IMAGERY AND ITS RELATIONS TO SCHIZOPHRENIC SYMPTOMS.

By Louis H. Cohen, M.D., Ph.D.,

Senior Research Psychiatrist, Worcester State Hospital, Worcester, Mass.

Of fundamental importance in the problem of symptom-formation in schizophrenia is the question of the relationship of given symptoms to specific aspects of the personality. The present paper bears on this question in that it is concerned with the investigation of the imagery of the schizophrenic, and the relationship of certain symptoms to specific imagery characteristics. More specifically stated, interest here is in the questions of (1) whether or not the imagery of schizophrenics is different from that of normal individuals, and of (2) the relationships of the imagery of schizophrenics to such symptoms as hallucinations, delusions, and activity disturbances. It is believed that these observations may serve the psychiatrist in understanding the nature of the schizophrenic process by its indication of the importance of imagery in schizophrenic symptom-formation.

That there exist various kinds of imagery in a given individual was first indicated by Fechner (17) and first systematically investigated by Galton (23). Galton considered that imagery might be visual, auditory, olfactory, gustatory, dermal (touch, pain and temperature), and "organic" (fatigue, hunger and other bodily states).* From this observation the notion of "imagery-types" arose, and on the basis of clinical observations Charcot (13) and Ballet (7) distinguished individuals as *visual*, *auditory*, *motor* or *mixed* "types"—a classification which was adopted by Taine (46), Ribot (38) and Binet (8, 9). That such conclusions regarding distinguishable types might be incorrect, however, was maintained by Segal (41), who found that most individuals utilize all kinds of imagery (i.e., belong to the *mixed* "type"). The determination of imagery-type in a given individual depends in large measure on the criteria employed to determine "type". The criterion of relative frequency of images in the various modalities was frankly adopted by Kraepelin (30),

* Lay (32) carried out one of the most extensive investigations of imagery in the literature. He studied the imagery of 125 well-known painters and sculptors, analysed the imagery in some of the works of Green, Burke, Tennyson, Browning, Shakespeare, Swinburne and Shelley, and in himself. His own mental images (he studied a total of some 2,500) were distributed as follows: Visual, 57·4%; auditory, 28·76%; olfactory, 5·88%; gustatory, ·58%; thermal, 2·0%; touch, 3·84%; organic, 1·1%; motor, ·32%; and "emotional", ·12%.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

Feuchtwanger (20), Secor (40) and others. But, as Fernald (18) asks, and as Angell (1, 2) and Seashore (39) echo, "How much will frequency of visual imagery compensate for lack of detail? How vivid must auditory imagery be to make up for deficiency in accuracy?" Fernald (18) is of the opinion, and with this the writer concurs, that "an adequate statement of an individual's 'imagery type' would involve an account of the kinds of imagery used in various representative situations, with an estimate of their relative importance and a discussion of the characteristics of such imagery under the varying conditions", . . . "and to refer to him *under such conditions* as predominantly visual, auditory, auditory-motor, etc."

The *change of imagery* has been the subject of numerous investigations, but mainly from the standpoint of change of vividness of images than of imagery-type. The variables studied have been those of *age* (Galton (23), Armstrong (6), Radosavlyevitch (37), Langfeld (31)), *sense-deprivation* (Fernald (19), Sylvester (45), Bond and Dearborn (11), *practice* (Meyer (34), Stetson (43), Talbot (47), Fernald (18), Hennig (26), Foster (22), Crosland (16)), *fatigue* (Titchener (49)), *drowsiness* (Hollingworth (27), Cason (12), Angyal (3)), *dreams* (Thompson (48)), and *cerebral lesions* (Charcot (14)). The significance of imagery in *schizophrenic thinking* has been referred to, but not thoroughly investigated, by Zucker and Hubert (50). But it is the relationship of imagery to the *hallucinatory state* which has mainly interested students of abnormal psychology, for it has been commonly thought that under conditions more or less properly called "psychosis", the projection of the individual's images may take expression as hallucinations.

At the meeting of the Société Médico-Psychologique in 1865, which was attended by such authorities as Garnier, Baillarger and Sandras, it was generally agreed that between the sensation produced by a present object and the representation of an object which is absent (image) there is a difference *in degree and in kind*—an "impassable chasm" (Binet (9)). Kandinsky (29), who was himself subject to hallucinations, subscribed to this view, as may be seen from this statement: "In spite of the old widespread theory, in no case can an hallucination arise from a mnemonic sensorial image . . . only by gradation of attention or by the intensity of the image. A high degree of intensity is never a necessary condition."* With this view de Clérambault (15) concurs, maintaining that hallucinatory phenomena are merely the result of the action of a pathological excitant upon specific brain regions. Prince (36) stated as an as yet unproved theory that it "is possible that in those (hallucinations) occurring in the intoxication psychoses and in certain forms of organic brain disease, particularly where the hallucination is of a simple unelaborated static structure, the imagery is induced by direct irritation of the cortical or sub-cortical neurones". But there are other writers who consider

* Nevertheless, as Mourgue (35) points out, even if intensity is not necessary or sufficient, it may at least be an important factor.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

hallucinations as intimately related, if not actually identical with images. The classical observation of Flaubert (21) has for a long time been considered as hallucinatory intensification of normal imagery: "When I was writing of the poisoning of Emma Bovary," he writes, "I felt strongly the taste of arsenic in my mouth; I was so completely poisoned myself, that I had two attacks of indigestion, one after the other, two very real attacks indeed, for I vomited my entire dinner." But Mourgue (35) points out that Leroy calls attention to the non-hallucinatory nature of this occurrence by reference to a further passage by Flaubert: "Do not liken the inner vision of an artist to that of the man who is truly hallucinated. I am very familiar with both states and they are separated by an abyss." Guiraud and LeCannu (25) maintain that hallucinations "are only a corollary of truly primitive symptoms (cœnesthetic) which they express, using the previously acquired ideo-affective complexes". Prince (36) pays more regard to the relationship of hallucinations to images with his frank statement: "The hallucination is due to the emergence into consciousness of the previously subconscious images." . . . "The psychological problem of differentiating between normal imagery and hallucinations disappears in that they are identical, the hallucination being only the normal imagery of a dissociated subconscious process." . . . "If the evidence given by subconscious introspection be not accepted, a possible interpretation of the hallucinatory imagery is that the images do not themselves occur primarily as subconscious elements, but by the same mechanism appear in awareness as the conscious correlates of a co-active dissociated physiological process." Binet and Féré (10), as early as 1885, had maintained that hallucinations are merely the external projections of images. A similar view was held by Sully (44), who states that the "hallucinations of the insane are due to a projection of mental images which have, owing to certain circumstances, gained a preternatural persistence and vividness".

As for the relationship of predominating imagery or imagery "type" to hallucinations, one finds but three observations in the literature, viz., those of Binet (9), Martin (33) and Mourgue (35). Binet (9) speaks of the danger of "hypertrophy" of imagery, stating: "Those who possess such intense visualization are half under the influence of hallucination, and it is a hundred to one that the hallucination will some day become complete. We may add that very probably *visuels* are specially predisposed to hallucination of the sight, and consequently to the forms of delirium of which visual hallucinations are the symptoms. According to this theory, a pure *visuel* can never become a *persécuté*, because in the persecution delirium only hallucinations of hearing are, in general, according to Lasègue's observation, met with; the *persécuté* does not see his persecutors, he merely affects to hear them." And, "It is possible that those who are subject to hallucinations of hearing and those individuals who are attacked by the delirium of persecution belong to the auditory type; and that the predominance of one order of images creates a

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

predisposition to a corresponding order of hallucinations—and perhaps also of delirium ".*

Martin (33) reports the cases of three students who " saw " ghosts ; of these, two were predominantly visual ; she states that the third also was " predominantly visual ", although she gives no data concerning his imagery.

In an investigation which approximates in purpose to the one to be reported upon here, Mourgue (35) asked the question whether an individual suffering from " so-called auditory or so-called verbal-motor hallucinations would also manifest a corresponding imagery-type ". It appears worth while to report Mourgue's experiment rather fully.

" We were fortunate," writes Mourgue, " to be able to study a patient who for three years had manifested auditory hallucinations of various types, echo of thought, many misinterpretations, and a very marked sense of depersonalization. These hallucinations obsessed her to such a degree that she dared not leave her home. Since this patient was perfectly lucid, and since . . . she showed an aptitude for self-analysis rather rare among the asylum patients we decided to study her mental imagery. We had at our disposal a method which we had employed first in Prof. Foucault's laboratory of experimental psychology. It consists of passing before the eyes of the subject a certain number of words chosen in advance, some of which should suggest visual images, for instance, others auditory ones. The subject is asked to state what *first* comes into his mind and only the first answer is considered ; after a sufficient number of trials, a percentage can be established, which has been proved to be quite constant for a given subject. We went through the first part of this procedure only ; since the results appeared so clear to us we did not deem it necessary to establish numerical values to which we could in any case only attach a relative value. We used a very simple little apparatus (which) . . . made it possible to present words in succession through a slit. The roll on which these words were written is operated by the subject, who is free to regulate the exposure-time to his own convenience."

It may be noted, briefly, from the extensive data which Mourgue presents, that visual imagery seemed to predominate in his patient. He states that although the number of words designed to elicit auditory imagery had been purposely increased, there was no correspondence between the patient's predominating imagery (visual) and her hallucinations (auditory). From his data this conclusion appears justified. But it is clear that Mourgue has not taken cognizance of at least two factors : (1) Whether purposely or not, the nature of the patient's imagery responses was restricted to visual and/or auditory, thus limiting the range of possible imagery-expressions to these two modalities only, and (2), as Mourgue himself states explicitly, the patient's hallucinations were such that it might be doubted if one was dealing, at least exclusively, with auditory hallucinations ; the data in Mourgue's report indicate that kinæsthetic imagery was present to a great degree in this patient, and that

* It is justifiable in this connection to translate " délire " not as " delirium ", which Binet's translator has done, but as " delusional state ".

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

her hallucinations also were strongly kinæsthetic. But one may say that Mourgue's experiment and interpretations, though limited and perhaps insufficient, represent the first systematic effort to relate imagery-type to hallucination-modality.

Within the knowledge of the writer, no study bearing upon the relationship of imagery-type to other psychotic symptoms, such as delusions and activity disturbances, has been made.

A review of the literature on imagery and imagery-type indicates in general that predominating kinds of imagery characterize given individuals. It may be said that change of *vividness* of imagery under various conditions has been reported, but it is relatively slight and difficult to achieve. Change of *frequency* in the proportions of the imagery-modalities in a given individual has been studied very little, but from what is known, it appears to be impossible or extremely difficult to achieve. And, despite the extensive literature on the importance of imagery to hallucinations, the relationship of imagery-type to hallucinations has been studied experimentally by only one investigator (Mourgue (35)), whose data, obtained from only one patient, are inconclusive.

Experimental and Clinical Investigation.

General Procedure.

The test selected for the determination of predominating imagery consists of the items of " Test A " published in the Appendix to C. H. Griffitts's *Fundamentals of Vocational Psychology* (24). A copy of this test is furnished in the Appendix to this report. It consists of 130 test words and phrases.

Schizophrenic patients were selected from the Research Service of the Worcester State Hospital. These patients were males between the ages of 20 and 40, without detected physical disease. Since patients vary considerably in the degree of co-operativeness and comprehension of directions, it is readily understandable that out of a total of about 50 patients examined, the data from only 21 could be considered sufficiently reliable to warrant inclusion within this report, and of these only 19 could be studied from the standpoint of the quantitative aspects. Factors which made for unreliability of data were states of confusion, stupor, excitement, and incoherence, leading to obvious inability to understand or follow directions.

After a preliminary examination of the subject's general mental condition an attempt was made to explain to him what was to be done. The " instructions ", adapted to the intelligence and comprehension of the subject, were roughly as follows : " Whenever you think of something, you have an image of it in your mind. Now the image which you have is different for different things. For example, if I say ' horse ' to you, you may see the horse, or hear it, you may feel the movement of it, you may smell it, or taste it, or you may feel it in contact with you. In the same way, if I say ' a butcher sawing meat ',

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

you may see him, or hear him, or feel the motions of sawing, or feel the saw in your hand, or something like that. Now, what sort of image do you have when I say ' pipe ' to you ? " The subject would be given as many test words or phrases as would satisfy the examiner that he understood what he was to do. If the subject was considered suitable, he was then given the formal imagery test. In order to facilitate the administration of the test, permission was asked of the subject (and invariably granted) that a stenographer be present to record everything that was said. In this manner it was possible to obtain complete verbatim data which could later be evaluated and scored.

The objection might be raised that these experimental conditions made impossible the differentiation of " mental images " from " memory images ". Our argument would be similar to that of Slaughter (42) in dealing with this question : " We have used the terms *mental image* and *memory* image, " writes Slaughter, " as referring to the same set of phenomena, and perhaps it is necessary to justify this procedure by explaining in what sense they are interchangeable. Memory image has come to mean, specifically, one in which is reproduced with more or less completeness the original observation, with all the factors necessary to make it determinate. It is a process in which recall and recognition play an important part. The meaning of mental image is not very definitely fixed by usage, but with some the term characterizes that large group of images whose location in space and time has been lost. The question is chiefly one of familiarity. We do not call the image aroused by the word *horse* a memory image, because horses have been seen under so many sets of circumstances that no one stands out in particular. It is valuable for some purposes to preserve this distinction, but it really rests on a superficial analysis. The word *horse* is, in ordinary usage, little more than a word, and if any image is aroused, it is in most cases general, shadowy, symbolic and of only an instant's duration. If it is required that a definite image be produced and held when the word is called, it will be found that a very definite associative complex will come up in connection with it. ' This is either a particular situation from past experience, or a composite of such situations. If the name of a certain building with which the subject is familiar is called, the resulting memory image has reference, not necessarily to a particular occasion of observation, but to many such occasions, and is, really, in its turn, a composite. So the mental image is hardly one in which particular reference is lost, but in which the possibility of particular reference is manifold. So under the conditions of our experiments, which necessitated in every case the production of a definite image, it would serve no purpose to keep the distinction rigid."

In responses in which several kinds of imagery appeared, the first kind of imagery expressed is regarded as the most significant one. However, the responses in which mixtures of imagery occurred were also considered, as will be seen. In some instances the patients answered, " I don't know " or " I can't imagine anything ".* Some of the answers, especially in the patients, were either so irrelevant or unintelligible that they were not scored ; in fact only three patients of the entire group could be considered from the standpoint of all the 130 test phrases.

Although this particular test was utilized by Griffitts (24) to determine " concreteness " of mental imagery, the same test words and phrases seemed suitable for the determination of " imagery-type ". Thanks to the full

* Mourgue (35) reports similar answers in his patient.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

stenographic report of the subjects' responses, it was possible to evaluate the particular modality of imagery which was betrayed, and also to determine mixtures of imagery-modalities when they occurred. Scoring was repeated several times in each instance to establish validity. The responses were considered from the standpoint of the *visual*, *auditory*, *kinæsthetic*, *tactual*, *temperature*, *olfactory*, and *gustatory* modalities, and the total number of responses in each modality was determined.

Some of the stimulus words (*cf.* Appendix) were repeated. These comprise items 10 and 11 (violin), items 12 and 13 (clapping the hands), items 35 and 36 (typewriter), items 110 and 114 (throwing a book on the table), and items 113, 122 and 129 (shelling peanuts). This was done in order to determine whether any differences in the type of imagery response evoked might occur to the same test word or phrase, and also to determine whether there were differences between the normal controls and the schizophrenic patients on repetition. It was found that the imagery responses were different in these repeated items except for the items "clapping the hands" and "throwing a book on the table", which were rather consistently kinæsthetic. The items "violin" and "typewriter" usually evoked either visual or auditory responses. The item "shelling peanuts" was found to be divided unevenly among visual, auditory and kinæsthetic responses in a given individual. There was found no significant difference in the variations of these repetitions amongst the normal and schizophrenic subjects.

In the scoring of the data it was found also that in some of the patients the answers were such that the nature of the imagery-modality involved could not be determined. The occurrence of these answers, in defiance of the instructions which the patient obviously understood and continued to follow, were usually of the nature of "associations" or of "definitions". These associations were similar to those found on the usual "association tests"; the "definitions" given were usually the meanings of the test word or phrase. In two of the patients the responses were of such a nature that no attempt was made to differentiate them quantitatively, but some of their data are presented, since they provide points of special interest.

A careful study was made of each patient's symptomatological picture, with particular reference to hallucinations, delusions, and disturbances of motor activity. These are the clinical findings with which the imagery data of the patients are correlated, and in the discussion of each case an attempt will be made to show their specific interrelationships.

I. Comparison of Imagery in Schizophrenics and Normal Individuals.

The first problem was to determine whether the imagery of schizophrenics is different from that of normal individuals. The best method of investigation, of course, would be to study the imagery of the schizophrenic individual before

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

and after the onset of his illness, but such a procedure is difficult for obvious reasons. An alternative method is to compare a group of schizophrenics with a group of normal individuals as " controls ". For such comparative purposes a group of 19 male individuals, ranging in age from 21 to 41, attendants in the Worcester State Hospital and of the same general social and educational background as the patients, was selected. The imagery test was administered to them under the same conditions as to the patients.

In Table I the total number of scored responses in each imagery-modality for the group of normal individuals and of the schizophrenic patients is presented. Because of the relatively few responses in the tactual, temperature, olfactory and gustatory modalities, the data of the tactual and temperature and those of the olfactory and gustatory modalities respectively have been combined. The combining of these modalities has psycho-physiological as well as statistical justification.

TABLE I.—*Number and Percentage of Responses Obtained in Each Imagery-Modality for Schizophrenics* ($N = 19$) *and Normal* ($N = 19$) *Individuals.*

	Visual.		Auditory.		Kinæsthetic.		Tactual-temperature.		Olfactory-gustatory.		Total.
	No.	%	No.	%	No.	%	No.	%	No.	%	
Schizophrenics	405	21·7	328	17·6	540	29·0	375	20·1	216	11·6	1,864
Normals	564	25·2	593	26·4	452	20·1	337	15·0	299	13·3	2,245

It can readily be determined that the difference between patients and normals with respect to the relative proportion of their responses is a statistically significant one.*

Column-by-column analysis reveals that the differentiation is greatest in the visual, auditory and kinæsthetic responses, present to some degree in the tactual-temperature responses, but not in the olfactory-gustatory responses. The auditory imagery is less, both absolutely and relatively, in schizophrenics as a group. On the other hand, kinæsthetic and tactual-temperature responses are absolutely and relatively greater in schizophrenics. This finding is rendered more significant by the fact that in a total of 1,864 scored responses in the schizophrenic group, 540 and 375 responses are kinæsthetic and tactual-temperature respectively, whereas in a total of 2,245 scored responses in the normal group, 452 and 337 responses are kinæsthetic and tactual-temperature respectively. It would appear from these data that, under conditions of schizophrenic illness, there are differences in the relative frequency of imagery. These differences suggest that in schizophrenics as a group there is a shift of imagery-preponderance from the visual and auditory modalities to the kinæsthetic and tactual-temperature modalities.

Differences such as have been found here between schizophrenic patients

* Statistical analysis of those data by the χ^2 method yields a total χ^2 of 98·8, which is highly significant.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

and normal controls would be invalidated if schizophrenic patients or normal controls, within their respective groups, were to differ from each other to the same extent as the two groups do. In order to test this, an analysis was performed of each patient's distribution of responses in various modalities as compared with the total schizophrenic distribution.* It was found that although great differentiation was present within each group, this was significantly smaller than the differentiation between the two groups. Furthermore, although definite heterogeneity relative to the distribution of responses over the various modalities was found in both groups, the degree of heterogeneity amongst the schizophrenic patients was found to be definitely greater than the degree of heterogeneity amongst the normal individuals. The schizophrenic patients are differentiated from each other in the kinæsthetic responses especially and are least differentiated in the auditory responses. The main differentiation for the normal group is in the visual and kinæsthetic modalities; they show no differentiation in the other modalities.

Summary.—It appears from these data that, as a group, schizophrenics may be differentiated from normal individuals with respect to preponderance of specific imagery-modalities. Generally the principal difference seems to consist of a shift of preponderance from the visual and auditory to the kinæsthetic and tactual-temperature modalities. Furthermore, it is seen that the relative heterogeneity of responses in the schizophrenic group is greater than in the normal group. The relative heterogeneity of given modalities is different in the two groups. Statement of the significance of these conclusions is reserved for later discussion, when the data on the relationships of specific symptoms to preponderating imagery-modalities will have been presented.

II. The Relation of Predominating Imagery to Clinical Symptoms in Schizophrenics.

The clinical and experimental data of each patient separately will be presented in the following manner: (*a*) A brief account of the manner of onset of schizophrenic illness; (*b*) his general activity in the hospital; (*c*) his hallucinations and delusions; (*d*) the imagery test results; and (*e*) a discussion of the relationship of his general activity, hallucinations and delusions to the predominating imagery as disclosed by the test.

In the presentation of the imagery-test data of each patient it is important for our purposes to indicate the deviations of the responses from the norm in

* χ^2 may be used as a measure of heterogeneity (R. A. Fisher, *Statistical Methods for Research Workers*, London, 1936, p. 95). If the classes differ from each other, that is, if they are heterogeneous relative to the variable under investigation, a significant χ^2 will result. Here each patient or normal respectively is a class. We test here whether or not the distribution of the various patients could be deviations from a common distribution. Likewise, we carry out such a test for the normal controls. For the former we obtain a χ^2 of 759, for the latter a χ^2 of 238. Both these χ^2's are significant for 72 degrees of freedom, and thus we may assert that patients as well as normal controls are heterogeneous relative to the distribution of their responses over the various imagery-modalities.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

each imagery-modality, and the significance of such deviations. The actual number of responses obtained does not serve this purpose because of their variable number (due to associations, definitions, or other responses which could not be scored), particularly among the patients. Intra-modality analysis under such conditions can be performed in a manner similar to the inter-group analyses which have already been presented. In the data for each patient there is presented for each imagery-modality, therefore, the actual number of responses (" obtained score "), and the " deviation from the expected score ". The latter is the deviation, in a plus or minus direction, of the " obtained score " from the number of the " expected score ". The " schizophrenic expected score " is the number of responses which is the average for the given imagery-modality within this group of schizophrenics ; the " normal expected score " is the average of the responses for a given imagery-modality within this group of normal individuals. If a given deviation, whether in a plus or minus direction as the case might be, is *significant* it is indicated by an asterisk.*

CASE 1 : H. A—.

The patient is a white male, aged 30. In 1931 he began to lose interest in his work and finally gave up his job. He became interested in Secret Service work and expressed hopes of getting a position in it. He talked of leading raids and of uncovering criminals. He became very depressed when the job as a Secret Service agent, on which he had planned, did not materialize, and began to say to his family that he was to be shot at Christmas, that his food was poisoned, that gangs were after him. He accused members of his family of being responsible for the various misfortunes which had befallen him ; he said that his parents were strangers, that he was not their real child, but that he was a full-blooded Indian. On another occasion he said he was a Persian prince, and that some other boy had his name. But it was only when he took to his bed, refused to eat and complained of stomach pains that it was decided that he was in need of medical attention. He was admitted to the Worcester State Hospital in December, 1933.

General behaviour.—The patient spends his time sitting about on the ward, but he is often to be seen walking along the corridors at a rather rapid rate. He is usually smiling in a vacant manner. Sometimes he is observed to make swift sudden jerking motions of his head, arms or legs. When questioned he answers quite readily in a relevant and coherent manner, but on occasion, especially when he is voluble, he is somewhat incoherent. He is oriented and his memory is quite good.

Hallucinations and delusions.—Voices speak to him from his stomach and from various other parts of his body, such as under his ears. " I have little people about 5 inches high in my stomach. One especially, a little girl called ' D-i-p K-o-d-a'. She talks to me and tells me what to do." The voices say his name. When he was first ill a voice from the sky would say to him, " Little Dip Koda ", and would also say his name. While at home he would hear a man's voice asking him what was the matter. He does not know from whom this voice comes, although he has tried to find out, but he thinks it may be the voice of another H. A—, who follows him at every step and interferes with him in every way. He is influenced by other people, and tells that he is able to read the thoughts of others and that others can read his thoughts. These are given to him and taken away. He recounted that he had been rescued from the " Titanic " by an eagle, and told

* We have considered only the χ^2 values above 6 as significant, since for a single cell such a value has a probability of less than ·01.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

of having awakened at night to find himself with his hands in the position of holding a steering-wheel, and to realize that he had apparently been dreaming, and that in the dream he found himself falling forward through space.

During hospitalization the patient became very much concerned about an operation he had had for an ingrown toe-nail. He went into great detail, describing it as though someone had hold of his foot and was pressing it back into his stomach, as though someone had a leg in between his while he was walking. Once, while dealing cards, he said, "I just wonder why it stops me". (What stops you?) "Something like a binding over your arms. It grips you and holds you back. It was just like somebody holding my arm back." His writing is almost illegible. He complains that he cannot control his muscles, that it is "just as if some string is pulling at his arms and holding his fingers back". On another occasion he said that his feet are continually trying to float up, in a way similar to the floating of his feet to the surface when he is swimming.

He reported that he is always occupied with his "unnatural life", that is, if he is to think naturally, it is necessary to keep his two lives "balanced". This balancing appears to be a turning away from his preoccupations toward the task. If the preoccupations intrude in spite of him he becomes "unbalanced", and must make a special effort to get back on the track.

When asked if he had ever had any visions he readily admitted that he had. He told, for example, of having a vision of a man who was dark, who resembled his father. He said that when he was out walking he would meet this man, that this man would offer him a drink of some reddish-orange liquid, that when he would try to take some of the drink himself he would get none of it, but that sometimes the man would put his head inside the patient's and take some of the drink, and that in this way he (the patient) would also get some of it. At times this man would appear to sit on the window-sill in his room at night.

Results of Imagery Test.

The patient seemed to have no difficulty in understanding directions and his co-operation was excellent. In Table II the data obtained on the imagery test are presented.

TABLE II.—*Imagery Test Data.*

Imagery modality.	Obtained score.		Deviation from expected score.*	
			Schizophrenic.	Normal.
Visual	12		− 15*	− 20*
Auditory	13		− 9	− 20*
Kinæsthetic "pure"†	30	91	+ 55*	+ 66*
Kinæsthetic "mixed"†	61			
Tactual	6	6	− 19*	− 13*
Temperature	0			
Olfactory	0	4	− 11*	− 11*
Gustatory	4			
Total	126			

From Table II it may be seen that the kinæsthetic imagery responses are strongly preponderant, and that there is a significant diminution in all other modalities.

The 61 "mixed" kinæsthetic responses were distributed among the other imagery modalities in the frequencies presented in Table IIA.

* See pp. 288–290 of *Procedure* for definition of obtained score, expected score, deviation from expected score, and the significance of the asterisk in these deviations.

† "Pure" refers to responses in which no other imagery modality is manifested; "mixed" refers to responses in which other imagery modalities were present, although, as in this instance, kinæsthetic responses were the first obtained.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

TABLE IIA.—*Distribution of "Mixed" Kinæsthetic Responses.*

Kinæsthetic :	
Visual	20
Auditory	13
Tactual	18
Temperature	4
Gustatory	3
Olfactory	3
Total	61

Discussion.

(1) *Hallucinations.*—There is an obvious preponderance in this patient of kinæsthetic imagery-responses, which comprise 72% of his total number of responses. The number of imagery-responses for all the other modalities is sacrificed to the kinæsthetic one. The nature of this patient's hallucinations, as has also been shown by Angyal (4, 5), is largely kinæsthetic ; for further details concerning these kinæsthetic hallucinations, the reader may be referred to Angyal's papers. The large number of "mixed" kinæsthetic responses indicates the pervasiveness of this patient's kinæsthetic imagery throughout all other modalities. It appears that he has an almost exclusively kinæsthetic imagery, which is related to his predominating hallucinations.

It appears that the patient's voices—what would go by the name of "auditory" hallucinations—are of two varieties, (*a*) "voices" which *force him to do certain things*, and (*b*) "voices" which are listened to with more or less passivity. These may be differentiated as *active auditory* and *passive auditory* hallucinations respectively ; the differences between them in imagery background will be referred to again and again in subsequent discussions.

Although the patient has had visual hallucinations, there is no corresponding preponderating imagery. Similarly, although he has auditory hallucinations, there is a lack of preponderating auditory imagery.

(2) *Delusions.*—The patient has "somatic" delusions which Angyal (4) has considered as elaborations of kinæsthetic illusions rather than as true somatic delusions. As will be seen in some cases to be presented later, true somatic delusions are related to specific predominating imagery modalities (tactual-temperature and olfactory-gustatory). In this patient there is an actual deficiency of responses of these modalities. His main delusional features are concerned with vague and indefinite persecution by the other H. A—. As part of the clinical picture they may be related to his imagery, but only the possibility of such a relationship will be indicated here, since more clear-cut data on this point will be presented in other patients.

(3) *Activity.*—The patient's activity disturbances, as his delusions, may also be related to his imagery, but from other patients more clear data on this point also will be presented later. It may suffice here to state that kinæsthetic impulses probably harass this patient from time to time, and find expression in his restless pacing and the occasional jerking myoclonic movements of his head and limbs. His "clumsiness" may also be mentioned in this connection ; it will be referred to later with similar findings in other patients.

CASE 2 : C. A—.

The patient is an extremely thin, 37-year-old white male. The onset of his illness occurred very suddenly in 1927, when one day during a meal he suddenly shouted that a blood-vessel was going to burst in his head. He called out, "I want to die right", and made attempts to get into bed with his mother, whom he grasped by the throat and began to choke. He made no sexual assault. He could not be persuaded to go back to his own room, but held tightly to his mother's arm,

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

insisting that he was blind and that he needed air. This period of excitement soon subsided, but thenceforth he began to say peculiar things, such as that he was being poisoned and needed to be circumcised. He talked in a confused fashion about religion. It was finally decided to send him to a mental hospital, where he was admitted in March, 1927.

General activity.—His ward activity is characterized by a rather empty talkativeness and euphoria, but such a state is punctuated irregularly by periods of underactivity and stupor, which last from several hours to several days. He spends most of his time merely standing about the ward. There are various peculiarities of dress; for example, he often wears a necktie without a collar, and a handkerchief over his head. His eyes are often covered, and bandages have been found about his knees. At times he walks leisurely up and down the corridors with his eyes closed, frequently bumping into furniture or people about him, or tripping up passers-by. Occasionally he wanders over to some other patient, gently touches him, and wanders away. Although he usually keeps to himself, he can mix quite well with the other patients and join them in some of the ward activities. He usually answers questions relevantly and coherently, but on the occasions when he is stuporous it is impossible to obtain sensible answers from him. Orientation and memory, when they can be tested, are intact. When asked why he was wearing a handkerchief as a cap he grinned and said, "I got a wallop on the ear this morning, so I'm wearing it to protect my ear". When asked if a cap made of a single thickness of handkerchief would afford much protection, he remarked that he had put it on his head to wash it, that the sun was too much for his hair, which he had to protect. (He is almost totally bald!) One day he was found in the washroom wearing the wrapper of an orange on his head for a cap. He frequently places paper in his nostrils and in his ears, which he states his mother always did when she was afraid she might catch cold.

Hallucinations and delusions.—As he entered the examining room he remarked, "What's that, two? I'll use it". Then turning to the examiner he declared, "I need a shave". He suddenly looked toward the ceiling and said, "I want to get some work from him". He was then asked what the voice said to him, and he turned quickly to the examiner and said, "Clairboidian", but when asked to explain he merely mumbled, "Over the radio. Heard quite a few last summer. Jesus, no way to put that light out. I think we have good weather here in summer. I'm a pretty good tattooist". To this may be added that the patient said that he hears and sees God. He would not describe this vision. "God is everywhere and is in everything that is created. He tells what to—I wonder what he does tell me. . . . We are all angels because we sing." When asked to explain, he said that he read in the magazines that angels sing, and therefore anyone who sings is an angel. When asked again if he hears voices he said, "At times I do, yes". Asked whether it is a man's or a woman's voice, he said it was a woman's and then he said it was a man's.

He said, "It seemed when I was put in the ice pack in the Psychopathic Hospital that my skin was being loosened from my body".

He was found sitting one day sprawled out in a chair; there was some saliva on the floor in front of him. When questioned about it he said, "That's saliva. My mouth doesn't taste right. Does it smell bad?" When asked why he had expectorated, he said, "Say, I couldn't tell you. I'm not down in the subway. When you are chewing tobacco you've got to spit".

One day the patient requested the examiner to examine his heart and lungs "and see if he were able to sustain the shock of walking". He is considerably worried about his health and protects his body from illnesses in various ways, as mentioned, such as making a cap for his head and stuffing paper into his ears and nostrils.

Results of Imagery Test.

The patient comprehended the instructions and seemed to be trying to co-operate throughout the test. His data are presented in Table III.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

TABLE III.—*Imagery Test Data.*

Imagery modality.	Obtained score.	Deviation from expected score.	
		Schizophrenic.	Normal.
Visual	6	− 9	− 11*
Auditory	20	+ 8	+ 2
Kinæsthetic	13	− 6	0
Tactual	16		
Temperature	6 (22)	+ 9	+ 12*
Olfactory	3		
Gustatory	3 (6)	− 2	− 3
Definitions	26	..	..
Associations	33	..	..
Total	126		

From this table it may be seen that, generally, the imagery responses were not very numerous.

The number of associations and definitions is very large. However, with respect to the imagery responses, it is clear that in relation to the normal imagery distributions, the visual type has suffered and that the tactual-temperature type is significantly increased.

Discussion.

(1) *Hallucinations.*—By reference to the clinical picture the evidence for the presence of hallucinations is not very striking, but it appears that visual and passive auditory hallucinations* are present, as may be tactual ones also. It is shown in this patient, as has been found to be the case in Case 1, H. A—, that the visual and passive auditory hallucinations which he is experiencing are not reflected in a preponderating type of imagery in either of these modalities; in fact the visual imagery is significantly diminished. In general the paucity of imagery responses seems to be reflected in a lack of any or of very rich hallucinatory experiences.

(2) *Delusions.*—The possible relation of high tactual-temperature imagery to his somatic delusions (which may have tactual hallucinations at their basis) may be mentioned here; we shall meet with this relationship again and again in further cases in which it will be discussed fully.

(3) *Activity.*—The picture is one of variable activity with stuporous episodes. His "touching" behaviour should be indicated, since the preponderating tactual imagery may be related to his manneristic touching of things and persons (compare Case 12, B. K—).

The high incidence of the tactual imagery seems to have significance also in the stuporous episodes; and, it may be mentioned here that this patient forms one of a group of six patients (the other five are Cases 11, S. K—, 12, B. K—, 13, J. L—, 15, W. M—, and 16, A. O'S—) in whom the clinical picture of somatic delusions and stuporous episodes is quite similar, as will be seen. This group of patients has in common preponderating tactual-temperature imagery with which these clinical symptoms are brought into relationship.

CASE 3: E. B—.

The patient is a white male, aged 23. He has been described by his family as a seclusive, rather asocial person, never manifesting much interest in others, and disliking to meet people; he was often observed to sit and talk to himself. His admission to the hospital in April, 1931, was precipitated by the breaking of several windows of an empty tenement near his home, which the patient explained to his mother was his means of taking revenge on someone. The police were called and he was sent to a hospital.

* For the differentiation attempted here and in similar discussions on other patients of "passive" and "active" auditory hallucinations, see p. 295.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

General behaviour.—He is fairly neat and tidy, and is well oriented. He is quite seclusive, and often smiles to himself. All his movements are angular and clumsy. His speech is rather retarded, slow, and somewhat disconnected, often containing contradictions within the same sentence. His mood, when he is not excited, is one of apathy. He talks vaguely of his parents as foster-parents, and says that he was sent to the hospital for breaking windows. He is usually friendly and co-operative, but requires constant supervision, since his powers of attention seem rather poor.

From time to time he becomes excited and confused. During his excited periods he mumbles to himself and swears. He is restless, and if given a piece of paper writes his name or scribbles over it continually, hardly aware apparently of what he is writing. One day he announced that he was a locomotive and began to race about the ward, suddenly stopping and backing, whistling and shouting, calling out that he had just shifted gears; he made incoherent remarks about "train loads". He sometimes strips off his clothing and races about the ward. He has broken windows. He tears up papers and scatters the pieces about the ward. On one occasion when asked why he was banging a tin pan with a stick he declared that he had been told (by whom could not be determined) to make a lot of noise. Now and then he cups his hands and swears at the radio, or argues with it. He frequently jumps up to look anxiously out of the window. He sometimes exposes himself, calling the attention of the nurses to his genitals, shouting obscenely and profanely as he does so. When striding about the ward he pulls the curtains and shakes his fist, saying, "I told you so". He beats his fists on the wall and on the tables, declaring, "I won't do it; no, I won't do it". As the examiner listened, the patient talked incoherently about railroads, cables, dams, airplanes, dynamite, Christ, oceans, electricity and divers other subjects.

During his quiet periods he works well on the farm. Sometime he refuses to work, and expresses a desire to write answers to advertisements he sees in newspapers about locomotives and automobiles. He sometimes tears up the letters immediately, shaking his fist, angrily talking to himself.

He has run away several times, and on one occasion was missing for several months. When he was returned to the hospital it was found that he had been in California, but no record of his activities during this period of vagabondage is available.

Hallucinations and delusions.—The patient told that he had been hearing voices for about two years. They were the voices of angels, who told him to break windows. The voices also tell him "one" and "two", the word "one" meaning "love" and the word "two", "coitus" (colloquial term). They also talk to his mother. About a year ago they told him to stop masturbating and go to a woman and "love" her. Sometimes he hears women's voices. He recognizes a few of them. These voices tell him that he ought to sleep with his mother, who he believes is really his step-mother, and to kill his father. He does not know whether they are within his head or outside. He said, "I was reading a book and I heard the voices; it was a young girl's voice. She tried to make love to me". And later, "I heard voices at noon and the day before, quite a lot. I have heard them for a week. They reminded me of X-1, a thing I did when I was 14 years old. Roll a thing with a stick. It was quite thick. I revealed it talking to myself here. The voices reminded me of it this noon".

When asked whether he had ever seen visions, he replied, "Certain things". Urged to tell more, he continued, "I see railroad visions when I am thinking about railroads, visions of a girl . . . (blocking in speech). Well, a girl, ordinary picture of her. It's a vision". Urged to tell how she was dressed, who she was, how long he had known her, how he saw the vision, and what he wished about it, he said, "Well—er—quite in different colours". Then, with considerable animation, "She's got a round hat and a leather coat that goes below the hips, and a white dress below the coat. Everything's different colours. I have seen her plenty of times. She's about eighteen or nineteen years old. I see that vision right in my head". Here the patient rolled back his eyes. "It comes from

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

thinking about it ". He calls the visions " mind pictures ". Usually these are of nude women, and he pictures himself having intercourse with them. He has had a " mind picture " of Carmen.

He harangued at great length about persecutory ideas. He said, for example, that he had had five boxes of cigarettes, of which all but two had been stolen by the nurses and attendants, and that the remaining two boxes had been poisoned by something put into the tobacco, which poisoned him. He wrote out, " I have been put in a very poor condition, *Poisoned* for at least four months. Poison was put on Chocolate pudding by a woman dishing it ".

Imagery Test Results.

The patient seemed to have some difficulty in understanding directions, but once started, did quite well. The nature of his responses is presented in Table IV.

TABLE IV.—*Imagery Test Data.*

Imagery modality.	Obtained score.	Deviation from expected score.	
		Schizophrenic.	Normal.
Visual	35	+ 15*	+ 8*
Auditory	6	− 10*	− 19*
Kinæsthetic	39	+ 12	+ 20*
Tactual	11	12	
Temperature	1	− 7	− 2
Olfactory	0	1	
Gustatory	1	− 10*	− 11*
Definitions	17	..	..
Associations	15	..	..
Total	125		

From this table it may be noted that the number of visual responses are significantly raised above both the schizophrenic and the normal values, and that the number of kinæsthetic responses are significantly raised above the normal values. The auditory responses, on the other hand, are markedly lower, as are the olfactory-gustatory. About one-fourth of the responses comprise the definitions and associations.

Discussion.

(1) *Hallucinations.*—The predominance of kinæsthetic imagery places this patient in the same group as Case 1, H. A—, and with others to be presented below. His kinæsthetic imagery seems also to be reflected in his " active " auditory hallucinations, which seem fundamentally to be kinæsthetic ; his voices *make him do things*, they activate him to peculiar behaviour ; they are of the nature of " ideas of influence ". On the other hand, he also tells of voices to which he listens passively. There is, however, a significant diminution of auditory imagery.

This patient has either an extremely high degree of visual phantasy, or true visual hallucinations. The question arises as to whether these can be related to his high visual imagery. In two other patients of this series in whom there is a significantly raised number of visual imagery responses (Cases 10, J. H—, and 17, A. P—), there have been no visual hallucinations. This finding would bear out Mourgue's contention that hallucinations are not to be regarded as mere intensifications of normal images, for, as will be seen, visual hallucinations are not necessarily associated with preponderating visual imagery. This patient's visual imagery is of such vividness that visual images were quickly elaborated into certain settings—an observation which may indicate a relationship between vividness of phantasy and heightened visual imagery. An additional important factor in this

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

connection may be the readiness to form definitions and associations by which the image may readily be elaborated into so-called phantasy.

(2) *Delusions.*—This patient has persecutory delusions centring about ideas of poisoning. One would expect that with such delusional ideas the gustatory imagery would be high; this is not the case, however. A similar situation obtains in Cases 6, T. D—, 10, J. H—, and 17, A. P—, who have had olfactory hallucinations, but whose olfactory imagery responses were either not increased or were even significantly diminished. The imaginal basis, if any, for such ideas of poisoning, and for gustatory and olfactory hallucinations, must apparently be sought elsewhere than in predominating olfactory or gustatory imagery.

A general problem arises here with respect to the significance of the content of delusions. Roughly speaking, delusions may be of the somatic or non-somatic type. The question may be asked as to whether or not the type of delusions, just as the type of hallucinations, may be determined by imaginal factors. This seems to be the case, as we have indicated in the discussion of Case 1, H. A—, whose delusions were persecutory, and in Case 2, C. A—, who had hypochondriacal ideas or somatic delusions. This patient's delusions are essentially persecutory in nature only. This question will again be discussed in later connections.

(3) *Activity.*—This patient bears marked resemblance to Case 1, H. A—, and others (to be presented) with high kinæsthetic imagery, who manifest periodic excitements. In these episodes there seems to be expressed periodically an overwhelming and poorly controlled flow of kinæsthetic activity. That the periodic excitements bear a relationship to high kinæsthetic imagery is an observation which will be pointed out in eight such patients (the others are Cases 1, H. A—, 6, T. D—, 7, F. D—, 8, J. D—, 17, A. P—, 19, H. S—, and 21, E. T—), and will be referred to again in the discussion of these cases. The unusual clumsiness and awkwardness of this patient's movements may again be pointed out for later discussion. It may also be indicated that his escapes may represent episodes which are "equivalents" of the disturbances of motor activity, expressed on the ward as states of excitement.

Case 4: J. B—.

The patient is a white male, aged 28. In August, 1933, it was first noticed by the family that the patient had become very restless, got up at night, paced the floor, and muttered to himself. He was much preoccupied, and did not always answer when he was spoken to. He drank great quantities of water, which he said was for his stomach, and talked a great deal about sin. On two or three occasions during the past year he had spoken of there being something wrong with his heart and his lungs, but this was not taken seriously by anyone. A few days before his admission he had an "attack" in which he clenched the sides of the car in which he was riding, he stiffened out, and his eyes "bulged". This attack lasted about twenty minutes. He did not want to go home until he had recovered from it completely in order not to frighten his mother. He had a similar attack the next day, but it was different in that he also moved about a great deal and could not be kept quiet. He insisted on seeing a priest, to whom he spoke of an unforgivable sin, said that he had heard Father C— speaking to him, and also intimated that God had spoken to him. Hospitalization was advised at this time.

General activity.—In appearance he is well ordered and neat, but his lack of affect is very noticeable. He is very quiet and co-operative about the ward, although on several occasions he has become excited for a short while and has made attempts to escape. Apart from these short episodes he has remained constantly under-active. He says nothing spontaneously, but answers questions promptly, though quite vaguely. He has often been noticed to laugh to himself. He is somewhat disoriented for time and place, but not for person. He is uninterested in doing any work or in gaining parole privileges.

Hallucinations and delusions.—The patient said, on admission, that during the week preceding admission he began to feel a little "nervous", could not seem to

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

get his work to go right, and had some peculiar bodily sensations. One night while going home from work, he felt afraid; he thought his heart wasn't working right, that it had changed, and he could not understand what had happened. The blood in his heart "seemed to go down my tube just so far and stop". He felt that his life was changed, that "they" had bothered him ever since he was born although he admitted that he did not notice he was being bothered until recently, when his heart began to give him trouble. It is more than one person who is bothering him, but he has never discovered who it was and has never caught anyone at it. About a week after admission to the hospital he began to be bothered by voices, which said pleasant and unpleasant things and told him what to do. He could not identify the voices, although he suspected that he should. He was not sure from where they came; they seemed to come both from a distance and from close by, and sometimes were "in" his ears. Sometimes they were loud, and at other times they could barely be heard.

As time went on he had begun to be bothered by electricity and smells that came to him. He explained that the electricity was "right in the air" and seemed to dry him up. The smells came from underneath his bed from a sponge, which was "full of dope and other diseases. . . . I took a couple of baths and felt better". He said, "It smells bad, like diseases. It comes from my inside and from my outside. The smells left me, but the electricity came back and bothered me". At the present time something else besides electricity is working on him, but he does not know just what it is. When asked to explain he said, "It bothered my tubes and my lungs. Different kinds of diseases and smells have been coming through the building right along". "I also pain inside badly since I am here. It feels as if I had bugs there or as if there is a tree growing inside. It's a form—there is a form wiggling inside all the time. It's not a sore feeling, but—— The fingers feel also numb and stiff, as if there were pins in the fingers and needles." (The patient smiles.) (Why do you smile?) "I can't help it. The people do that—they bother me. Some I know, some I don't." He refused to say what people he means. He displayed a strange moving of the head, and when asked to explain, said, "It is stiff there, as if there were steel around". He also refers vaguely to steel wire bands around his abdomen. Electricity is shot at him by unknown persons, and comes through the walls. He can see it. It is turning his skin white and it is affecting the other patients on the ward in the same way. At this point he suddenly broke out weeping, and called out that electricity was being passed into him, his tongue was dry, his bowels were dry, and his stomach had nothing in it. He complains of a "funny numb feeling" in his head and that there is a "brush or something" turning in it. He feels dead.

"They" make him "twisted here and there". "They" also made him once run away from the hospital, and he says, "I must have walked 60 miles until I came back". When he is asked again who "they" are he says, "Well, that's it everywhere. Don't you see the switches in the walls and everything else?" but he does not elaborate on this.

Prior to coming to the hospital he was persecuted by certain unknown people: "It felt as though someone was tearing my heart out." The method used involved electricity. "This dries my skin and makes my skin lighter than it was." These influences affect other patients; he has noticed changes in the skin colouring of others in the bath house. He advances no reason for the persecution. These people annoy him very much in other ways also. They take his shovel away from him when he is working outdoors, and they take cigarettes away from him just when he is about to smoke.

He feels that he has many thoughts that don't belong to him. "They" make him lose his memory. His thoughts were being read, but he does not know by whom this is being done. When asked to explain his troubles in thinking he said, "I don't know. I can't seem to think only of certain things off and on". At times his thoughts come quite slowly, at other times quite fast. He is aware that his thoughts are sometimes confused. At times he feels "like a blank in his head", that at once all his thoughts stop and that "just that blank feeling" is there.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

As an example he gives the incident where he once went to a drug store and asked for castor oil " without feeling anything about it ".

The voices he hears are male and female, but sometimes he hears merely whistling sounds. He says, " You can imitate it with steel. You can take two pieces of steel and rub them with each other, and you get such a whistling sound ". Very often the voices are " more like a whistling and like wires ". They are put into his mind through some " telephone arrangement ". Usually the voices revile him and swear at him, calling him names, like a " G.D. fool; get out of here; you will never be out, you will be out to-morrow ". Occasionally they are friendly. He has no ideas concerning the reason for persecution or why he is selected for a victim.

One day he broke a window on the ward with a broom. When asked why he had done it, he answered, " A voice told me to break the window so that I could get out ". On some occasions he attempts to start fights with other patients, insisting that the voices are coming from them.

He is able to see electricity, which makes itself evident by little sparks in the air when his eyes are open and by rays of light when they are closed. He can also feel it by tickling sensations over his body. Sometimes he sees " visions ". They are moving pictures. He does not describe them, but says that they are men and women, and adds, " They are not supposed to be there. It is flies-like ".

Imagery Test Results.

During the examination the patient sat quietly in a chair and seemed to try to listen. He seemed to grasp quickly what was required, and from time to time throughout the test gave evidence of attempting to give a response suitable to the test-phrase. Examination of the data revealed, however, that it was impossible, except here and there, to evaluate the modality of his responses. Although these data could not be included within our quantitative series, they offer interesting and important information indicating the chaos of the mental life which may occur in deteriorated schizophrenics in the terminal states. Some of the raw data are presented for exemplification before further discussions :

Test phrase : The heat from the sun.

Answer : " Very strong, it seems."

Examiner : How do you imagine it ?

Answer : " Feeling as though crowded by—give a crowded feeling off and on."(?)

Test phrase : Something sour.

Answer : " Sour ? Sour ? Off and on—heat—the different smells, you mean ? " (?)

Examiner : How do you imagine something sour ?

Answer : " Oh, I never cared an awful lot for sour—if there's anything sour, such as pickles—once in a while but not often " (? association).

Test phrase : Clapping your hands.

Answer : " Different sound—different feeling— "

Examiner : What kind of feelings ?

Answer : " I suppose just the feeling of my own fingers— Sometimes tender, at other times careless— " (auditory, tactual ?)

Discussion.

Hallucinations, delusions, activity.—There seems to be a frank attempt, without very much success, by this patient to give imagery responses ; when they occur they fit, more or less, the test phrase. The patient has hallucinations of all the modalities, excluding possibly only the gustatory ; his delusions are somatic and non-somatic (persecutory) ; his disturbances of activity are both those of under-activity and periodic excitements. As we have mentioned above, his imagery test furnishes interesting and perhaps important examples of a mental state in which there is little differentiation between the mental processes. The clinical

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

picture shows a similar heterogeneity. The diffuse definition-association and imagery picture which is indicated may be said to follow the diffuse hallucinatory, delusional and activity symptoms. In this patient may be seen an example of *diffusion*; there is no clear-cut indication of, or adherence to, any imaginal or associative factors. He is in a literally chaotic mental state, and the chaos of his imagery, definitions and associations may be reflected in the heterogeneous symptom picture of the hallucinations, delusions and activity disturbances.

These data may indicate that as a factor in deterioration, the variety of hallucinations, delusions and activity disturbances may be due to the fact that the patient, left only with a turbulent sea of uncontrolled images and associations, cannot maintain any symptom by any adequate or continued elaboration. Hence the symptom begins to break down, tending eventually to disappear entirely. And as deterioration proceeds, the background which makes possible the existence of the symptoms and which sustains them at any degree of complexity or elaboration also disappears. This, in general, is what seems to occur when it is observed that the patient " goes to pieces ". The very diffuseness of the symptom-picture, springing apparently from a background in which there is little or no differentiation between the mental processes, appears therefore to be a grave omen of a colourful, but none the less malignant, deterioration.

Case 5 : G. C—.

The patient is a white male, aged 32. At the age of 22, after leaving the Navy, he declared his intention to enter the religious life and enrolled in a Catholic university. While there he apparently got into difficulties and was told he should not pursue religious studies. He left school and hitch-hiked over the country. He was arrested several times for vagrancy. He began to talk peculiarly, saying that people in the next town were waiting for him, that he was a priest, and that the Roman Catholic Church was against him, and had turned the whole world against him. He spoke of being influenced by the radio, and believed that he was being influenced, in an indirect manner, by God and the Devil. He was admitted to the Worcester State Hospital. He soon escaped and wandered over the country, but in 1935 was found and again sent to the hospital.

General activity.—He is quite alert, but spends most of the time walking or sitting about the ward, muttering to himself. He is oriented, and his memory is good. There appears to be very little affective impairment; in fact when he speaks about his delusional ideas with religious content he becomes quite excited. He shows no initiative in any kind of work, but is compliant with requests that are made of him and can carry out fairly complex tasks quite well.

Hallucinations and delusions.—The patient says that he hears voices, which speak to him as radio broadcasts. Sometimes they call him names, and say, " If he does this we will do this, of if he does that we will do that ". He feels that these arise from some influence which is trying to turn him aside from an " individual course ". He says of the voices, " They try to direct my very speech along the line of someone else's talk, to put words into a person's mouth, which if he did use, he would not mean, and to have them broadcast ". The voices do not seem to speak to him directly, apparently because they would imply sometimes that he was undesirable. He is " influenced " by the radio. He is " trying to offset my enemies as much as possible by keeping my mind on God and by being civil to my associates ". . . . " I exploded in the hall, and that was the climax of it all, and I'm not going to worry about it any more." " There is nothing angelic about my voices. My heavenly voices are not in the same concern than those of Joan of Arc."

The ramified nature of his delusions may be gathered from the following: (How did you happen to come here ?) " Some well-wisher brought me here." (Do you know why ?) " I have an unfailing way of taking care of myself which other people might not approve of." (How do you take care of yourself ?) " Hearing the word of God and keeping it." (How do you hear the word of God ?)

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

" In two ways. First your conscience. Then the organization formed by God to direct conscience. I'm no different from others in my creation." (Can you talk with God ?) " Yes, through spiritual perception, but not as you speak . . . meditation. I can say that I notice an attempt of a contact by others than the divine—having my mind prayed on by others—sort of a hypnotic spell. It's due to curiosity or search for knowledge ; an unbelieving mind would do that, to control a mind for their own purposes." He denies ever having experienced a divine visitation. He says, " The people working this are a group or society ; they were trying to bring about a conflict in the individual conscious without any physical force ". For the rest, his delusions are a rambling, semi-coherent account in which the religious theme is central, and to which he invariably returns in all remarks which he makes.

Imagery Test Results.

As was the case with Case 4, J. B—, this patient appeared to understand the directions, but the nature of his responses is such that they do not lend themselves to quantitative elaboration. The following samples are characteristic :

Test phrase : Opening an umbrella.

Answer : " The object symbolized by the words and the letters—by the sight of that to understand what it meant. If you said the opening of anything I'd just think of the operation." (?)

Test phrase : Heat from the sun's rays.

Answer : " Well, the distinction between, we might say, the reaction and the temperature. Distinction between shade and light, light and shade." (?)

Discussion.

(1) *Hallucinations.*—It was found that this patient responded with few images. His responses were mainly of the nature of definitions. In the definitions given there were various admixtures of visual, auditory, and kinæsthetic images. It was impossible to tabulate these specific modalities, since the nature of the imagery could not be accurately ascertained. From his clinical picture it is difficult to determine whether or not he is hallucinated, and if so, what the nature of his hallucinations is. His so-called " voices " are impossible to diagnose as unquestionably hallucinatory.

2. *Delusions.*—The clinical picture is almost exclusively paranoid. The delusions are vague, diffuse, and poorly systematized. None of the delusions are somatic in nature. No relationship between his delusions and his imagery could be ascertained.

The outstanding finding in this patient, as with Case 4, J. B—, was the apparently inextricable mixture of images, definitions and associations. Furthermore, as was also the case with that patient, the schizophrenic inclusions in the total picture indicate here also a relatively high diffusion or chaos of the mental processes. Although this case, too, contributes little to our study of the specific relationships of imagery to schizophrenic symptoms, its importance for the nature of deterioration may be quite great. For here again the nature of the chaos of mental functions, dominated by the tendency to form definitions and associations, seems to account for a diffuse picture. Though somewhat better " encapsulated " apparently than is the case with Case 4, J. B—, the nature of this patient's deterioration seems no less extreme or malignant.

CASE 6 : T. D—.

The patient is a 33-year-old white male. He lost his position because of the financial depression, and for reasons of economy his wife and he separated by mutual consent. The patient was quite unhappy about this turn of affairs, and from this time on his behaviour became peculiar. He began to say that various people were endeavouring to carry out sexually perverse practices with him, and that numerous perverts were about a hotel in which he had resided with his wife.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

He said that he was third assistant to the head of the United States Secret Service, that he must attend meetings where Hitler and Mussolini are present, that many enemies are planning to have him killed and to influence his family against him, and that he receives invitations by short-wave radio from his Chief in Washington, whom he had never seen, but who was going to elevate him in rank in the Service and destroy his enemies. He spoke of hearing people talking about him, and that certain nearby residents had been placed there " for no real good at all ". There was also the complaint that poisoned gases were being used constantly about him, especially civet-cat odours, which were meant to kill him. He threatened to commit suicide by jumping through a window at his hotel, and made attempts on two occasions to leap from the third floor, saying that he did not mind whether or not he killed himself, and that he could walk right out on the air anyway. He was admitted to the hospital in 1935.

General activity.—The patient spends his time pacing about the ward. He is generally well behaved, but occasionally becomes very irritable and has had several fights. Sometimes he becomes so destructive that it has been necessary to give him pack treatment. One day he threw a pitcher at another patient. He talks constantly to himself. When one comes and asks him what he is talking about he often does not answer. Though he is quite excited and over-active on these occasions, his mood generally is one of indifference. All his talk and hyper-activity when excited are performed in a machine-like way. He has said that he does not really know what is happening to him. When he talks of his delusions he is over-productive and rambling, with a tendency to neologism and verbigeration. He repeats over and over certain phrases and words like "recuperating", "adversary", "construed" and "constructive", without much regard for the context. He says that with one part of his brain he knows that he is insane, while the other part of his brain affirms to him that he is a Secret Service man. Throughout interviews he frequently expectorates, sometimes on the floor and sometimes on his hands. Asked why he does this, he says that it is simply due to excess saliva and refuses to develop the subject further.

Delusions and hallucinations.—The patient thinks his trouble is pretty well understood by everybody, at least by most people. Colonel W. C. M— is his superior, and Chief of the U.S. Secret Service. He has had " mental processes communication ". He says, " We all should go home, and follow the Chief's plan. Communication came to me through the radio short wave, and this will be good news ". When asked if he were persecuted he said, " I'd say yes ", and goes on to tell of various gangsters whom he must apprehend since they are trying to do him harm. The Secret Service is going to accomplish the greatest good for all. His mental difficulties will straighten out when the meeting with his Chief is accomplished. He has heard from the Chief indirectly through a voice. While at home recuperating from what he felt was illness, but which was the result of influences between God and the Devil, he was brought to the hospital. There had been a three-cornered debate between God and his adversaries. His father is also being influenced "destructively ".

When questioned further about the voices he said that they always give him commands and advice which he always tries to follow. He knows to whom the voices belong, although he is not personally acquainted with the persons. He admitted that he heard two different voices during the interview. He interrupted once to say, " There was another voice just then, but I just didn't catch it ". The voices are tormenting him to make statements quite without any relation to what he wants to talk about, but he cannot make them stop, although he often shouts at them to do so. The people who are persecuting him had been using coke or civet, which smelt terribly. These are poison gases that are being used constantly about him to kill him.

Imagery Test Results.

The patient grasped the instructions quickly and was co-operative throughout the entire period. His data are presented in Table V.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

TABLE V.

Imagery modality.	Obtained score.		Deviation from expected score. Schizophrenic.	Normal.
Visual	4		− 11*	− 11*
Auditory	20		+ 8	+ 2
Kinæsthetic	25		+ 5	+ 11*
Tactual	9	13	− 1	+ 3
Temperature	4			
Olfactory	2	6	− 2	− 3
Gustatory	4			
Definitions	46		..	..
Associations	9		..	..
Total	123		..	..

This table reveals that visual responses have suffered, and that the kinæsthetic responses are significantly above the distribution of those for the normals. Almost half of the responses are definitions and associations, the definitions having a large preponderance.

Discussion.

(1) *Hallucinations.*—The patient's predominating kinæsthetic imagery seems to be related to his auditory hallucinations which are *active* (" ideas of influence "). He also has *passive* hallucinations, but there is no significant change in the distribution of his auditory imagery.

The olfactory hallucinations which the patient appears to have had at the onset of his illness have no corresponding imagery relationship. The possible delusional nature of this symptom should be mentioned, since at the time of his admission the Italo-Ethiopian war was in progress, and the newspapers were publishing frequent statements of the use of civet cats by the Ethiopians to poison the Italians' water supply.

(2) *Delusions.*—The patient's delusions are mainly persecutory in nature; their mildly grandiose features are probably secondary formations. They also are to be related to the predominating kinæsthetic imagery, as was shown in Case 3, E. B—, and, as will be seen, in other patients also.

(3) *Activity.*—Here also, as was pointed out in Cases 1, H. A—, and 3, E. B—, one finds a patient in whom restless pacing and periodic outbursts of excitement and over-activity are prominent symptoms. These activity disturbances may also be brought into relationship with the high kinæsthetic imagery, and the associated active auditory hallucinations, ideas of influence and delusions of persecution.

CASE 7: F. D—.

The patient is a white male, aged 21. His illness apparently began in September, 1934, for he later wrote: " I absorbed every sight and sound and recorded them in my memory. There was not an incident from the period from September to June upon which I failed to place an interpretation, and if puzzled, I sought the solution from one who did understand." During his examination period in June, 1935, he was unduly worried. In July, while at a summer camp, he began to talk a great deal of his fear of being dropped from the seminary, and it was impossible to reassure him. He prayed a great deal, and his companions became so alarmed that after a few days they sent him home. The night of his arrival at home he left the house in his pyjamas in an excited state, spoke incoherently of many religious matters, and of seeing and hearing God and the Devil. He became unmanageable, and was sent to the hospital.

General activity.—On admission he was so excited that it was necessary to place him in the continuous bath. He was very resistive, and shouted that he heard the voice of God telling him to deliver a special message to the Pope, and that he must see a priest. His excitement subsided after about a week into a

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

period characterized by an empty euphoria with considerable silly laughter. At this time he spoke of being in communication with God and prayed a great deal. One morning he threw a billiard ball through a window, saying that he " just had to yield to the impulse ". After a few weeks he quieted down completely and became entirely co-operative. He seemed to enjoy listening to himself talk. His speech was entirely intelligible, but very circumstantial, with an inevitable trend toward the inclusion of ecclesiastical explanations. His judgment and insight were excellent, and his memory unimpaired.

Hallucinations and delusions.—He said that since he had come in he had heard the voice of God, distant, but definitely and clearly talking to the saints. God has never addressed him directly. He has had visions of himself as a priest and a saint, and has frequently seen an altar in this fashion. While in the hospital he has seen the devil repeatedly bothering other patients, and has exorcised him by staring him out of countenance. The spirits of many saints, including that of Father —— (principal of the seminary), are in the hospital with him. He was of the opinion that the devil must be at the bottom of the whole situation, for since coming to the hospital the devil has suggested to him that he stop eating, die, and go to heaven. For a time the devil made him laugh, but he does not do so any longer. Nurses have given him potions which he is sure were not medicine, but poison given to test him. Once he asked that the discussion be interrupted while he talked with God. At another time he told the examiner that the devil was still about, and went through a few sparring motions as though warding off an antagonist.

" Let's skip the details," he wrote, " of what happened at my house that night. Suffice it to say that I took desperate measures to throw off the ' jinx ', ' the devil ', the ' demon ', the ' something ' that was tormenting me. I did finally, but not until I attracted the attention of a police car. From my home I was taken to the Hospital, and from there to the —— Hospital, where my existence was like a living nightmare."

" There are no limits to the imagination, and my imagination certainly went the limit. I imagined—

" (1) That there was a relationship between my case and almost every other case in the hospital.

" (2) That I was in some vague way responsible for the condition of the other patients.

" (3) That my presence caused certain patients to become more violent.

" (4) That some unseen force was active, be it a voice, or a light, or a creaking sound.

" (5) That I was to be entombed for ever in one of the back cells.

" (6) That my food was poisoned."

Imagery Test Results.

The imagery test instructions were quickly comprehended by the patient, and his co-operation throughout was excellent. The data are presented in Table VI.

TABLE VI.

Imagery modality.	Obtained score.		Deviation from expected score.	
			Schizophrenic.	Normal.
Visual	13		− 4	− 7
Auditory	12		− 2	− 9
Kinæsthetic	31		+ 8	+ 15*
Tactual	14	16	0	+ 4
Temperature	2			
Olfactory	3	6	− 3	− 3
Gustatory	3			
Definitions	23		..	..
Associations	28		..	..
Total	129			

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

It may be noted from this table that the only deviation is in the kinæsthetic imagery responses, which are significantly above the frequency of the normal group. There are a large number (51) of definitions and associations, divided almost equally.

Discussion.

(1) *Hallucinations.*—The only imagery responses which are preponderant are the kinæsthetic. The patient's auditory hallucinations are both "active" and "passive". These correspond to his imagery only with respect to the "active auditory", which here again seem to be "ideas of influence", i.e., kinæsthetic in nature. There is no preponderant visual imagery to correspond to his visual hallucinations, nor preponderant auditory imagery to correspond to his passive auditory hallucinations. The point as to the relationship between preponderant kinæsthetic imagery and the active "auditory" hallucinations indicated in our discussion of previous patients (Case 1, H. A—, Case 3, E. B—, and Case 6, T. D—) seems to be quite clearly established. It will again be referred to in Cases 17, A. P—, 19, H. S—, and 21, E. T—. Also, the lack of relationship between visual imagery and visual hallucinations and between auditory imagery and "passive" auditory hallucinations respectively may again be pointed out.

(2) *Delusions.*—In this patient, as in the others mentioned as belonging to the same group, the delusions are essentially persecutory in nature. As with the other patients these delusions, like the "active" auditory hallucinations, may also be brought into relationship with predominating kinæsthetic imagery.

(3) *Activity.*—As has been pointed out in former patients, and as will also be seen in later ones belonging to this group, the occurrence of preponderant kinæsthetic imagery is found in association not only with "active" auditory hallucinations and persecutory delusions, but also with periodic over-activity of the nature of "excitements". In this respect also it would appear that this patient bears this further resemblance also to the group of patients mentioned.

CASE 8: J. D—.

The patient is a white male, aged 32. In his third year in high school he seems to have become seclusive, stopped going out with friends, and always wanted to be alone. His seclusiveness became more marked as the years went on. But his peculiarities were overlooked until he began to say that he was the manager of a radio organization which he was financing, that he had a great deal of money, that he had two automobiles and a chauffeur, that he could control people by radio. He began to annoy prominent people with a continual bombardment of letters. Finally it was decided that his eccentricities were unbearable, and he was committed to the hospital.

General activity.—In general the patient is friendly and co-operative, but rather imperious and patronizing in his manner. He holds himself aloof from the other patients. He shows considerable spontaneity and initiative in conversation; in fact he joins every conversation without invitation. He is helpful with the ward work, but insists on doing only work which falls within the range of the attendants' duties; he prefers to supervise the work of other patients, and is able to get them to work satisfactorily. With an air of great condescension he answers questions which are asked him. He manifests various mannerisms of speech, e.g., pausing, hesitating, clearing his throat, when asked questions he is unwilling to answer, but usually his speech is very ready and rapid. Orientation and memory are intact.

His stream of speech is somewhat incoherent, but this incoherency is due in large part to his unwieldy phraseology. For example, when he is asked to explain his situation in the hospital he states: "We couldn't agree on the subject. Some people saw fit to see things differently from what I did. A general difference in appearance of a few industrial and social dissemination and dissociation. A difference in constructive associate pathology. We have a difference in opinion and social constructive propriety. That's something we have differed on since

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

I was a youngster. For example, sociology does not seem to agree with some people. They are much roiled because that procedure industrially and socially differs. They don't care to adopt my methods of social procedure. I have my office work done with a visual and mental point-to-point radio tracer connection for the general conduction of my business interests—very handy. All business under detectors, values ascribed by assessment association." Sometimes he talks so rapidly that it is impossible to follow him.

On frequent occasions the patient stays in his room and with a show of great authority delivers excited diatribes against numerous imaginary persons who have neglected to carry out his orders. The patient becomes quite upset at these times, but he can be quieted down easily.

He manifests numerous myoclonic movements of the head and hands which he ascribes to becoming "careless and inattentive", with the result that his enemies' radio breaks through his guards and causes his legs and arms to quiver, and at such times he shows twitchings of his body. He says that these are decidedly unpleasant. He becomes frightened, but always reassures the examiner that in a minute or two he will have them well in control. He refuses, however, to discuss these movements in much detail, "since it is a private matter, and I doubt your ability to understand fully".

Delusions and hallucinations.—He talks a great deal of a "tracer radio". "I want you to understand that I have a tracer radio, and I'm continuously sending out messages in order to conduct my business. In fact I'm sending out messages right now." It follows him wherever he goes on the ward or in the shops, and by its means he sends messages out over all the world, directing affairs everywhere. When asked to explain something of the mechanism of this tracer radio he promptly assures the examiner that he will be glad to do so to anybody possessing sufficient intelligence to comprehend. Asked what this radio was, he replied, "It's a tracer connection. Within a very few years, a short period of time, tracer radios will be understood by the most ignorant. Mine is the first, and by means of it I keep in connection with certain of my associates. I really have a number of these protective devices, and I can leave the whole situation to them."

He says he has travelled extensively, and that he can throw the world into an economic crisis by closing his banks or by ordering an increase in prices, and many similar things. He does all this by radio control, and is very busy sending out radio messages and receiving them. He has innumerable lawsuits in progress against the nurses, attendants, patients, physician, hospital and state, as well as the United States Government and the League of Nations. He has innumerable detectives watching people and protecting his interests, and he expects daily that innumerable people will be brought to the bar of justice and made to suffer for their sins against him. He discusses in his rambling, incoherent fashion the racial types of Portuguese in New Bedford, the sea-shells to be found there, and the researches in a physics laboratory that he is conducting by means of these sea-shells. He has written several volumes during the past year of his travelling all over the world. He told of lecturing in all the great universities, nonchalantly informing the examiner that he had gradually lost track of the number of degrees that had been granted him. In his published work on etymological ethnology he had evolved a few new "geogeletic" astral computations which were having considerable vogue in astronomy and astrology.

As for hallucinations, the patient says he can hear voices which are continually "riding" him, but he pays no attention to them. Asked from where the voices come, he replied, "It's —— the son-of-a-gun outside is giving me some of his radio energy. You want to look out for him. I'm just letting you know I have outside radio energy. He's just energized me with a little energy". (What is that outside energizer?) "It's a wrongly developed form of radio that is used." (Do you hear voices at all?) "I do know of one, but I know the sources of them, and everything connected with them." "Certain voices try to cut in on my radio, but I know the definite parties that voice their opinions and intrude upon my privacy. I shall take care of that in due time. I shall take care of the entire

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

situation in a legal fashion, and I am right now sending out orders over my tracer radio to take care of the entire situation."

Imagery Test Results.

The patient seemed to grasp the instructions well and was co-operative during the test period. His data are presented in Table VII.

TABLE VII.

Imagery modality.	Obtained score.	Deviation from expected score. Schizophrenic.	Normal.
Visual	23	+ 7	+ 5
Auditory	10	− 3	− 9
Kinæsthetic	28	+ 7	+ 13*
Tactual	4		
Temperature	3	7 − 8	− 4
Olfactory	1		
Gustatory	4	5 − 4	− 5
Definitions	10	..	..
Associations	38	..	..
Total	121		

It may be noted from this table that the only unusual variation of imagery is the kinæsthetic, which is significantly above the normal distribution. Of the total number of scored responses (121), 48 are definitions and associations—mainly the latter.

Discussion.

(1) *Hallucinations.*—This patient's preponderating kinæsthetic imagery seems to correspond to his hallucinations, which are exclusively of the " active " auditory type. Such a relationship has already been referred to in the case of Cases 1, H. A—, 3, E. B—, 6, T. D—, and 7, F. D—.

(2) *Delusions.*—This patient's delusions are mainly ideas of influence, and are persecutory in nature (as was also the case in the above-named patients). They seem to be elaborated secondarily in a grandiose manner. Thus one finds that he acts as if he were himself the originator of the influences to which he is subjected. There is also a large number of definitions and associations, particularly the latter. Their significance is not clear; they may indicate, as has previously been pointed out, a relationship to the degree of delusional elaboration, which in this patient is very great.

(3) *Activity.*—The patient's periodic excitements may be related also to his preponderating kinæsthetic imagery. His general jerkiness of manner, the tic-like movements of his head, arms and legs and clumsiness in motor expression may also have relationship to his kinæsthetic imagery. We have already referred to such a possible relationship in Cases 1, H. A—, and 3, E. B—. The patient elaborates these movements in a delusional manner, by projection to the outside world as " influences ".

CASE 9: A. D—.

The patient is a 28-year-old white male. Shortly before admission he became an excessive masturbator and became much wrought up over it, speaking a great deal of its deleterious effect on his body. He became very seclusive, and spent all his time rocking in a chair. He said that someone was going to kill him, and that various things have a special significance for him. He was admitted to a mental hospital in 1929, when he talked about his relations with a school-teacher,

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

saying that for a year he was " under a contract " to make up his mind about Miss M—, " to give her some answer ", and that during that time she had been attempting to get in touch with him from the town in which she lived by means of the " autophone ". He was admitted to the Worcester State Hospital in July, 1932.

General activity.—The patient is very submissive, spending his time on the ward, or doing simple work. He spends much of his time in a rocking-chair. He is somewhat apprehensive and worried, and whimpers frequently. He regards himself as an invalid, as not capable of doing much work. There is an obvious lack of energy. His speech, though relevant and coherent, betrays considerable apathy and indifference even when he is discussing the things which he says distress him most. He is oriented and his memory is good.

Delusions and hallucinations.—He says that every organ of his body is sick, and describes in detail his various bodily ills. He is subject to electricity, which affects every part of his body except his genitalia. His intestines are broken in two, and since the ends are sticking out through his side, there cannot be normal intestinal activity ; his liver is enlarged or contracted or broken ; his stomach is enlarged or contracted to microscopic size or it is broken open, filled with air, twisted into a knot, dislocated, failing to function at all ; it is rotten, diseased, swollen and bleeding. He has tumours of the abdominal cavity, of the kidneys, and of the liver ; these cause enormous swelling in his abdomen. He has rotten or absent or diseased or atrophied or broken lungs. His heart has been broken into four pieces, each of which is swollen and bleeding, and it has ceased to beat. He knows all these things are so, since he sees pictures of them on the walls, and he can look down at his body and see for himself. Also he can feel all this with his hands, and he often does so, each time finding his worst suspicions confirmed. He has a weakness in his back, arms and legs. His only spontaneous remark is usually, " I wish my stomach was well. It's rotting inside ". " The inner layer of my skin is broken ; my bones are broken ; my skull opens up ; I have no lungs, no heart, and inside of my chest there is only a space." His jaw hurts and he wonders if it is broken. His neck is swollen and painful. He has lost a piece of bone from the side of his head. He has pains throughout his body, particularly in the region of his abdomen. His internal organs move around in an abnormal manner. He tells of spitting up blood and seeing red splotches and blotches on his skin. He has peculiar sensations in his legs and arms. He things he has tuberculosis of the spine. His sides click every time he moves. He suffers from dizziness. He talks of his head opening up and his brains sticking out, of his skin, bones and teeth being " feverish ", of something " funny " happening to his spine.

He hears voices every day, usually in the morning and at meal-times. The voices are quite distinct—quite as distinct as the examiner speaking to him ; they come from somewhere not in his head ; maybe from the air ; he is not sure. The voices of his family refer to his bill at the hospital. They say to him, " You are not wanted any longer ", and make other disparaging statements, such as " A— is a total hindrance ", and sometimes vulgar remarks also. He suddenly asked, " Did you hear somebody say ' pronounce ' then ? " He explained to the examiner, " I saw her out there and I thought I would pronounce her name. Sometimes I pronounce Miss M—'s name. She used to like me. She's talking to me now. She called me ' foolish ' for being in this hospital. I hear Miss M— talking to me. She was my high school teacher. She told me she loved me. I can hear her. I have heard her for a year. I heard her voice in the room. First she said, ' I like you '. I called her name ; she said, ' Bonne homme '. Yes, I did hear her voice. There, I just thought I heard Miss M—'s voice saying, ' You better leave the baby business alone '. At other times the voices say, ' Go along, go play with yourself. It's a nice baby.' "

He said that sometimes he saw people who were not present and that sometimes he saw movements in inanimate objects ; for example, " I have been in tight places. One night I saw a dollar roll upstairs all by itself. The room began closing in, walls came near me." From time to time he has seen profiles of different people,

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

especially of Miss M—, on the wall over the piano. They have been more like shadows than actual persons and have never spoken to him or made any sign.

He sees blotches on the walls which he says are his wounds; for instance, he had just seen a blotch which was the wound of his Adam's apple. The blotches are pea-green or flesh-coloured, but some are brown and yellow. He sees his inner organs like pictures on the wall. He sees his stomach as black and white. He believes his former school teacher is pregnant; he has had no physical contact with her, but he can tell she is pregnant because of the "sour" odours that he smelled in his room. He has asked the nurses if the food smelled like poison to them.

Imagery Test Results.

The patient understood the instructions quickly and co-operated well during the test. His data are presented in Table VIII.

TABLE VIII.

Imagery modality.	Obtained score.		Deviation from expected score.	
			Schizophrenic.	Normal.
Visual	25		+ 6	+ 7
Auditory	23		+ 8	0
Kinæsthetic	3		− 22*	− 14*
Tactual	14	14	− 3	+ 1
Temperature	0			
Olfactory	3	21	+ 11*	+ 10*
Gustatory	18			
Definitions	37		..	..
Associations	0		..	..
Total	123			

It may be seen that the olfactory-gustatory imagery responses are significantly raised in number, and that the kinæsthetic responses are significantly diminished. About one-third of the total number of responses were definitions; there were no associations given.

Discussion.

(1) *Hallucinations.*—In this patient the olfactory-gustatory imagery, which is preponderant, may bear correspondence to his olfactory hallucinations. The visual hallucinations have no corresponding imagery preponderance. The auditory hallucinations are entirely *passive*, but they too have no corresponding preponderating imagery. His depleted kinæsthetic imagery should be again referred to, since he furnishes the first example, in this series, of those patients in whom preponderating olfactory-gustatory imagery is associated with depleted kinæsthetic imagery (*cf.* Cases 15, W. M—, 16, A. O'S—, 20, F. St. P—).

(2) *Delusions.*—His delusions are somatic in nature. As will be seen in other patients also, these somatic delusions dominate the clinical picture, and are very colourful and bizarre. The problem will also be discussed later as to whether somatic delusions are related to specific imagery preponderance. One does not find here any ideas of influence or persecutory delusions such as those shown by the patients in whom kinæsthetic imagery is preponderant. The large number of definitions given by this patient, as by some others, may indicate that the directions for the imagery test were misunderstood; on the other hand, if this were so, the imagery responses would not have recurred time after time among the definitions. Hence it would appear that the definitions actually precede the images as the response in the patient, and have then been elaborated secondarily by his imagery. When they are woven into his thinking, they become the means for elaboration

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

of his delusions. The large number of definitions then seems to operate to give to his experiencing the elaboration which makes possible, out of his particular imagery background, its expression in delusions of a bizarre nature.

(3) *Activity*.—The patient is generally under-active. This point will be discussed fully in a later connection, when the relationship of under-activity and stupor in relation to preponderant tactual-temperature and/or olfactory-gustatory imagery will be considered. This is in contrast to the activity of patients in whom preponderant kinæsthetic imagery was found associated with over-activity.

CASE 10: J. H—.

The patient is a white male, aged 36. It was stated on admission in 1931 that the patient had become more and more seclusive and that he had given up going out with girls as he had formerly done. He then had begun to show much interest in religion, and had become more and more seclusive. He became easily upset by minor things. Gradually he found it increasingly difficult to keep his mind on his work, and he made a retreat at a monastery. On coming home he talked a great deal about religion, fasted for long periods of time and lost considerable weight. He began to complain that his underwear and trousers did not fit him, and would change his underwear six or seven times a day, and on one occasion he burned it. He broke a window in his room and threw his clothes out of the window. He set fire to his bed and burned fifty dollars. He was sent to a private sanatorium where he complained of smelling peculiar disagreeable odours, and suspected that nuns put these odours into different rooms to irritate him.

General activity.—The patient is very quiet, seclusive, somewhat shy and diffident. He associates very little with the other patients, spending as little time as possible on the ward. He does a good deal of reading in the library. He is extremely neat and tidy in appearance. He studies maps for hours. He does not talk spontaneously, and although he answers questions politely and relevantly, he is not very productive. His affect is quite flat. Orientation and memory are excellent. He has done some work in the hospital which is of excellent calibre, although it is done very slowly and in an over-meticulous manner.

Delusions and hallucinations.—The patient stated that he left his position on the last working day of 1930 because he was sick, and that he went to bed at home for 10 days. He said he felt " as though I was all burned up ", that he did not enjoy breathing as he normally did since the air did not seem fresh, that he was completely tired out and did not feel like walking. He was unable to concentrate. " I thought that my nerves were not strong enough." He said he had cut up his underwear because he did not think it fitted him properly. As for the peculiar odours, he said, " I thought that the Sisters felt my mind was getting bad, and they put odours in my room to make me angry and clear my mind and make it more active ; the same as though someone had slapped you in the face. These odours were as though there were a skunk in the room ". He burned up fifty dollars " to kill the odour " in the room.

Palpitation of the heart had bothered him, and he often wondered if his " heart and liver and stomach were working all right, due to my nervous system from not working all right ". " It hurts me to concentrate. It makes me tense ; my nerves." When asked to explain this more completely, he said, " If I read too much I'll feel the tension in my toes, for instance ". Asked if he feels tension anywhere else he replies, " My toes, my stomach, and it will lead to trembling. Well, I can't go hardly to describe except that I feel shaky. It doesn't worry me any as I feel that any way I will get strong and conquer it." He denies hearing voices and says he has no visions. He insisted that the peculiar odours of which he had formerly complained were real. He admitted that he had smelled the same odours in the hospital here as he had in the sanatorium, but that these odours had not been so disagreeable or strong. At the present time these odours have disappeared. He admits that he has " queer thoughts ", and that people may be able to read his thoughts at times, but he is sure that he has no enemies in the world.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

It should be mentioned that the psychiatric staff has not been able to agree as to the diagnosis in this patient's case, despite almost five years of constant surveillance. The differential diagnosis seemed to rest between schizophrenia simplex and far-advanced anancastic (compulsive) psychopathy.

Imagery Test Results.

The patient readily understood the directions for the imagery test and co-operated well throughout. His data are presented in Table IX.

TABLE IX.

Imagery modality.	Obtained score.	Deviation from expected score.	
		Schizophrenic.	Normal.
Visual	81	+ 55*	+ 51*
Auditory	14	− 7	− 17*
Kinæsthetic	4	− 31*	− 20*
Tactual	10 | 15	− 9	− 3
Temperature	5 |		
Olfactory	3 | 5	− 9	− 11*
Gustatory	2 |		
Definitions	0	..	..
Associations	1	..	..
Total	120		

The marked preponderance of visual imagery responses is obvious. All the other imagery modalities have been depleted, especially the kinæsthetic. No definitions were given, and there was only one association.

Discussion.

(1) *Hallucinations.*—The outstanding feature in this patient is the great predominance of his visual imagery. There is no preponderating olfactory imagery to correspond to his olfactory hallucinations; in fact, olfactory imagery is significantly depleted. It may be that these olfactory disturbances, as was indicated in Case 6, T. D—, were merely hyperosmic phenomena elaborated in a delusional manner.

In contrast to Case 1, H. A—, in whom preponderant kinæsthetic imagery was associated with kinæsthetic hallucinations and delusions, there are no visual hallucinations corresponding to the large number of visual-imagery responses in this patient.

(2) *Delusions.*—There are no delusions in the patient's clinical picture at the present time. In the past history there is some evidence that somatic and persecutory delusions may have been present, but these were vague and were not at all elaborated or systematized. The imagery data on this patient contribute nothing, therefore, except negative implications to this aspect of the problem.

(3) *Activity.*—Here also, as with the delusions, there is little light shed by our present data. The behaviour of the patient, except for the likely anancastic activity, is not unusual enough to warrant his inclusion within either of our large groupings of over-activity and under-activity.

It is quite probable that if a schizophrenic process is or has been present in this patient, it is now "burnt out". No apparent change in the clinical status has occurred for at least five years. From a nosological standpoint, it would appear that if this patient is schizophrenic, the nature of the process is of the simple type. But for our present purposes the fact that his imagery is so similar to that of the normal individual may account for the relatively undramatic nature of his illness at present, for the lack of such symptoms as hallucinations, delusions

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

and conspicuous activity disturbances. In this respect, then, this patient, if he is psychotic, may furnish an important example of the significance of " negative " findings for the relationship of imagery to clinical symptoms.

CASE 11 : S. K—.

The patient is a white male, aged 23. The first alarming change in the patient was noted at about the age of 14, when he began to express ideas of himself out of all proportion to his abilities. His friends nicknamed him " Professor ". About two months before admission, in 1935, he became quite over-active and went without food or sleep, hiking long distances from one city to another. In one city he stopped automobiles in the street, barricaded himself inside a store, and was arrested. He talked in such an incoherent and grandiose manner that he was sent to the hospital.

General activity.—On admission the patient was untidy, stripped off his clothes, disarranged furniture, and ran about the ward. At times he became so over-active and destructive that pack treatment was necessary. At other times he was found in fixed, rigid attitudes. There was marked echopraxia. He was resistive to passive movements, and failed to obey commands.

On two occasions there were outbreaks, after which he went into a curious semi-stuporous state. These occurred while lying in bed ; he began to bellow and scream that he wanted to go home. The eyeballs turned upward and outward, his face was bloodshot, and his eyes red and puffy. He frothed at the mouth and bit his tongue and cheeks. This attack lasted for about 20 minutes, after which he became stuporous. One attack was described by the nurse who observed it as follows :

" The patient suddenly thrust his hand through a pane of glass, receiving lacerations on the back of the hand. He cried and blubbered while his hand was being dressed. He cried out ' Mama, mama ', several times, but refused to answer questions which were asked him. He looked stuporous. After crying for about 10 minutes he became rigid ; his eyes were open, but his gaze was fixed ; the pupils were dilated. He did not respond to questions or prodding. Breathing was stertorous, and his mouth was open. He remained this way for several minutes, then gradually relaxed and began to cry softly. He became calmer, ate his lunch, and answered questions in a low, monotonous voice. Then he talked spontaneously in a rather stuporous, trance-like manner. He believes to-day is Sunday (Thursday). He wants to see his mother, father, sister and brother, and have a family reunion. He heard voices and footsteps while talking to his mother, and also felt their ' presence '—he believes they were men and women actors. He says his mother also heard them and therefore was afraid. He felt great turmoil within himself when he broke the window. He is penned up just like a chicken —that is why he is chicken-breasted."

Hallucinations and delusions.—At the time of the present investigation the patient spoke spontaneously of the visions he used to have in which he saw people moving in front of him. He thought that these were real, especially those of the girl with whom he was in love.

He admitted that he had heard voices saying, " I just imagined I heard God ; I imagined that I was the Lord. I don't believe that now—I did for a while. The voices called me bad names and sometimes they spoke pleasantly to me ". God's voice had talked to him constantly and he had not thought that unusual. He was sure it was an actual occurrence and not imaginary. He admitted he had been hearing voices " talking to him in his mind " ever since he was 19 years old ; sometimes the voices said good things to him, and at other times bad things. They were usually those of a man's voice. At times he could hear his own voice coming from the region of his heart.

Imagery Test Results.

The patient comprehended the instructions readily and co-operated throughout the test. His data are presented in Table X.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

TABLE X.

Imagery modality.	Obtained score.		Deviation from expected score. Schizophrenic.	Normal.
Visual	15		− 8	− 12
Auditory	30		+ 11*	+ 2
Kinæsthetic	9		− 22*	− 15*
Tactual	29	37	+ 16*	+ 21*
Temperature	8			
Olfactory	5	16	+ 4	+ 2
Gustatory	11			
Definitions	14		..	..
Associations	7		..	..
Total	128			

It may be seen from this table that the auditory imagery responses are significantly above the schizophrenic level, and that the tactual imagery is significantly higher than for both groups; the kinæsthetic imagery responses are significantly depleted. The definitions and associations number 21 of the total 128.

Discussion.

(1) *Hallucinations.*—The patient's extremely high tactual imagery is not reflected in tactual hallucinations. Although he has had visual hallucinations, there is no preponderating visual imagery to which this might be related. He is the only patient in the entire series to have significantly raised auditory imagery, and he has auditory hallucinations. That the latter are *passive* only is of interest in the light of the fact that his kinæsthetic imagery responses are very significantly diminished.

(2) *Delusions.*—The delusions, when they were present, were of grandeur, and were always indefinite and unelaborated. The number of definitions and associations is fairly small and, in contrast with Cases 7, F. D—, and 8, J. D—, may represent in this patient a limiting factor to extensive paranoid formations.

(3) *Activity.*—The acute attacks described are of special interest, and will be discussed later in connection with similar attacks in other patients in whom crying for their "Mama" is a distinctive feature. It may be indicated here, however, that this patient's high tactual-temperature imagery may be brought into relationship with his stuporous episodes; we have already referred to this relationship in Case 2, C. A—, and will be confronted with it again in Cases 12, B. K—, 13, J. L—, 15, W. M—, and 16, A. O'S—. It is to this group of patients that this patient corresponds most closely, as will be seen. His occasional excitements may also be noted; their significance in a patient with this type of preponderating imagery background must apparently be evaluated in terms different from the excitements in patients in whom stupor is not a clinical feature.

CASE 12: B. K—.

The patient is a white male, aged 29. In 1932 he began to complain of difficulty with his head, eyes, stomach and bowels. He said that his stomach was "rotten", and that he had headaches and was unable to sleep. He was admitted to a hospital, from which he was soon discharged, and remained at home for about six weeks, during which he seemed to be his usual self. He then began to awaken early in the morning, turn on the radio and sit quietly beside it until long after midnight. After an unsuccessful attempt to find a job he began to have "ugly spells". He complained that he tasted pepper in his food, which made the blood rush to his head, that he had peculiar feelings in his head and body. At these times he became excited and paced the floor. His family finally found it necessary to have him admitted to the hospital.

General activity.—The patient stands about the ward in a peculiar, awkward

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

posture, or sits quietly for hours. There is occasional urinary incontinence. He mingles with no one. His face is expressionless, and mucus is frequently found on his nose. There is frequent drooling. His behaviour is characterized by a stiff, uneasy manner. He has little initiative. He frequently stands with one knee bent, one arm flexed at the elbow, his fingers pressed deeply into his palms. He holds his hands out in the air, his elbows at his sides, and keeps such a position for hours. He does not carry out any activity that has been begun. He sits down in a semi-standing, uncomfortable posture. Before doing this he usually touches either the wall, furniture, or other persons in the room. He makes awkward movements with his feet and legs.

From time to time he has prolonged crying spells, during which he weeps bitterly and calls out for his " Mama ".

He walks with a hesitating, dancing step, and sometimes tries to go into another room so as to avoid having an interview. When offered a piece of candy he starts towards it, but his hand remains suspended in the air. He walks very awkwardly, shuffling his feet from side to side. When he attempts to pick up an object, such as a card, he seems unable to manage his hands properly, and apparently provoked says, " Oh, what's the matter; it's funny." In manipulating cards he makes many false motions, much of the time wiggling his legs and his arms. He may cry and say, " I'd like to do the cards. I like to play cards ". If given the opportunity he picks up the pack in the fashion of a very young child, using his palm rather than his fingers. He handles a pencil much in the manner of a small child, with his whole hand. Several times he gets up as if to make an exit, but sits down again, complaining that he feels very uncomfortable.

Although he stands in a rigid manner, he makes frequent motions with his right hand as if he were about to touch something, then quickly draws his hand back. When asked about this he answers, " I have to touch something. I love my ma ". He often touches everybody who passes him, and has been struck by many patients whom he has touched. Sometimes he is observed to make movements upon himself as though he were brushing off cobwebs. When sent on an errand he frequently may be found in one spot moving from one foot to the other, but not making any forward progress, and when asked what the trouble is, he answers, " I'm stuck ". He must be urged to eat, and he makes many unnecessary motions, often getting his fingers entangled in his mouth. When told to wipe his nose he makes a movement towards his handkerchief, but stops midway.

When his mother comes for a visit he eats the food she brings, then places his head in her lap and sleeps away the entire afternoon.

Delusions and hallucinations.—The patient expresses many somatic complaints. His stomach is in poor condition. He has many aches and pains. He has a feeling in his head and body as if needles were going through him, and asks for liniment with which to rub his body. He talks of frequent earaches, and says that his body will fall apart. He has pains in his chest, his arms and shoulders, and occasionally in his legs. The pains are dull in nature and vary with the weather. Ice-packs help him considerably, making him " feel like a new man ". Sometimes he feels some burning of his skin. When asked about his peculiar movements he says, " Oh, it makes me feel kind of funny, kind of nervous at times. Partly a nervous feeling I have ". He says he feels as if something were lacking within him, but that he is unable to find out just what it is.

He admits hearing voices; these are male voices, and they seem to come through the wall. (What do the voices say?) " I just hear voices. I don't remember." When asked again about them, he says, " I heard—I hear strange voices once in a time. It is a kind of—I mean—I kind of forgot what they say ". (Are they male voices or female voices?) " Male voices." Here the patient cried and his whole body trembled.

Imagery Test Results.

It was only after considerable preliminary conversation that the patient " thawed " sufficiently to participate in the imagery test. Once begun, however,

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

it was clear that he understood the directions well His data are presented in Table XI.

TABLE XI.

Imagery modality.	Obtained score.		Deviation from expected score. Schizophrenic.	Normal.
Visual	28		− 6	− 11
Auditory	16		− 2	− 13
Kinæsthetic	7		− 11	0
†Tactual ("pure"	32			
†Tactual ("mixed"	20	53	+ 23*	+ 30*
Temperature	1			
Olfactory	3			
Gustatory	0	3	− 4	− 6
Definitions	0		..	..
Associations	12		..	..
Total	119			

† As was tabulated with Case 1, H. A—, in whom "pure" and "mixed" kinæsthetic imagery responses were differentiated, so in this patient, tactual responses which occurred alone and those which were mixed with other types of imagery are presented separately. In the "mixed" type the tactual imagery was always the first elicited.

From this table there is clearly seen a great preponderance of the tactual imagery responses. There were no definitions and only 12 associations given.

Discussion.

(1) *Hallucinations.*—The outstandingly high number of tactual imagery responses, found also in mixtures with many of his other imagery responses, may be related to his tactual hallucinations. There is no preponderance of auditory and olfactory-gustatory imagery to relate to the passive auditory and gustatory hallucinations respectively which are also part of his hallucinatory picture.

(2) *Delusions.*—This patient has numerous somatic delusions. Although Case 11, S. K— had no somatic delusions, this patient resembles him with respect to the preponderating tactual imagery. It may be true that there is a relationship between somatic delusions and preponderating tactual imagery *if tactual hallucinations are present.* In other words, somatic delusions may arise from preponderating tactual imagery if hallucinatory elaboration has occurred as an intermediate step, i.e., the sequence of symptom-production may be: tactual imagery ——→tactual hallucinations——→somatic delusions.

There are relatively few associations and no definitions. This observation seems to confirm the point previously made that the extensiveness of paranoid elaboration may depend upon the realization of the capacity for giving meanings. In the production of somatic delusions, however, this may not be as important as in persecutory delusions and ideas of reference. The close similarity of somatic delusions to tactual hallucinations may be due to the limited meanings which can be ascribed by the patient to both these "types" of experiences. It would appear at any rate that the elaboration of delusions may depend upon the existence of the capacity to give meanings.

(3) *Activity.*—The patient's manneristic touching behaviour seems to be related to his high tactual imagery. Of apparently greater importance, however, is the relationship between this type of preponderating imagery and stupor. This patient belongs to the group of patients referred to in the discussion of Case 11, S. K—, in whom preponderating tactual-temperature imagery is found in association with stupor. His resemblance to Case 11, S. K—, and also to Case 15, W. M—, is also close in that each of these three patients manifest confusional episodes in which they cry for their "Mama".

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

This patient gives observers the suspicion that he is suffering from post-encephalitic Parkinsonism. The diagnostic difficulties which arise out of the frequent resemblance between post-encephalitic Parkinsonism and some catatonic syndromes are well known. This patient's resemblance to a post-encephalitic seems to be in the nature of his movements, i.e., not in the movements themselves, which are carried out pretty well once they are begun, but in a certain quality of clumsiness in them. In the post-encephalitic the clumsiness arises from disturbed motor co-ordination. What may differentiate a similar picture in the schizophrenic? This patient's clumsiness resembles that shown by individuals in whom there is numbness or paræsthesia in the extremities due to damage in the afferent systems. Such patients grope about in a stiff, uncertain, unconfident manner, trying apparently to obtain as many tactual impressions as possible. They resemble somewhat a blind person who gropes about with as much of the surface of his hands as possible to find a familiar object. If this analogy is correct it may indicate that schizophrenic clumsiness arises from a centripetal or central (imaginal) defect in contrast to that of the post-encephalitic, in whom the clumsiness is conditioned centrifugally. A similar situation seems to obtain rather clearly in some patients with preponderating *kinæsthetic* imagery, e.g., Cases 1, H. A—, 3, E. B—, and 8, J. D—, in whom clumsiness and jerkiness of motor activity is easily to be observed. Afferent or central (imaginal) *tactual* disturbances, as in this patient, with preponderating tactual imagery, may be of similar significance in the determination of the " smoothness " of movement which is often observed clinically to be destroyed in schizophrenics.

Case 13: J. L—.

The patient is a white male, aged 20. About two years before admission the patient began to sleep poorly at night, preferring to spend the night hours in building radio sets and in planning various machines. He became very irritable, expectorated indiscriminately about the house, and refused to shave, bathe, or change his clothing. There were frequent grimaces and periods of silly laughter. His family said that he passed his hand frequently in front of his face and along the back and side of his head as if visions of some kind were floating around him. As time went on he became more disturbed and confused, and finally was admitted to the hospital.

General activity.—The patient stands about the ward and refuses to do any work. He keeps himself neat and tidy. He is mute, sullen, asocial and uncooperative. His mood is essentially one of irritability. He often maintains a fixed standing position for hours at a time. His speech, on the rare occasions when he talks, is incoherent and disconnected, with occasional neologisms. He occasionally makes use of long scientific terms in an incorrect manner. He occasionally inserts pieces of toilet tissue or rags into his ears and nostrils.

Delusions and hallucinations.—The patient told of an elaborate electrical system which was connected to the hospital, and through which the examiner was able to keep in touch with him. He said that he hears the examiner's name mentioned frequently over the radio. Although obviously reluctant to elaborate upon the topic he admitted that he hears voices which say many unpleasant things about him such as " J— is a (performer of fellatio) ". He said that while at home he frequently heard the examiner's name being broadcast. He states that he knows the voices are " imaginations ". He talked in a confused fashion about the influence of people who were crossing his path. " I seem to think people are talking about me." " I have mental amnesia, mental distortion." " There is electricity in all of us." " I'm inventing a machine to utilize force of electrons."

At first he wore gloves constantly because he complained that when he touched metal it gave him shivers in his spine, but he has since discarded them. On occasion he is found walking about with a towel over his face " to shut out the smells ", but he refuses to explain this. During the interview he was obviously distressed, and finally admitted, " Talking to you gives me a funny taste in my mouth ". By

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

further questioning it was learned that he likens the taste in his mouth to sand; he then added that he has such sensations when he talks to any men in the hospital.

Imagery Test Results.

The patient understood the directions fairly readily, and co-operated well throughout the test. His data are presented in Table XII.

TABLE XII.

Imagery modality.	Obtained score.		Deviation from expected score. Schizophrenic.	Normal.
Visual	22		− 6	− 11
Auditory	21		− 2	− 13
†Kinæsthetic { "pure"	6	26	− 11*	0
†Kinæsthetic { "mixed"	20			
†Tactual { "pure"	13	49	+ 23*	+ 30*
†Tactual { "mixed"	34			
Temperature	2	11	− 4	− 6
Olfactory	2			
Gustatory	9			
Definitions	0		..	..
Associations	0		..	..
Total	129			

† See footnote to Table XI, p. 318.

The outstanding feature of these data is the high number of tactual imagery responses. The number of kinæsthetic responses are significantly lower than that of the schizophrenic group. Neither definitions nor associations were given.

Discussion.

(1) *Hallucinations and delusions.*—The patient's preponderating tactual imagery may be related to his experiences, which seem to have been tactual hallucinations. That some of his queer bodily feelings may actually be somatic delusions rather than hallucinations is quite likely; we may refer to our discussion of Case 12, B. K—, in this connection. This patient gave no definitions and associations—a fact which might account in him also for the lack of delusional elaboration to his bodily feelings. The "ideas of electricity" seem to have a tactual basis; he protects himself against these strange feelings; he does not carry out their messages as is the case in "ideas of influence". The patient's diminished kinæsthetic imagery would favour this interpretation, in the light of our findings in Cases 1, H. A—, 3, E. B—, 6, T. D—, 7, F. D—, 8, J. D—, and also as will be seen in Cases 17, A. P—, 19, H. S—, and 21, E. T—. There is no preponderating auditory imagery to correspond to his passive auditory hallucinations. Also, there is no preponderating olfactory-gustatory imagery to correspond to his hallucinations in this modality, except in so far, perhaps, as they may be involved in his somatic delusions.

(2) *Activity.*—This patient offers another case in the group consisting of Cases 2, C. A—, 11, S. K—, 12, B. K—, 15, W. M—, and 16, A. O'S—, in whom high tactual imagery is found in association with stupor. The concomitance of tactual hallucinations and/or somatic delusions in this group of patients who manifest stupor as a clinical symptom has already been pointed out in the discussion on Cases 11, S. K—, and 12, B. K—.

CASE 14: R. M—.

The patient is a white male, aged 26. Several months before admission at the age of 25 he began to talk frequently of being very tired. He complained that his

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

associates were " riding " him, that they talked among themselves about him because he did not mingle with them, and did not gamble and drink. He remained at home and spent a great deal of time alone in his room. His only topic of conversation was the men who were talking about him. On his arrival in the hospital he was confused and irritable. He attempted to strangle himself with his pyjamas. Though he did not admit hallucinations, he appeared to be attending to them. He tasted his food very carefully before eating it, and then voiced the suspicion that his food was " doped ".

General activity.—The patient spends his time either sitting about the ward or doing a little farm work, at which he persists fairly well. He is fairly neat and tidy. He is very seclusive and often looks out of the window and whispers to himself. Sometimes he laughs in a silly fashion, but most of the time he is apathetic. He always responds to questions, but his answers are usually monosyllabic and evasive. He makes no complaints about food. Orientation is intact and memory is not impaired.

Delusions and hallucinations.—The patient's apathy and evasiveness make it difficult to arrive at an adequate evaluation of these symptoms. When asked why he is here he answered, " The trouble with my back ". He admitted that at one time he thought people were poisoning his food, but he did not commit himself on this point when asked if this was still going on. He denied having thought that the food was poisoned, or that he had tried to strangle himself, or that people were talking about him. Only on one occasion did he admit hearing voices ; when asked what they said to him he replied, " I've got a backache ". When asked if the voices had told him that, he said, " Yes ". He refused to elaborate this statement further.

Imagery Test Results.

The patient seemed to comprehend the instructions well, although he was obviously not very much interested in the test. However, it was felt that his co-operation was adequate. His data are presented in Table XIII.

TABLE XIII.

Imagery modality.	Obtained score.	Deviation from expected score.	
		Schizophrenic.	Normal.
Visual	27	+ 4	0
Auditory	24	+ 5	− 4
Kinæsthetic	31	0	+ 10
Tactual	6		
Temperature	6	− 9	− 4
Olfactory	5		
Gustatory	7	0	− 2
Definitions	15	..	..
Associations	7	..	..
Total	128		

It may be seen from this table that none of the specific imagery responses are significantly different in frequency from the distributions of the schizophrenics or the normals. Definitions and associations comprise 22 of the total number of responses.

Discussion.

(1) *Hallucinations, Delusions and Activity.*—The patient's present clinical picture seems generally to correspond to his imagery picture, in which no significant deviations are observed. The former auditory hallucinations were apparently passive in nature, but there is no preponderating imagery to which they may be related. His delusions, when they were present, were mainly of a vague persecutory nature. The imagery and clinical picture of Case 18, G. P—, corresponds to

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

those of this patient very closely. Altogether the lack of conspicuous variation in the imagery picture seems to be reflected in the colourlessness of the patient's clinical symptoms. He seems to have settled down to a state of deterioration and, apart from the apathy, is essentially symptom-free.

CASE 15: W. M—.

The patient is a white male, aged 32. Three months before admission in June, 1926, when 21 years of age, the patient got into some sort of difficulty at work and was discharged. He came crying to his father, and complained that he was unable to remember the work which he was supposed to do. He sat about the house, took no interest in his surroundings, and spoke to no one. He said he was afraid to go out because there was somebody who was going to harm him, and spoke of there being something harmful to him in the phonograph. On admission to the hospital at this time he was found to assume fixed postures, and often to lie motionless in bed, staring straight ahead. He was usually mute, but occasionally mumbled a monosyllabic though relevant answer to questions. In August, 1926, he had acute follicular tonsillitis, and following this became completely mute and stuporous for one month. He was transferred to the Worcester State Hospital in 1930.

General activity.—The patient's behaviour on the ward is quite variable. Sometimes he is disorderly, difficult to manage, and careless about his clothes. Sometimes he sits on a bench with his head hanging, paying no attention to anyone, drooling, and not responding to commands. At other times he is active, alert to his surroundings, good-natured and co-operative. On the whole his speech is very unproductive, and despite occasional relevance, is quite incoherent and fantastic. For example, when asked, "How are you to-day?" he answered, "I was trying to make a God out of toilet paper", his voice then trailing off into a mumble of verbigerations. There are rapid fluctuations of mood, the patient manifesting occasional silly giggling or intense fury. When disturbed he has plunged his hand through a mirror on the ward; when seen at one such time he was standing very stiffly, holding his hand before him, asking that the hand be cut off with an axe. He gave no reason for this request except that he did not want his hand. He has been noted to take off all his clothes, put them in the bathtub, and turn the water on them. He is frequently incontinent. When he is disturbed he keeps crying "Mama!"

When stuporous he stands in one place most of the day, or lies in bed in an uncomfortable position. He answers questions by nods and shakes of his head, but does not utter a word. His eyes are open. When asked his name, he merely shrugs his shoulders. He behaves as if he has something in his mouth, but if asked if this is true, he shakes his head.

He is apparently very much interested in food. For example, in answer to a question, he said irrelevantly, "It's the lean supper they give you down there; some pea soup. They all push through the line. There's to be a big dance, eat doughnuts, drink wine and cider". During interviews he asks every few minutes for something to eat, or when he may go to the cafeteria. He often stands about on the ward and says he wants money to buy some sandwiches. When the call for supper comes, he moves quickly to get in line, even when stuporous. When he was urged to speed up some task he said, "Can't go fast. Good eats, girls down there". When he hears the bell for meals he refuses to continue working. He has written the following letter home: "Could you tell me something about the way things are up there in New Bedford. Please send me a few dollars or some Candy and some Clothes. Why don't you buy something good and bring it over. Bring me or send me some Hershey Bars of Candy also some fruit and Oranges and some Sandwiches or something of that sort. You couldn't very well send me a little money so that I can spend it up here. (Signed) W. M.

"Don't forget to send me some fruit and candy also."

Hallucinations and delusions.—From time to time he expresses many bizarre and unusual ideas: "I ate a piece of bread once. There was a guy inside the

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

bread and he took the germ out of the bread." When asked what he had had to eat at dinner he answered, " I had some kind of Chinese food ". Then there was much obscene talk about the Chinese, mentioning rape, then, " I was born out of one of them cockroaches ". He tells that he is thinking about crawling up a man's penis. He commented that he had had a piece of a man's leg for his breakfast. When questioned about stupor, he said he could not move because someone told him to watch the spot he was standing on. He asked if the doctors were going to cut off his arms and legs and wailed, " Jesus Christ, why don't you let me alone, I can't go. I can't walk downwstairs ".

Asked about voices, the patient said, " Christ talks to me all the time. He wants to know if I'm coming along all right. I don't think you can see that man. I used to think you could see Him when I was small, but He must be dead or something. He talks that way at night-time ". He said one day when found laughing that he heard a woman telling him about a funny serial picture she had seen at the movies.

Imagery Test Results.

The patient co-operated surprisingly well on the imagery test, apparently enjoying himself very much. His data are presented in Table XIV.

TABLE XIV.

Imagery modality.	Obtained score.		Deviation from expected score.	
			Schizophrenic.	Normal.
Visual	3		− 21*	− 25*
Auditory	28		+ 9	− 1
Kinæsthetic	23		− 9	+ 1
Tactual	22			
Temperature	13	35	+ 13*	+ 18*
Olfactory	1			
Gustatory	21	22	+ 9*	+ 7
Definitions	9		..	..
Associations	10		..	..
Total	130			

It may be seen from this table that the visual imagery responses are significantly depleted, and that the tactual-temperature and olfactory-gustatory responses are significantly increased in number. A total of 19 definitions and associations was given.

Discussion.

Hallucinations, delusions and activity.—The patient's high tactual-temperature and gustatory imagery have no clearly corresponding hallucinations. On the other hand, they seem to be related to the somatic delusions. They also seem related to his stuporous episodes and to his unusual pre-occupation with food. He may be compared with Case 9, A. D—, who also had high olfactory-gustatory imagery and somatic delusions, and with Cases 16, A. O'S— and 20, F. St. P—, to be presented later.

Like Cases 2, C. A—, 11, S. K—, 12, B. K—, 13, J. L—, this patient shows preponderatingly tactual imagery in association with somatic delusions and stupor. There was observed numerous bizarre associations. Much of his imagery is quite twisted around, *e.g.* he tastes instead of hears, touches instead of sees. Here again we have an example, as was indicated in the case of Case 12, B. K—, of the formulation of expressions in terms of the imagery which predominates.

This patient has manifested excited episodes, similar to those of Cases 12, B. K—, and 11, S. K—, in which there are crying spells and calls for his " Mama ! " These incidents have occurred several times with each of these patients. To their

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

similarities in imagery, hallucinations, delusions and stuporous episodes, this "Mama-crier" factor may also be added as a feature to justify grouping these patients together.

CASE 16: A. O'S—.

The patient is a white male, aged 26. The patient's illness seems to have begun at the age of 19. He began to read all the material available in the Library on the subject of epilepsy and its hereditary aspects. He seized upon tinnitus, from which he himself occasionally suffered, as a sign that he had "recessive epilepsy". However, after he saw a picture of the ova of hookworm in a book, he also became convinced that he was suffering from that illness. He took thymol to cure himself. He became quite depressed and somewhat confused. When he was inoculated against typhoid he was convinced that the injection was that of *Trichina*. He began to say that the faculty greatly resented, and was persecuting him, because of an essay which he had written criticizing Nietzsche. He talked of being followed. He voluntarily went to a general hospital, from which he was soon discharged. He decided to leave school and wandered about looking for a job. On one of his trips he talked of being followed, and so great was his anxiety that he went to a police-station and registered complaints against several men. At this time (1935) he was seen by a psychiatrist and admitted to the Worcester State Hospital.

General activity.—The patient is generally under-active, although he is capable of fairly efficient farm work. He is apparently very much preoccupied with his own thoughts. Orientation is intact, and his memory, as far as can be determined, is unimpaired. From time to time he becomes stuporous, sits or stands rigidly with his fingers pressed in his palms, his eyes shut tight. The stuporous periods usually last only a few hours, rarely more than a day or two. He often complains of having to make a tremendous effort in order to accomplish things. He refers to his stuporous periods as a "dream", and is not sure whether or not he may really have been asleep.

Delusions and hallucinations.—The patient says the former fears of being followed by a gang of university students have entirely disappeared. He is reluctant to discuss this, and says that one should let well enough alone. He is now much involved in religious thoughts. He reported that sometimes he imagines himself all day long as swimming. In the cafeteria he has the idea that when the patients walk by the metal serving counter they are excited and afraid, that when they sit at the wooden tables this feeling disappears; he is sure that the metal has something to do with it, that "it takes something out of them". He has often expressed the wish that he were a girl, and at times has felt that his body was changing into a girl's; he has had the feeling that his penis was growing smaller and disappearing within his body. He says that he is more feminine than masculine, and that his natural tendency to be kind and gentle supports this idea. He feels that he can transfer his sensations to others; all people do not have feelings in their entire body in the way which he does. He wants to make himself a responsible person, but the tickling sensation in his legs and arms, and a sinking sensation, particularly when he lies down at night, makes him feel "like shooting down a slide", and has made it impossible for him to study. He has the suspicion that his cigarettes have been tampered with and poisoned, made many guarded inquiries as to where they had been obtained, and indicated that he could taste the obnoxious substance.

He reports that he has heard voices coming from inanimate objects. They have the quality of coming from outside rather than within himself. They are accompanied by a sensation of tickling in the ear and dizziness. While working in the cafeteria he has the feeling that the dishes and food answer him when he talks to them. For instance, he may say to a tray, "Are you a tray?" and the tray replies, "I am a tray". He admits that this experience is a very strange one, but also very humorous. The voices which come from people he had known "have a make-believe quality about them". He can distinguish them from real voices,

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

but he adds that he is also puzzled as to what reality is. He also hears "spiritual voices". God has talked to him about religious matters and the spirits of his parents speak to him.

Imagery Test Results.

The instructions for the imagery test were quickly understood, and the patient's co-operation throughout was excellent. His data are presented in Table XV.

TABLE XV.

Imagery modality.	Obtained score.	Deviation from expected score. Schizophrenic.	Normal.
Visual	1	− 24*	− 28*
Auditory	28	+ 7	− 3
Kinæsthetic	14	− 20*	− 10
Tactual	34	+ 19*	+ 24*
Temperature	8 (42)		
Olfactory	19	+ 18*	+ 17*
Gustatory	13 (32)		
Definitions	0	..	..
Associations	3	..	..
Total	120		

From this table it may be seen that the auditory imagery responses are the only ones which approximate the average frequency. The visual responses are significantly diminished, as are the kinæsthetic. The tactual-temperature and olfactory gustatory responses are significantly increased.

Discussion.

Hallucinations, delusions and activity.—There is close correspondence in this patient of increased tactual-temperature and olfactory-gustatory imagery and the hallucinations of these modalities. There is no preponderating auditory imagery to correspond to his passive auditory hallucinations. In addition he has somatic delusions and manifests periodic stupors. As has already been indicated, he may be grouped with Cases 2, C. A—, 11, S. K—, 12, B. K—, 13, J. L—, and 15, W. M—. He resembles Case 15, W. M—, closely in that *both* tactual-temperature and olfactory-gustatory imagery are increased.

CASE 17: A. P—.

The patient is a white male, aged 24. Five days after enlistment in the Navy at the age of 19 he became ill with gastro-enteritis, and was put to bed. A few days later he jumped through the wire-screened window of the ship's hospital into the ocean. After his rescue he was found to be very restless, confused and disoriented, but at times he was apathetic. He was sent to a mental hospital, where he remained for a year in a confused state, continually picked at his face, seemed childish, cried easily, and engaged in many fights. He gradually improved and was finally discharged. At home he again looked for work and finally succeeded in obtaining some, but a few days later he seemed constantly exhausted, became restless, and prayed a great deal. He went to a distant town to see a girl, but to the wrong house, broke down a door, and was arrested. Again at a mental hospital he was described as surly, unco-operative and quarrelsome. On admission to the Worcester State Hospital in 1935 he was in a state of excitement, and apparently at the mercy of hallucinatory voices. He talked in a very tense and rambling manner about being persecuted by the Pope and the Catholic Church, saying that mental telepathy and television were being directed against him.

General activity.—The patient's clinical picture is quite variable. For the most

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

part he is neat and tidy, but he is incapable of doing any productive work. He is usually very loquacious, but speaks only of his own difficulties. These centre mainly about " voices " which " put me under stress ", by which he means that they command him to masturbate. Masturbation is excessive and fairly open. He becomes very excited immediately after having masturbated. For periods which last from two or three hours to three or four days he presents a picture of acute excitement with shouting, raving and destructiveness. His facial expression is variable, and will cloud over from time to time with an expression indicating bewilderment, and he often shakes his head as though puzzled about his thoughts.

During the early part of his stay he was on parole, but apparently an excited period supervened, and after he had made two escape attempts it became necessary to keep him on the ward constantly.

Delusions and hallucinations.—From time to time the patient demands his immediate release, saying that he has received orders to this effect from the President. He says he hears voices " all the time from all over the world ". Father Coughlin, the President, the Pope, various other notables, his family, and others speak to him. " They say, ' I will be home in 12 days.' Heck, I don't know." " They talk a lot about getting married." But the voices which distress him most are those which he hears over the radio. These " put me under stress to masturbate ", and made him thrust his hands through the windows. He complains that he is constantly troubled by the many voices which direct him what to do. By ordering him to masturbate he feels they have harmed him physically, and he complains of the weakness resulting from the practice. The voices suggest making sexual attacks upon the nurses. He sometimes says that he is controlled by telepathy, and mentions vaguely that he is able to read the thoughts of others by telepathic means. He had heard a threat of castration just before he had jumped out of the window into the sea. Concerning his arrest, he said, " They locked me in a room and that was when the mental telepathy started on me. . . . When I went to —— Street instead of going to —— Street. The voices said, ' Let me see your punch; punch in the door '. I shouldn't have obeyed that damn voice. I broke the door down, and there were two ladies there, and I started to apologize. I got arrested ". The voices he now hears talk about everything he does. Sometimes they are simply engaged in conversation which does not concern him, and at other times they command him to do things. There seem to be two sets of voices, and he does not know which set of voices to obey; one tells him one thing, and the other another.

Imagery Test Results.

The patient co-operated very well on the imagery test, apparently understanding what he was to do quite readily. His data are presented in Table XVI.

TABLE XVI.

Imagery modality.	Obtained score.	Deviation from expected score. Schizophrenic.	Normal.
Visual	36	+ 13*	+ 9
Auditory	11	− 8	− 17*
†Kinæsthetic { "pure"	43	+ 21*	+ 30*
†Kinæsthetic { "mixed"	9		
Olfactory	0	− 22*	− 16*
Gustatory	0		
Tactual	4	− 5	− 6
Temperature	4		
Definitions	0	..	..
Associat	8	..	..
Total	115		

† See footnotes on pp. 294 and 318; Table II and Table XI.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

It may be observed from this table that the visual imagery responses are significantly increased above the schizophrenic level, and the kinæsthetic responses are also significantly increased. The auditory responses are below the frequency of the normals. There were no olfactory-gustatory responses, no definitions, and only eight associations were given.

Discussion.

(1) *Hallucinations.*—This patient's preponderant kinæsthetic imagery corresponds to the auditory hallucinations which are *active* ("ideas of influence"). He has high visual imagery but, as was also indicated in the case of Case 10, J. H—, there are no visual hallucinations. He resembles Cases 1, H. A—, and 3, E. B—, in that olfactory-gustatory imagery is significantly depleted.

One may ask whether the kinæsthetic factors are operating with visual eidetic factors in this patient to make his phantasies projected and vivid. The existence of high visual imagery is unusual among the patients of this study, in only 3 of whom increased visual imagery was found (Cases 3, E. B—, 10, J. H—, and the present patient), and of these, only one (Case 3, E. B—) has had visual hallucinations.

(2) *Delusions.*—It seems noteworthy that this patient's delusions are entirely secondary elaborations of his active auditory hallucinations. They are persecutory in nature. As has been previously pointed out in other patients, such delusions are to be related to preponderating kinæsthetic imagery.

(3) *Activity.*—The high kinæsthetic imagery in this patient can also be related to the periodic excitements. The relationship between kinæsthetic imagery and periodic over-activity has already been indicated in the case of Cases 1, H. A—, 3, E. B—, 6, T. D—, 7, F. D—, 8, J. D—, and will be referred to again in Cases 19, H. S—, and 21, E. T—. It appears likely that in these patients the periodic overactivity is mediated through kinæsthetic hallucinations (active auditory hallucinations, "ideas of influence") from a predominating kinæsthetic imagery background. The sequence may be: kinæsthetic imagery, kinæsthetic hallucinations ("ideas of influence", persecutory delusions), excited over-activity. Such a sequence follows essentially the pattern of that formulated previously in the discussion of Case 12, B. K—, with respect to the inter-relationship of predominating tactual-temperature imagery, tactual hallucinations, somatic delusions and stupor.

CASE 18: G. P—.

The patient is a white male, aged 30. The patient had a minor injury at work in 1931, and it is said that since then he had been acting peculiarly. But his complaints were so vague that nothing definite could be made out of them and he was considered to be suffering from a "traumatic neurosis". In October, 1935, when he had again gone back to work, he almost immediately told his employer that voices were bothering him and that he needed a two-weeks' rest. He came home and would not leave the house. He complained of pains in his heart and lungs and spoke with an artificial accent. He had insomnia and was very restless. He stated that people were going to make a slave of him. He complained that voices were instructing him to kill people and to commit suicide. At the time of his admission to the Worcester State Hospital in 1932 he was extremely apprehensive, made many defensive gestures, spoke excitedly about strangers talking about him, and said that voices over the radio accused him of killing people and of masturbating. The patient's excitement subsided in a few days and he became quite calm and co-operative. The hallucinations and delusions disappeared, and after a short time he was discharged. For three years he got along very well, and then he again began to talk and act in a similarly peculiar manner as had characterized his previous hospitalization. In 1935 he was readmitted to the hospital.

General activity.—At the present time the patient is quiet and co-operative. He works about the ward and in the cafeteria, quite content to do such simple tasks as swabbing, or peeling potatoes. Orientation and memory are intact.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

His mood is essentially one of apathy; he betrays no surprise or resentment. He talks in a rather rambling, semi-coherent manner. Sometimes he adopts "Injun language" which can scarcely be understood, but he does not explain why he does this.

Delusions and hallucinations.—The patient told of his early experiences, that for two or three nights after moving into a new house he was unable to sleep, would sit around with his eyes open and not move or speak. He began to feel "queer" inside, as if worms had eaten him up. Whenever he went near the garbage barrel he would feel that all the bugs in the barrel jumped on him and made him itchy. Whenever he got into a bathtub he had feelings as if he were being electrocuted. The first voices he heard said, "Go this way—do this—do that—look at that"; they directed him in everything he did, and told him to "play" with himself. They were his father's voice, his mother's voice, and the voice of a stranger. These three people seemed to be talking among themselves and commenting on the patient's actions at the moment he was saying his prayers, such as that "he is scratching his backside", or "jerking off". When he had finished saying his prayers he thought he saw a pair of eyes in the sky, in the north-east direction from his house, about one mile up and five miles away. These he thought must be the devil; he spent all night looking at the eyes. He states that he saw people moving in the bushes near his house; this was in the daytime, and they looked like ghosts. He thought he saw things in the backyard like "moving pictures", and when he looked at pictures in books or on the wall, he thought they were moving.

His body had a burnt smell, as if he had been given a shock of electricity. His eyes weren't right. When he drank water he felt that it went to the wrong place. Once he felt magnetism; something seemed to draw his body towards the earth. He was carrying a shovel on his shoulder at the time, and he thought that the earth-magnetism attracted the metal. Sometimes when he did something it did not seem that it was his own action, but as if another mind was directing him. His body felt unnatural, not like flesh and blood, but some dead feeling instead. He had thought that the milk was being poisoned and refused to take medicine for fear of poison; his family were trying to "get rid" of him by putting poison in his food.

At the time of the present investigation none of the hallucinations and delusions described above were present. The patient referred to all these earlier experiences somewhat humorously.

Imagery Test Results.

The patient understood the directions quickly and co-operated well throughout. His data are presented in Table XVII.

TABLE XVII.

Imagery modality.	Obtained score.	Deviation from expected score.	
		Schizophrenic.	Normal.
Visual	8	0	0
Auditory	10	+ 4	+ 1
Kinæsthetic	9	0	+ 2
Tactual	2		
Temperature	1 | 3	− 3	− 2
Olfactory	2		
Gustatory	1 | 3	0	− 1
Definitions	12	..	..
Associations	73	..	..
Total	118		

It may be seen from this table that the distribution of the imagery responses shows no significant deviations from the schizophrenic or normal levels. The

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

number of definitions and associations, on the other hand, is extremely large (total 85), of which 73 are associations. The number of imagery responses is so very small (33) that these data may not have very much significance.

Discussion.

Hallucinations, delusions and activity.—The patient's relatively few imagery responses have a normal relative distribution. He has had *passive* and *active* auditory, visual, tactual and olfactory hallucinations. The relative lack of any preponderating type of imagery may be related to the fact that at the time of the test the patient was free of hallucinations, delusions and activity disturbance. His colourless clinical status at this time resembles that of Case 14, R. M—, very strikingly ; and they also have in common a lack of any preponderating imagery.

On the other hand the associations and meanings dominate the picture. Some of the associations are very striking ; one would expect from this fact that his delusional picture would have been quite elaborate, diffuse and bizarre. This indeed was the case, as the history reveals.

CASE 19 : H. S—.

The patient is a white male, aged 27. The patient's difficulties seem to have begun in 1931, at the age of 22, when he became interested in religion. At work he became quite preoccupied and forgetful ; he smashed several pieces of machinery, explaining that he only wanted to see how they would look when broken up. He began to talk about people who were persecuting him, and said that someone was broadcasting vile statements about him. He said that he was being experimented upon and subjected to annoyance. He thought people about him were in league to harm him. He refused to shave and became unkempt and depressed. He threatened to kill the son of a nearby neighbour whom he thought was responsible for persecuting him. A revolver was found in his room. The night before his admission to the hospital he hurled a heavy iron bar through the bedroom window of the man whom he suspected.

General activity.—The patient is usually quiet, tidy, and a productive worker. He is very polite and co-operative, but mingles very little with the other patients. His answers are brief, and often evasive and irrelevant. His mood is usually one of apathy. He is suspicious and afraid that everything he says will be used as evidence against him. Everything he is asked he tries to convert into a problem. He carries out his activities in an extremely methodical, almost ritualistic manner. He arranges and rearranges articles in the closet, brushing places on the shelves which are usually inaccessible. He has occasionally been seen to pick up small pieces of paper from the floor and put them in his mouth. He says that he has been slowed down by the type of work in which he has been engaged.

On several occasions, however, he becomes excited, combative and destructive. These acute episodes last only a short time and now occur infrequently.

Delusions and hallucinations.—At the present time the patient's evasiveness is such that it is difficult to evaluate his delusions and hallucinations. (I understand you got into some difficulty ; is that true ?) " Yes. I don't know whether they took it up that way or not." (What was the difficulty ?) " I don't know." (What about the voices down in the cellar ?) " I forget about them." (Have you heard them since ?) " No." (How many times did you hear them ?) " I don't know. I didn't figure it out. I let it go at that." (This voice that told you to heave that iron bar through the window, is that particular individual your friend ?) " It might be." (Did you recognize the voice ?) " No." (Did the voices usually tell you to do pleasant things ?) " I don't figure it out that way. I was asleep in the early part of that morning. I don't know whether I was sleep-walking or not. Other people might consider it that way." (Do you think that somebody is imposing their will on you ?) " It seemed so at that time, but it all depends on the outcome." (What was it ?) " The reason I used is that before

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

I threw it I didn't want to throw it because I would break the window, so I threw it."

Occasionally he frankly admits hearing voices, stating that they are instructing him as to what he should do. The voices are those of both men and women. During a visit home he admitted hearing voices in the cellar, where he had been working. He threw things about and broke dishes.

Imagery Test Results.

The patient understood the directions fairly quickly and co-operated well on the imagery test throughout. His data are presented in Table XVIII.

TABLE XVIII.

Imagery modality.	Obtained score.	Deviation from expected score.	
		Schizophrenic.	Normal.
Visual	12	− 9	− 12*
Auditory	15	− 2	− 10
Kinæsthetic	54	+ 26*	+ 35*
Tactual	8		
Temperature	0	− 11*	− 6
Olfactory	3		
Gustatory	4	− 4	− 7
Definitions	22	..	..
Associations	1	..	..
Total	119		

The preponderance of kinæsthetic imagery responses is clear. The tactual-temperature and the visual responses are significantly diminished. There were 22 definitions and 1 association given.

Discussion.

(1) *Hallucinations.*—The patient's imagery is preponderatingly kinæsthetic. and corresponds to his hallucinations, which are of an *active* auditory type (" ideas of influence "). He is therefore to be grouped with Cases 1, H. A—, 3, E. B—, 6, T. D—, 7, F. D—, 8, J. D—, 17, A. P—, and with 21 E. T— (to be presented). There have been no other kinds of hallucinations. Like Cases 1, H. A—, and 17, A. P—, his preponderating kinæsthetic imagery is associated with depleted tactual-temperature imagery.

(2) *Delusions.*—His delusions at present are vague and difficult to elicit, but betray somewhat their former more vivid persecutory nature. These may also be related to his preponderating kinæsthetic imagery, as has been indicated in previous cases of this group. From the number of the definitions given one would expect a more elaborate delusional picture than is the case.

(3) *Activity.*—An outstanding symptom here, as was also pointed out in other patients in this group, is the periodic over-activity. In this patient also this seems to arise from impulses, which in turn may be related to uncontrolled kinæsthetic imagery; the patient, at the mercy of these impulses, lashes out from time to time in a violent manner toward the world about him.

CASE 20: F. St. P—.

The patient is a white male, aged 34. At the time of his mother's death in 1925 the patient became very much depressed, kept by himself, and frequently cried. He then began to wander, going from place to place, for almost ten years. For some time in 1935 he lived with a relative, but remained constantly in his room and refused any food, saying it was poisoned. He lost a great deal of weight. He became untidy in his habits, and refused to talk. It was finally decided to consult a physician, and the patient was admitted to the hospital.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

General activity.—The patient usually sits about the ward doing nothing, although occasionally he is observed to read the newpsapers. He rarely smiles, and his mood is characterized by apathy. He does not talk with other patients on the ward. He answers questions relevantly, but is not very discursive. From time to time he is found in a stuporous state, in which he does not answer questions, or answers only monosyllabically. Only four or five such episodes have been observed to date. They last for a period of three or four days to two weeks; during them he stands rigidly in one position, is untidy, mute, and refuses to dress himself.

Delusions and hallucinations.—In answer to specific questions at the time of this study the patient said he remembers that about ten years ago he felt that "all the energy had gone out of me", and that since then "I have not been myself". He complains of "internal trouble". When asked what he feels is wrong with him, he points somewhat dramatically to his abdomen and says he has a growth there. He does not know the nature of it, but he thinks it might be a tumour or tuberculosis, or something equally grave. He eats very poorly, and in answer to questions concerning this he says, "Yes, Doctor, it is very grave; it is something with my intestines—very grave indeed. Everything is terrible. I am going to die". Once when asked to tell about his stomach he said, "Wait", and then paused a long time, and then mentioned something irrelevant; in explanation of this behaviour he said that he cannot talk with different people at once; "it is very difficult, but it is sometimes possible to do it". (Do you feel as if your body is gone?) "Wait——" —pause—"I feel within me a new life. This new life came on May 1, May 1, 1935. None could understand."

During his stuporous periods he gave voice to such ideas as "I am dead. Everything is rotten inside of me". When a stool specimen was ordered he refused to give one. When asked why, he answered, "I have been told by a Higher Authority —in fact, by God. The Great Voice tells me what to say. I sometimes make mistakes". When an attempt was made to feed him he said, "The Great Doctor said not to eat this. I can't do it. The Great Doctor will not let me eat. I cannot". Without questioning, he offered, "I have to wait for an inspiration. It's all rottenness, this hospital. The higher they are the rottener they are in their flesh and spirit". (What's the rottenness?) "The body inside. The food does it; it's too rich, too concentrated. I can feel every part of my body inside. The food has burnt me."

He denies that his commands come to him as voices or as visions, maintaining rather that they are "inspirations" for which he must wait. No sensory attributes for these "inspirations" which might make them, at least presumably, hallucinatory could be discovered.

Imagery Test Results.

The patient was examined during a lucid interval. He grasped the instructions quickly and co-operated well. His data are presented in Table XIX.

TABLE XIX.

Imagery modality.	Obtained score.	Deviation from expected score.	
		Schizophrenic.	Normal.
Visual	24	+ 5	+ 2
Auditory	14	− 2	− 9
Kinæsthetic	6	− 20*	− 12*
Tactual	16		
Temperature	4	20 + 2	+ 7
Olfactory	10		
Gustatory	15	25 + 15*	+ 12*
Definitions	41	..	..
Associations	0	..	..
Total	130		

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

From this table it may be seen that the kinæsthetic imagery responses are significantly depleted, and the olfactory-gustatory responses markedly increased. There were 41 definitions given (a third of the total number of responses), but no associations.

Discussion.

(1) *Hallucinations and delusions.*—The patient's preponderating olfactory-gustatory imagery corresponds with no manifest hallucinations of this modality; on the other hand the relationship of such preponderating imagery to his somatic delusions seems quite clear in the light of our similar findings in Cases 9, A. D—, 15, W. M—, and 16, A. O'S—. As in Cases 9, A. D—, and 16, A. O'S—, also, there is associated with preponderating olfactory-gustatory imagery a concomitant significant diminution of kinæsthetic imagery. The large number of definitions may also have significance in the elaboration of his delusions.

(2) *Activity.*—This patient resembles Cases 15, W. M—, and 16, A. O'S—, in that preponderating olfactory-gustatory imagery is found in association with stupor. The other patient with such imagery (Case 9, A. D—) has never been in stupor, but is markedly underactive. These patients resemble the group, also characterized by stupor, in whom the imagery background is preponderatingly tactual-temperature. Cases 15, W. M—, and 16, A. O'S—, manifest *both* preponderating olfactory-gustatory and tactual-temperature imagery, and for this reason represent "overlapping" instances of patients who have the symptom of stupor in common.

CASE 21: E. T—.

The patient is a white male, aged 25. In November, 1934, he began to complain of fatigue and insomnia, to say that gangsters were after him, that he had syphilis, that there was danger of his infecting other members of his family, that a dictagraph had been installed in his home. He was taken on a trip abroad by a relative, but no sooner had the boat docked in Germany than he jumped overboard. He was admitted to a mental hospital in Jena, but soon afterward was discharged and returned to this country. He spent a fairly active summer holiday at home, but refused to go to the public beach. He began to complain that his saliva had an odour. One evening he burst out with: "Now I know what it's all about. The crew have *filled* me with syphilis germs. Just look at that pillow-case and sheet—full of germs!" "Smell of that handkerchief! Those are the drugs that they gave me at the hospital!" From then on he seemed to become worse. He spoke of voices and became very irritable. He said that he was Martin Luther, the Messiah, King of Rumania, son of the Pope. He believed he had syphilis, that his nose was becoming of enormous size, that his hair was falling out, and that there were other bodily changes. He was responsible for certain political occurrences. Gangsters were pursuing him and the rest of the family, and his food was being poisoned. He was admitted to the Worcester State Hospital in 1935.

General activity.—The patient is usually preoccupied. He is extremely unsociable. He frequently refuses meals, stands about in a corner of the ward or lies on his bed. He appears depressed. He is usually monosyllabic in his answers, but once conversation has been begun he elaborates quite extensively upon his delusions. He does a little work. There are no formal speech disorders. He washes his own underwear on the ward and frequently is seen washing his hands. He wears an athletic supporter, but when asked about this gives no explanation. Frequently he gets up at night to wash his teeth. On numerous occasions he expectorates for a long time in the sink. He questions the cleanliness of everything he uses. When other patients touch him he rubs his clothing at the place of contact. From time to time he becomes embroiled in altercations with other patients, resulting from his suddenly jumping on them. He is frequently seen mumbling to himself in an angry way, striding up and down the ward, sometimes suddenly running towards a corner of the ward, where he stands quietly.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

Delusions and hallucinations.—The patient says that he believes his present condition has resulted from being drugged, that it makes him act the way he does. He is puzzled as to why he is being kept in the hospital, and disturbed because he feels that medicine and drugs are being put into his food. He talks of gases being used on him. He referred to different types of devils, such as red, green and black devils, smoke devils, forest devils, bathroom devils and phallus worshippers. He claimed that the examiner had special influence over him and was putting evil thoughts into his mind. The devils were trying to get him to think sexual thoughts but he was making every effort to keep from them. He occasionally attributes these to the hypnotic influence of other patients, and admits that on one or two (*sic*) occasions he has become excited and attacked them. He speaks about the red devil who looks over his left shoulder. One night he didn't sleep very well because " it seemed as though someone were shooting electricity into my head ". Several persons, from behind and one in front of him, had succeeded in throttling him so that he had become unconscious.

He said, " It isn't right—I haven't got clean blood—I shouldn't touch things—devils are after me—I have devilish gases in my mouth—I shouldn't be with people ". Many of his actions are accomplished without his wish. He feels that thoughts are being put into his mind. Through the voices outside forces are attempting to convert him to their beliefs, which he considers evil. He finds himself talking involuntarily once in a while and comes to the conclusion that he is expressing the thoughts of others ; in other words, that people are talking through him. In some respects he doesn't feel quite like himself. It is as though he had impulses over which he has poor control. As an example, he finds himself laughing in response to things which are being asked him, and he knows that laughter does not fit the situation. This laughter seems to come spontaneously without his being able to stop it, even though he knows it is ridiculous.

He states that " they " are pumping gas into his mouth which dissolves in his saliva and tastes like urine. He then complains that he smells gas in the room, and the examiner pointed to the pipe he was smoking. The patient admitted that the pipe might possibly be the source of the gas, and is the means the examiner used for putting special medicine into him.

Imagery Test Results.

The patient comprehended the instructions quickly and co-operated very well throughout the imagery test. His data are presented in Table XX.

TABLE XX.

Imagery modality.	Obtained score.		Deviation from expected score. Schizophrenic.	Normal.
Visual	36		+ 8	+ 3
Auditory	8		− 15*	− 22*
Kinæsthetic	56		+ 18*	+ 30*
Tactual	12			
Temperature	3	15	− 11	− 5
Olfactory	3			
Gustatory	12	15	0	− 2
Definitions	0		..	..
Associations	0		..	..
Total	130			

It may be seen from this table that the kinæsthetic imagery responses are highly predominant. The auditory responses are significantly depleted. There were no definitions or associations given.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

Discussion.

(1) *Hallucinations.*—The patient's preponderating kinæsthetic imagery may be related to his *active* auditory hallucinations. In this respect, therefore, he belongs to the group which consists of Cases 1, H. A—, 3, E. B—, 6, T. D—, 7, F. D—, 8, J. D—, 17, A. P—, and 19, H. S—. No preponderant auditory, visual or olfactory-gustatory imagery was observed to correspond with the hallucinations in these modalities.

(2) *Delusions.*—As was found to be the case with the above-mentioned patients, this patient also suffers from "ideas of influence" and persecutory delusions which may be related to his preponderant kinæsthetic imagery. These are poorly systematized, perhaps because of the lack of definitions and associations. Although he, unlike all the other patients in this group, has somatic delusions, his imagery is quite unlike that of the group consisting of Cases 2, C. A—, 9, A. D—, 12, B. K—, 13, J. L—, 15, W. M—, 16, A. O'S— and 20, F. St. P—, in whom the somatic delusions are almost exclusively present, and which seem to be related to preponderating tactual-temperature and/or olfactory-gustatory imagery.

(3) *Activity.*—This patient bears a further resemblance to the "kinæsthetic" group in that he manifests periodic excitements. The relationship of such activity disturbances to preponderating kinæsthetic imagery has been discussed previously.

General Summary of Experimental and Clinical Data.

In the discussion of the data of the individual patient certain relationships between significant deviations of imagery and the hallucinations, delusions and activity disturbances have been pointed out. In Table XXI the data are presented in tabular form, in order that the groupings may become more clear. Only those patients in whom quantitative measurements of imagery were possible and who at the same time were not symptom-free will be discussed here. These comprise 16 of the group of 21. The patients omitted from the present discussion for the reasons states are Nos. 4, J. B—, 5, G. C—, 10, J. H—, 14, R. M—, and 18, G. P—. The significant deviations, whether from the schizophrenic or normal subjects' norms, in each imagery-modality are recorded as a + (positive) or a − (negative).

(1) *The Distribution of Preponderating Imagery.*

It may be seen that only 2 patients manifest significant positive deviations in visual, only 1 a significant positive deviation of auditory, 8 a significant positive deviation of kinæsthetic, 6 a significant positive deviation of tactual-temperature, and 4 a significant positive deviation of olfactory-gustatory responses. For 4 of the patients with increased kinæsthetic responses there is a corresponding significant diminution of the auditory. *None of the patients with increased kinæsthetic responses are found to have increased tactual-temperature or olfactory-gustatory responses.* Preponderant kinæsthetic imagery and predominant tactual-temperature or olfactory-gustatory imagery seem therefore to be mutually exclusive. This point is further borne out by our data, which reveal that the two patients who have a significantly diminished tactual-temperature imagery are included within the 8 whose imagery is predominantly

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

kinæsthetic, and all 3 of the patients with significant diminution of olfactory-gustatory responses also manifest predominating kinæsthetic responses. Furthermore, 3 of the 4 patients who manifest predominant olfactory-gustatory imagery also show significantly diminished kinæsthetic responses. All of the 16 patients presented in this table fall within either the kinæsthetic (8 patients) *or* the tactual-temperature and/or olfactory-gustatory group.

(2) *The Relation of Predominating Imagery to Hallucinations, Delusions and Activity Disturbances.*

(a) *Visual.*—Of the 2 patients who manifest predominating visual imagery, only 1 has visual hallucinations. Conversely, none of 6 other patients who have visual hallucinations manifest preponderating visual imagery; in fact, 2 of them have diminished visual imagery. Neither do characteristic relationships appear between increased or decreased visual imagery and the other clinical symptoms (delusions and activity disturbances).

(b) *Auditory.*—Only one patient manifests predominating auditory imagery, and he has " passive " auditory hallucinations. On the other hand, he is the only one of the 13 patients with passive auditory hallucinations in whom such a relationship occurs; of the other 12, 4 manifest significant diminution of auditory imagery. Of the 4 patients with significantly diminished auditory imagery all manifest ideas of influence, 3 of them persecutory delusions, and 1 somatic delusions in addition; all of them also manifest restlessness or periodic excitements. However, these relationships may be due to the fact that all these 4 patients have highly predominant kinæsthetic imagery; hence the diminished auditory imagery-symptom relationship may be only an indirect one.

(c) *Kinæsthetic.*—A group of 8 patients manifest predominating kinæsthetic imagery. This includes the group of 4 patients with significantly diminished auditory imagery. Significantly diminished kinæsthetic imagery is found in 5 patients; all of these patients have predominating tactual-temperature and/or olfactory-gustatory imagery. The fact that none of the patients with predominant kinæsthetic imagery also have predominant tactual-temperature and/or olfactory-gustatory imagery has already been mentioned. In 1 of the patients the hallucinations are frankly kinæsthetic; in 6 of the other 7 the hallucinations are of the " active " auditory type. In this group also 7 have ideas of influence, 6 of them with persecutory delusions, and 1 of these with somatic delusions in addition; the other patient has persecutory delusions only. The entire group manifest periodic over-activity, as restlessness or excitements, or both; in several patients of this group escapes and tic-like movements also occur.

(d) *Tactual-temperature.*—In the group characterized by preponderating tactual-temperature imagery, 6 patients are found. These include 3 with

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

TABLE XXI.—*The Relationship of Imagery-Deviations and Clinical Symptoms in* 16 *Schizophrenic Patients.*

Patient.	Imagery deviations.										Clinical symptoms.		
	Visual.		Auditory.		Kinæsthetic.		Tactual-temperature.		Olfactory-gustatory.				
	+	−	+	−	+	−	+	−	+	−	Hallucinations.	Delusions.	Activity disorders.
1. H. A—	..	−	..	−	+	..	..	−	..	−	Visual, passive auditory, kinæsthetic	Ideas of influence	Periodic restlessness, myoclonic movements, clumsiness.
2. C. A—	..	−	..	..	..	..	+	..	..	..	Visual, passive auditory, tactual	Hypochondriacal ideas (? somatic delusions)	Under-activity, stupor, touches objects.
3. E. B—	+	..	..	−	+	..	..	..	..	−	Visual, passive auditory, active auditory	Ideas of influence, persecutory	Periodic excitements, escapes, clumsiness.
6. T. D—	..	−	..	..	+	..	..	..	..	..	Active auditory, passive auditory	Ditto	Restlessness, periodic excitements.
7. F. D—	..	..	..	..	+	..	..	..	..	..	Visual, active auditory, passive auditory	,,	Periodic excitements.
8. J. D—	..	..	..	..	+	..	..	..	..	..	Active auditory	,,	,, ,,
9. A. D—	..	..	..	..	..	−	..	..	+	..	Visual, passive auditory, olfactory	Somatic	Under-activity.
11. S. K—	..	..	+	..	..	−	+	..	..	..	Visual, passive auditory	..	Stupor (with occasional excitement), "Mama-crier".

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

TABLE XXI.—*The Relationship of Imagery-Deviations and Clinical Symptoms in* 16 *Schizophrenic Patients*—continued.

Patient.	Imagery deviations.										Clinical symptoms.		
	Visual.		Auditory.		Kinæsthetic.		Tactual-temperature.		Olfactory-gustatory.				
	+	−	+	−	+	−	+	−	+	−	Hallucinations.	Delusions.	Activity disorders.
12. B. K—	..	..	..	..	..	..	+	..	..	..	Passive auditory, tactual, gustatory	Somatic	Stupor, touches objects, " Mama-crier ".
13. J. L—	..	..	..	..	..	−	+	..	..	..	Passive auditory, tactual, olfactory-gustatory	,,	Stupor.
15. W. M—	..	−	..	..	..	..	+	..	+	..	Passive auditory	,,	Stupor (with occasional excitement), interest in food, " Mama-crier ".
16. A. O'S—	..	−	..	..	..	−	+	..	+	..	Passive auditory, tactual, olfactory-gustatory	,,	Stupor.
17. A. P—	+	..	..	−	+	..	..	..	..	−	Active auditory	Ideas of influence, persecutory	Periodic excitements, escapes.
19. H. S—	..	−	..	..	+	..	..	−	..	..	,, ,,	Persecutory	Periodic excitements.
20. F. St. P—	..	..	..	..	..	−	..	..	+	..	?	Somatic	Stupor.
21. E. T—	..	..	..	−	+	..	..	..	..	..	Visual, active auditory, passive auditory, olfactory-gustatory	Ideas of influence, persecutory, somatic	Periodic over-activity.

diminished kinæsthetic imagery. All of these patients have passive auditory hallucinations, and 4 of them frank tactual hallucinations. In 1 of the patients delusions are absent; in the other 5 the delusions are exclusively somatic. All 6 of these patients have been in stupor, and of these 1 is constantly under-active, 2 have occasional periods of excitement, and 3 manifest episodes in which they cry for their "Mama". The clinical status of 2 patients in this group is also characterized by their "touching" activity. In only 2 patients is there significantly diminished tactual-temperature imagery; both of them are in the preponderating kinæsthetic group.

(e) *Olfactory-gustatory.*—The group with preponderating olfactory-gustatory imagery comprises 4 patients. Of these 2 are also in the preponderant tactual-temperature group and 3 in the diminished kinæsthetic group. Hallucinations are visual in 1 patient, passive auditory in 3, tactual-temperature in 1, olfactory-gustatory in 2, and absent in 1. The delusions of all the patients in the group are exclusively somatic. Of the activity disturbances which characterize the group, 3 patients have been in stupor (these include the 2 patients within the preponderant tactual-temperature group; 1 has, in addition, an unusual interest in food) and the other patient is quite under-active. The 3 patients with diminished olfactory-gustatory imagery fall within the preponderatingly kinæsthetic group.

It may again be noted that all the 16 patients found suitable for discussion in this section fall within either the preponderating kinæsthetic group (8 patients) or the tactual-temperature and/or olfactory-gustatory group (8 patients).

General Discussion.

In the present section an attempt will be made to evaluate the significance of the imagery data presented and their relationships to the symptoms of the schizophrenic disease process.

(1) *In schizophrenics, as contrasted with normal individuals for whom the preponderant imagery is visual and auditory, the imagery tends to be preponderatingly kinæsthetic or tactual-temperature.*

One may consider that visual and auditory imagery arise from perceptual processes which derive their stimulation from the outside world, and that kinæsthetic and tactual-temperature imagery arise from perceptual processes which derive their stimulation from within the patient's own body. Furthermore, visual and auditory images have their locale in the "outside world", whereas kinæsthetic and tactual-temperature images have their locale in the patient's body, in the "inside world". The imagery of schizophrenics seems essentially referable, therefore, to a localization of psychic processes which are derived from or localized to the somatic world. A separation within the schizophrenic group itself may also be made in which one group characterized by preponderant kinæsthetic imagery may be contrasted with the other group

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

characterized by preponderant tactual-temperature imagery; these two groups are mutually exclusive.

That the imagery in schizophrenia takes on a distinctly somatic stamp may arise from the fact that the external world is no longer experienced by the patient in the same manner as formerly. There seems to occur a corresponding relative increase in importance of the patient's "inner" world in which the body plays a more important role in his experiencing. One might state, in other words, that the patient's "body-images" become of greater importance in his way of experiencing than the images which are externalized from his body. That such a difference in imagery may comprise a fundamental feature of what is clinically interpretable as more complete narcissism need only be mentioned here.

(2) *There is a greater variability of imagery within the schizophrenic group than within the normal group.*

The data on relative variability of imagery conform with other data, especially those concerning physiological variables, which indicate by and large that schizophrenics as a group are distinguished by their greater variability (Hoskins and Jellinek (28)). It may be that under schizophrenic conditions the personality must operate under conditions which make for greater variability; one of these conditions may be the tendency towards greater diffuseness of mental processes; they become more scattered and uncontrolled, their cohesion tends to disappear. Another explanation may be that schizophrenic is a generic term for various different conditions. Or, it may be that in schizophrenia, a shift of utilizable imagery of the "outer" to that of the "inner" world adds such a number of points at which regressive fixation may occur that the imagery becomes more variable. Hence the imagery of the schizophrenic becomes more heterogeneous than is the case in the normal individual. The relative fixity of imagery, noted in our review of the literature, is apparently an important characteristic of normal mental activity; its change and its greater diversity in schizophrenia seems to betray a fundamental disruption of the mental life. The increased variability of imagery may also offer, therefore, some indication of the nature of the schizophrenic process.

(3) *The relation of imagery to type of hallucination varies with the specific modalities.*

Visual and auditory.—There is no relationship between visual imagery and visual hallucinations, nor, strictly speaking, between auditory imagery and auditory hallucinations. As has already been indicated, such a lack of relationship may be due to the fact that the modalities concerned are those in which stimulation for their perceptual elaboration is referred to the outer world, and in the externalized localization of visual and auditory images. The inference seems clear that under schizophrenic conditions visual and auditory imagery diminish in significance for the personality.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

One must bear in mind, at least with respect to auditory hallucinations, that many of them are not auditory at all. We have characterized as "passive" auditory hallucinations only those voices and sounds to which the patient listens in a passive manner. On the other hand, the voices which serve as ideas of influence, which force the patient to do certain things, we have subsumed as "active" auditory hallucinations under the kinæsthetic modality. The lack of relationship stated applies only to the "passive" auditory hallucinations, since the "active" type of auditory hallucinations has been shown to have a positive relationship to kinæsthetic imagery.

Kinæsthetic.—Kinæsthetic images have impulse-like characteristics in large measure. Auditory hallucinations which serve as ideas of influence ("active auditory hallucinations") seem most properly to be considered as kinæsthetic hallucinations, and they are found to be related to preponderating kinæsthetic imagery in a group of our patients.

Tactual-temperature and olfactory-gustatory.—Similarly, preponderating tactual-temperature and olfactory-gustatory imagery were also found to be related to hallucinations in these respective modalities in a group of patients. Such hallucinations, however, must be of the nature of bodily hallucinations, and they are frequently characterized as somatic delusions, from which they are clinically often indistinguishable. In this connection one might point to the old observation by Griesinger, who, in discussing the illusions and hallucinations of touch, taste and smell, stated that there is no sharp line of demarcation between illusions and hallucinations in these modalities; this may arise from the inextricability of the characteristics of experiences, clinically considered as somatic delusions, from those which are *sensu stricto* visceral hallucinations. Thus, if the imagery background is the same, sensations or perceptions involved in the creation or secondary elaboration of peculiar bodily experiences may not play an important role in the differentiation of hallucinations and delusions. In experiences of the body, sensations and perceptions are difficult to distinguish from images. With this group of patients, therefore, as with the kinæsthetic group, a relationship may be said to be present between this specific form of "body" imagery and the hallucinations or delusions to which it corresponds.

These data on kinæsthetic, tactual-temperature and olfactory-gustatory imagery may be adduced to extend the conclusion already made, namely, that when under schizophrenic conditions a change of imagery which involves exclusion of the external world and exaggeration of the somatic world occurs, the body-imagery (kinæsthetic, tactual-temperature and olfactory-gustatory) and the hallucinations produced are in a positive relationship. Hence, it appears that the law or laws governing the relationships of imagery and hallucinations are different for the visual and auditory modalities than for the kinæsthetic, tactual-temperature and olfactory-gustatory modalities.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

(4) *The type of delusions in schizophrenics is related to specific preponderance of certain imagery-modalities.*

It has been found that in the group of patients characterized by preponderating kinæsthetic imagery, there are present "externally" projected delusions, mainly of ideas of influence and of persecution. This group is again to be contrasted with the group of patients with preponderating tactual-temperature and/or olfactory-gustatory imagery in whom the delusions are "internally" projected, so to speak, and are exclusively somatic in nature. These differences are referable to the imagery background, when one considers the nature of kinæsthetic imagery as *active* and tending, as delusions, toward externalization for its expression in contrast to tactual-temperature and olfactory-gustatory imagery as *passive* and tending, as delusions, toward internalization for its expression within the patient's body.

(5) *The type of disturbance of motor activity in schizophrenics is related to specific preponderance of certain imagery-modalities.*

Here, again, a sharp distinction between the two groups of patients can be drawn. Those patients who have preponderating kinæsthetic imagery manifest motor disturbances such as restlessness and, very frequently, periodic overactivity with excitement. Tic-like movements and clumsiness occur in several of them. On the other hand, those patients in whom the tactual-temperature and/or olfactory-gustatory imagery preponderates are characterized by underactivity, and in 7 of the 8 patients of this group, by stupor.

In 2 of the patients in whom tactual-temperature imagery is preponderant, movements of "touching" were observed. Such motor activity can reasonably be ascribed to the specific imagery characteristics of these patients, and would indicate again that specific imaginal factors are involved in the form which specific motor activities may take. In 3 of the patients in the tactual-temperature and/or olfactory-gustatory group there have also been observed incidents in which there are acute confusional episodes during which the patient cries for his "Mama". The occurrence of these incidents in 3 of the 8 patients of this group, and not at all in patients of the kinæsthetic group, may indicate that this feature also is a part of the common imagery background which characterizes this group of patients. It appears that in these patients there exists a preoccupation with their bodily affairs which makes their experiencing essentially infantile. For, just as the early existence of an infant is characterized by intense and almost exclusive concern with its bodily affairs, with inevitable association to its mother, so in these patients the way of experiencing seems to operate in the manner closely resembling infantilism.

(6) *The "total" symptom-picture of schizophrenics is related to specific imagery backgrounds.*

Certain total clinical pictures in terms of specific preponderating imagery can now be drawn. There is a group of patients with preponderating kinæsthetic imagery who are characterized, as has been indicated, by "active"

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

auditory hallucinations, ideas of influence, delusions of persecution and periodic over-activity. There is a second group of patients with preponderating tactual-temperature and/or olfactory-gustatory imagery, characterized by corresponding hallucinations, somatic delusions and stupor. The differentiation between these two groups on a clinical basis is understandable in terms of the mutually exclusive imagery backgrounds which characterize each of them. Generally, in the former group (kinæsthetic) the imagery and the total clinical picture are essentially *active* ; in the second group the imagery and the clinical picture are essentially *passive*.

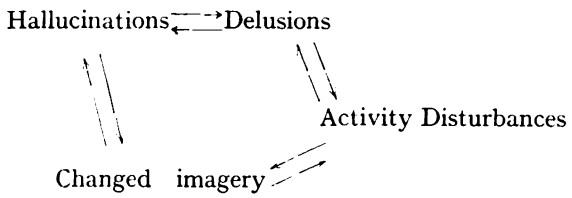
There is some indication that other groups may exist, groups which may, however, merely represent stages of greater or lesser advance of the schizophrenic process. In one symptom-free patient, for example, the imagery closely resembled that of a normal individual, but the significance of this case is doubtful since the diagnosis of whether or not he is schizophrenic is uncertain. In two patients the clinical symptoms and the imagery were inextricable. In two other patients, now free of hallucinations, delusions and activity disturbances, but unquestionably in a rather advanced stage of apathy, the imagery was found not to be distinctive in any way ; the colourlessness of their clinical picture seems to reflect the colourlessness of their imagery.

These investigations have shown that the imagery of schizophrenics is different from that of normal individuals, and that if such a difference can be regarded as a change of imagery, it is in one of two mutually exclusive directions. These directions have been considered " active " (kinæsthetic) and " passive " (tactual-temperature and/or olfactory-gustatory). The possible sequence of events whereby the clinical picture may come about in each of these groups may be diagrammatically represented in the following ways :

(*a*) Changed imagery——→hallucinations----→delusions----→activity disturbances.

It is obviously very difficult to determine whether this sequence of production of hallucinations, delusions, and activity disturbances is correct. The question of priority of experiential change cannot be decided here. What seems to be fairly reasonable to assume, however, is that it is as a consequence of changed imagery that the production into specific forms of certain schizophrenic symptoms—whatever their peculiar sequence of production may be—becomes possible.

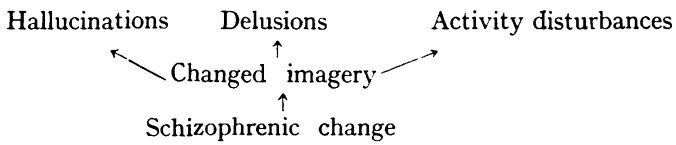
(*b*) An extension of this scheme would be the following :



https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

With such a concept the question of priority need not arise, since the specific features involved are considered mutually modifiable. In explanation of the vicious circle which is set up, an additional common factor must be postulated ; in this instance, perhaps, the schizophrenic disease process itself.

(*c*) Another possible explanation is that out of imagery, changed as a feature of schizophrenic disease, hallucinations, delusions and activity disturbances appear as discrete symptoms rather than as mutually dependent ones :



It is towards this explanation that the present investigator is most favourably inclined. As a manifestation of the schizophrenic process a change of imagery occurs ; by virtue of the specific nature of the imagery change, the form of specific symptoms which have a common imagery background is determined. That these symptoms may be related to each other *per se* in the early stages of the disease is not unlikely ; on the other hand, there is some clinical evidence which indicates that the occurrence and disappearance of specific symptoms may be independent of each other, such as in the earliest stages of illness, and particularly when the disease process has reached the point at which the disintegration and fragmentation of symptoms occurs.

In the patients studied, the schizophrenic process has been present for some time. It appears from our data that the total clinical pictures which have been discussed represent two types of the schizophrenic process, namely, *active* and *passive* ; one might say that the nature of the schizophrenic process in patients of these respective groups is differentiated by the *direction* of the preponderating imagery. In both groups there is preoccupation of the patient with the imagery intimately relating to his body, but in one group (kinæsthetic) the imagery has an outward direction, and in the other group (tactual-temperature and/or olfactory-gustatory) an inward direction. In the former group the form of the symptoms represents projection toward the outer world ; in the latter group projection toward the inner world of the body. It is not yet possible to establish proof that one or the other direction is to be considered more malignant or benign. Rather, the importance of the present observations seems to be that the direction of the changed imagery determines to a large extent, if not exclusively, the form (if not also the production) of specific symptom-pictures.

One might say, in general, that under schizophrenic conditions there is a change in the " horizon of the personality ". In the one case (" active ") the horizon extends limitlessly outward, into the world ; in the other (" passive ") the horizon is limited to the patient's body. The limits of the horizon are

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

specific for the ego-world relationship of a given patient. In the patient with preponderating kinæsthetic imagery, the hallucinations, delusions and activity disturbances seem to indicate constant strife between the ego and a world for which the boundaries are so far away that it is always eluding attempts on the part of the ego to be "taken in", so to speak, and experienced. In the patient with preponderating tactual-temperature imagery and corresponding symptoms such strife is not found, since the world is bounded by the patient's body; he is occupied with only his bodily affairs. In this way, then, stupor may be understandable as the complete limitation of the ego in a world, the boundaries of which do not extend beyond the limits of the body. That the schizophrenic of the former group falls within the classical category of the *paranoid*, and the schizophrenic of the latter group within the classical category of the *catatonic*, may indicate that a fundamental differentiation in terms of the ego-world "horizon" between these "types" of schizophrenic can be drawn.

One should not infer from these observations that imagery is the only factor of importance in schizophrenic symptom-formation. Other variables which have not yet been studied are doubtless also involved in the specific pictures which have been discussed here, such as associative and affective functions. In some of the patients studied here, for example, differences in the number and kind of non-imagery responses were found; these were of the nature of associations and definitions which seemed to be related to the degree of elaboration achieved by the patients' delusions. A systematic study of such factors is needed in order to determine their change and their specific relationships in schizophrenia. And, as in the case of imagery, the manner of change of such other mental functions may also be found of importance in schizophrenic symptomatology, and, in addition, throw some light on the nature of schizophrenic deterioration.

APPENDIX.

The following test is adapted from Test A in the Appendix of C. H. Griffitts's *Fundamentals of Vocational Psychology*, pp. 357–360.

(1) Opening an umbrella. (2) Features of the members of your family. (3) Ringing of bells. (4) Heat from the sun. (5) Using the telephone. (6) Rose. (7) Something sour. (8) Lightning. (9) Pain of a pin scratch. (10) Violin. (11) Violin. (12) Clapping the hands. (13) Clapping the hands. (14) Reaching for a pencil. (15) Lamp. (16) Writing with a pen. (17) Whistle of a locomotive. (18) Walking down-stairs. (19) Scissors. (20) Rattling of a newspaper. (21) Using a tooth-brush. (22) Pressure on the arm. (23) Chocolates. (24) Rain beating against the window-pane. (25) Hand in cold water. (26) Object in the eye. (27) Apple blossom. (28) Book. (29) Water running from a faucet. (30) Ink-stand. (31) Passing a dish at the table. (32) Umbrella. (33) Closing a book. (34) Coarse cloth. (35) Typewriter. (36) Typewriter. (37) Using a hammer. (38) Striking of a clock. (39) Cold feet. (40) Onion. (41) Shoe. (42) Putting on a shoe. (43) Closing a door. (44) Using scissors. (45) Tooth-brush. (46) Voice of lecturer. (47) Unfolding a newspaper. (48) An orange. (49) Cheese. (50) Cold wind. (51)

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

Kitten. (52) Clinking of glasses or dishes. (53) Automobile. (54) Kerosene or gasoline. (55) Postage stamp. (56) Nodding your head. (57) Pain from a burn. (58) Drawing a circle on paper. (59) Report of a gun. (60) Vinegar. (61) Sore throat. (62) Church building. (63) Heat from stove. (64) Ringing of telephone. (65) Putting on a coat. (66) Telephone. (67) Ice-cream in the mouth. (68) Dog. (69) Throwing a ball. (70) Fire engine. (71) Salt. (72) Watch. (73) Reaching up to a high shelf. (74) Rattling of leaves. (75) Milk. (76) Snow or ice in the hand. (77) Clock. (78) Chirping of insects. (79) Rose. (80) Lifting a weight. (81) Flag. (82) Sugar. (83) Winding a watch. (84) Fire engine. (85) Locomotive. (86) Coin lying in the hand. (87) Running. (88) Piano note. (89) Freshly popped corn. (90) Features of lecturer. (91) Stooping to tie a shoe-string. (92) Voices of the members of your family. (93) Waving your hand. (94) Dog. (95) Automobile horn. (96) Putting on a hat. (97) Ticking of a watch. (98) Biting hard candy. (99) Smoke from an engine. (100) Horse trotting on a pavement. (101) Coat. (102) Opening a book. (103) Thunder. (104) Smell coffee or tea. (105) Sound of hammering. (106) Pineapple. (107) Bird. (108) Squirrel. (109) Tobacco smoke. (110) Throwing a book on the table. (111) Hot food in the mouth. (112) Velvet. (113) Shelling peanuts. (114) Throwing a book on the table. (115) Nuts. (116) Opening a pocket-knife. (117) A pocket knife. (118) Odours from a kitchen. (119) Crying child. (120) Warm dish held in the hand. (121) Something bitter. (122) Shelling peanuts. (123) Knife and fork. (124) Hand in hot water. (125) Using knife and fork. (126) Pain from bruise. (127) Bird. (128) Sandpaper. (129) Shelling peanuts. (130) Closing a door.

References.—(1) Angell, J. R., " Methods for the Determination of Mental Imagery ", *Psychol. Rev. Monog. Suppl.*, 1910, xiii, whole No. 53, pp. 61–107.—(2) *Idem*, " Thought and Imagery ", *Philos. Rev.*, 1897, vi, pp. 646–651.—(3) Angyal, A., " Der Schlummerzustand ", *Zeitschr. f. Psychol.*, 1927, ciii, pp. 65–99.—(4) *Idem*, " The Perceptual Basis of Somatic Delusions in a Case of Schizophrenia ", *Arch. Neur. and Psychiat.*, 1935, xxxiv, pp. 270–279.—(5) *Idem*, " The Experience of the Body-Self in Schizophrenia ", *ibid.*, 1936, xxxv, pp. 1029–1053.—(6) Armstrong, A. C., " The Imagery of American Students ", *Psychol. Rev.*, 1894, i, pp. 496–505.

(7) Ballet, G., *Le Langage Intérieur et les Diverses Formes de l'Aphasie*, Paris, Baillière, 1888, pp. 174.—(8) Binet, A., " L'hallucination ", *Rev. Philos.*, 1884, xvii, pp. 377–412, 473–502; " L'intensité des images mentales ", *ibid.*, 1887, xxiii, pp. 473–497.—(9) *Idem*, *The Psychology of Reasoning*, Chicago, Open Court Publishing Co., 1899, pp. 191.—(10) *Idem* and Féré, Ch., " La Théorie Physiologique de l'Hallucination ", *Rev. Scientif.*, 1885, ix, pp. 49–53.—(11) Bond, N. J., and Dearborn, W. F., " A Comparison of the Auditory Memory and the Tactual Sensitivity of the Blind with those of Persons who have Normal Vision ", *Journ. Educ. Psychol.*, 1917, viii, pp. 21–26.

(12) Cason, H., " Imagery in the Waking and Drowsy States ", *Amer. Journ. Psychol.*, 1923, xxxiv, pp. 486–495.—(13) Charcot, J. M., *Leçons sur les Maladies du Système Nerveux*, 1886–1890, iii, pp. 154–193.—(84) *Idem*, cit. by A. Binet (9).—(15) de Clérambault, G. G., " Les Psychoses Hallucinatoires Chroniques ", *Bull. Soc. Clin. Méd. Ment.*, 1924, xii, pp. 17–44.—(16) Crosland, H. R., *Imaginal Types and Intellectual Endowments*, 1916, MSS. in Clark University Library.

(17) Fechner, G. T., *Elemente der Psychophysik*, Leipzig, Breitkopf, 2nd ed., 1889, pp. 469–491.—(18) Fernald, M. R., " The Diagnosis of Mental Imagery ", *Psychol. Monog.*, 1912, xiv, whole No. 58, pp. 169.—(19) *Idem*, " The Mental Imagery of Two Blind Subjects ", *Psychol. Bull.*, 1913, x, pp. 62–63.—(20) Feuchtwanger, A., " Versuche über Vorstellungstypen ", *Zeitschr. f. Psychol.*, 1911, lviii, pp. 161–199.—(21) Flaubert, G., *Correspondance*, third series, Paris, Charpentier, 1892, i, pp. 94, 349.—(22) Foster, W. S., " The Effect of Practice upon Visualizing ", *Journ. Educ. Psychol.*, 1911, ii, pp. 11–22.

(23) Galton, F., *Inquiries into the Human Faculty and Development*, London, Macmillan, 1883, pp. 387.—(24) Griffitts, C. H., " Individual Differences in Imagery ", *Psychol. Monog.*, 1927, xxxvii, whole No. 172, pp. 91; *Fundamentals of Vocational Psychology*, New York, Macmillan, 1924, pp. 372.—(25) Guiraud, M. P., and Le Cannu, Yv., " Symptômes primitifs et secondaires de la psychose hallucinatoire chronique ", *Ann. Méd.-psychol.*, 1929, lxxxvii, No. 2, pp. 422–428.

(26) Hennig, R., " Bemerkungen zu einem Fall vom abnormen Gedächtnis ", *Zeitschr. f. Psychol.*, 1910, lv, pp. 332–342.—(27) Hollingworth, H. L., " The Psychology of Drowsiness ", *Amer. Journ. Psychol.*, 1911, xxii, pp. 99–111.—(28) Hoskins, R. G., and Jellinek, E. M., " The Schizophrenic Personality with Special Regard to Psychologic and Organic Concomitants ", *Proc. Assoc. Res. Nerv. and Ment. Dis.*, 1933, xiv, pp. 211–233.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press

(29) Kandinsky, V., " Zur Lehre von den Hallucinationen ", *Arch. f. Psychiat., u. Nerv.*, 1881, xi, pp. 453–464.—(30) Kraepelin, E., " Der Psychologische Versuch in der Psychiatrie ", *Psychologische Arbeiten*, Leipzig, Engelmann, 1896, i, pp. 73–74.

(31) Langfeld, H. S., " Concerning the Image ", *Psychol. Rev.*, 1916, xxiii, pp. 180–189.—(32) Lay, W., " Mental Imagery, Experimentally and Subjectively Considered ", *Psychol. Rev. Monog. Suppl.*, 1898, ii, whole No. 7, pp. 59.

(33) Martin, L. J., " Ghosts and the Projection of Visual Images ", *Amer. Journ. Psychol.*, 1915, xxvi, pp. 251–257.—(34) Meyer, G. H., *Untersuchungen ueber die Nervenfaser*, Tübingen, Laupp, 1843.—(35) Mourgue, R., *Neurobiologie de l'Hallucination*, Brussels, Lamertin, 1932, pp. 426.

(36) Prince, M., " An Experimental Study of the Mechanisms of Hallucinations ", *Journ. Nerv. and Ment. Dis.*, 1922, lvi, pp. 248–256; also *Arch. Neur. and Psychiat.*, 1922, vii, pp. 780–787.

(37) Radosavlyevitch, P. R., *Das Fortschreiten des Vergessens mit der Zeit*, Dissertation, Zurich, 1907.—(38) Ribot, T., " Enquête sur les idées générales ", *Rev. Philos.*, 1891, xxxii, pp. 376–388; *Evolution of General Ideas*, transl. by F. A. Welby, Chicago, Open Court, 1899, pp. 231; *Essay on the Creative Imagination*, transl. by A. H. N. Baron, Chicago, Open Court, 1906, pp. 370.

(39) Seashore, C. E., *Elementary Experiments in Psychology*, New York, Holt, 1908, pp. 218.—(40) Secor, W. B., " Visual Reading: A Study in Mental Imagery ", *Amer. Journ. Psychol.*, 1899, xi, pp. 225–236.—(41) Segal, J., " Ueber den Reproduktionstypen und das Reproduzieren von Vorstellungen ", *Arch. f. d. ges. Psychol.*, 1908, xii, pp. 124–235.—(42) Slaughter, J. W., " A Preliminary Study of the Behaviour of Mental Images ", *Amer. Journ. Psychol.*, 1902, xiii, pp. 526–549.—(43) Stetson, R. H., " Types of Imagination ", *Psychol. Rev.*, 1896, iii, pp. 398–411.—(44) Sully, J., *Illusions: A Psychological Study*, London, Kegan Paul, 1881, pp. 372.—(45) Sylvester, R. H., " The Mental Imagery of the Blind ", *Psychol. Bull.*, 1913, x, pp. 210–211.

(46) Taine, H., *On Intelligence*, transl. by T. D. Haye, New York, Holt, 1889.—(47) Talbot, E. B., " An Attempt to Train the Visual Imagery ", *Amer. Journ. Psychol.*, 1897, viii, pp. 414–417.—(48) Thompson, E. R., " An Inquiry into Some Questions Connected with Imagery in Dreams ", *Brit. Journ. Psychol.*, 1914–15, vii, pp. 300–318.—(49) Titchener, E. B., *Experimental Psychology*, New York, Macmillan, 1901; *Students' Manual*, pp. 195–200; *Instructors' Manual*, pp. 387–402.

(50) Zucker, K., and Hubert, W. H. de B., " A Study of the Changes in Function Found in Schizophrenic Thought Disorder ", *Journ. Ment. Sci.*, 1935, lxxxi, pp. 1–45.

https://doi.org/10.1192/bjp.84.349.284 Published online by Cambridge University Press