KURT GOLDSTEIN

# FUNCTIONAL DISTURBANCES IN BRAIN DAMAGE

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**Kurt Goldstein**

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# FUNCTIONAL DISTURBANCES IN BRAIN DAMAGE

Our knowledge of functional disturbances in brain damage is based on the patient's symptoms. Symptoms are modifications of behavior in various performance fields. If one considers the symptoms as directly dependent upon damage of the brain matter in various regions and as directly related to defects in different performance fields, one can draw some conclusions about the relationship between a disturbance of a particular performance and a specific brain damage. Although the results thus reached are useful for practical purposes, we learn little of how a lesion modifies the specific function, and of the origin of the symptoms.

First of all, the pathological-anatomical picture seldom indicates the degree of functional disturbance produced by the injury, since this depends primarily upon the extent and intensity of the injury—factors which cannot be correctly determined even by careful microscopic investigation. Furthermore, the difficulty is increased by the fact that the kind of damage—such as hemorrhage, tumor, inflammation, or intoxication—has a different effect on the functional disturbance.

The question of the relationship between the symptom and the disturbance of the brain matter's function is by no means as simple as has often been thought; indeed, one can say it has become increasingly

problematical. The main difficulty consists in determining which of the observed phenomena are actually directly related to the defect of the brain—a question which is, as yet, far from clear. Increasingly, we have learned that, when we refer to disturbance of performance caused by a brain lesion, we must consider not only the disturbed performance but all the observable modifications of the patient's behavior. We know from Jackson's distinction between different groups of sequelae of brain damage (see p. 183), that this is a very difficult task. When one further realizes that, in a brain lesion, the symptoms can differ because of various conditions of the whole organism, and that they may become understandable only as phenomena depending also upon the organism's general condition, it is doubtful whether one can speak of symptoms as caused by brain lesion alone, or whether one can do so only in an abstract, theoretical consideration of the facts.

As clinicians, we cannot be satisfied with merely theoretical interpretations of the symptomatology—interpretations based not on clinical experience but derived from studies in normal physiology and psychology—as has frequently been tried in the past. We have to try to reach a better understanding of the functional disturbances in brain damage by taking into consideration all that we observe about the patient, his whole behavior at a given moment, especially its deviation from the norm. This is what I consider to be my task in this presentation.

The material available for this procedure is so vast that to discuss a considerable part of it here would be impossible. I shall therefore try to show, by use of typical examples of symptom complexes, which factors must be considered for an understanding of the structure of symptoms in brain damage, thus enabling the reader to apply our results to other symptom complexes.

## Previous Views Regarding Brain Damage

Until recently, the symptoms observed in damage of the brain cortex were considered to be expressions of a loss of so-called "images," the aftereffects of previous experiences deposited in different circumscribed regions of the brain cortex, according to the different performance fields. It was also postulated that the symptoms could not result exclusively from the effect of these circumscribed defects—that additional factors must be involved; only thus could the variations, the alternation between normal and abnormal reactions of the patient in seemingly the same task, be understood. These other modifying factors were considered to be "general mental capacities" such as attention, memory, interest, and emotions. The additional factors were brought more or less into relationship to localized or general brain functions. The influence of the atomistic theory of brain function was so great that one overlooked the fact that, by introducing these general functions, nothing was gained. As a matter of fact, closer observation showed that these "general functions" varied in the same way as did the single performance. Attention, for instance, may seem to be sometimes grossly disturbed, and yet the same patient, under other conditions, may appear attentive or even abnormally so (see Goldstein, p. 249). Thus we found ourselves in the same situation as before when we tried to understand the variations of the phenomena by assuming the influence of such general functions.

Today it is hardly understandable that the solution to the problem was not discovered earlier, namely: to consider the symptoms not only in relation to the dysfunction of limited parts of the brain but in relation to the individual in whom they appear; in other words, to consider them as performances of the sick individual. The concentration of study not on the single symptom but on the behavior of the total personality of the patient, during examination and in everyday life, made it more and more evident that the symptoms could only be correctly evaluated if one considered them in relation to the condition of the total psychophysical personality. This instigated an intensive study of each single symptom in relation to the behavior of the total patient at a given moment, which, in turn, became the point of departure for the concept of the so-called organismic approach to psychopathology in general (see in regard to this, Goldstein). It is this organismic approach which is the basis for this presentation.

The new approach was not the result of a new theoretical concept but the outcome of better observation and investigation. Closer scrutiny led to the concept that the symptoms are consequences of the sick organism's struggle with the demands of the tasks confronting it; in other words, symptoms are forms of behavior by which the individual tries, in spite of his defect, to come to terms in the best way with the outer and inner world. The approach grew out of the necessities of neuropsychiatric practice, out of the task of retraining a great number of young men with brain injuries and different mental defects

with which we were confronted during and after World War I, and out of the recognition that the psychopathological theories prevailing at that time, and the methods of training based on them, were insufficient to fulfill the task. There was an urgent need to find a more successful interpretation of the phenomena, particularly so because the subjects with whom we were dealing could not any more be considered as interesting objects for theoretical studies, as was often the case in psychopathology in earlier times. The disastrous condition of the young men confronted us with a strong challenge to help them in every way possible. The approach became particularly promising after the analysis of the symptomatology of a great number of patients with various brain injuries had revealed another point of view in the consideration of organismic life in general and of man's in particular, namely: that the basic motivation of the living being is to realize its own nature; that is, to realize all its capacities to the highest degree possible in a given situation. By applying this viewpoint, many seemingly contradictory symptoms became understandable, and much better results of retraining were achieved.

The structure of the organismic approach will become clearer when we consider individual symptoms in brain damage. We shall see, then, that phenomena which were once considered to be different, isolated defects appear now to be simply different expressions of the same brain damage under different conditions of the whole organism.

Before entering into the subject, I want to make a few general remarks about the period in which the organismic approach originated and the place of this new approach within the ideas of that time. It was related to the new "holistic" orientation in physiology and medicine in general, which finds its expression in such a saying as, "There is no sickness—there are only sick human beings." I refer in this connection to a congress held in 1932 under the topic *Einheitsbestrebungen in der Medizin,''* where men famous in anatomy, physiology, and different fields of medicine came together to discuss this question with great enthusiasm.

While the new approach brought deeper insight into the function of the organism and a better understanding of pathological phenomena, it confronted us with a number of new methodological problems. When one considers each symptom as dependent on the condition of the entire organism, great difficulty arises in determining the relationship of a symptom to the specific brain damage. This particular problem had been seriously considered fifty years before by the famous English neurologist and psychopathologist, John Hughlings Jackson, who reached a general point of view in psychopathology to which ours bears much similarity.

Jackson, as an outgrowth of his experiences with aphasic patients, emphasized that psychopathological phenomena can be understood only if one gives up the theory of images, and he stopped considering disturbances

of images in brain defects as causes of symptoms. He believed that, in order to understand psychopathological phenomena, one has to begin by analyzing the modification—due to its damage—of the function of the brain, and by considering the different symptoms of aphasic patients as expressions of a disintegration of the brain matter; expressions of a lowering of the function of the brain to a level where automatic and emotional reactions still are possible, while the highest function, the propositional symbolic function, is more or less lost.

Jackson's ideas were so far ahead of his time that he found little approval. In the famous discussion between him and the French neurologist, Broca, at the British Association for the Advancement of Science in London in 1868 in which both men defended their contradictory theories about the function of the brain, Broca emerged as victor; afterward, Jackson had little influence on the work in psychopathology. Although some great men in the field at that time, A. Pick, C. von Monakow, Adolf Meyer, and others, stressed Jackson's great significance, referred to his ideas, and used them in their work, he was nearly forgotten for a long time. He had to be newly discovered. This rediscovery occurred during the period referred to previously when clinical practice demanded better procedures for helping brain-injured soldiers in England. It was the English neurologist, Henry Head, who based his treatments on Jackson's ideas and demonstrated their fruitfulness for understanding much of the aphasic symptomatology and for its treatment. A

little earlier, other unbiased studies by Storch, Heilbronner, Pierre Marie, Lotmar, Boumann, Gruenbaum, Woerkom, and K. Goldstein, influenced more or less by Jackson, gave different new interpretations of psychopathological phenomena which can be considered as precursory to the organismic approach.

By stressing the organismic approach as the best one for an understanding of the symptoms in brain damage, I do not want to imply that this approach has found full acceptance. Although a considerable amount of psycho-pathological research is more or less influenced by it, certain men prominent in the field are strongly opposed to it, for example, in this country, Nielson and some others.

Adherents to the older "classic" theory, founded on associationism and the assumption of isolated, circumscribed disturbances, base their opposition primarily on the argument that the new approach is too general and does not therefore do justice to the problem of localization, and, even more important in respect to the problem with which we are dealing here, to the great variety of modifications of performance of the brain-damaged patient.

As to the opposition concerning the problem of localization, I would like to point to various papers of my own, particularly the presentation of the subject in the German *Handbuch der normalen und pathologischen Physiologie.*

There I have shown that this problem is by no means neglected by the new approach; moreover, *that the approach put it on a more realistic basis,* so that many mistakes originating from the old concept can be avoided.

Proof that the new approach emphasizes the great variety of symptoms and the problem of understanding them will become apparent when we now discuss the symptomatology of patients with severe damage of the brain cortex.

## Effect of Impairment of the Abstract Attitude Owing to Brain Damage

I shall not start with a description of patients with defects in special performance fields, such as speech, motility, vision, sensation, etc., but with patients who show disturbances in all these fields in such a way that some performances in each field are impaired and even lost, while others seem relatively well preserved. This clinical picture occurs particularly in severe lesions of the frontal lobes or in diffuse damage of the brain cortex by injury or intoxication, in general paresis, etc. It can be shown that the complex and outwardly very inconsistent symptomatology of the patient can be understood as an effect of the damage to a special mental capacity which we call the abstract attitude. Before going into this matter, it seems necessary to make some remarks concerning the concept of the human mind which underlies this interpretation.

The normal individual displays two kinds of attitudes toward the world —the *concrete* one and the *abstract* one. In the concrete one we are given over passively and bound to the immediate experience of the very things or situations in their uniqueness. Our thinking and acting are determined by the immediate claims made by the particular aspect of the object or situation. For instance, we act concretely when we enter a dark room and turn on the light switch. If, however, we refrain from turning the switch, reflecting that we might awaken someone asleep in the room, then we are acting abstractly. We

transcend the immediately given aspect of sense impressions, we detach ourselves from the latter, and consider the situation from a conceptual point of view, reacting accordingly. The abstract attitude corresponds approximately to what Henry Head has called—in relation to speech — symbolic behavior.

The healthy individual is able to shift voluntarily from one attitude to the other, according to the demands of the situation. Some tasks can be performed only by virtue of the one, some only by virtue of the other attitude. For the beginning of any activity, the abstract attitude is a presupposition. During activity, the concrete attitude is often dominant, but, should the course of action be interfered with or disrupted, abstraction is required to correct such disturbances and to continue the activity properly.

Patients with impairment of abstract attitude may not appear to deviate grossly from normals in everyday behavior, because many routine tasks do not require the abstract attitude once these tasks have been set going. During observation of the patient in a variety of situations, however, it becomes evident that he does not react like a normal individual; he appears more stereotyped and reserved. He seems to lack initiative and spontaneity. Tasks which demand choice or shifting particularly reveal the defect.

From analysis of the behavior of a great number of such patients in

various everyday and test situations, we have compiled a list of modes of behavior in which the performances are disturbed owing to impairment of the abstract attitude.

The patient fails if he has:

1. to assume a definite mental set;

2. to give an account to himself for acts and for thoughts;

3. to shift reflectively from one aspect of a situation to another;

4. to keep in mind various aspects of a task or of any presentation simultaneously;

5. to grasp the essential of a given whole, that is, break it up into pieces, isolate them, and synthesize them;

6. to abstract common properties reflectively;

7. to perform concepts, symbols, to understand them;

8. voluntarily to evoke previous experiences, for example images;

9. to assume the attitude toward the “merely possible;” and

10. to detach the ego from the outer world or from inner experiences.

It has often been said that the defect of the patients consists of an

inability to cope with new situations, but that they are able to proceed in an abstract way as far as old experiences are concerned. The fact, however, is that patients fail equally in familiar situations and in new ones, if the situations demand the abstract attitude. On the other hand, they can cope with new tasks successfully, but they can do so only as long as these do not require the abstract attitude. Indeed, patients are more likely to fail in new situations rather than in old ones because the former frequently demand new sets, in other words, the abstract attitude.

The analysis of many patients' failures in different tasks has shown that a great number of symptoms are explainable as the result of this one defect and that in the same way the variations of the patients' reactions in apparently the same task can be so explained. If the patient seems to be successful at one time and fails at another, this seeming inconsistency is resolved when we realize that the tasks which appear equal to us may (as a result of the disturbance of this function) not be at all the same for the patient. The following example may illustrate this. If we present to the patient an angle built of two little sticks, with the opening downward, and ask him to copy the presentation after it is removed, he produces the angle correctly. If we present the same angle with the opening upward, the patient, after the angle is removed, is not able to produce it. For us, the angles are not different; for him, they are not only different, they have nothing in common. He says that the one (with the opening downward) appears to him like a roof; the

other structure does not mean anything to him. His correct response was determined by the fact that the first structure appeared to him as something which corresponds to concrete experience; he failed with the second structure because this was not the case, because he could not assume the abstract attitude which is necessary to fulfill this task.

This is one of numerous examples which definitely show not only that the patient can react only to (for him) concrete conditions, but also how careful we should be in our interpretation, since the task set before the patient may to him appear totally different from the way it appears to us.

A few further examples from different performance fields may illustrate the failures due to impairment of abstract attitude. Just as the patient cannot deal with figures when they do not represent concrete objects, he fails further when he is confronted with ideas, thoughts, and feelings when their handling presupposes abstract attitude. He is unable to shift from reciting one series (for instance, numbers) to another (days of the week), because active shifting is impossible for him. He can follow or even take part in a conversation about a familiar topic or a given situation, but if he has to shift to another topic—even one equally familiar—he is at a complete loss. He may be able to read a word and, at another time, spell it, but when asked first to read and immediately afterward to spell, he is unable to do so. The patient's speech in everyday life may not show much deviation from the norm. He may in certain

situations have a great number of relevant words at his disposal; this is the case when the words belong concretely to the situation. He will fail concerning the same words, however, when the situation demands that he consider their meaning. His words fit only definite concrete situations. He cannot understand that the same word can have different meanings. In respect to learning, he has the greatest difficulty in rote learning and very quickly forgets what he has learned. The same difficulty exists in the behavior of the patient with regard to practical activities, such as handicraft and labor. (Concerning the symptomatology of such patients, see.)

I would like further to mention two important general points. The first is that loss of abstract capacity cannot be regained by retraining. Only improvement of the brain damage may more or less restore the impaired capacity. The second point is that there are different degrees of abstract behavior, depending on the extent of conceptional complexity which the performance in question involves. Thus the patient may be able to fulfill some performances which need abstract consideration. The highest degree of abstract behavior is required for the conscious and volitional act of forming generalized concepts or for thinking in terms of a principle and its subordinate acts and verbalizing these acts. Similar abstract behavior is the act of consciously and volitionally directing and controlling every phase of a performance and of accounting for it verbally.

A lower degree of abstraction is necessary in volitionally planning an act or series of acts without distinct awareness of or self-accounting for every phase of its further course. In some performance, as in intelligent behavior in everyday life, only the directional act is usually abstract, and the ensuing performance follows a concrete plan. Here the patient may be successful until difficulties arise. He may fail when the required shift demands the abstract, anticipatory deliberation. It is apparent that only careful analysis of each performance in respect to the degree of abstraction required for execution will allow us to decide whether or not the patient is disturbed. The decision is easiest if some tests which have been constructed for this purpose are used.

We are inclined to believe with Jackson that the abstract capacity, the symbol function, being the expression of the most complex function of the brain, suffers first in damage to the brain cortex, while isolated lesions in the motor and sensory areas show only damage of the concrete performance "instrumentalities" (see p. 188). Not infrequently, the symptomatology consists of a mixture of damage to both parts, although the damage may not necessarily be equal in both. Thus we can get very complex clinical pictures.

The opponents to the organismic approach stressed that it took into consideration only symptoms belonging to the higher level, the abstract attitude. This criticism may appear to be justified, since some authors mentioned only these disturbances in aphasic patients, because they

considered aphasia an expression of a damage of symbolic function or "intelligence." This holds true, for example, for Pierre Marie, Ludwig Binswanger, and Kronfeld and Sternberg. It is, from the organismic approach, not at all appropriate, however, to omit the symptoms belonging to defects in the lower-level function, the so-called motor and sensory instrumentalities, which are necessary for realization of the symbolic function in the performances of the organism. The very complex picture which aphasia represents, in which motor and sensory disturbances of letters, words, and other features of language not dependent on the defect of the symbolic function are often so completely mixed with those which are dependent on it, gives all the more reason to study carefully the structure of *all* abnormal phenomena. Otherwise, one cannot reach a correct conclusion as to the origin of the clinical symptoms. This is all the more necessary since defects in the instrumentalities *secondarily* influence the use of the symbolic function. Only by analysis of all symptoms can one clarify what is primarily due to the latter. Indeed, even Jackson showed insufficient interest in the effects of disturbances of the "instrumentalities," in the destruction of single words and letters, in the disturbances of grammar, of the finding of words, and of sentence formation which are related to dedifferentiation of the function of the motor and sensory apparatuses.

The problem of the relationship between the disturbances in damage of the instrumentalities of language (the instrumentalities belonging to the

concrete forms of behavior, see Goldstein, p. 163) and those due to damage of the symbolic function interests us, particularly, because clarity concerning this relationship is essential for correct evaluation of the symptoms not only in aphasia but in all performance fields.

Jackson did not sufficiently evaluate the disturbances of the instrumentalities, because he considered the separation between the higher and lower functions of the brain cortex to be too absolute. There is no doubt that the processes in the higher and lower levels of the brain are, to some extent, associated; both belong to the "mental apparatus." The organismic approach assumes that any damage which concerns one part of an apparatus changes the function of the rest of the apparatus as well; the "parts" can be considered as only artificially separated "parts" of a whole. This is the case in the connection between the lower- and higher-level functions of the brain cortex. Under normal conditions all performances are determined by a working together of both functions as a unit. Under certain conditions, performances come into the fore which are related to the one level; under other conditions, those which are related to the other level. Such a preponderance of behavior related to one level exists if this level is important for the self-realization of the individual in a particular situation. Thus, for instance, if an individual is thinking with concentration, the concrete world is more or less forgotten; it is, so to speak, in the background (see p. 109). The opposite holds true when an individual is totally involved in concrete

behavior. The various abnormal performances correspond to the different ways in which the union of the two functions is impaired.

Jackson speaks of a disintegration from the voluntary to the automatic-emotional level. He goes so far in his separation of the two levels that he assumes, concerning language, that the lower-level activities are related to the "inferior" hemisphere, the right one, while the symbolic function is connected with the "superior" left hemisphere, an assumption which is not in accord with the newer concept of localization. Indeed, Jackson has stressed, in general, the modification of the function of one apparatus owing to damage of another one connected with the first one. On this concept is based his distinction of positive and negative symptoms; the negative ones are an expression of the direct damage of an apparatus, the positive ones the effect of the modification of the function of an apparatus due to another one to which it is related. But he did not come, in my opinion, to a correct conclusion regarding the function of the lower-level apparatus separated from the function of the higher one in disintegration of brain function. He assumed that defects in the higher level did not alter the behavior related to the lower level, in so far as the lower level continues to remain "integrated." We assume, too, that impairment of abstract attitude is an effect of a dedifferentiation of brain function, a reduction of the most complicated function to a simpler one; however, this does not imply that the undamaged lower-level apparatus remains unmodified in its way of functioning. Phenomena belonging to the

lower level do *not* remain fully integrated, and the preserved automatic and emotional performances of the patient do *not* simply represent the effect of the lower-level function as it existed before. It is not enough to say that the function of the brain is *reduced* from a level corresponding to the voluntary activities to a lower one corresponding to emotional and automatic performances. The character of this reduction, of this modification of the brain function, has to be considered if one wants to understand behavior on the lower level in all its details. Neither the automatic nor the emotional reactions of patients with impairment of abstract attitude appear, on closer investigation, “normal.”

## The Automatisms in Damage of the Higher Level of Brain Function

The automatic reactions in damage of the higher level of the brain function show definite deviations from the norm. They do not come so easily into action. Conditions in the outer world or within the individual, which usually instigate them, must now be present in a very "adequate" way; in even small deviations from the familiar conditions, the learned automatisms do not occur. So, for instance, it is not enough to ask the patient to utter the (very automatized) series of numbers; the first numbers often have to be presented orally; only then is the patient able to speak the rest of the series correctly. If the patient is interrupted at any point in the procedure, he will not be able to continue, as a normal person would. These and many other phenomena not only show that the automatisms also are functionally modified in damage to the higher level, but also point to the fact that the automatisms are normally closely related to the higher level, more closely than one usually assumes.

The observable modifications of the automatic reactions are not fully explainable by the assumption of a lack of the influence of the higher-level function; only when one considers them as a change in the normal relationship between the figure and ground in the unit they represent can they be understood. Every process in a stimulated area is accompanied by a definite excitation in the part of the organism not directly stimulated. We call the excitation in the stimulated area the *figure* and the excitation in the rest of

the organism the *ground.* All performances of the organism, as well as all experiences, are so organized. Figure and ground are intimately interconnected; to every figure belongs a definite ground. The phenomena corresponding to either one can be properly evaluated only by considering the other as well. What is meant by figure and ground is most obvious in visual experiences; however, all other experiences and performances, such as motor reactions, speaking, thinking, feeling, etc., are organized in a similar way. To this organization of the performances correspond equal organizations of the physiological processes in the nervous system.

All damage to the nervous system, especially brain damage, disturbs the figure-ground organization in general or in a part which belongs to a definite performance field. The sharp differentiation of figure from ground suffers, including a general leveling or intermingling of the phenomena belonging to figure and background. This can, at times, be carried to the point of inversion, so that what normally is figure becomes ground, and vice versa. We expect a definite figure as reaction to a definite stimulation, but the patient may respond according to the background. This change of the normal figure-ground organization is the basis of a great number of symptoms in damage of the nervous system and in neuroses and psychoses. It is clear that reactions in isolated parts will be deprived of the influences of the normal figure-ground organization which goes on within them, and that they will thus be changed, particularly in respect to their contents. Normal figure-ground organization

is, like all performances, dependent upon processes belonging to the higher level as well as to those within the realm of the instrumentalities. It is determined by previous experience, by memory. Furthermore, one has to consider that figure-ground organization in one field is related to the figure-ground organization which the whole organism represents.

In all performances the whole unit is in action. According to the significance of one or the other part for the performance, this part is in the foreground, but the performance is correct only if it occurs in correct relationship to the background which the other part represents—which changes according to the demands of a definite task. If the lower-level function is somewhat separated from the higher-level function, this will come to the fore in modifications of the automatisms, according to the significance of the higher-level function in preserving the relationship of the two levels for definite tasks of the organism—in some tasks more, in others less. Thus the patient's difficulty in starting an automatic series shows that, for the setting in motion of an automatism, some higher-level function (I would say some abstract attitude) is necessary. What has taken place following disintegration of the brain function is a damage of the normal figure-ground relationships between the two levels, which may be observed in variations of the automatic activities under various conditions of the whole organism, by which the figure-ground relationship is determined. Normally, this figure-ground relationship exists which makes possible the fulfillment of the task to which

the organism is exposed. After damage to the higher level function, the figure-ground organizations are disturbed—the most complicated ones more than the simpler ones. This shows that the automatisms are, in general, effective, but they are not normal, being modified by the disturbance of the more complicated figure-ground configurations in the disintegration of the brain function involved.

This interpretation of the automatic performances in disintegration of the brain function corresponds to the general explanation of the automatisms and reflexes, to concrete behavior in general, which I have given on another occasion (see Chap. 5 American Handbook of Psychiatry Vol. 4). I tried to show that these phenomena are not the effect of isolated processes in the organism but represent figures in organizations of the whole organism which differ from those in normal performances only in the special form of the organization.

There is another factor which brings us further understanding of the modification of the behavior in damage of abstraction: the influence of isolation of the lower level in its function. The change of the function of one part of a unit owing to its separation from another part cannot be considered alone as the effect of a lack of influence of one on the other. The effect of isolation itself modifies the function of the separated part. Consideration of this factor has proved to be of the greatest significance for understanding many symptoms in pathology. It has shown that the modification follows

definite laws which are equally discernible in each performance field which is in a state of isolation. The modification by isolation concerns particularly the dynamics of the processes. We shall consider them in more detail later, when we take up symptoms which are the effect of direct damage to the instrumentalities.

## Emotional Reactions in Disintegration of the Brain Function

For Jackson, the paradigm of the lower-level function was emotional, interjectional speech which is usually fully preserved in damage to the higher level, the symbolic function. Concerning this preservation of emotional, interjectional speech, we are confronted with a more difficult problem than in the automatisms—owing to the uncertainty of opinion about the nature of emotions. Jackson was inclined to consider emotional reactions as belonging to the same category of behavior as the automatisms, and thus to consider the preservation of both in disintegration of brain function as equal phenomena. It is doubtful whether it is justified to put the two groups of phenomena under the same heading. Normally, they show a number of differences, particularly a different relationship to the total personality and to the symbolic function. Automatic phenomena represent part processes of the voluntary activities and are dependent on them. They always occur under the direction of the latter or under the direction of outer-world influences. Emotional reactions are not voluntarily produced, but their connection with the abstract attitude differs essentially from the connection of the automatic activities with the latter. The emotional activities have something in common with the abstract activities in that both represent attempts of the personality to come to terms with the world, that both are emanations of a definite attitude toward the world. The emotional attitude differs from the abstract attitude, however, in that this coming together of personality and world is

more immediate, more in relation to the existence of the individual, while the abstract attitude guarantees the organization of an ordered world separated from the individual. Because of this close connection to the existence of the individual, emotions play a particular role in all forms of self-realization and occur in concomitance with, and not in dependence on, the voluntary activities. One has often assumed that emotions are simply disturbing phenomena. This is most certainly wrong. I would like to refer in this respect to newer research published by Leeper and K. Goldstein. Success and failure in all performances are accompanied by definite emotions. Which kind of emotion arises depends on the implications of the situation with regard to the individual's way of realizing his nature in a particular case. The correct emotions—that is, those which help to achieve self-realization—are of great significance for executing correct performances.

The emotions are complex phenomena; they consist of inner experiences which are not conscious in the usual sense of the word, but of which we are well *aware*. They consist further of activities by which they are "actualized"—movements of the face and body, the so-called expressive movements of different kind; of linguistic utterances such as interjections, sounds, words, and sentences which are brought to the fore in characteristic intonations; and finally of physiological processes in the vegetative nervous system.

What has been called emotional language represents the linguistic part of the motor activities (instrumentalities) belonging to emotions. The activities in emotions—and so also the linguistic phenomena—are based on innate mechanisms acquired in experiences related to the world in general, and most particularly in relation to other human beings. These motor phenomena correspond to the other automatisms in so far as they are concrete activities and come to the fore in emotional situations, as the automatisms do in voluntary activities.

From this aspect it seems incorrect to speak of emotional language; it would at least be less prejudiced to speak of linguistic means, linguistic instrumentalities for realizing the emotional attitude which a situation provokes. They represent special linguistic phenomena, but they are not different in principle from those instrumentalities which are used in abstract attitude. Emotional language is a special, not a more primitive, form of language. The emotional attitude is not a more primitive attitude than the abstract one; it differs from it by another kind of relationship to the total personality, a closer one. It seems appropriate to assume that the greater significance of emotions for the existence of the personality in the world makes the substrata underlying them more resistant to damage of the brain function. It is for this reason that they are better preserved than those substrata underlying the symbolic attitude.

From our discussion it seems that we are not justified in considering that emotional reactions are equal to automatisms. We have mentioned that the automatisms show modifications in impairment of abstraction. Does that impairment not find expression also in differences between the emotional reactions of the patient as compared to those of normal individuals? I think it does. Clarification of this point seems to me important for a better understanding of the abnormally frequent occurrence of emotional reactions and their modifications in patients.

Considering the facts, we must stress the following: Emotional phenomena usually are more predominant in patients with impairment of abstraction than in normal people. Most probably the reason for this is that the world of the patient, owing to impairment of abstract attitude, is not organized normally and so makes many normal reactions impossible. The patient, when urged to react, tries to do what he is able to do, and he is most able to produce emotional reactions, and therefore also emotional language. The emotional activities, however, occur not only more frequently than normally but they are modified as well. They show the characteristics of *isolation*; the isolation is due to the lack of the normal relatedness to the reactions in the abstract world, by the impairment of the latter.

Thus we come to the following result: Preservation of the emotional language is an expression of the preservation of emotional reactions; in

individuals with disintegration of the brain function, it is *not*—as is the case in preservation of the automatisms—a direct effect of an inferior brain function coming to the fore. Preservation of emotional reaction represents the maintenance of this attitude of man toward the world, which, in normal man, exists alongside the abstract attitude. Because the emotional attitude is more closely related to the personality and more important for its self-realization, it shows greater resistance toward damage of the brain function and thus may remain undisturbed when the abstract attitude is disturbed. The emotional instrumentalities are preserved in the same way as are the instrumentalities in general in impairment of abstract behavior. This shows in the possibility of using them in concrete behavior. The odd preservation of emotional language does not present a special problem. Whether a patient is able to produce language or not depends on the attitude under which such language is demanded in a given situation, that is, whether the abstract one or the emotional fits the situation. If the latter is the case, the patient will bring out words; in the former case, he will not. This could be demonstrated by a great number of examples which show that the patient is able to utter a word in an emotional attitude but is not able to do so voluntarily, that is, in the abstract attitude, even immediately afterward. One particularly instructive example concerning a patient of Jackson may illustrate this. The patient responded to the demand to say "no" by saying, "I cannot say 'no.' " He was not able, however, to repeat the word "no." The speaking of the word "no" in the

sentence is not a voluntary act but belongs to the patient's concrete reactions. The repetition of the word "no" presupposes the voluntary attitude (see ref. p. 71) which he could not assume, therefore he was unable to say the word on demand. From a superficial aspect this would seem to be a contradiction, since the patient was able to say the word "no" with great emphasis when asked to do something which he could not do, that is, when in an emotional attitude. This seeming contradiction is resolved when we realize that the words appear to be the same but actually are not the same, since they represent totally different reactions of the whole organism. The patient was able to utter the word only when the situation induced him to take an emotional attitude. It is obvious that wrong interpretations of the patient's capacities can easily occur if this difference in attitude is not taken into consideration.

I would like to mention, in the latter respect, another very instructive example: it concerns the difficulty in finding words, particularly names of even the most common objects. This is a very frequent symptom of aphasic patients. No matter how similar, on face value, failures of the patients may appear in respect to the finding of words, the defects can be due to a defect of an entirely different function. In one kind of patient, the inability to name is an expression of an impairment of abstraction; in another, it is a sequela of a defect in the instrumentalities of language, a memory defect. The patients of the first kind have not lost the words but are not able to utter them in naming,

because naming, as analysis has revealed, presupposes the abstract attitude. The other kind of patients, with difficulty in finding the name, have no defect in abstract attitude, but their instrumentalities of language are damaged, and therefore they cannot find the words. Only when one considers the whole picture which the patients present does the difference of the origin of the symptom become apparent. As long as one pays attention only to the effective reaction, as has often been done—in this case the difficulty in naming objects—the underlying damage of the brain function may appear the same. This fallacy occurs particularly if one records the results of examination by the plus and minus method and considers the answers only in respect to success or failure. This conclusion from the effective answer, without analysis of the way in which the patient came to the answer, the "fallacy of effect," is the cause of many mistakes in the interpretation of psychopathological phenomena and in the building of theories. It shows up particularly in failures of retraining when the interpretation was wrong.

Similar observations, as we have mentioned, can be made not only concerning the language of the patients but in regard to other motor activities which belong to emotional situations. An example may illustrate this: The patient was asked to behave as he would in a situation in which he became angry with some one and was menacing him. He was not able to do so. When we demonstrated such behavior to him, he began to laugh, apparently perplexed, not quite sure what was meant. He was not able to perform the

action on demand. But, observed in a situation in which he actually got angry, he behaved instantaneously like a normal individual as shown by the expression of his face, the action of his fists, etc. This example points to the important difference which often exists between the patient's behavior during special examination and during everyday life. Observation under the latter condition, so often neglected, deserves the greatest attention.

## Symptoms Due to Direct Damage of the Instrumentalities

Up to now, our description of symptoms in damage of the brain cortex was concerned with effects due to disintegration of the brain function from the higher-level function to the lower one. We have discussed symptoms caused by impairment of the higher-level function, the abstract attitude, and have discussed the effect of the impairment of the abstract attitude on the lower-level function, the motor and sensory activities, the so-called instrumentalities, by which the higher-level function is actualized.

At this point we shall consider symptoms which are the effect of direct damage to the instrumentalities. We have to restrict ourselves here to a *survey* of the different ways in which damage of the function of the brain, concentrated in definite regions, is revealed in modifications of normal behavior. From this point of view, we have to classify the symptoms into two main groups.

### Symptoms which Represent Direct Sequelae of Damage to the Substratum of a Definite Region

These sequelae rarely take the form of complete loss of a performance; more commonly, the performances affected undergo modifications. Such modifications can be considered as a result of a systematic disintegration of the concerned function. Structurally, this disintegration invariably exhibits

the same features, regardless of the region involved, be it the spinal cord or the subcortical apparatus, and regardless of whether it concerns reflexes, motility, sensation, speech, thinking, or feeling. A particularly important consequence of this dedifferentiation is impairment of abstract attitude and abnormal concreteness of behavior, about which we have spoken before.

All direct damage causes a rise of the threshold and a retardation of excitation. The receptivity of the patient is reduced in the involved sense organ. It takes him much longer to react. This manifests itself in the fact that patients may succeed perfectly in a task when they are given a sufficiently long time of exposure but fail in the same task when given only brief exposure, for example, when examined by the tachistoscope. (The tachistoscope is an instrument which allows exposure in different short lengths of time.) Pathology consists of a slowing down of the physiological process.

The patient may perceive when the stimulus is strong enough and presented long enough, but he may cease to see it after a certain time, in spite of continued stimulation. Later, the sensation may appear again; it seems that the threshold changes during stimulation. This is also true in stimulation of normal individuals, but it is far more apparent in brain damage.

When excitation takes place despite obstacles, it spreads abnormally

and remains effective an excessively long time. This is due to disturbance of the process of "equalization" by which the effect of the stimulation is regulated (see Goldstein, p. 113). Examples here are phenomena such as tonic innervation, repetition of the same movements, reiteration in reflexes (clonus), etc. A word grasped with great difficulty by an aphasic patient sticks, perseverates, and influences subsequent performances.

Another characteristic effect of the damage is the fact that performances are determined to a much greater extent than normally by stimulating influences, external or internal. We call this abnormal stimulus responsiveness.

### Symptoms Due to a Separation of an Undamaged Area from a Damaged One

By such separation or, better, "isolation," the function of the undamaged area, and thus the performance, is modified in a definite way. The pathology can consist in an isolation of parts of the unit which the organism as a whole presents and an isolation of the subunits corresponding to definite performance fields. Isolation can occur in gross anatomical separation or in functional separation; it can also occur in psychological conditions.

It seems useful to give here a brief summary of the functional changes caused by isolation (see Goldstein, p. 133). The reaction appears modified in the following ways:

1. The effect of an adequate “stimulus” is abnormally strong.

2. The effect of an adequate stimulus is of abnormal duration.

3. The reaction is abnormally influenced by inadequate stimuli, external or internal. It is abnormally “stimulus bound.”

4. The individual is forced to react. He appears to be easily fixated when his reaction to the present stimulus is completely successful. If his reaction, however, is not fully successful, he seems to be forced to react to another present stimulus. If, now, the correct reaction takes place, fixation will set in; if the correct reaction does not take place, the patient will again be forced to react to still another stimulus, etc. Thus he may appear very distracted. The patient seems to be driven to achieve an “adequate” reaction by which the entrance of “catastrophe” is eliminated (p. 197). Fixation and distractibility appear so as the two results of the same defect under different conditions.

5. As a result of loss of the normal influence of the rest of the organism on the activity in the isolated part, the reaction appears to be lacking special contents. It appears, or actually is, more “primitive” because it lacks properties belonging to the “nature” of the individual. The degree of primitivity and diminished appropriateness depends on the place and extent of the isolation, on how large a part of the whole organism is excluded from cooperating in the reaction (see p. 148 ff.).

6. Isolation distorts the normal figure-ground organization which is of essential importance for the outcome of any normal reaction.

All the factors mentioned above are responsible for occurrences of abnormal performances, and all of them have to be considered in the evaluation of any one symptom in damage of the brain cortex.

## Symptoms Representing the Reaction of the Individual to the Defect

So far, we have discussed symptoms in brain damage only in their relation to defects of structure and function of the brain. Our results were still somewhat unsatisfactory, particularly in regard to *understanding the variability* of the symptoms. We must try, therefore, to go a step further, to regard the phenomena not only in their relation to the damage of structure and function but in their relation to the reaction of the individual and of the whole organism to the defect. Such a step corresponds to the procedure of the organismic approach and often leads to a better understanding of the patient's behavior.

Systematic investigation of the patient's general condition while he is able to fulfill a task and when he is unable to do so reveals another fallacy, which consists of only recording the effect of failure or success in the performance. One observes, particularly in patients with impairment of abstract attitude, that the patient, unable to fulfill a simple, seemingly unimportant task, may be completely changed in his total appearance. The same man who, shortly before, looked animated, calm, in good mood, well poised, collected, and cooperative, while successfully fulfilling a task, appears now to change color, to be agitated; he starts to fumble and becomes unfriendly, evasive, even aggressive. This overt behavior is very reminiscent of that of a person in a state of anxiety. The relationship of this general

condition to the capacity of fulfilling a task becomes particularly evident from the fact that such a general condition can be experimentally produced, in some patients, by presenting them with a task which we know they will not be able to perform.

We call the state of the patient, when he is successful, an ordered condition; the state in a situation of failure, a disordered or catastrophic condition. In the latter condition the patient is incapable of performing tasks in which he is usually successful, which he is able to do very well when in the "ordered" condition. Such failure lasts for shorter or longer periods of time. One observes frequent catastrophic conditions, particularly in patients with impairment of abstract capacity. Since an individual with such impairment is unable to account to himself for what he is doing or experiencing we assume that he is not aware of his failure; as a matter of fact, he is unable to say, when questioned about it, whether or not he has been confronted with something frightening. Hence we come to the conclusion that the catastrophic condition is not a conscious reaction to the failure but, rather, belongs intrinsically to the objective situation of the organism in failure.

Even the smallest failure may have this effect on these patients, since they are unable to decide which failure might be dangerous for them and which might not. They are, so to speak, always endangered whenever their reaction is not adequate. Thus any objective failure can bring the organism

into disorder, into catastrophe, into anxiety.

I cannot, in this presentation, discuss the consequences of our description of these phenomena for a theory of anxiety (see Chap. 7 American Handbook of Psychiatry Vol. 4). Here, we are interested only in the symptoms which these patients show, owing to the occurrence of anxiety, which are not directly related to the damage of the brain. If we do not pay attention to this, we may be deceived about the patient's brain defect and may consider symptoms as being related to it, when actually they are not. Consideration of the phenomenon of catastrophe explains the variability of symptoms under similar conditions.

One factor which is apt to modify the symptomatology considerably is the development of protective mechanisms by which the occurrence of catastrophes is eliminated or at least reduced. It is easy to understand that all patients, when they do not essentially improve, have the greatest desire to get rid of the anxiety, for otherwise they are prevented from using even their preserved capacities and thus from coming, at least partially, to a state of self-realization.

We realize that patients with even severe brain damage and impairment of abstraction show, after a certain time, a diminution of the disordered behavior, of catastrophic conditions and anxiety, and yet, examination reveals no change whatever in the damage to their mental capacities. In such cases

this can occur only if the patient is no longer exposed to tasks he cannot cope with, or is able to take the failure without reacting with catastrophe. Concerning the first point, observation of his behavior in everyday life reveals that he lives apparently in a modified environment, an environment from which far fewer tasks arise which might lead to catastrophes. How does such modification of environment take place? Observation shows that the patient is withdrawn from the world around him so that a number of stimuli, including dangerous ones, do not arise. He avoids company. He is as much as possible doing something which he is able to do well. What he is doing may not have any particular significance for him, but concentration on activities which are possible for him makes him relatively impervious to dreaded stimulation. Particularly interesting is his excessive orderliness in all respects. Everything in the surrounding world has a definite place. Similarly, he is very meticulous in his behavior as to time, whereby the determination as to when he should do something is related to events and to activities of his which always occur at the same time, or to a definite position of the hands of a clock. This orderliness enables him to prevent too frequent catastrophes.

Another interesting protective mechanism is unawareness of the defect. We observe this particularly in patients with impairment of abstract attitude, but also in patients who are incapacitated in a special performance field without mental damage, for instance, in severe hemiplegia. This symptom, called Anton's symptom, described first by Anton in 1899, occurs particularly

when the incapacitation is total (see p. 38), so severe that the patient is not able to use the disturbed capacity at all. The symptom may not take place if the defect is partial and if the patient is able to use the capacity at least to a certain degree, for example, if he can move his paralyzed leg somewhat. This protective mechanism has been described as denial, a procedure which would demand a somewhat conscious activity. I do not think that such an interpretation is correct. Certainly, it can be rejected as far as it applies to patients with impairment of the abstract attitude, who are, owing to this defect, unable to do anything voluntarily. Whether the phenomenon becomes more understandable if one ascribes to it unconscious influences is doubtful. I think it is sufficient to consider it as an effect of a new organization of the behavior of the organism, which, though *not directly related to the defect,* occurs from the organism's tendency to realize the capacities which it has, in pathology those which are preserved. Within this new organization the effect of the disturbance does not become apparent. This would make it understandable that the patient is not only unaware of the defect, but that the defect is so arranged in his behavior, without his knowledge, that the disturbance does not show.

It is not the disagreeable experience of the failure itself which produces the new organization. This becomes evident when lack of awareness or other protective mechanisms disappear under the influence of the physician. As transference develops between patient and physician—when, for example,

under the influence of the physician the patient learns to bear his disturbances and learns through his own experience that, by bearing them, his general contact with the world is improved—then he is more able to realize himself without the shelter of the protective mechanisms. With this added security, he is able to give up his safeguards. Indeed, the more the abstract capacity which makes such deliberation possible is preserved, the more is this the case.

We consider the organization of protective mechanisms as an expression of the attempt of the organism to come to terms with the demands made on it, in such a way that self-realization is guaranteed as much as possible. I would like to stress that these passively originating, protective mechanisms occur not only when the abstract attitude is impaired but also if it is by circumstances diminished, as, for example, in severe anxiety in normal individuals.

There is another way to eliminate danger to self-realization which is produced more actively by conscious interference. One should distinguish these mechanisms, which occur particularly in neuroses, from the passively originating protective mechanisms by terming them differently—by calling them defense mechanisms.

In view of these facts, we should be very cautious in the interpretation

of symptoms; the possibility that some phenomena observed in the patient might not be the effect of a damage but of a protective mechanism always has to be considered. This concerns also the absence of symptoms by "denial," which might be expected in a special damage of the brain.

Somatic symptoms, resulting from defects of the nervous system, can also bring the patient into general disorder. Here also, we observe after a certain time, a modification of behavior by which, even when the original damage is neither eliminated nor improved it is no longer effective. For instance, a patient may, after damage to one hemisphere of the cerebellum, suffer from disequilibrium, falling, deviations in walking, etc., and from different disturbances in general, subjectively and objectively, and so may be hindered subjectively or objectively in his self-realization. After a certain time the general disturbances improve, without improvement of the pathological condition (which special examination shows existent as before). Concomitantly with the general improvement, however, we see that a deviation of the body has occurred, which seems to bring about a new equilibrium, a better general condition, and thus a better possibility for self-realization. The patient, however, is not aware of his deviation.

That this general improvement is related to the deviation becomes apparent by the fact that improvement disappears immediately when one tries to eliminate the deviation; in other words, such action brings the patient

into the previous condition, into catastrophe. We say that the deviation represents the individual's new, preferred condition (see p. 340). The following few remarks may explain what is meant by this. If we consider an organism by the usual atomistic method as composed of parts, members, and organs which can be used in very different ways, and if we then look at the organism in its natural behavior, we find that many kinds of behavior which, on the basis of the first consideration can be conceived of as possible, are actually not realized. Instead, only a definite selective range of behavior can be observed. Normally, each performance is executed only in a definite or, as we say, preferred manner. Observation of the whole organism in a situation where one performance field—be it motility, perception, language, etc.—shows preferred behavior reveals that all other performance fields exhibit preferred behavior as well. In the above case we say that the organism is in an ordered condition; it performs all its activities in the best way; it can use all its capacities in coming to terms with the demands of the outer world; it has a definite constant visual acuity, an erect position of the body, is able to speak and to act according to its nature, that is, is able to realize itself in the best way.

The organism always tries to achieve such ordered behavior in spite of its defect. It can be reached only through modification of the behavior in the damaged performance field by finding a new preferred behavior which goes along with a somewhat modified but preferred behavior all over. This must be

considered in our evaluation of deviations; we have to distinguish those which are the expression of the defect from those which are an expression of the new, preferred behavior; that is, from those which are means to guarantee the new order. This distinction demands careful study of the influence of the deviation on the behavior of the whole organism, that is, whether or not it is accompanied by order or disorder of the latter. A symptom belonging to a preferred condition is characterized by the fact that any voluntary change of the new preferred behavior brings the organism into general disorder and that it returns involuntarily to that very behavior. So, for instance, should the head be in a tilted position, any attempt to bring it to the normal erect state produces not only general disorder, but the head returns involuntarily to the new preferred condition, in this case a tilted position.

What we have described here concerning the effect of a cerebellar damage can be observed in damage of each performance field in the change of the direction of the performances toward a new preferred order. This new preferred condition can be achieved in two different ways. One way consists of yielding, giving in to the defect; the other, of building a counteracting mechanism by which the effect due to an abnormal condition is compensated. These two ways of eliminating the danger to self-realization do not present equal effects. By the first, the normal functioning is, in principle, unchanged. It is the more “natural” procedure; it occurs more automatically, scarcely demands voluntary activity on the part of the individual, and therefore brings

greater security. By the second way the normal form of functioning in the particular apparatus is changed. It is a more volitional type of behavior; it is not as secure, leads more readily to fluctuation, and admits greater possibilities for catastrophic reactions. Whether one or the other way of adapting to the irreparable defect occurs depends on which offers the best possibility for self-realization under the given conditions. If this is guaranteed by the first procedure, it will occur, since it is the more secure procedure; if, however, this is not possible, then the second way of adaptation occurs.

The significance of the preferred condition for the best performance must be considered most carefully in all therapy, even if that condition deviates from the "normal." Any attempt to bring the patient into the "normal" condition may make all treatment meaningless and inane. The similarity of this situation in organically disturbed patients and in neurotics is theoretically of the greatest interest. Unfortunately, we cannot even touch this point here.

We mentioned before that the symptomatology of a patient with brain damage can become more difficult to understand in direct relation to the defect because of a factor other than the protective mechanisms. This factor is the development of the relation between the physician and the patient. If this relationship is good, the patient will no longer become afraid so easily and the occurrence of catastrophes may be diminished; thus, many defects may come

to the fore which the patient concealed simply by not reacting because he was afraid to let them appear. The development of a kind of transference between the patient and the physician is of the greatest significance for a correct examination, for finding the defects related to the damage, for evaluation of the symptoms, and, not least, for execution of correct therapy. This development of transference in organic patients has not had the attention it deserves. In this respect I would like to refer the reader to my article about organismic therapy.

## The Nature of "Distorted" Performances and Their Interpretation as Symbolic Phenomena

The discussion of the protective mechanisms, particularly their consideration as new preferred behavior, has some bearing on the understanding of phenomena which are usually called compensational or distortive. When we observe such phenomena, the question of whether we are actually dealing with pathology always arises. I have in mind particularly some reactions, unusual as to form and content, of aphasic, apraxic, agnostic patients. What does the material which the patient brings to the fore represent? Sometimes it certainly is the expression of disturbances in the field of the instrumentalities. Sometimes, however, one gets the impression that the material corresponds to activities and experiences which have played a particular role in the premorbid life of the personality, and which are now released, so to speak, through pathology. From this point of view such material has been considered as of particular significance for the study of the deeper level of the patient's personality. It seems to me important that we look at these phenomena a little more carefully than is usually done. They deserve attention not only in relation to their interpretative value as symptoms but from a more general point of view as well. They have suggested an interpretation as "symbolic" phenomena, which, in my opinion, is mostly wrong. The error originated because their relationship to the total condition and behavior of the patient was not fully considered.

Some utterances of aphasics, also of such whose symbolic function was generally disturbed, can easily give the impression of symbolic phenomena and often have been interpreted as such. I think they can be understood in various other ways as well which are not in contradiction to the existing basic defect, the defect of the symbolic function. Some are so-called "physiognomic phenomena" and represent normal reactions which occur in a special concrete and not symbolic attitude of the individual. This is easily overlooked because these phenomena are not well known. In our culture particularly, they play a small part in everyday life and are not familiar except in the experience of artists. In normal life they are, so to speak, embedded in our realistic everyday attitude toward the world, and they come to the fore only in special situations. We do not have sufficient studies of the physiognomic behavior of our patients, but I feel justified in assuming, from my experience, that this behavior differs from normal physiognomic experiences which are related somewhat to the symbolic attitude. This relation is lacking in the physiognomic experiences of the patients. They appear particularly when the attitude of abstraction is diminished by pathology, and especially in patients with a premorbid inclination for the physiognomic attitude toward the world. Such utterances should not be considered as symbolic. For these patients, a shifting from the physiognomic attitude to the more usual attitude, which, for normal individuals is easy, becomes almost impossible. Their aspect is, so to say, fixated due to "isolation."

Other utterances are more difficult to evaluate and frequently give rise to symbolic interpretations. They are outstanding in the sense that they consist of poetic, symbolic, or even newly coined words; they may appear to be utterances of particularly intelligent, cultured, and erudite personalities. I have often observed such "quasi-symbolic" phenomena in aphasic patients. In a recent paper, W. Riese has stressed the occurrence of such phenomena. He has considered them as means "evidently to compensate the naming defect of the patients." The patients' neologisms "impress the listener by their descriptive and figurative power." The language of one of his patients, "a highly educated scientist and humanitarian" before his sickness, became "after a brief initial period of complete loss of speech, formal, solemn, poetical, dramatic, pathetic and 'Shakespearean,' frequently using quotations." He continues: "What the brain injury brought to the fore was that element in his nature which disease could not destroy, but rather released" and "I reached the conclusion that disease may occasionally reveal though in a distorted fashion what is great and noble in man's nature." p. 11

It is true that such utterances and behavior may occur in patients with brain defects. I have noted that disease may emphasize the premorbid character of the patient, especially in the way the patient now bears the defect and in what way the untouched part of the personality helps him to overcome his failures. Whether in a patient with impairment of the abstract attitude an interpretation such as W. Riese suggests is justified, I would doubt. In such

cases, I think, we are dealing with phenomena of "quasi-high" value, and I assume that the patient Riese describes belonged to that group. Closer consideration may show that the phenomena represent material which previously belonged to the behavior of a high-level personality, which appears now in the form of protective mechanisms and has lost their previous meaning for the particular individual. These utterances represent the undamaged remnants of the instrumentalities of speaking and thinking, which prevail now because the adequate activities due to the impairment of abstraction are impossible. The previous particular way of speaking, the previous rhythm and preference for poetic, dramatic, pathetic expression of the personality are preserved, but this material no longer is an expression of the attitude to which it originally belonged, the attitude which is lost through damage to the brain. Some abnormalities which these utterances show, and which Riese has carefully reported, reveal that we are no longer dealing with utterances prompted by the premorbid personality of the patient. They reveal "no planning, no effort, they occur passively, apparently without intent." In all this, they show the characteristics of isolated automatisms. The rapidity and fluence with which they are uttered (which Riese mentions, and which I have often observed on such occasions) may be even better described as being "thrust out." I think that the patient utters the words in this manner because he wants to get rid as quickly as possible of the distress in which he finds himself when he cannot react correctly but feels forced to do so. As one of my

patients said: “If one is asked, one has to answer,” and he brought out something which occurred passively in him by *association* of previous knowledge to the task he had to fulfill now. He said definitely that he did not know and could not say how it entered his mind, but that he was forced to utter it.

Such examples definitely point to the fact that these utterances are not related to the present personality. Certainly, their prominence is an indicator that we are confronted with experiences which the individual has had before, and therefore his utterances may reveal the premorbid character of the personality, but we cannot assume that they represent the old personality as released by pathology. In any case, we must be careful to see whether we are justified in so doing or whether these utterances do not belong to “quasi-high” behavior.

I have discussed these phenomena in some detail because I consider it important for the psychiatrist to be fully aware of this problem. We meet the same problem and the same wrong interpretation in the evaluation of utterances of schizophrenics, which have often been considered as symbolic, as expressions of deep insight into the essential things of human life, which disease has revealed. Here too, I do not want to deny that the particular premorbid personality of the schizophrenic patient may become apparent in some of his behavior. This is understandable, because we assume that the

patient is not totally modified in the typical schizophrenic manner but is partially normal, or, better, in some respects normal. (Federn has stressed this particularly.) Thus he may show normal and even high-level personality behavior under some conditions, but I would deny that this particular high-level behavior is related to the schizophrenic condition. We shall understand the behavior of the patient only when we distinguish sharply between high-level behavior and "quasi" reactions which only appear to be of high-level nature. That the latter occur in schizophrenics is to be expected, particularly when we assume that the patient's behavior is frequently abnormally concrete.

We know, since Vigotski's investigation, that thinking in concepts is disturbed in schizophrenic patients, at least in some groups of such patients. This was confirmed by the work of Hanfmann, Kasanin, Bolles and Goldstein, and others. Storch was already doubtful whether one is justified in considering schizophrenic behavior as symbolic. Beck has stressed, on the basis of his Rorschach studies on schizophrenics, that it is an error to assume that the schizophrenic gives the world "a form and outline which the healthier do not see," that he has "a greater power or superior ability to transmute his experience into something richer." The author wonders "whether the general belief in the schizophrenic profuse fantasy life is not due to confusing distortion with fantasy." He adds: "Fantasy actually involves a *creating* of something totally new. . . . The schizophrenics' misconstructions take on

fantastic form. But this is still not fantasy. It is inaccuracy. . . . Not having the power to apprehend the presented real world is what chiefly distinguishes the schizophrenic's percepts and his thinking."

I have come to the conclusion that in schizophrenia we are dealing not with an organic defect of abstraction but with a nonuse of abstraction which concerns only a definite part of the world, and that this is an effect of the anxiety which the schizophrenic experienced in early youth in relation to his personal environment. This nonuse of abstraction is a protective mechanism against the danger of catastrophe and anxiety.

The fact that the origin of the abnormal concreteness in schizophrenics differs from the origin of such concreteness in organic patients becomes apparent in certain essential differences of the symptomatology. This can be seen, for instance, in the frequent appearances of physiognomic experiences. The schizophrenic's utterances sometimes yield "symbolic" interpretations but are often revealed, by analysis, to be only pseudo-symbolic phenomena. Such phenomena are here particularly suited to appear as symbolic, since the distortion of behavior brings out much of the instrumentalities belonging to the preschizophrenic condition of the patient where the symbolic attitude plays a more or less important role in the thinking of the patient. Further attention must be paid to the fact that schizophrenics often build complex mechanisms to cover their ideas, feelings, etc., which may easily appear to be

of a high-level function, owing to their complexity, but which prove to be only complex associations built on a very concrete basis. This is often difficult to unveil, because the schizophrenic has not only passively originating protective mechanisms, like the organic patient, but also has defense mechanisms, which he produces intentionally, that may give the impression of higher-level function and sometimes may be also an expression of it. The picture of schizophrenic behavior is so complex that its origin may be understood only by a very detailed analysis. In this analysis the distinction between real symbolic and "quasi," pseudo-symbolic behavior has to be taken very seriously.

## The So-called General Mental Functions as Origin of Definite Symptoms

I stressed, in the beginning of my presentation, that in the interpretation of symptoms a distinction has often been made between defects in a special performance field and defects of so-called general functions, and that this distinction is not justified since the general functions appear changed in the same manner as do the specific performances. There is not enough space here to give detailed proof of the correctness of my statement, but I would like to make a few remarks about the changes in these general functions, particularly those which are related to the personality change of the patient owing to impairment of abstract attitude. I have chosen these because analysis of this dependence may be especially useful for psychiatrists.

First, there is the problem of memory. Under certain circumstances the faculty for reproducing facts acquired previously may be about normal in patients with impairment of abstract attitude. Things learned in school, for example, may be recalled very well, but that is the case only in certain situations. The situation must be suited to the reawakening of old impressions. If the required answer demands an abstract attitude on the part of the patient, he may be unable to recollect. Therefore he fails in many intelligence tests which seem very simple to a normal person, and may be amazingly successful in others which appear complicated to us, namely in those which can be executed without the abstract attitude. He is able to learn

new facts and to keep them in mind, but he can learn them only in a Concrete situation and can reproduce them only in the same situation in which he has learned them. Because intentional recollection of experiences acquired in infancy requires an abstract attitude of the adult in relation to the situation at that time, and the events in infancy were not experienced abstractively, the patient is unable to recall experiences of infancy, but we can observe that aftereffects of such experiences appear passively, at times, in his behavior. He is incapable of recollecting when asked to recall things which have nothing to do with the given situation. He can recall only when he is able to regard the present situation in such a way that facts from the past belong to it. Repeated observation in many different situations demonstrates clearly that such memory failures are not caused by an impairment of memory content. The patient has the material in his memory, but he is not able to use it freely. He can use it only in connection with a definite concrete situation.

We arrive at the same results in testing attention. At one time the patient appears inattentive and distracted; at other times, he is attentive, even abnormally so. The patient's attention is usually weak in special examinations, particularly so at the beginning, when he has not as yet become aware of the approach to the whole situation, something he can get only through concrete activity. When he has done so, has entered the situation concretely, his attention is usually satisfactory, and he may even appear abnormally attentive, because under such circumstances he might often be

totally untouched by other stimuli from the environment to which normal persons would unfailingly react. In other situations he will seem to be very distracted, as, for instance, in those which demand a change of approach. He seems distracted because he is incapable of making a choice. Consequently, it is not correct to speak of a change in attention in such patients in terms of plus or minus. The state of the patient's attention is but part of his total behavior and is to be understood only in connection with it.

Another important problem is judgment as to the patients' emotional experiences. Usually, the patients are considered emotionally dull, and often they appear so, but it would be incorrect simply to say that they are suffering from a diminution of emotions. The same patient can be dull under some conditions and very excited under others. This can be explained when we consider the patient's emotional behavior in relation to his entire behavior in a given situation. When he does not react emotionally in an adequate way, investigation may reveal that he has not grasped the situation in such a way that emotion could arise. The patient may have grasped only one part of the situation—the part which can be grasped concretely—and this part may not give any reason for an emotional reaction. His emotional reaction appears to us inappropriate because we grasp the whole situation to which the emotional character is attached, while he reacts only to a part of it. This connection between emotions and total behavior becomes understandable when we consider that emotions are not simply related to definite

experiences but are, as I have stressed before (see p. 190), inherent aspects of all behavior, are part and parcel of behavior. No behavior is without emotion, and what we call lack of emotion is a deviation from normal emotions corresponding to the deviation of behavior in general. From this point of view, the following modifications of reactions, which are of particular interest in respect to the problem of emotions in general, are interesting: We frequently see that a patient reacts either not at all or in an abnormally quick manner. The latter occurs particularly when the patient believes he has the correct answer to a problem. Although this quick behavior might seem to be simply an effect of a change in the time factor of his reactivity, it is actually the effect of an emotional factor. To some extent, the patients are always in danger of coming into catastrophic conditions, and the quick response is an effect of their tension, of which they want to rid themselves by all means. They are forced to release tension because they cannot handle it and cannot bear it. To bear tension presupposes deliberation, considering the future, etc., all of which is related to abstraction. The difference in behavior between these patients and normal people throws light on the nature of the trend to release tension. The patients must, so to speak, follow the "pleasure principle." They must, owing to their abnormal concreteness, react to the stimulus in a way which brings release. The trend to release tension thus appears as an expression of pathology, as an effect of a protective mechanism to prevent catastrophic conditions. The ability to speed up an activity or part

of it, when this corresponds to the requirements of the task, belongs to normal behavior, but in the same way as the capacity to bear tension and even to enjoy it at times, when it is necessary to fulfill a particular task. In contrast to this, patients with impairment of abstraction are only able to experience the pleasure of release of tension. They never appear to enjoy anything, a fact which is often clearly revealed by the expression of their faces. This becomes understandable when we are aware of the fact that in any kind of joy immediate reality is transcended, that joy is a phenomenon which presupposes the abstract attitude and especially the category of possibility. Thus brain-injured patients who are impaired in this attitude cannot feel joy. Experience with brain-injured patients teaches us that we have to distinguish between pleasure through release of tension and the active feeling of enjoyment and freedom so characteristic of joy. Pleasure through release of tension is the passive feeling of being freed from distress, and therefore this feeling lasts, in normals, only until a new situation stimulates new activity. Joy, on the other hand, is something we try to extend, something which admits the possibility of infinite continuation.

The two emotions of joy and pleasure play essentially different roles in regard to self-realization. They belong to different performances or different parts of a performance. Pleasure may be a necessary state of respite, but it is a phenomenon of standstill. It is akin to death. It separates us from the world and the other individuals in it; it is equilibrium, quietness. In joy there is

disequilibrium. But this disequilibrium is productive, leading toward fruitful activity and a particular kind of self-realization. This difference in the significance of the two emotional states for the normal person and the brain-injured patient is an expression of the essentially different behavior of the latter and of the different world in which he lives.

The drive toward release of tension is one of the causes for the strange behavior of brain-injured patients in friendship and love situations. The lack of the experience of future forces them to look for close relationships to other people and to maintain such relationships at all costs. At the same time, close relationships are terminated suddenly should their maintenance necessitate some bearing of tension, that is, should any difficulties arise in the relationship. The following example is illustrative: One of my patients, Mr. A., was for years a close friend of another patient, Mr. X. One day Mr. X. went to a movie with another man. Mr. X. had invited Mr. A. to go along with them, but the latter did not want to go, since he had seen the picture before. When Mr. X. returned, my patient was in a state of great excitement and refused to speak to Mr. X. He could not be quieted by any explanation. He was told that his friend had not meant to offend him and that his friendship had not changed, but these explanations made no impression at all. From that time on, Mr. A. was the enemy of his old friend, Mr. X. He was aware only of the fact that his friend had been companion to another man, and he felt himself slighted. The experience had produced great tension in him. He regarded his

friend as the cause of that tension and reacted to him in a way which is readily understandable in terms of his inability to bear tension and to put himself in the place of someone else.

Another patient never seemed to be concerned about his family. He never spoke of his wife or children and was unresponsive when we questioned him about them. When we suggested to him that he should write to his family, he was utterly indifferent. He appeared to lack all feelings in this respect. At times, according to an established practice, he visited his family in another town and stayed there for several days. We learned that while he was at home he conducted himself as any man would in the bosom of his family. He was kind and affectionate to his wife and children, and interested in their affairs in so far as his abilities would permit. Upon his return to the hospital from such a visit, he would, when asked about his family, smile in an embarrassed way and give evasive answers; he seemed utterly estranged from his home situation. Unquestionably, the peculiar behavior of this man was not actually an effect of deterioration of his character on the emotional and moral side; his behavior was the result, rather, of the fact that, owing to his impairment of abstraction, he could not summon up the home situation when he was not actually there, and therefore he could not show adequate feeling and behavior. Lack of active imagination, which is so apparent in this example, makes such patients incapable of experiencing any expectation for the future. Active imagination depends on the abstract capacity.

This lack is apparent, for instance, in the behavior of a male patient toward a woman whom he later married. When he was with her, he seemed to behave in a friendly, affectionate way and to be very fond of the girl. But when he was separated from her, he did not care about her at all; he would not seek her out and certainly did not desire to have a love relationship with her. When he was questioned, his answers indicated that he did not even understand what sexual desire meant. He could not imagine any sexual situation and did not understand pictures which showed such situations. When he met the girl again, however, when she spoke to him, he was immediately able to enter into the previous relationship. He was as affectionate as before. When she induced him to go to bed with her, embraced him and put his penis into her vagina, he performed an apparently normal act of sexual intercourse, with satisfaction for both. She had the feeling that he loved her. She became pregnant, and they married. The above case also reveals the great significance of speech and voice for any relationship, particularly when other possibilities are destroyed by the defect of the brain function, as was the case here.

Some other so-called general factors which are often mentioned as obstacles to examining such patients consist of fatigue and perseveration. Here, also, observation shows that these phenomena are not always present in the same way, that they change according to the situation, as do all performances. Observation of our patients shows that fatigue is not a simple

function of the duration of continuous performance but depends to a high degree upon whether or not the performance in question is within or somewhat above the capacity level of the patient. Thus a paradoxical situation may occur, where fatigue decreases as the activity continues. This happens, for instance, when a later task is “easy” to perform while the earlier tasks could be executed only with difficulty. Another point is the fact that fatigue does not express itself simply as a slowing down of performance but, especially at the beginning, as a fluctuation of performance (Goldstein, p. 260). Subjectively, the individual feels not only incapacitation but also discomfort, uncertainty, and distress. The phenomena occurring in fatigue show great similarity to those observed in catastrophic conditions and seem to be closely related to them. Patients with severe brain damage tire easily because many normal tasks represent difficult ones for them, thus producing distress. While fatigue in difficult tasks may thus be understandable, we may ask whether the same point of view is appropriate to explain the fact that fatigue occurs also in continuous work consisting of a task which is within the limits of the individual’s capacity. I think that is the case. Continuation means consumption of energy which deteriorates the function of the substratum, so that a task which was previously easy to perform may be changed into a difficult one; therefore, mere continuation may produce catastrophe and fatigue. This becomes evident by the fact that fatigue does not set in as early when the task is varied. Boredom and interest influence the fatigue rate. This

must be considered particularly in testing situations. If, after we recognize the onset of fatigue, we should change the task, the patient may then perform without fatigue and may do so better, both subjectively and objectively. This is particularly true if the succeeding task is within the capacities of the individual, and if the change does not demand a voluntary shifting on the part of the individual, which, as we have mentioned previously, is an especially difficult problem for many brain-injured patients. Automatized performances may be continued for a long time without the patient showing and experiencing fatigue. We frequently observe, however, severe breakdowns after excellent performances. This suggests that the symptoms of fatigue are not only signs of catastrophe but also indications of imminent catastrophe—warnings, which, thoroughly considered, may help to prevent the latter. Patients with a mental defect which appears in a lack of planning and foresight are particularly prone to fatigue, since they do not recognize the protective danger signals and thus become abnormally tired.

Perseveration is a frequent phenomenon in brain damage. I am inclined to assume that it is a secondary phenomenon due to incapacitation in some performances, and a means to avoid catastrophe occurring under such conditions. Perseveration occurs particularly when the patient is forced to fulfill tasks with which he is unable to cope. For instance, a patient who has difficulty with arithmetic may be able to answer promptly at long as he has to solve problems which are within his capacity. The moment he is given a

problem which he is unable to fulfill, he may either be thrown into a catastrophic state and not react at all, or he may repeat the last correct result or a part of it, that is, he perseverates. If he is then given an example, however, which he is able to solve, he may again answer correctly, and all perseveration will disappear. The same patient may show perseveration under some conditions and distractibility under others, so that it becomes evident that we are not dealing with a primary defect of rigidity. As we have explained previously, the sick organism tries to react as well as possible to the task set before him. Confronted with assignments which he cannot fulfill, he tries to react to that part of the task in which he is able to succeed by means of his remaining capacity, and he sticks to that rigidly, because thus he can best avoid catastrophe. But under certain conditions he becomes aware that he has not fulfilled the task correctly. Then he gives up the first reaction, I think, because continuing it does not help in overcoming distress. He tries again and may become attached to another part of the situation to which he is able to react, but again may feel that he is not performing the task demanded. Thus he appears abnormally distractible. Neither rigidity, perseveration, nor distractibility is a defect per se; they are phenomena coming to the fore under special conditions which can be defined. They can be avoided—at least to a certain degree—by the same means by which abnormal fatigue can be avoided, because ultimately they originate from the same cause.

## Some Remarks Concerning the Method of Examination

I would like to conclude with some remarks concerning the method of examination which follows the rules prescribed by the organismic approach. From our discussion it is evident that only a method can be successful which takes the relationship of each performance of the patient, each success and each failure, to the whole behavior of the patient and the whole organism into consideration, and which particularly keeps in mind that a performance can be evaluated correctly only in respect to the trend of the organism for self-realization. The organismic approach by no means overlooks the significance of the study of details, correct reactions and failures, of the quantitative deviations from the average and the influence of previous capacities of the individual patient; it uses all available quantitative methods and applies statistics to the evaluation. But one should be aware that statistics can be really helpful only when we are confronted with quantitatively different material, and that, in the symptomatology of brain cortex damage, particularly those which are of interest for the psychiatrist, we are mostly dealing with qualitative deviations from the norm. Statistically valid results, therefore, are not too important for the increase of our knowledge of what pathology did to the patient and what we can learn from pathological findings for understanding normal behavior.

According to our evaluation of the significance of abstract attitude for all

performances, the capacity of abstraction should be tested in the beginning of any examination. Whether the abstract attitude is impaired and how much it is impaired can be evaluated by observing the patient under the conditions of various modes of behavior which can be correctly executed only in this attitude. Some tests have been constructed which allow one to judge the patient's capacity in an easier and more correct way. The tests differ as to whether the material used is language or the execution of some performances —matching, sorting, making choices, etc. The results with the first group of tests are sometimes difficult to establish because of the ambiguity of language and because they are not always simple to apply when the patients are suffering from language defects. The advantage of the other group of tests is not only that they do not use language but also that they are so organized that judgment can be based directly on the results of the behavior of the subject in the test.

As an example of the first group of tests, the Proverb-and-Phrases tests by Hadlich, John Benjamin may be mentioned; as an example of the other group, the Vigotski test should be mentioned, particularly in the presentation by Hanfmann and Kasanin; further mention should be made of the various performance tests of Goldstein and Gelb, Goldstein and Scheerer, Weigl, and others. (See also the papers by Von Domarus, Beck, Cameron, and Angyal, and the psychological monograph by Goldstein and Scheerer.)

The use of various tests in examining the same patient is recommended, since each test differs somewhat as to its applicability and definiteness in determining the impairment of abstraction and as to its ability to characterize the various forms of abnormal concreteness. The technique of the Goldstein-Gelb-Scheerer tests enables one, by the use of various materials and by the application of various specified subtests besides the main test, to determine whether or not a patient can assume the abstract attitude, to measure somewhat the degree of the impairment, and to find out the specific type of concreteness to which the patient is confined. This proved to be particularly helpful in distinguishing between the defect in organic patients and in schizophrenics.

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