reveal "covert feelings."

One of the projective techniques, proposed by Morgan and Murray,has been called the Thematic Apperception Test (T.A.T.). It consists of separate pictures depicting situations without any definite content. According to Murray's instructions, the subject is told that his imagination is being studied and he must compose stories based on the pictures.

According to the way in which Murray interprets the utterances of the subjects, their stories have to be regarded as symbolic reflections of their feelings and opinions and their notions concerning their past and future. According to Murray, an identification occurs between the subject and the hero in the picture.

In a master's thesis by N. K. Kiyashchenko done in our laboratory, the instructions to the subject were changed. The subjects were told that the problem concerned the study of perception (and not imagination). The subject was not given questions but was simply presented with the following "blind" instructions: "I will show you pictures, look at them and tell me what is depicted on them." Only after the task had been completed was the question asked: "What suggested this or that description?"

The findings of Kiyashchenko's research showed that healthy subjects approached the task in order to explain the content of the pictures. Their attempts to define the subject of the pictures were carried out by posing and by imitating the depicted personages. As

a rule, in carrying out this task, the healthy subjects expressed their attitudes toward the events and personages in the pictures.

The results with simple schizophrenics were completely different. In contrast to healthy people, the patients in this group had no desire to find the correct interpretation. The answers of the patients contained only formal declarations about the elements in the pictures: "two people," "a man is sitting in an arm chair," "a conversation between two people." There were formal generalizations: "rest," "a minute of silence." As a rule, the patients did not express their own attitudes toward picture themes. To illustrate, a few examples of picture descriptions by healthy individuals and by patients with simple schizophrenia are given in Table 8. These descriptions have been taken from Kiyashchenko's studies.

Table 8. Examples of Descriptions of Pictures by Schizophrenics (In Comparison with Healthy Subjects)

Healthy subjects		Schizophrenics	
Subject G	This picture is laughable because the physiognomy of the patient is so smug. It seems to him that he is doing something that is generally very helpful and without a doubt, pleasant. Otherwise he would not be in such an emotional state.	N	A man is sitting.
		K	A man reads a book, holding it in his left hand; and in his right hand, a pipe.
Subject M	A man who is reading a book recalls a similar event from his own life (the event was pleasant and significant) and he falls into a reverie.	M	Someone is relaxing.
		O	A minute of silence.
		F	A man is sitting near a round window.
Subject A	A man is in an airplane. He reads a book but then he had a pleasant recollection and his eyes wander from the pictures, which change into a window. Undoubtedly he recalled something pleasant which occurred before his departure.	M	A man sits in an armchair. There is a cushion on it.

Peculiarities in the perception of the TAT pictures by schizophrenics were not associated with lowering of the level of generalization; their descriptions were not based on concrete representation; on the contrary, they amounted to formal contentless characterization.

To recapitulate, the modeling of the cognitive processes (the application of experimental tests requiring generalization, isolation of essential attributes, comparison of actualized relationships, and so forth) always includes the arousal and actualization of personality components (motives and attitudes).

Finally, one of the ways of studying personality change is the application of techniques aimed directly at revealing emotional and volitional peculiarities of the sick individual and revealing his changed attitude toward the experimental situation. This group of techniques stems from research in the affective-volitional area. S. L. Rubinshtein's book "Concerning Thought and Ways of Studying It" states that a research finding which reveals any essential relationships whatsoever, can be turned into a technique, into an instrument of subsequent investigation. This happened in fact with some of the techniques developed for research in the affective-volitional area by Kurt Lewin's school. Despite the fact that Lewin's general methodological position is unacceptable to us, his experimental techniques have turned out to be quite useful.

Here we will discuss some of these in more detail. A few words first concerning the principles behind the construction of such techniques. Major care must be taken that the artificially created experimental situation factilitates attitude formation as much as possible. As we said above, any experimental situation evokes an attitude on the part of the subject (hence the very possibility of indirectly studying his personality reactions). However, if we want our technique to be proper models of cognitive processes in the human being, then those methodological tactics, which are aimed at direct study of personality properties, must be models of everyday situations, which compel the subject to be responsive.

To achieve this goal we used Hoppe's technique, known in the psychological literature as "study of the level of aspiration." It was proposed and standardized in the Lewin school.

Kurt Lewin (1890-1947) was a representative of the German school of Gestalt psychology, who, after the onset of the fascist regime, emigrated from Germany to the United States. He was the first to systematically develop a theory about the will and affects and he was one of the first to devote experimental attention to studying the properties of human behavior in concrete circumstances.

In Lewin's conceptual system, it was necessary to distinguish two periods: the first took place before 1933 and it was in this period that he created his dynamic theory of personality. The second or American period took place after 1933, when his scientific views began to change under the influence of American sociological psychology. The methods that we are going to describe belong to the first period.

In contrast to the atomistic thinking of his time, or, as they called it then, associationism in psychology, Lewin believed that needs rather than associations lie at the basis of human behavior and thought. Under the heading "needs" Lewin understood not biological implications but rather psychological formations which arise in conjunction with the everyday goals of the individual. More than anything else, Lewin emphasized that goals and intentions belong, in their dynamic properties, in the same category with needs. In Lewin's teaching concerning needs the question arose concerning the relationship between need and object. He showed that the individual always exists in a definite concrete situation (according to his terminology, "in a psychological field"), where each object occurs not in itself but in relationship to the needs and strivings of the individual. Lewin pointed out the dynamic quality of these relationships and that any behavior of the individual changes the "relationship of forces in the situation" and this in turn affects the behavior of the individual.

Hence, any experimental research requires analyzing the mutual relationships between the individual and the environment. Lewin emphasized that the individual is always included in the environment of his situation and that the environment itself must be considered in its relationship to the behaving individual. The nature of these relationships is dynamic, and depends on the structure of the individual's needs.

Yet Lewin resolved the question of needs as a motive force in human activity from the idealist position of Gestalt psychology. For him, a need means some internal psychological dynamic "charge" or "tension system," striving for discharge of relaxation. Discharge of this "tension system" constitutes need satisfaction, according to Lewin. He failed to see the social-historical determination of needs and he ignored their substantive character. Indeed even the concept itself, "psychological field," did not mean a real objective environment, but rather the phenomenal world that was essentially a reflection of those same tension systems. According to Lewin, volitional behavior can be explained by discovering the structure of the dynamic tension systems and their relationships with the "psychological field."

The idealist biases of Lewin are especially evident in his view of the nature of volitional behavior, a cornerstone of his doctrine. Just as he did not see that needs are socially conditioned, he did not perceive that volitional behavior, although it is linked in its origins with needs, does not flow directly from them but is mediated by the awareness of the individual.

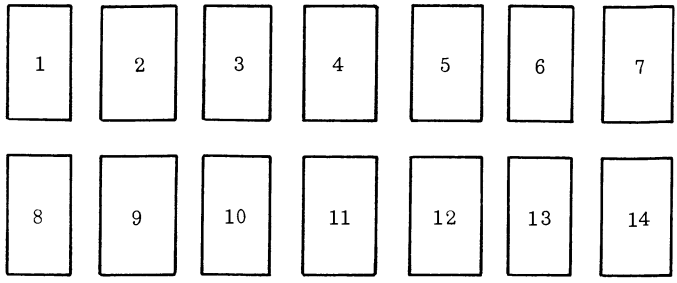
Regardless of methodological errors, the theory of Lewin played a positive role in the history of psychology. Lewin introduced into psychological research new parameters for studying the individual: he showed that it is possible to do experiments on needs, motives, intentions, and goals. But what was especially significant was the role of Kurt Lewin and his school in the development of experimental techniques applicable to the psychology of personality. The writings of Lewin and his pupils (Dembo, Mahler, Karsten, Hoppe) permitted the experimental discovery of relationships between the personality and the environment and within the personality itself. To these internal relationships belong the problems associated with "level of aspiration." Lewin believed that level of aspiration is formed in the process of concrete activity. Success and failure play an important role in level of aspiration and it is an important personality development because it is linked with self-evaluation, the activeness of the subject, and the complexities of his affective life.

The method of studying level of aspiration consisted in the following. The subject was presented with a number of problems (from 14 to 18), which differed in their degree of difficulty. All the tasks were put on cards which were laid out in front of the subject in numerical order. The degree of difficulty of the task corresponded to the number on the card.

Research done with this technique (F. Hoppe, M. S. Neimark, B. I. Bezhanishvili, E. A. Serebryakova) showed that, as a rule, subjects choose more difficult tasks after they have been successful, and when they have not been successful they turn to easier tasks. The quality of task performance affects the choice of the next task.

The tasks which were given to the subjects could be quite different in content depending upon the level of education and the occupation of the subjects. For example, subjects who were school children or students at technical institutes could be given mathematical tasks; students of the humanities, tasks requiring knowledge in the area of literature and art. The tasks could be like puzzles. In other words the content of the tasks had to correspond to the social and educational level of the subjects. Only under these conditions was it possible to get the subjects to relate seriously to the experimental situation; only under these conditions was there a real choice.

In order to carry out the experiment 12 × 17 centimeter cards were prepared, and on these cards the numbers from 1 to 14 were clearly written. In addition, a stopwatch was required. The cards were laid out in two rows:



The subject is instructed: "In front of you are cards with problems on the back. The number on the card indicates degree of difficulty of the problem. The problems are arrayed in front of you in terms of increasing difficulty. For the solution of each problem a definite amount of time is allotted which is unknown to you. I will monitor time with the help of a stopwatch. If you do not get the problem right in the allotted time I will consider that you have not done it at all. You must choose which problems you do yourself." In this fashion the subject had the right to choose the difficulty of the problem. After the instructions, the subjects had to choose a task. Upon completing each succeeding task, the subject was told: "And now choose a problem of whatever difficulty you want." The experimenter set the time for completing the task and after each problem said: "You completed this problem in time, I'm going to give you a plus" or: "You did not get it in time, I am giving you a minus." The experimenter could increase or reduce the time allotted for carrying out the task and thus arbitrarily induce a feeling of failure or success. The experimenter could show that the task was completed correctly or, by limiting the time, cause bad results to be obtained. The subject chose the next task, whether harder or easier, only *after* the evaluation of the experimenter. The analysis of the experimental findings showed that the choice of the problem (its degree of difficulty) depended upon whether the previous problem had been done successfully or not. However the feeling of success or failure itself depended on the attitude of the subject toward the goal of the task. Subjects always begin work with definite aspirations and expectations, which are then changed in the course of the experiment. The sum of these aspirations, which shifts with each trial, was called "level of aspiration" by Hoppe. The feeling of attainment, of success or failure, depended, consequently, not only on objective performance but also on the level of aspiration. Without a level of

aspiration, a given trial performance was not felt either as success or failure.

Hoppe's research showed that after successful problem solution, the level of aspiration rises and the subject turns to more complex material; after failure the level of aspiration slowly decreases. The work of Hoppe was the first experimental attempt to study stages in the formation of aspiration under the influence of successful or unsuccessful problem solution. His work was followed by others.

The law for the shift of level of aspiration, as established by Hoppe, was checked out by Juknat, in his "Achievement, Level of Demand, and Self-awareness." By modifying the technique somewhat, a series of labyrinth problems were developed instead of the individual tasks as in Hoppe's research. The first series (ten labyrinth problems) guaranteed success, i.e., the subject could solve the problem, he could find a path from the beginning to the end of the labyrinth. This was the "success series." In the second series, the "failure series," all the problems (also ten labyrinth problems) except the first were unsolvable, that is, all paths of the labyrinth led to a dead end.

Juknat studied two groups of subjects. The first group began the task with the series which guaranteed success; the second group began with the failure series. It turned out that subjects who began with the success series began the second series with a supposedly more difficult problem and, conversely, subjects who started with the failure series began the next series with easier problems. Juknat tried to show that the development of the level of aspiration was linked with prior experience.

Yet for Juknat, just as for Hoppe, "level of aspiration" turned out to be completely isolated from the objective influence of its component attitudes.

The studies of Soviet authors, e.g., E. A. Serebrykova and M. S Neimark, attempted to show the dependence of level of aspiration on the content of the activity. Basing her research on Hoppe, Serebrya kova tried to establish the roles of successful task completion and social evaluation in the development of self-evaluation and self-confidence. If Hoppe in his technique abstracted from real life conditions to the greatest possible extent, Serebryakova tried to maxi-

mize naturalism. As a result of her research Serebryakova showed that the development of self-confidence depends upon the type of self-evaluation. Using children, she established correlations between the following:

1. Reliable and appropriate self-evaluation and well-established self-evaluation.
2. Inappropriate reduction of self-evaluation and lack of self-confidence.
3. Inappropriate elevation of self-evaluation and self-confidence.
4. Unstable self-evaluation and poorly established self-evaluation.

Besides this, Serebryakova discovered that different groups of pupils had different types of affective reaction to success and failure. But questions connected with the emotional relationship of the pupils to task difficulty were ignored by Serebryakova. Her research was limited to establishing the nature of self-evaluation but the question concerning the relationship between self-evaluation and level of aspiration was not considered.

However, both these problems were studied in the article by Neimark, "Psychological analysis of the emotional reactions of school children to the difficulty of their work." Neimark indicated that, to the extent that self-evaluation is developed, it begins to affect the behavior of the child and determines his reaction to the influence of adults. If this evaluation is high and gives the child an honorable place in his collective, then it finally becomes a need. From here Neimark was led to a conclusion about the relationship between self-evaluation and level of aspiration. "Level of aspiration is a need for a definitely satisfying self-evaluation." Her research assessed the emotional reactions of children to their success and failure. In her design the subjects were divided into four groups.

1. Pupils with an appropriate reaction to success and failure (disappointment at failure and a feeling of satisfaction at success).
2. Pupils with an inappropriate reaction to failure (after an unsuccessful attempt to solve a problem the children set out on even more difficult problems, displayed resentment toward the experimenter, and were rude).

3. Pupils with inappropriate reaction to success (lowering of the level of aspiration after achieving success).
4. Pupils fleeing from difficulty (after the first failure the children refused to participate in the experiment).

Neimark showed the relationship of level of aspiration to the material of the experiment, she demonstrated the nature of the emotional reaction in the critical situation, and she came close to the problem of the relationship between level of aspiration and self-evaluation.

In this fashion the studies of Serebryakova and Neimark showed that Hoppe's technique was feasible for studying the development of school children's attitudes. This method also turned out to be suitable for studying changes in the emotional conditions of patients.

The studies of our colleague V. N. Myasishchev had already used this technique to illuminate the personality traits of hysterical children (R. I. Meerovich and V. M. Kondratskaya).

Using different variations of this technique in our laboratory, studies of the development of level of aspiration were carried out (by B. I. Bezhanishvili) in patients with various mental illnesses. As an experimental task the subjects were given problems which might be regarded as indicators of certain cultural levels. Arithmetic tasks, or other tasks requiring special skills, had to be rejected since for most people they do not permit development of a meaningful level of aspiration.

In all there were 24 tasks (there were two cards for each level of difficulty). Here are some examples.

1. Write three words beginning with the letter "Sh."
2. Write three words beginning with the letter "N."

2a. Write the names of four animals beginning with the letter "L."

2b. Write the names of four fruits beginning with the letter "A."

3. Write the names of five cities beginning with the letter "L."

3a. Write six names beginning with the letter "P."

4. Write six names beginning with the letter "A."

4a. Write the names of six nations beginning with the letter "I."

5. Write the names of three flowers beginning with the letter "R."
5a. Write the names of five subway stations beginning with the letter "K."
6. Write the names of six animals beginning with the letter "K."
6a. Write 20 words beginning with the letter "S."
7. Write the names of 5 flowers beginning with the letter "G."
7a. Write those parts of the world which begin with the letter "A."
8. Write four names of trees beginning with the letter "O."
8a. Write the names of 15 cities beginning with the letter "M."
9. Write the names of 10 cities beginning with the letter "A."
9a. Write the names of 5 films beginning with the letter "M."
10. Write the names of 5 authors beginning with the letter "S."
10a. Write the names of 5 well-known Soviet film artists beginning with the letter "L."
11. Write the names of four composers beginning with the letter "S."
11a. Write the names of well-known Russian composers, artists, and authors beginning with the letter "R."
12. Write the names of seven French artists.
12a. Write the names of 5 well-known Russian artists beginning with the letter "K."

The experimental results obtained with healthy subjects supported the findings of Hoppe and Serebryakova. The selection of tasks by healthy subjects depended on whether the prior tasks were done successfully or not. The initial level of aspiration was different for different subjects: for some subjects their entire behavior was careful and "groping," while others developed a more or less high level of aspiration immediately, as if "on the run." However it was quite evident that the choice of tasks was dependent on how well the previous task had been done. This relationship was frequently not straightforward but the element of choice was always present.

With schizophrenics the findings were completely different. (These were simple schizophrenics who were rather dull and listless). According to the findings of Bezhanishvili, 26 out of 30 schizophrenics showed no relationship between the choice of task and prior performance. No level of aspiration developed nor was

there any sign of an adequate self-evaluation of abilities. The statements of the patients did not have any emotional coloring whatsoever. The patients did not display embarrassment even when the experimenter emphasized their failure.

Psychopaths were completely different when their level of aspiration was studied; it developed very quickly and, as a rule, it was rather high. However it was characterized by fragility and instability: at the least failure, it fell and, at the same time, it would quickly increase when a problem was solved successfully. In studying the psychopathic personality with this method one other feature was observed, namely, affective explosiveness. The patients quickly became irritated, their mood turned bad, they became gloomy, malicious, and sometimes tore up pieces of paper that contained the experimental instructions which they deprecated, saying "stupid problems."

However, in further work with these techniques some insufficiences with the level-of-aspiration tasks were found, especially as they had been applied by Bezhanishvili. In her thesis, N. K. Kalita showed that the use of questions which allegedly reflect general educational level, was unreliable since the questions presented by Bezhanishvili afforded no basis for judging the degree of difficulty for individual subjects. It turned out that for some subjects the answer to question No. 8 (write four names of trees beginning with "O") was considerably more difficult than the answer to question No. 10 (write the names of five authors beginning with the letter "S"). In other words, there were no clear gradations of difficulty and complexity in these questions and because of this, it was difficult to conduct a proper experiment. Another experiment was thought up which permitted the experimenter to artificially regulate the time for solving the problem and thereby arbitrarily determine success and failure. However the time control by the experimenter must occur within reasonable limits so that the subject doesn't suspect anything. The subjects had different amounts of knowledge about the topics of the questions: subjects sometimes succeeded very quickly in answering questions No. 10 or No. 11, while they were unable to do ones that were actually easier. As consequence, the experimenter's evaluation lost its significance for the subject and his own self-evaluation prevailed.

Kalita concluded that it was necessary to find more objective gradations of task complexity. He introduced the following varia-

tion: subjects are presented with a pair of pictures which are different from one another in terms of the number of elements (this is akin to a test of attention). The subjects have to find the difference between them. Twelve pairs of tasks were set up and laid out in terms of increasing degrees of difficulty. As a criterion for the difficulty of the task the investigator used the number of differences between two pictures and the time which was necessary for normal subjects to find these differences (from 15 seconds to 3 minutes). The subject was told that his attention was being studied.

This modification in technique permitted Kalita to show the following: (1) The development of level of aspiration depends not only on the evaluation of the experimenter but on the self-evaluation of the subject. (2) A level of aspiration is not formed in circumstances in which the subject is still developing a working relationship to the experiment or when he is simply motivated to become acquainted with problems.

All these data lead us to the following conclusion. In order that an experiment may reveal the self-evaluation and level of aspiration of an individual, it must be set up in such a fashion that it evokes not only an orientation toward the content of the task but it also must facilitate the formation of a relationship to the experimental situation and to the experimenter.

The technique of studying the level of aspiration has turned out to be fruitful in investigating patients with vascular diseases of the brain. The reactions of these patients at the beginning of the experiment was adequate. They tried to test their power, they demanded more of themselves after successful problem solving and returned to easier problems after failure (but these fluctuations were not particularly sharp). However, gradually, toward the end of the experiment, the patients became exhausted and began to be somewhat perplexed; at the same time they did not want to acknowledge their failure. As a result their choice of tasks became unjustified; "I just don't know which one I should take, you tell me," "How would you advise me," etc. The patients, as it were, transferred responsibility for choosing tasks to the experimenter. Frequently the patients refused further work: "I'm tired."

In studying the emotional-volitional behavior of children with oligophrenia, especially interesting results were obtained. The studies of L. Balakireva have shown that in these children the entire

development of level of aspiration has a rather different structure. For the majority of oligophrenics the level of aspiration was not appropriate to their self-evaluation. In spite of successful task completion, the children selected less difficult tasks and, conversely, long-term failure did not lead to a reduction in their level of aspiration. The sluggishness of their emotional reactions came to light in his experiment showing the difficulty with which these oligophrenic children changed their level of aspiration.

At the same time research has revealed another characteristic, namely, the exceeding sensitivity to failure. The least reproach by the experimenter led to a catastrophic decay in the level of aspiration and subsequent successful problem solving did not make the level of aspiration go back up again. The children with oligophrenia were especially vulnerable to the experimenter's assessment. This fact underscores the unusual combination of inertness and instability in the emotional-volitional sphere characteristic of oligophrenics and it demonstrates the immaturity and the insufficiently differentiated quality of their personality. The paradoxical combination of inertness and sluggishness, together with instability, is very likely one of the characteristic personality traits of oligophrenics.

Another appropriate technique for studying pathological personality changes has been "the study of mental satiation" which was launched by a student of Lewin's, A. Karsten. Her research focused on the ability to maintain and to restore the impetus to complete some monotonous task. The subject has to carry out a task, for example, drawing dashes or circles (in doing this task a large pile of sheets of paper is placed in front of the subject). The subject is instructed: "please draw dashes in this fashion" (the experimenter draws some identical dashes or circles ○○○○○). If the subject asks how many he has to draw the experimenter answers in an indefinite and impassive manner: "As many as you want, there you have some paper."

Studies carried out by Karsten and I. M. Solov'ev show that at the beginning, the subjects rather accurately carried out the task that was assigned to them; however, after a short period (5 to 10 minutes), they began to introduce variations into the task, that is, unknown to himself the subject changes the task. These variations seemed to be changes in the external structure of the task: the dashes or circles became smaller or bigger, the subjects changed

work tempo or drew the dashes and circles in a definite rhythm (for example, ○○ ○○○ ○○ ○○○). Sometimes the subjects had recourse to concomitant behavior; they began to sing, whistle, and tap their feet. These variations show that the instigation to complete an assigned behavior begins to run down and, as Karsten expressed it, the phenomenon of "mental satiation" begins to supervene.

According to Karsten such phenomena, that is, variations in the task, not only show that the desire to complete the task is beginning to fade; to some extent these variations perform a prophylactic service; change in the structure of a given task enabled the subject to continue it.

The experimenter conscientiously records spontaneous statements of the subject, the nature of his reactions, his mimic behavior, and his expressive movements. In this way he determines the point of time at which the new variations appear.

After a certain amount of time (usually 20 to 30 minutes), when variations are becoming more frequent and are beginning to take on a somewhat coarse character, the subject is given new instructions: "This task is monotonous for you and it was given to you in order to study your stamina. Continue it if you want."

The reactions of the subjects to these new instructions are diverse. Some subjects become angry: "Why didn't you tell me that earlier," and they stop working. For other subjects, however, the new instructions provide a new comprehension of the situation: "Well, that is another matter" is frequently heard in reply.

This new comprehension of the task situation often makes variations become less frequent, less pronounced, and sometimes they even disappear altogether. After the new instructions the experimenter conscientiously records the responses and the statements of the subjects and notes, just as he did before, the time at which variations supervene and their nature. A good time for stopping work before completion has not been established. As a rule the subjects themselves stop work: "I can't do any more." But sometimes some of them are not disposed to stop work because they frequently change their interpretation of the task, or, more correctly, they add something to it. This is shown both by the spontaneous utterances and the self-awareness of these subjects. "I

wanted to see who would get fed up sooner, you (that is the experimenter) or I," or "I wanted to test myself to see how long I could work on this boring task."

When this study was done with healthy adults and children it was shown that, after a certain amount of time, the subjects introduce variations into a monotonous task: the variations consist in changes of the activity itself, for example, the circles are transformed into "mug" cartoons and ears and hair are added. Then pauses occur in the work, and concomitant behavior begins to occur. The child begins to sing and whistle, just as if the children were satiated with the monotonous work and were attempting to change its meaning for themselves. The variations are temporary withdrawal from work and a shift to activity which is fundamentally similar. Solv'ev followed Karsten in labeling this withdrawal, that is, this variation, "an equivalent withdrawal from work." The more subtle such equivalences, the more they demonstrated the flexibility of the child's behavior.

In doing this experiment with mentally retarded children it turned out that they kept at the task as long as healthy children, and it followed that their work capacity can appear to be undisturbed. However, the unfolding of the satiation process revealed peculiarities consisting in the polarity of their reactions.

In intellectually retarded children we find coarse forms of the variations: long pauses, temporary withdrawals from work, even together with stamina and endurance (especially in connection with monotonous tasks). On the other hand, children with oligophrenia quickly throw aside the work that they are tired of; no variations or changes are introduced. Such a polarity, so noticeable in the daily behavior of oligophrenics, demonstrates the immaturity of their intentions.

This methodological technique turned out to be very useful for revealing the personality features of epileptics. It turned out that they not only can maintain monotonous performance for a long time but that they introduce few variations. It was especially interesting to observe the responses of patients to the second instruction. While the second instruction imparted new meaning to the entire situation for healthy subjects, in epileptics and in children suffering from oligophrenia, this kind of meaning transformation did not occur. Hence, the techniques which we used showed that, for a def-

inite group of patients, the process of meaning formation is disturbed.

As we have mentioned above in Chapter 3, interesting results were obtained by using this method on patients with disorders of work capacity. Experimenting with patients with brain trauma, we were able to note that satiation occurred for them much more quickly. While variations occur on the average after 10 minutes for healthy subjects, the traumatized subjects generate variations after only two or three minutes; and these variations are quite crude in nature. The experiment reveals the rapid extinguishability of mental processes in such patients.

Recently some other approaches to the study of personality traits in mental patients began to appear, such as comparison of patients' complaints about their intellectual deficit with what has been revealed experimentally. This methodological technique was followed by V. V. Kostikova, who made a very interesting attempt to analyze the so-called "internal dynamics of illness" in the mentally ill.

The well-known Soviet therapist R. A. Luriya introduced the concept of "internal dynamics of disease," by which he means "all that which the patient experiences and feels, the entire aggregate of his sensations, not only local sensations due to his illness but also his general feeling about himself, his self-observation, how he represents his illness to himself (with respect to its causes), all that which is linked with approaching a physician – that entire internal world of the patient, which consists of very complex combinations of perceptions and sensations, emotions, affects, conflicts, mental feelings, and trauma." He indicated that the behavior and mental processes of the individual are changed at the very moment when he learns about his illness.

Luriya discussed the significance of studying the "internal dynamics of disease" in somatic illnesses. Undoubtedly these dynamics play a larger role in mental illness. The author was completely right when he pointed out that a comparison of subjective and objective amnesia in the history of the patient facilitates establishing whether the patient is aware of his disease, to what extent he adequately appraises the burden that his condition will be for him, and what feelings are linked with the disease. It can be no less informative to compare the patient's complaints with

the results of experimental research. The experiment is a situation that has personal significance for the patient and therefore the relationship of the patient to it and his emotional response to the fact that his capability is being studied characterize his personality.

Kostikova made an attempt to compare the results of experimental research with patient complaints. Patients with different kinds of illnesses were presented with a number of standard questions aimed at revealing their complaints and their opinions about the causes of their illness (for example, the questions: "How does your illness show itself?" "What do you think is the cause of your illness?"). Then the usual experimental steps were taken and a number of experimental methods were used (classification of objects, pictogram, memorization of ten words, transmission of the metaphorical meaning of proverbs, counting, and others).

Comparison of patients' complaints with the experimental and clinical evidence enabled Kostikova to observe different kinds of relationships between them. In some instances a very crude uncritical attitude is observed: the patients did not notice and they are unable to evaluate the signs of their own mental weaknesses. Some patients who in conversation created the impression of being completely uncritical were enabled to show critical ability by the experiment. These abilities were manifested as an unstable but, all the same, active personality disposition. At the same time, there are instances of the passive awareness of disease without any effect on the disposition of the patient toward everyday life. In many instances in which more or less correct assessment of their disease is available to the patient, he talks about it incorrectly to the doctor. This frequently signifies that there is "dissimulation." But such a dissimulation can have two meanings; in one case, the patient, who is trying to compensate for his defect, does not talk about it, and tries to struggle with the disease and to make a good life adjustment. In the second instance the patient dissembles; he conceals the pathological feelings because he is trying, for delirious reasons, to get discharged from the hospital and he acts in terms of these delirious ideas.

The characterization of this kind of personality disposition is important since the experiment has artificially created a personally significant situation which facilitates discovery of the patient's relationship to the doctor, to the treatment situation, and to his disease in general.

Whatever may be the disposition of the individual during experimental research, if there is even a shred of interest displayed, it always demonstrates that personality has been preserved to some extent.

The problem of personality disposition has recently been raised by psychologists working on the problem of the development of personality in the child (L. N. Bozhovich, S. L. Slavina). They correctly show that the formation of needs in the individual is associated with the availability of awareness of the need. Therefore, study of changes in awareness has fundamental significance for questions of general psychology as well.

Recently still another technique has begun to show up, namely, the analysis of illness-history data. These data, that is, a description of mental status, the findings of anamnesis, diaries, etc. are valuable material, which have been insufficiently used by psychologists. Meanwhile casting of many of the factors which have been described by clinical psychologists in the terms of contemporary psychological science could vastly facilitate the analysis of the structure of needs and motives, which change so much in many mental patients (schizophrenia, epilepsy, chronic alcoholism). This kind of analysis is being carried out now in many studies such as those of B. S. Bratuse, L. V. Bondareva, and M. M. Kochenov.

Combining psychological techniques and pharmacological tests has turned out to be especially valuable in illuminating personality properties. The studies of S. Ya. Rubinshtein are moving in this direction. While affirming the opportunity afforded by applying experimental methods to the study of psychopathological phenomena, this author states that the following means of constructing experimental techniques are most objective and appropriate to the problems of psychiatry: 1) variation of the situation in which the patient finds himself, 2) variation of the activity which the patient must perform, and 3) variation of the condition of the patient by means of experimental and pharmacological stimulation. It is possible to combine these techniques in a very productive fashion.

Rubinshtein showed that the patient's susceptibility to change and his susceptibility to pharmacological influence can serve as major criteria for the effectiveness of therapy. The author has

developed a number of methodological techniques which enable him to carry out such research; this branch of research is extremely promising for the study of abnormality in personality.

The enumerated research techniques for studying personality alterations are not the only ones. The analysis of so complex a problem must be carried out from different points of view and from different directions. However, the fundamental basis for these studies must be the tenets of contemporary materialist psychology.

Chapter 7

Mental Decay and Mental Growth

Knowledge about the relationship between mental growth and decay is poorly developed even though this issue is very important for psychiatric and psychological theory and for understanding the structure of mental activity and the principles of mental development. The correct resolution of this question may help to defeat biologizing tendencies in psychiatry and psychology. In a practical sense, this question generates data for classifying and analyzing psychopathological syndromes.

G. E. Sukhareva repeatedly cited the necessity for an evolutionary-biological approach to the resolution of theoretical questions in psychiatry. L. S. Vygotskii, who devoted much attention to mental development and maturation in the child, emphasized the importance of information about mental decay. In this connection, he indicated that, as far as human development and maturation are concerned, the genetic approach, as applied to animals, cannot be simplistically extrapolated, since, in phylogenesis, the laws of biological evolution yielded to the principles of social-historical development. Continuing with Vygotskii's conceptualization, A. N. Leont'ev stated that human development consists not in adaptation to the environment but in mastering all the accumulated knowledge of mankind.

The question arises as to whether the relationship between decay and growth can be resolved in psychology as it is in biology. It is well known that research on anatomical and cell pathology has established that brain disease first of all affects the "young" formations in the cortex, that is, those portions whose phyloge-

netic development has been most recent (Gerstman, Gurevich, Miskolchy, Snesarev, Vogt).

The animal experiments of Pavlov and his co-workers supported the view that pathology first affects whatever was acquired most recently. Thus, acquired conditioned reflexes are destroyed in brain diseases considerably more easily than unconditioned reflexes. Further studies of the physiology of higher nervous activity established that impairment of phylogenetically recent formations entails weakening of their regulatory role and the consequent disengagement or freeing of earlier formations.

From these considerations, the conclusion is frequently drawn that some brain diseases entail activity at a lower developmental stage, which may correspond to a specific stage in childhood. This notion about mental regression to an ontogenetically lower level, stimulated many investigators to try to find a relationship between the structure of mental decay and a specific stage in child development. Thus, even in their time, Blonskii and Krechmer compared schizophrenic thinking to the thinking of the child at puberty. And today the American authors Pinkerton and Kelley state that patients with cerebrovascular diseases lose the ability to abstract in a way that corresponds to the development of that ability in children. In his report to the 18th World Congress of Psychology the well-known Swiss scholar Ajouriaguerra also defended the view that in mental illness there is psychological regression to an ontogenetically lower level of development.

The basic idea here is that mental decay proceeds stage by stage from higher to lower levels. The supporting evidence comprised the following observations.

1. In many mental illnesses the patients cease being able to manage more difficult kinds of behavior while simple habits and skills are preserved.
2. Some forms of disturbance in thinking and ways of behaving are actually superficially reminiscent of the child's thinking and behavior at certain developmental stages.

However, close scrutiny of these observations shows them to be unfounded. First and foremost, it is far from always true that illness causes deterioration of higher functions. In the clinical

treatment of nervous diseases we often encounter impairment of elementary sensory-motor operations, and this impairment underlies the complexities of the disease.

Close examination of the second set of facts (in which the thought styles and behavior of adult patients are compared with those of children at certain developmental stages) also shows that the analogy is superficial.

Let us examine some of these facts. First of all, it is necessary to discuss skills since ontogentic formation of skills occurs in an especially clearcut fashion. Consider some interesting data from S. Ya. Rubinshtein's work. She studied the deterioration of different skills: writing and reading, habitual behaviors in older people who are mentally ill. She found that in different diseases the structure of impairment was different. In some diseases (for example, cerebrovascular disease without a focal symptomatology), she found lack of coordination, behavioral discontinuity, and paraphrasis; the patients' movements were awkward and they blundered in any ordinary undertaking. Rubinshtein notes that the lack of coordination is due to desensitized and retarded cortical motor control.

Patients with brain atrophy suffer from impairment of stereotyped motor behavior, such as writing and reading. Rubinshtein points out that the typical decline of complex human skills in these patients is caused by the loss of previous experience. Furthermore these patients do not develop any compensating mechanisms, while in vascular patients, on the other hand, skill deterioration is accompanied by compensating mechanisms which, in turn, complicate the disorder.

All these findings indicate that skill deterioration is complex. Sometimes it is a dynamic disorder, sometimes disturbed compensatory mechanisms are involved, and, in some cases, the structure itself of behavior is impaired. The main point, as Rubinshtein correctly notes, is that in all these instances of skill deterioration no mechanisms have been observed which resemble stages in the skill development of children.

This conclusion is supported by the analysis of thought disorders presented in Chapter 5, in particular, those disorders which were called "lowering of the level of generalization." The

patients were mainly ones suffering from deep organic brain lesions and their reasoning and behavior could seem to be reminiscent of elementary school children. They couldn't perform a series of intellectual operations at a normal level of abstraction and generalization. Their reasoning was dominated by direct and immediate images of objects and events. These intrusions occurred experimentally when the patients worked on such tasks as "classification of objects." They began to be influenced by concrete-situational attributes and properties (bear and fox are grouped together because "these animals live in the woods," and cat and goat, "these live at home." Vegetables and fruits were put in the same group not because they are both "plants" but because "they are sold in the stores." Systematic conceptual generalization is replaced by concrete, situational linking.

Superficial analysis might support the idea that the properties of cognitive disorder in patients with lowered level of generalization are somewhat reminiscent of preschool thinking since thinking at this age is also based on sense images rather than abstract concepts. However deeper analysis discloses a qualitative distinction between the thinking of the imbecile patient and the child. The adult imbecile cannot master a new set of relationships, he cannot establish unconventional relationships between objects while doing mental work; at the same time, he relies on a supply of previous knowledge and skills. The child, on the other hand, who does not have a store of prior knowledge or a wide array of associations, easily masters a new system of knowledge. In the course of learning, the child's associations become more ramified, and his knowledge of the environment gradually increases and becomes complex. Even though the child's thinking is incomplete and maps only a portion of reality, it becomes complete through everyday living; thanks to the powerful orienting reflex and his commerce with the environment, the child quickly assimilates quite different aspects of objects and the knowledge of these aspects is accumulated and synthesized. Even a mentally retarded child is always trainable in principle, while a demented patient cannot be trained because he is unable to learn new material and has to use previous experience. So, regardless of the superficial similarity between the thinking of the adult imbecile patient and the child, they are in fact qualitatively different.

An analogy is frequently drawn between that pathological condition referred to as "hyperresponsiveness" and the distractibility of the young child. The hyperresponsive patient cannot proceed firmly toward the accomplishment of his intended objectives. His associations are misdirected and his level of intellectual performance fluctuates. Any object or stimulus, whether or not it is addressed to the patient, can evoke a heightened response from him. In our articles we described a patient who, upon entering the ward dining room, declared that "he had come to a restaurant to make merry," and then he immediately stated that he is at a watchmaker's (a hospital attendant had just set the wall clock). A minute later the patient acknowledged that he was in the hospital. Some patients who had been lying in their beds without having any conversation with other patients or hospital staff suddenly responded to questions or remarks intended for others.

This hyperresponsiveness of adult patients seems to be a rejection of normal behavior. In our environment there are always objects which do not compel our attention. A normal cognitive process assumes the ability to pick out important stimuli and to avoid the incidental ones which interfere with cognitive harmony. However, for our patients any object seemed capable of having a signal function and influencing their thinking and behavior.

The hyperresponsiveness of adult patients can resemble the distractibility of very young children in that the latter are also distracted by any stimulus and their attention drawn by every object. Proponents of the view that pathological phenomena constitute regression to earlier developmental stages might, it seemed, find support for their position in this phenomenon. In fact, however, the genesis of distractibility in the child is completely different. It is founded on an amplified orienting reflex, that is, a heightened degree of cortical arousability, and, therefore, the child's distractibility enrichens his intellectual activity; it confers the ability to generate a large number of temporary relationships, which is the basis for human purposive activity. The "hyperresponsiveness" of patients, however, is due to a lowering of cortical arousability and it not only doesn't enrich them intellectually but, on the contrary, it helps to destroy purposiveness. Indeed, "hyperresponsiveness" occurs systematically in conjunction

with other manifestations of increased cerebral inhibition: memory impairment, paraphases, and so forth.

Finally, it is possible to draw an analogy between uncritical behavior in the patients (for example, those suffering from progressive paralysis) and the carelessness of the child. However, in this instance the analogy is purely superficial. The behavior of the little child is thoughtless in the sense that his limited knowledge does not enable him to predict the results of his behavior; there are no causal relationships between events for him since his actions seem to him to be without purpose. In fact, however, it is not this way at all. The goals pursued by the child are limited; they are not included in a complex chain of relationships. However, the limited goal of the small child does exist; and each of his actions is determined by a need (however elementary), and in this sense his actions are always motivated and goal-directed. The child's goals change quickly due to his powerful orienting reflex, and as a result his behavior seems to be readily manipulable over the short term.

But it is different for adult patients with uncritical thinking. Our experimental data and clinical observations show that the behavior of these patients was insufficiently determined by their personality orientations and intentions. Their goals were unstable, their behavior lacked direction and self-correction, and the regulatory function of speech was impaired. Hence, these kinds of behavior disorders only superficially resemble the child's behavior at particular developmental stages.

At the same time, studies of cognitive decay reveal types which are not even superficially similar to the thinking characteristic of children. Such peculiarities of thinking as "dissociation" or "distortion of the level of generalization" are not encountered at any developmental level.

In thought "dissociation" it is usually difficult to find out what the object of thought is. For these patients, speech is neither a means of communication with a listener nor of relating to other people; it is neither a tool of thought nor a means of social intercourse.

Such features do not characterize the child's thinking. No matter how disconnected is the child's speech, it is always di-

rected at some object. No matter how we distract him, the child's babble is always directed at some object; his speech always reflects the child's relationship to his environment, and it is directed at the people who are around him. Soviet psychological research has shown that even in egocentric speech, the child is expressing his thoughts and desires and his speech is not aimless. In sum, analysis of clinical material has shown that the behavior and cognitive activity in the adult patient does not correspond structurally to behavior and thinking in the child.

If, on the one hand, we look at the principles of development of mental processes during childhood (infancy, preschool, elementary school, junior and senior high school, etc.) and, on the other, at the forms of mental deterioration, it is easy to see that none of the diseases is a repetition of mental properties peculiar to certain developmental stages.

This conclusion follows from the general tenets of Soviet psychology. Mental activity arises in a reflex fashion on the basis of socially-conditioned bonds which are formed during a lifetime of upbringing and education. Soviet psychologists (A. N. Leont'ev, A. R. Luria) repeatedly emphasized that the material substrate of higher mental functions is not composed of separate cortical parts or centers but rather consists in a functional system of cortical areas working together. These functional systems do not mature independently but they are formed in everyday life and gradually become durable and complex interfunctional relationships. Following A. A. Ukhtomskii, Leont'ev suggests calling them "functional organs."

These ideas radically change our notions regarding the essential nature of mental development: human mental processes and personality traits are not (in contrast to animals) simply the result of the maturing of individual parts or zones of the brain. They are formed ontogenetically and, as a consequence, they depend on the child's life style.

In point of fact, the course of a disease follows biological laws which cannot replicate the laws of development. Even in those instances where disease affects the youngest, and the most specifically human, sections of the brain, the behavior of the patient does not assume the structure of that of a sick child at an earlier developmental level. The fact that patients lose the ability to think

and reason at a more advanced level only means that they have been deprived of more complex forms of behavior and cognition, but it does not signify a return to a childhood level. Anyway such a regression would not justify concluding that levels of decay and development are qualitatively uniform: decay is not negative development.

Different pathological states lead to qualitatively different kinds of decay. Experimental psychology has studied the multifarious forms of these mental disorders and the findings constitute valuable evidence which must be taken into account in constructing a general psychological theory.

Bibliography

Abashev-Konstantinovskii, A. L. "The psychopathology of frontal lesions." Nevropatologiya i psikhiatriya, Vol. 18. No. 4 (1949).

Abashev-Konstantinovskii, A. L. "The problem of consciousness in the light of clinical psychopathology." Voprosy psikhologii, No. 4 (1958).

Abramov, V. V. Research on Creativity and Other Intellectual Functions in the Mentally Ill. (Saint Petersburg, 1911).

Abramovich, G. B. "The clinical psychological experiment." Sovetskaya psikhonevrologiya, No. 1 (1939).

Anfimov, V. Ya. "Concentration of attention and capacity for mental work in epilepsy." Obozrenie psikhiatrii, nevrologii i eksperimental'noi psikhologii, Nos. 11-12 (1908).

Anikima, A. M. "The differential features of the work processes of patients with idiopathic and traumatic epilepsy." In: Epilepsy and Clinical Aspects of Working Capacity (Medgiz, Moscow, 1939).

Averbukh, E. S. "Recall of completed and incompleted actions by manic-depressives (a study of affective-volitional training in manic-depressive psychosis)." Sovetskaya nevropsikhiatriya, No. 1 (1936).

Banshchikov, V. M., Gus'kov, V. S., and Myagkov, I. F. Medical Psychology (Meditsina, Moscow, 1967).

Bassin, F. V. "The disturbance of word values in schizophrenia." Candidate's dissertation (Khar'kov, 1936).

Bekhterev, V. M. "The objective study of neuropsychic activity." Obozrenie psikhiatrii i nevrologii, No. 4 (1907).

Bekhterev, V. M. "The objective study of the mentally ill." Obozrenie psikhiatrii, nevrologii i eksperimental'noi psikhologii, No. 11-12 (1907).

Bekhterev, V. M., and Vladychko, S. D. Objective Experimental Study of the Mentally Ill. (Saint Petersburg, 1911).

Beringer, L. "Sprache und Denkstörungen bei Schizophrenie." Z. Neurol., Vol. 103 (1927).

Bernshtein, A. N. "Experimental-psychological patterns of intellectual disorder in the mentally ill." Reports given at the April 30, 1910 Meeting of the Moscow Association of Neurologists and Psychiatrists (Moscow, 1910).

Bernshtein, A. N. Clinical Tactics in the Psychological Study of the Mentally Ill (Gosizdat, Moscow, 1922).

Berze, J. and Gruhle, H. W. Psychologie der Schizophrenie (Berlin, 1929).

Bezhanishvili, B. I. "Some peculiarities of fixed sets in Pick's disease." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Birenbaum, G. V. "The formation of metaphors and conventional word meanings in the presence of pathological changes in intelligence." In: Advances in the Study of Apraxia, Agnosia, and Aphasia (Moscow–Leningrad, 1934).

Birenbaum, G. V., and Zeigarnik, B. V. "The dynamic analysis of intellectual disorders." Sovetskaya nevropatologiya, psikhiatriay i psikhogigiena, Vol. 4, No. 6 (1935).

Bleikher, V. M., and Mints, A. Ya. "Memory disorder in cerebral arteriosclerosis." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Blumenau, L. M. "The study of the originality of associations." Vestnik psikhologii, Vol. 3, No. 5 (1906).

Blyumina, M. G. "Techniques for psychological research on oligophrenic children from age two to five." Voprosy eksperimental'noi patopsikhologii (Moscow, 1965).

Bogdanov, E. I. "Techniques for studying visual perception with incomplete information." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Bzhalava, I. T. "Psychopathology of the fixed sets in epilepsy." In: Proceedings from a Conference on Psychology, (Izd. APN RSFSR, 1957).

Bzhalava, I. T. "Use of D. N. Uznadze's study of fixed sets in clinical treatment of the mentally ill." In: Psychological Research Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Cameron, N. The Psychology of Behavior Disorders (Boston, 1947).

Cattell, R. B. Personality (New York, 1950).

Chapman, L. J., Burstein, A. G., Day, D., and Verdone, P. "Regression and disorders of thought." J. Abnorm. soc. psychol., No. 63, pp. 540-545 (1961).

Chizh, V. F. "Apperception of simple and complex ideas as studied by the method of complications." Vestnik psikhiatrii, Vol. 1 (1885).

Chizh, V. F. "Measurement of the duration of elementary processes in the mentally ill." Vestnik psikhiatrii, Vol. 1 (1885).

Chizh, V. F. "Perceptual scope in the mentally ill." Arkhiv psikhiatrii (Moscow, 1890).

Conference Proceedings of the Society for Experimental Psychology. "A review of psychiatric and neurological experimental psychology" (Saint Petersburg, 1904).

Delay, J. Etudes de psychologie medicale (Paris, 1953).

Dement'eva, N. F. "Emotional-volitional changes in schizophrenics suffering from psychogenic relapses." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Destunis, G. Einführung in die medizinische Psychologie (Berlin, 1955).

Dokuchaeva, M. A. "Use of Kraepelin's scoring technique in the psychiatric clinic." In: Psychological Research Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Dubinin, A. M., and Zeigarnik, B. V. "The problem of traumatic dementia." Nevropatologiya i psikhiatriya, Vol. 9, Nos. 7-8 (1940).

Dukel'skaya, I. N., Melekhov, D. E., and Korobkova, É. A. "Assessment work capacity and job replacement of remitted schizophrenics." Metodicheskoe pis'mo TSIETINa (Medgiz, Moscow, 1955).

Dukel'skaya, I. N., and Korobkova, E. A. Medical Assessment of Working Capacity and Placement of Schizophrenic Patients (Medgiz, Moscow, 1958).

Epshtein, A. L. "Some properties of attention in the mentally ill." Psikhologiya, nevrologiya, i psikhiatriya, No. 2, (1933).

Évlakhova, E. A. "Types of intelligence in schizophrenia." In: 50th Anniversary of the S. S. Korsakov Psychiatric Clinic (Moscow, 1940).

Gadzhiev, S. G. "Analysis of the disturbance of intellectual activity in lesions of the frontal areas of the brain." Candidate's dissertation (Moscow, 1947).

Gal'perin, P. Ya. "Two conceptions of higher nervous activity and their relationship to psychology." Sovetskaya psikhonevrologiya, No. 2 (1933).

Gal'perin, P. Ya. "The intellectual action as the basis of formation of thought and image." Voprosy psikhologii, No. 6 (1957).

Gal'perin, P. Ya. "The development of investigations of the formation of intellectual actions." In: Psychological Science in the USSR, Vol. 1 (Izd. APN RSFSR, Moscow, 1959).

Gal'perin, P. Ya., and Golubova, R. A. "Mechanism of paraphasias of the complex type." Sovetskaya psikhonevrologiya, No. 6 (1933).

Gal'perina, R. A. "Special features of the working capacity and compensatory powers of schizophrenics." In: Assessment of Working Capacity and Resettlement of Schizophrenic Patients (Moscow, 1940).

Gellershtein, S. G. Rehabilitative Work Therapy in the Evacuation Hospital (Medgiz, Moscow, 1943).

Golant, P. Ya. "Recall of complete and incompleted action in progressive paralysis." Sovetskaya nevropathologiya psikhiatriya i psikhogigiena, No. 6 (1935).

Golant, P. Ya. Memory Disorders (Moscow-Leningrad, 1925).

Golant, R. Ya., and Yankovskii, A. E. "Some experimental data relating to the problem of the disintegration of intelligence in schizophrenia." Sovetskaya nevropatologiya, psikhiatriya i psikhogigiena, Vol. 3, Nos. 2-3 (1934).

Golodets, P. G., Zeigarnik, B. V., and Rubinshtein, S. Ya. "Mental disorder in asthenic conditions caused by industrial hazards." Voprosy psikhologii, No. 5 (1963).

Gutman, L. S. "Experimental-psychological investigations of manic-melancholic psychosis (the state of concentration, attention, capacity for mental work, and association)." Doctoral dissertation, Seriya doktorskikh dissertatsii, No. 15 (Saint Petersburg, 1909).

Hanfmann, E., and Kasanin, J. S. Conceptual Thinking in Schizophrenia (New York, 1942).

Il'in, A. V. "The processes of concentration (attention) in patients with dementia." Izvestiya imperatorskoi voennomeditsinkoi akademii, No. 3 (1909).

Ivannikov, Yu. V. "Research methods for studying some peculiarities of visual awareness." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Ivanov, A. Ya. "The training experiment as a means of investigating children with abnormal mental development." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Ivanov, A. Ya. "Principles for designing a training experiment." In: Psychological Research Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Janet, P. La medicine psychologique (Paris, 1923).

Kekcheev, K. Kh. "The application of the chronocyclograph technique in studying pathological findings." Psikhologiya, nevropatologiya i psikhiatriya, Vol. 2 (1923)

Khvilivitskii, T. Ya. "The psychoneurotic's attitude toward work and its role in develment of the work curve." Sovetskaya nevropatologiya, psikhiatriya i psikhogigiena, Vol. 4, (1935).

Khramtsova, S. T. "Standardization of the technique, 'comparison of concepts,' in a psychoneurological clinic for children." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Kiyashchenko, N. K. "Standardization of alternative TAT techniques." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Klimusheva, T. A. "Experimental investigation of paranoid schizophrenics with the automatism syndrome." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Kochenov, M. M. "Experiences with experimental research on patients' motivation." In: Psychological Research-Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Kogan, V. M. "Occupational placement of mental patients." In: Technical Instructions in Relation to Industrial Medical Boards (Moscow, 1940).

Kogan, V. M. "Special features of the working capacity of mental patients (with schizophrenia and epilepsy) and measures of organization of their work." Abstracts of Proceedings of a Scientific Session 3-7 Feb., 1941 (Moscow, 1941).

Kogan, V. M. Speech Rehabilitation in Aphasia (Meditsina, Moscow, 1963).

Kogan, V. M. "Principles of collaborative research." In: Psychological Research Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Kogan, V. M., and Kostomarova, N. M. "Special features of the working capacity and placement of schizophrenics." In: Assessment of Working Capacity and Placement of Patients with Schizophrenia (Moscow, 1940).

Kokin, M. K., and Perepelkin, V. M. "Characteristics of associations in persons suffering from chronic alcoholism." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Kononova, M. P. "Psychological findings from a study of slowly progressing schizophrenia in children." Sovetskaya nevropatologiya, psikhiatriyi i psikhogigiena, Vol. 6, No. 11 (1935).

Kononova, M. P. "The psychological analysis of the asthenic state during exhaustion (in children and adolescents)." Trudy bol'nitsy im. Kashchenko, No. 4 (1945).

Kononova, M. P. Handbook of Research on Mentally Ill Children (Medgiz, Moscow, 1963).

Korobkova, É. A. "An experimental investigation of the factors stimulating and depressing working capacity." In: Problems in the Assessment of Working Capacity and Diagnosis of Borderline States (Biomedgiz, Moscow, 1939).

Korobkova, É. A. "Occupation placement of epileptics." Sotsial'noe obespechenie, No. 9 (1940).

Korobkova, É. A. "Time parameters in the abnormal psychology experiment." In: Psychological Research Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Korobkova, É. A., and Savich, M. G. "Psychological characteristics of the working capacity of neurotics." Abstracts of Proceedings of a Scientific Session of TsIETIN, 11-15 Feb., 1936 (Profizdat, Moscow, 1936).

Korsakov, S. S. "The psychology of microcephaly." Voprosy filosofii i psikhologii, Book 1 (1894).

Korsakov, S. S. Medical-psychological Investigation of One Form of Memory Disorder (Moscow, 1894).

Kostikova, V. V. "Psychological analysis of patients' complaints in comparison with clinical and experimental findings in relationship to the so-called internal description of disease." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Kostikova, V. V. "Some practical applications of psychology in the mental hospital." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Kostomarova, N. M. "Qualitative characteristics of intellectual activity in patients with diffuse changes in the central nervous system as a result of head injury." In: Traumatic Lesions of the Central Nervous System (Moscow, 1940).

Kritskaya, V. P. "Techniques for studying speech perception." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Kritskaya, V. P. "Speech perception in schizophrenics." Candidate dissertation (Moscow, 1966).

Kurganov, Zh. L. "The psychology experiment in the cerebro-arteriosclerosis clinic." Sovetskaya nevropatologiya, psikhiatriya i psikhogigiena, Vol. 3, No. 4 (1934).

Kutaliya, N. A. "Toward a technique for investigating conceptual thinking in schizophrenics." In: Psychological Research Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Lagache, D. "Psychologie clinique et methode clinique." Evolution psychiatrique (April-June, 1949).

Lange, N. N. Psychological Studies (Odessa, 1893).

Lebedinskii, M. S. "Speech disorders in schizophrenics." Sovetskaya psikhonevrologiya, No. 3 (1933).

Lebedinskii, M. S. "Speech disorders in schizophrenics." Sovetskaya psikhonevrologiya, No. 3 (1938).

Lebedinskii, M. S. "Mental disturbances from lesions of the right hemisphere." In: Problems of Contemporary Psychiatry (Moscow, 1945).

Lebedinskii, M. S. "Some principles and problems for psychological research in the clinic." In: Psychological Research Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Lebedinskii, M. S. "Motor and behavior disturbances in patients with frontal lesions." Candidate's dissertation (Moscow, 1967).

Lebedinskii, M. S., and Myasishchev, V. N. Medical Psychology (Meditsina, Moscow, 1966).

Lenin, V. I. Complete Collected Works, Vol. 29.

Leont'ev, A. N. A Sketch of the Development of the Mind (Moscow, 1947).

Leont'ev, A. N. "The nature and formation of human mental properties and processes." (Paper read to the 14th International Congress of Psychology.) Voprosy psikhologii, No. 1 (1955).

Leont'ev, A. N. "Biological and social aspects of the human mind." Voprosy psikhologii, No. 6 (1960).

Leont'ev, A. N. Problems in the Development of the Mind (Izd. APN RSFSR, Moscow, 1960).

Leont'ev, A. N. "Some long-term problems of Soviet psychology." Voprosy psikhologii, No. 6 (1967).

Leont'ev, A. N., and Rozanova, T. V. "Relationship between the formation of associative links and the content of the action." Sovetskaya pedagogika, No. 10 (1951).

Lotze, R. H. Medizinishche Psychologie (Leipzig, 1852).

Luriya, A. R. "The conjugate motor trend in studying affective responses." Trudy instituta psikhologii (Moscow, 1928).

Luriya, A. R. Internal Description of Illness and Pathogenic Diseases (Moscow, 1944).

Luriya, A. R. Restoration of Brain functions after war injuries (Izd. AMN SSSR, Moscow, 1948).

Luriya, A. R. (ed.). Problems in the Higher Nervous Activity of the Normal and Abnormal Child, Vols. 1-2 (Izd. APN RSFSR, Moscow, 1956-1958).

Luriya, A. R. Traumatic Aphasia (Izd. AMN SSSR, Moscow, 1957).

Luriya, A. R. Higher Cortical Functions in Man (Izd. MGU, Moscow, 1962); Engl. transl., Consultants Bureau, New York, 1966).

Luriya, A. R. The Human Brain and Mental Processes (Izd. APN RSFSR, Moscow, 1963).

Luriya, A. R. and Khomskaya, E. D. "Disturbances of intellectual functions from lesions of the posterior frontal area." Dokl. APN RSFSR, No. 6 (1962).

Madsen, K. B. Theories of Motivation (Munksgaard, 1968).

Maksytova, É. L. "The evaluation and use of experimental data obtained from schizophrenics after they had the flu." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Mandrusova, É. S. "The role of experimental research in evaluating cognitive disorders in children." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Mandrusova, É. S., and Raiskaya, M. I. "Clinical analysis of a diagnostically complicated case." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Marx, K., and Engels, F. Works, Vol. 3.

Meerovich, R. I. "Experimental analysis of the curve of working capacity of patients with manic and depressive syndromes." Sovetskaya nevropatologiya, psikhiatriya i psikhogigena, Vol. 4, No. 1 (1935).

Meerovich, R. I. "Psychological analysis of completion tendencies in progressive paralysis." Sovetskaya nevropatologiya, psikhiatriya i psikhogigiena, No. 1 (1935).

Meerovich, R. I., and Kondratskaya, K. M. "Level of aspiration in hysterical children." In: Mental Features of Difficult and Mentally Retarded Children. Vol. 5 (Leningrad, 1936).

Meerovich, R. I., and Plotnikova, E. E. "Success and failure and their influence on level of aspiration in hysterics." In: Soviet Neuropsychiatry, Vol. 1 (1936).

Meleshko, T. K. "Actualization of information in the course of schizophrenic thinking." Candidate's dissertation (Moscow, 1966).

Murray, H. Thematic Apperception Test (Cambridge, 1943).

Myasishchev, V. N. "Working capacity and diseases of the personality." Sovetskaya nevropatologiya, psikhiatriya i psikhogigiena, Nos. 8-10 (1935).

Myasishchev, V. N. "Personality and work of the abnormal child." In: Mental Peculiarities of Difficult and Mentally Retarded Children (Leningrad, 1936).

Myasishchev, V. N. "Mental functions and sets." Uchenye zapiski LGU, No. 119 (1949).

Myasishchev, V. N. "The importance of psychology to medicine." Voprosy psikhologii, No. 3 (1956).

Myasishchev, V. N. "Problems, techniques, and importance of medical psychology." In: Psychological Research Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Nepomnyashchaya, N. I. "Some conditions of disturbance of the regulatory function of speech in mentally backward children." In: Problems in the Higher Nervous Activity of the Normal and Abnormal Child. Vol I (Izd. APN, RSFSR, Moscow, 1956).

Nikol'skii, V. N. "Types of planning and task performance by children who are difficult to train." In: Mental Features of Difficult and Mentally Retarded Children (Leningrad, 1936).

Obraztov, V. N. "The writing of the mentally ill." Candidate's dissertation (Saint Petersburg, 1904).

Osipova, V. N. "The psychology of complexes and an association experiment modeled after the works from the Zurich clinic." Nevropatologiya i psikhiatriya, No. 6 (1908).

Pavlov, I. P. Complete Collected Works, Vols. III-IV (Izd. AN SSSR, Moscow-Leningrad, 1951-1952).

Pavlovskaya, L. S. "The experimental investigation of young idiots and imbeciles using the method of Academician V. M. Bekhterev and S. D. Vladychko." Obozrenie psikhiatrii (Saint Petersburg, 1909).

Payne, R. W., Mattuset, P., and George, H. "An experimental study of schizophrenic thought disorder." J. Med. Sci., No. 105, p. 627 (1959).

Perel'man, A. A. Disorders of Intelligence (Tomsk, 1957).

Perepelkin, V. I. "Comparison of visual objects by epileptic children. In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Petrova, A. E., and Anikina, A. M. "The nature of working capacity in schizophrenia." In: Problems in Borderline Psychiatry (Medgiz, Moscow, 1935).

Petrova, A. E., and Anikina, A. M. "The role of experimental psychology in the determination of the character of working capacity in patients with idiopathic epilepsy." Nevropatologiya, psikhiatriya i psikhogigiena, No. 5 (1936).

Pevsner, M. S. Oligophrenia – Mental Deficiency in Children (Izd. APN RSFSR, Moscow, 1960; Engl. transl. Consultants Bureau, New York, 1961).

Philosophical Problems of the Physiology of Higher Nervous Activity and of Psychology (Izd. AN, SSSR, Moscow, 1963).

Piaget, J. La psychologie de l'intelligence (Paris, 1952).

Pichot, P. Les testes de personalité en psychiatrie (Paris, 1956).

Pinskii, B. I. "Diagnostic aspects of research on children's behavior." Voprosy psikhologii, No. 2 (1968).

Pittrich, O. Denkstörungen bei Hirnverletzten, Sammlung psychiatrischer und neurologischer Einzeldarstellungen (Leipzig, 1944).

Polyakov, Yu. F. "Properties of slight cognitive disturbances in schizophrenia." Candidate's dissertation (Moscow, 1961).

Polyakov, Yu. F. "Comparative description of cognitive disturbances in patients with early arteriosclerosis of the brain and schizophrenics." In: Problems of Cerebrovascular Diseases. Vol. 2 (Moscow, 1961).

Polyakov, Yu. F. "Methods in the study of cognitive processes in schizophrenics." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Povarnin, K. N. The Role of Attention in the Most Elementary Mental Processes (Saint Petersburg, 1906).

Protopopov, V. P., and Rushkevich, E. A. Investigation of Disorders of Abstract Intelligence in Mental Patients and Their Physiological Characteristics (Kiev, 1956).

Rey, A. Monographie de psychologie clinique (Neuchatel–Paris, 1952).

Rodgers, C. R. Client-Centered Therapy – The current Practice, Implications and the Theory. (Houghton, Boston, 1957).

Rodionova, E. A. "Techniques for studying skill deterioration in mentally ill children." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Rotschild, D. Senile Psychoses with Cerebral Arterioscleroses – Mental Disorders in Later Life. (Stanford, London, 1945).

Rozenblyum, I. I. "The comparative characteristics of schizophrenia and paralytic dementia. I." Sovetskaya nevropatologiya, psikhiatriya i psikhogigiena, Vol. 3, Nos. 2 (1934).

Rubinshtein, S. L. Foundations of Social Psychology (Gosudarstvennoe uchebno-pedagogicheskoe izd. Narkomprosa RSFSR, Moscow, 1940).

Rubinshtein, S. L. "Problems in psychological theory." Voprosy psikhologii, No. 1 (1955).

Rubinshtein, S. L. Being and Consciousness (Izd. AN SSSR, Moscow, 1957).

Rubinshtein, S. L. Thinking and Ways of Investigating It (Izd. AN SSSR, Moscow, 1958).

Rubinshtein, S. Ya. "Restoration of working capacity in patients with war wounds of the brain." Candidate's dissertation (Moscow, 1944).

Rubinshtein, S. Ya. "Assessment and restoration of working capacity after war wounds of the brain." In: Neurology in Wartime, Vol. 1 (Izd. AMN SSSR, Moscow, 1949).

Rubinshtein, S. Ya. "The reflex nature of hallucinations." Report of the All-Union Congress of Psychology. Proceedings of a Conference on Psychology (Izd. APN RSFSR, Moscow, 1957).

Rubinshtein, S. Ya. The Psychology of the Mentally Retarded Child (Uchpedgiz, Moscow, 1959).

Rubinshtein, S. Ya. "Methodology of studying sensory motor performance in patients suffering from vascular diseases." In: Cerebrovascular Diseases (Moscow, 1960).

Rubinshtein, S. Ya. Methods of Experimental Abnormal Psychology (Moscow, 1962).

Rubinshtein, S. Ya. "Study of skill deterioration in the mentally ill aged." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Rubinshtein, S. Ya. "Use of the experimental method for studying psychopathological phenomena." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Rubinshtein, S. Ya. "Experimental study of patients with diencephalous pathology of diverse etiology." In: Deep-Seated Structures of the Brain and Problems of Psychiatry (Moscow, 1966).

Rubinshtein, S. Ya. "Joint use of the abnormal psychology experiment and pharmacological treatment." In: Psychological Research Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Ruzer, V. I. "The role of the experimental investigation in mental hygiene work in higher educational establishments." Sovetskaya psikhonevrologiya, Vol. 5, No. 2 (1935).

Rybakov, F. G. An Atlas for the Experimental-Psychological Study of Personality (Moscow, 1910).

Sagalova, S. R. "Some results of the psychological investigations of patients with cerebral arteriosclerosis." In: Cerebral Arteriosclerosis and Working Capacity (Biomedgiz, Moscow, 1934).

Sakharov, L. S. "Concept formation in mentally retarded children." Voprosy defektologii, No. 2 (1928).

Savitskaya, L. V. "Treatment effects on speech disorders in schizophrenics." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Scheid, K. F. "Die Psychologie des erworbenen Schwachsinns." Zentralbl. Neurol. Psychiatr., Vol. 107 (1939).

Second All-Union Congress of Neuropathologists and Psychiatrists. Sovetskaya psikhonevrologiya, No. 1 (1936).

Sechenov, I. M. Selected Philosophical and Psychological Works (Gospolitizdat, 1947).

Sharashidze, G. I. "Effects of insulin and neuroleptic treatment on attention processes in schizophrenics." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Shevelev, E. A. "Thinking out loud in mental illnesses." Sovetskaya psikhonevrologiya, No. 1 (1937).

Shif, Zh. I. Intellectual Development of Pupils at Auxiliary Schools (Prosveshchenie, Moscow, 1965).

Shubert, A. M. "Description of cases with disturbed visual-spatial perception." In: Prophylaxis and Treatment of Mental Illnesses, No. 3 (1938).

Shubert, A. M. Schizophrenic Disturbance of Intellectual Performance in Organic Brain Disease, Vol. 5 (Moscow, 1946).

Shubert, A. M. "Some special features of the disturbance of intellectual activity after frontal trauma." In: Problems in the Clinical Course and Treatment of Mental Diseases (Moscow, 1949).

Shubert, A. M. "Disturbances of abstractions and generalization in schizophrenia and their pathophysiological basis." Voprosy psikhologii, No. 4 (1955).

Shubert, A. M. "Schizophrenic disturbances of intellectual performance in patients with skull trauma." In: Wartime Problems of Psychiatry (Moscow, 1965).

Shubert, A. M. "Some disturbances of perceptual activity in a traumatizing situation." In: Proceedings of a Conference on Psychology (Izd. APN RSFSR, Moscow).

Stanishevskaya, N. N. "Toward an experimental methodology for the forensic-psychiatric clinic." In: Psychological Research Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Szekely, L. "Knowledge and thinking," Acta Psychologica, No. 1 (1950).

Techniques of Experimental Research on Personality (Saint Petersburg, 1908).

Tepenitsyna, T. I. "An analysis of errors in a study of attention using the correction trial technique." Voprosy psikhologii, No. 5 (1959).

Tepenitsyna, T. I. "Comparison of physical and verbal classification as a technique for studying cognitive processes in vascular and other diseases." In: Cerebrovascular Diseases (Moscow, 1961).

Tepenitsyna, T. I. "The psychological structure of ratiocination." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Tepenitsyna, T. I. "Use of the psychology experiment in the study of the personality components of thinking." In: Psychological Research Methods in the Clinic. Symposium Proceedings, 14-17 Feb., 1967 (Leningrad, 1967).

Teplov, G. M. Psychology (OGIZ, Moscow, 1946).

Terekhov, V. A. "Mechanisms which regulate solution seeking (heuristics)." Candidate's dissertation (Moscow, 1968).

Tikhomirov, O. K. "Cognitive value of a computer simulation of creative thinking." Proceedings of the Polish-Soviet Symposium (Izd. AN SSSR, Moscow, 1967).

Tikhomirov, O. K. "The structure of human cognitive activity: theory and experiment." Doctoral dissertation (Moscow, 1968).

Tokarskii, A. A. "The association of ideas." Voprosy filosofii i psikhologii, Vols. 21-35 (1896).

Tokarskii, A. A. "On stupidity," Voprosy filosofii i psikhologii, Vol. 35 (1896).

Tokarskii, A. A. "Notes on the psychological laboratory of the Psychiatric-Clinic, Moscow State University." Voprosy filosofii i psikhologii, Books 21-35 (1896).

Transactions of the 14th Meeting of the Ukrainian Psychoneurological Institute (Izd. AN SSSR, Moscow, 1963).

Urakov, I. G. "Clinical features in patients with slowly progressing paranoid schizophrenia." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Valitskaya, M. K. The Associations of the Mentally Ill (Kazan', 1891).

Valitskaya, M. K. "Psychophysical changes in mental patients." Vestnik klinicheskoi i sudebnoi psikhiatrii, Vol. 6, No. 1 (1898).

Vasil'ev, Yu. A. "Qualitative analysis of errors with the correction method." Zh. psikhologii, nevrologii i psikhiatrii, Vol. 4 (1924).

Veisfel'd, V. M. "Lawfulness in the process of memory impairment." Sovetskaya psikhonevrologiya, No. 3 (1933).

Vikulova, L. V. "Level of aspiration in oligophrenic children." In: Problems of Experimental Abnormal Psychology (Moscow, 1955).

Vladychko, S. D. "Attention, mental working capacity, and free associations in patients with dementia praecox." Obozrenie psikhiatrii, nevropatologii i eksperimental'noi psikhologii, No. 6 (1908).

Vladychko, S. D. The Character of Associations in Patients with Chronic Primary Dementia (Saint Petersburg, 1909).

Voprosy filosofii i psikhologii, Book 4/24 (1894).

Vygotskii, L. S. "The problem of mental retardation." In: Selected Psychological Investigations (Izd. APN RSFSR, Moscow, 1956).

Vygotskii, L. S. "The disturbance of concepts in schizophrenia." In: Selected Psychological Investigations (Izd. APN SSSR, Moscow, 1956).

Vygotskii, L. S., Samukhin, N. V., and Birenbaum, G. V. "Dementia in Pick's disease." Sovetskaya nevropatologiya, psikhiatriya i psikhogigiena, Vol. 3, No. 6 (1934).

Wallon, A. From Action to Thought (Russ. transl. IL, Moscow, 1956).

Wechsler, D. Measurement and Evaluation of Intelligence of Older Persons in Old Age in the Modern World (London, 1954).

Wechsler, D. Manual for the Wechsler Adult Intelligence Scale (New York, 1955).

Zalmanzon, A. N. "The basic disorder in schizophrenia." Transactions of the Psychiatric Clinic, 1st Moscow Medical Institute, No. 5 (Medgiz, Moscow, 1934).

Zalmanzon, A. N. "Structure and limits of schizophrenic imbecility." Sovetskaya psikhonevrologiya (Khar'kov, 1937).

Zalmanzon, A. N. "The problem of pervasive imbecility." Transactions of the Psychiatric Clinic, 1st Moscow Medical Institute (Moscow, 1937).

Zalmanzon, A. N., and Skornyakova, S. I. "The structure of epileptic and schizophrenic thinking." Transactions of the Psychiatric Clinic, 1st Moscow Medical Institute, No. 4 (Moscow, 1934).

Zankov, L. V., and Petrova, V. G. "The comparative investigation of the differentiation of similar material in mentally retarded and normal schoolchildren." Izv. APN RSFSR, No. 57 (1954).

Zaporozhets, A. V. The Development of Voluntary Movements (Izd. APN RSFSR, Moscow, 1960).

Zavalloni, R. La psycologia clinica nello studio del ragazzo (Milano, 1957).

Zeigarnik, B. V. "The understanding of metaphors or sentences in the presence of pathological changes in intelligence." In: Advances in the Study of Apraxia, Agnosia, and Aphasia (Medgiz, Moscow, 1934).

Zeigarnik, B. V. "Psychological analysis of posttraumatic impairment and deficit." Transactions of the Central Institute of Psychiatry, Ministry of Health, RSFSR (Moscow, 1941).

Zeigarnik, B. V. "Local and general cerebral factors in frontal lesions of the brain." Nevropatologiya i psikhiatriya, Vol. 12, No. 6 (1943).

Zeigarnik, B. V. Psychological Analysis of Postconcussional Disturbances of Hearing and Speech (Medgiz, Moscow, 1943).

Zeigarnik, B. V. "Experimental psychological findings in relation to frontal-lobe injuries." Trudy Tsentral'nogo instituta psikhiatrii, Vol. 3 (1947).

Zeigarnik, B. V. "The experimental psychological investigation of patients with brain injuries." In: Nervous and Mental Diseases in Wartime (Medgiz, Moscow, 1948).

Zeigarnik, B. V. "The disturbance of spontaneity in patients with wartime injuries of the frontal lobes." In: Neurology in Wartime, Vol. 1 (Izd. AMN SSR, Moscow, 1949).

Zeigarnik, B. V. Intellectual Disturbances in Mental Patients (Medgiz, Moscow, 1958).

Zeigarnik, B. V. "The properties of compensation for mental deficits in patients suffering from cerebral arteriosclerosis." In: Cerebrovascular Diseases (Moscow, 1961).

Zeigarnik, B. V. The Pathology of Thinking (Izd. MGU, Moscow, 1962; Engl. transl. Consultants Bureau, New York, 1965).

Zeigarnik, B. V. "The relationship between mental growth and mental decay." In: Problems of Psychoneurology in Children (Moscow, 1964).

Zeigarnik, B. V. "Experimental investigations of personality change in the mentally ill." In: Problems of Experimental Abnormal Psychology (Moscow, 1965).

Zeigarnik, B. V. and Birenbaum, G. V. "The problem of conceptual perception." Sovetskaya nevropatologiya, psikhiatriya i psikhogigiena, Vol. 4, No. 6 (1935).

Zeigarnik, B. V., and Gal'perin, P. Ya. "Psychological changes after leucotomy in schizophrenics." Nevropatologiya i psikhiatriya, Vol. 17, No. 4 (1948).

Zeigarnik, B. V., and Karanovasaya, É. L. "The psychopathology of negativism in epidemic enchephalitis." Sovetskaya nevropatologiya, psikhiatriya i psikhogigiena, Vol. 4, No. 8 (1935).

Zeigarnik, B. V., and Rubinshtein, S. Ya. "The experimental psychological investigation of patients in psychoneurological institutions." Metodicheskoe Pis'mo (Moscow, 1956).

Zeigarnik, B. V., and Rubinshtein, S. Ya. "Experimental psychological laboratories in the psychiatric clinics of the Soviet Union." In: Psychological Sciences in the USSR, Vol. 2 (Izd. APN RSFSR, Moscow, 1960).

Zvereva, M. V., and Lipkina, A. I. "Comparison of objects by mentally retarded schoolchildren." In: Special Features of the Perceptual Activity of Pupils at a Special School (Izd. APN, RSFSR, Moscow, 1953).

Index