

# AN INQUIRY INTO THE NATURE OF HALLUCINATION.

## II.

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### I.

A peripheral process often of a pathological nature, a state of dissociation and a subexcitement of secondary sensory and ideomotor elements constitute the main conditions of hallucinations. The peripheral pathological process and the state of dissociation are requisite to the formation of the hallucinatory percept, while the content of such percepts are given by the systems of sensory-motor and ideomotor elements. A peripheral process alone even if it be pathological in character does not give rise to hallucinations. Similarly a state of dissociation by itself or a state of subexcitement of secondary and representative elements cannot give rise to hallucinations. It is only when these conditions coöperate, it is only then that hallucinations arise. The state of dissociation and that of subexcitement of 'central' systems may be regarded as the 'central' conditions of hallucinations, while the peripheral process is the factor that supplies to the systems the primary sensory nuclear elements round which the secondary elements crystallize and form a hallucination.

States of dissociation, provided the other conditions are present, are preëminently favorable to the formation of hallucinatory percepts. In sleep, when the mind is immersed in darkness, isolated isles of systems may stand out of this general night of consciousness and give rise to dreams of various degrees of intensity. Dreams are sleep hallucinations, while hallucinations are waking dreams. Both hallucinations and dreams develop under the same conditions of dissociation. The nature of

dreams and hallucinations are essentially the same. An isolated dissociated system of secondary sensory and representative elements predisposed to function become awakened by a special peripheral stimulus or by a summation of series of stimulations and gives rise to hallucinations or dreams according to the general state of consciousness, waking or sleeping. The hallucination of the comparatively waking state stands out alone, it remains more or less isolated and becomes obliterated by the general inrushing flood of peripheral sensations and perceptions of the waking consciousness. The dream is made up of a series of hallucinations going sometimes to form a complicated hallucination expanded into a whole life history. From this standpoint we may say a hallucination is an abbreviated dream, while a dream is an expanded hallucination.

In sleep the primary sensory nucleus of the dream hallucination is supplied by the peripheral processes coming either from external stimuli or from internal stimulations, from changes taking place in the organism. The psychophysiological threshold is raised in sleep, the resistance to the entrance of sense impressions is increased, the rise being proportionate to the depth of the sleep state. The peripheral sensory channels are closed to external stimulations. External stimuli, however, assail the peripheral sense organs from all sides and now and then, whether on account of the intensity of the stimulus or of the summation of a series of stimulations or of the temporary rise of the sleep level and consequent fall of the threshold and decrease of resistance to the influence of external stimuli, sense impressions force an entrance and awaken to activity some slightly slumbering systems thus giving rise to the dream hallucination. Under such conditions the sense impressions have but small chance to awaken its appropriate systems and hence become incorporated into any chance system they happen to awaken thus giving rise to the phantastic combinations characteristic of dream life. The sense impressions form the nucleus around which cluster systems of secondary sensations and representations all tinged with the sensory color derived from the original primary nuclear sense impressions. The systems of secondary sensory and representative elements once awakened

may go on expanding and developing, awakening other groups and systems, assimilating them or being assimilated by them as much as the nature of their content permits and being further reinforced by incoming stimulations. During the whole course of its expansion the aroused groups and systems maintain their sensory or rather their perceptual character. For, if a system is once awakened to activity, the threshold, the resistance to incoming stimulations is lowered and many more sense impressions gain access to the functioning systems and become incorporated and assimilated. This assimilation of chance systems and sense-impressions often give birth to highly elaborated phantastic dreams and visions.

## II.

Systems awakened by stimuli must have some relation of familiarity to the nuclear sense impressions. If perception is to take place, there must be some congruence between the sense impressions and the stimulated systems. Only on such conditions can assimilation take place. Similarly the awakened systems in sleep assimilate congruent sense impressions, the latter becoming so transformed as to fit the system and the system is modified by the incoming impressions. This congruence in the dream state is often strained and remote and consequently often of a phantastic and irrelevant character. Thus the taking off a plaster may give rise to a dream of being skinned alive, or of being scalped by an Indian. A change to an easier position and a freer respiration may generate a dream of flying. In one of my experiments of dream hallucination the uncovering of the feet in a cold room gave rise to the dream of walking on the frozen surface of a river and the impeded respiration awakened the feeling of fear of falling into the water.

The internal sensations such as arise from the different functions of the bodily organs are very important factors in the generation of dream hallucinations. Every one knows the fact that indigestion often gives rise to nightmares and unpleasant dreams, but not many realize the fact that cœnæsthetic sensations, sensations that come from our internal organs play a very important rôle in the production of dream hallucinations. The

circulation of the blood, the secretion of the various glands, the peristaltic movement of the small intestines, the action of the stomach, the changes in the muscles, the metabolism going on in the various organs of the body, in the cells of the organism, all these give rise to sensations which, though obscure and confused, go to make up the general sense of organic life activity. The sense of *cœnæsthesia* may in fact be regarded as the basis of our physical being or of our physical personality. A change of this sense is frequently an important factor in the formation of delusions, when mental life becomes dissociated and disaggregated. *Hypoæsthesia* or *anæsthesia* of the leg, for instance, may form the nucleus for the formation of the delusion that the leg is made of glass or of putty or is totally gone. *Anæsthesia* of the body or of the internal organs may develop the delusion of being dead, the patient asking to be buried. Similar conditions are also present in dream life. Changes of *cœnæsthesia* play no doubt an important rôle in the activity of the dream consciousness. Changes in the various component elements that go to make up the obscure but highly complex life of organic sensibility affect profoundly the rich exuberant play of the dream consciousness. Since the channels to external stimulations are closed, the *cœnæsthetic* sensations that form the obscure basis of waking consciousness become the sole possessors and guides of whatever mental activity is present in sleep. These internal sensations are woven by the dream consciousness into phantastic images of all shapes and forms.

The dream consciousness presents many characteristics found in states of mental dissociation and disintegration. Moral tone is lowered, attention is greatly reduced, logical thought is enfeebled and the sensory-motor and ideomotor elements are thrown out of gear, often resulting in the formation of illusions, hallucinations and delusions. In the dream state there is present the mental degradation of dementia, the sordid delusions of hypochondria and melancholia, the delirious states of mania, the delusions of grandeur of general paralysis, and even the persistent systematized delusions of paranoia. The dream consciousness is extremely unstable, it forms no definite type of mental disintegration and has no determinate course, it is extremely

fluctuating in its states and its background is usually shifting ceaselessly. From this standpoint it may be said that the dream consciousness is a normal form of mental alienation and that mental alienation is an abnormal form of dream consciousness. A very characteristic diary brought to my notice in which a retrospective and introspective account is given by a patient in the normal condition of the experiences lived through in the state of mental aberration opens with the suggestive title: *Memories of my Dream Life* and with the following interesting introductory remarks:

“Where shall I commence? How shall I begin to recall and record this to me mysterious life I have been living? So beautiful, so strange, and in some way so terrible. Yet I would not forget, for it seems as though I must have been in communication with intelligences above — spirits of the air, if it were possible.

“When did it commence? How long has it been with me? are questions I cannot solve. For weeks before coming to the hospital I must have been living this ‘ideal life’ as in an ‘ideal world.’ I have jotted down what I have thought, though they are not one hundredth part of the thoughts which passed through my mind during this strange time of dreaming.” In one of my cases of katatonia the frightful dreams of the year preceding the disease became hallucinations of the maniacal stages and appeared again as dreams during convalescence. The dreamer dreams with his eyes closed, the insane dream with their eyes open.

In both the dreamers and the insane the disaggregated states under the influence of external and especially of internal stimuli give rise to illusions, hallucinations and delusions. Dissociated states grouped round nuclei of primary sensations form the internal organizations of hallucinations and delusions so often characteristic of dream life and insanity. Cœnæsthetic sensations are important agents in the formation of insane delusions and hallucinations, there are so many fermentation nuclei among masses of dissociated states. Irritation of the ovaries may in the insane awaken hallucinations and delusions of a sexual character; constipation and heaviness in the intestinal

tract may generate delusions and hallucinations of rats and pigs in the stomach; rumbling in the stomach and the intestines may give rise to the delusions and hallucinations of devils in the body or of electric discharges of powerful batteries placed in the abdomen. The hallucinatory delusional dream consciousness works on similar lines — thus the first stages of migraine with a heaviness of the head may in sleep give rise to the dream hallucination of the head being opened, the brain swept away and chalk substituted; pain in the abdomen may form the hallucination of mice gaining an entrance into the abdominal cavity and gnawing at the intestines.

The difference between the walking life of the insane and that of dream consciousness is the mode of activity, the dream consciousness works in images, in sensory percepts, while in the insane mind the activity is largely representative. This difference is due to greater dissociation present in dream consciousness. The awakened dissociated systems in dream life become tinged with a perceptual sensory color by the process of absorption and assimilation of all the incoming sense impressions. Pathological states of rapid mental dissociation, such as the acute states of maniacal excitement or in states of psychopathic functional dissociation, such as the ‘*Dämmerzustände*’ of psychic epilepsy and other states of functional psychosis, closely approximate to the condition of dream consciousness, though the former are more stable and far more consistent, being narrowed to the active functioning of definite mental systems, conditions rarely to be met with in dream states.

The dream consciousness lacks unity of logical thought, certainly fails in critical judgment and is sometimes brutally indifferent to immoral situations and acts. The credulity of dream consciousness is well known to every active dreamer. Changes of time, place and of objects are often instantaneous and the most incongruent situations as well as transformations of personality are placidly and credulously accepted. The dream consciousness is entirely at the mercy of incoming sense impressions which spin the dream experience regardless of truth and reality and steadiness of logical purpose and moral ideals of the race. From this standpoint it may be claimed that

the dream consciousness is to some extent a reversion to the earliest forms of mental life, when the race was as yet undisciplined by the accumulated experience of ages of social life.

The teleological aspect of the dream consciousness may possibly lie in the fact suggested by some that the many trains of thought started in the activity of waking life and arrested and suppressed by the selective thought and logic of things and events of waking life find their vent and completion in the activity of dream consciousness. This vent relieves us from the high pressure of suppressed thought and makes it easier to sustain the rigid selection of sequences of mental states required by the struggle of existence and social life in our adjustments to the conditions of external environment. This view, however, is not strictly correct. For the dream consciousness follows not only along the lines of thoughts started in waking life, but more often forms new lines of associations giving rise to highly dramatic situations and far from relieving waking thought impedes and depresses it, since the mind feels unrefreshed by the sleep and in many cases serious mental troubles arise due to the disturbing influence of active dreams on the course of waking thought. It is more likely that there is little teleology to dream life and if any teleology there be, it may consist in the freedom and ease in which the mind finds itself in the dream state, fettered as the mind is by the rigid relations of the external environment. In dream life the routine of waking life is interrupted and new associations are formed. This possibility of forming new associations and thus breaking through the routine of life, a possibility maintained and fostered by the dream consciousness, might have possibly proved of the highest consequence to the human race. The dream consciousness may thus be regarded as an important factor in the progress of human thought, as an agent in the breaking up of habits of thought due to the routine of life and calling the attention of man, absorbed as he is with the interests and requirements of the needs of his physical world, to another life existence and strange universe of reality.

## III.

The sense of reality and belief in external existence of the hallucinatory objects are quite strong in hallucinations and in some of the more vivid and intense dream states. In order to explain this seemingly anomalous sense of reality, it may be well to revert to our general principle of subsuming both the normal and the abnormal under the same general laws and processes. Although the abnormal is of the highest importance in revealing new relations which the customary and habitual normal seems to hide, as it is found for instance in the growth and development of physiology largely due to pathological research, still we must clearly remember that from a strictly scientific standpoint the normal and abnormal are but teleological concepts which are of importance for the practical purposes of our habitual life activity and possibly for classification of various types of phenomena, but which science is to reduce to the same laws and processes. The abnormal is the normal out of place. In mental life as in the phenomena of life in general the atypical, or the variation, helps to explain the typical, the normal and the latter in its turn explains the atypical, the abnormal. We may therefore turn to the criterion of the normal sense of reality and validity of experience as explaining the same relations in abnormal mental life and the latter in its turn may throw light on the 'reality and validity' of 'normal' experience. A brief review will suffice for our purpose. It may look as if we attempt to make an excursion into a domain not belonging to normal or abnormal psychology proper, but to epistemology. This may be so, but the nature of our subject brings us so closely to this problem that a brief discussion may help us to see the facts in a clearer light. Abnormal psychology with its various forms of mental aberration, such as are to be found in the phenomena of insanity, functional psychosis, hallucination, delusion, somnambulatory states, hypnoidic states, is so intimately connected with aberrations of the 'sense of reality and validity' of experience that not only the abnormal psychologist, but also the clinician must take it into account from a purely practical standpoint. We shall view the problem only in so far as it directly concerns and illustrates the general subject of our discussion, namely hallucination and illusion, or fallacious perception.



The objective reality of the physical world is sometimes defined, and with best of reasons, as social experience, as experience common to ourselves and our fellow men, as experience which men share in common seems in contradistinction to the psychic experience which is essentially of an individual character. The tree yonder can be seen by everyone who possesses eyes, but my perception of the tree, or my idea of it, can only be experienced by myself. It may be said that this difference between the physical object and psychic state is a valid and valuable one. It is, however, neither general enough, nor specific enough. For on the one hand it may be claimed that from a more general philosophical standpoint even the physical object belongs ultimately to the individual only and on the other hand it may be claimed that psychic experience is communicated to our fellow men not only in terms of the physical object, but far more often in terms drawn directly from our psychic experience. Neither the physicist nor the psychologist will be quite satisfied with this point of view as both physical objects and psychic objects are entirely emptied of their specific contents and must remain at best in the dubious regions of epistemology. Still this social aspect of the physical object is significant and valid and is even used by the psychiatric clinician as a practical standard in the valuation of abnormal mental life in general and of insanity in particular. It may, therefore, be of great value even if we do not agree with the extreme way in which this view is sometimes put.

It is true that at the first glance we cannot help being struck by the import of the common or social aspect of external reality. We are well assured of the existence and presence of an external object, if we have the assurance of our fellow-beings, and what is accepted by our fellow men assumes the dignity and authority of actuality. A fact is regarded as existing beyond the shadow of any dispute, if every one can verify it in his own experience. The categorical necessity of our modern science rests entirely on this principle of validity: The social object is the valid object. This criterion of validity of the external object stands out specially clear and distinct in our standard of abnormal mental life. A belief is regarded as insane and delu-

sional, if it is in opposition to social beliefs and experience and is emphatically rejected by all other men. An object is regarded as illusory or hallucinatory, if it is treated as non-existent by other people; a desire, an action is considered immoral, if it is spurned by our neighbors. The real object is the social object, the valid belief is the social belief, and the social will is the moral will. The individual object, the individual belief, the individual will are treated as insane. One can not help noticing the semblance of truth in the assertions of those pathological anthropologists who put genius in the same category with insanity. What is social is alone true, valid and real, the individual is false, non-existent. The individual can buy the reality and truth of his being on condition of becoming social. Sociality is verity.

Let us now, however, try to break through, if for a moment only, the traditions of social *régime* with its criteria of social reality and validity. When being pricked or in getting a blow, or when cut or scratched, along with the experience of the sensation, the experience of the external stimulus is also given. In looking out of the window and seeing the tree with its green leaves moving in the wind, along with the perception of the sensory elements, primary and secondary, the external existence of the object tree is also given. Similarly in listening to the sounds of a familiar and dear voice and listening to the words as they form into phrases and sentences is not the sense of reality of the external object given along with the series of sound sensations? Sensation carries along with it the sense, the reality of its stimulus. It is not that the sense of reality is different from the sensation, it is given in the sensation itself. Similarly the percept and the sense of reality of the external object are not two different things; they are given together in the same process of perception and are identical. The percept tree is the perception of the reality of the objective tree yonder. The sensory process is also the process of the sense of reality. As Spinoza puts it in his *Ethics*: 'If the human body is affected in a manner which involves the nature of any external body, the human mind will regard the said external body as actually existing.' In seeing or perceiving the chair yonder we

do not perceive it as real, because of its social or common aspect — the reality of its existence is given directly in the sensory processes of the percept itself. Sensory elements involve the reality and existence of their stimuli; the percept involves the existence of the perceived objective content.

The sense of reality of the external stimulus or object is strengthened by association of the original sensory systems with other sensory systems, and the intensity rises in proportion to the number of systems of sensory elements, brought into relation with the functioning sensory system. If on perceiving an object, we wish still further to assure ourselves of its reality, we verify it by means of other sense organs. If one sees an apple and wishes still further to assure himself of the real presence of the object, he goes to it and examines it with his other sense organs, he touches it, presses it, bites it, tastes it. Kinæsthetic elements, being the most important in adaptations and reactions to the stimuli coming from the external environment, are possibly of all sensory elements the ones that give the keenest and most intense form of sense reality. Facts warrant us to assert with some show of probability that the sense of reality is chiefly centered in the sensory motor or kinæsthetic elements which serve as nuclei for other sensory elements. Whether this be correct or not, it remains true that the sense of reality is given directly by sensory elements and their combinations and organizations. The more systems of sensory elements are pressed into service, the stronger is the sense of reality and the more assured is the reaction to the stimuli of the external environment. In the evolutionary process of man's adaptation to his environment he becomes extended in being and grows more developed because of his social relations with other men. Man presses into active service the systems of sensory elements of his fellow beings. Adaptations and hence successful reactions to the external environment are now more assured and the sense of reality is still further emphasized and intensified. Throughout the course of intensification of the sense of reality the principle remains unchanged in a nature. The sense of reality is given by and consists in nothing else but the sensory elements.

Social experience may be regarded as more real or as giving

a more intense sense of reality, because of the greater number of sensory systems involved, but an object is not felt as external and real, because of its social aspect merely, the sensory aspect is by far the more fundamental. If one's perception of the house yonder is of a purely 'individual' character, not shared by his fellow men and even emphatically denied by them, the visual preception as such still directly perceives it as real, external and physical. Should furthermore this experience be intensified or confirmed by all the other senses — should he be able to touch it, to press it and feel its resistance, knock against it and feel concussion and pain, and have a series of tactual and muscular sensations by walking into the perceived house and around it, and should he further have this purely 'individual' experience of all the senses each time he comes to the same spot, the perceived object would then be a real, external, physical object and no amount of social contradication and lack of the ear marks of community could make it less real objective and physical. Epistemologically regarded, community may be sufficient for the purpose of reality; psychologically regarded, the real, existent physical object is essentially the perceived sensory object given by the 'community' of sensory elements. Sensory elements give the objective 'reals.'

#### IV.

From this long digression we may turn again to the question: "What is it that makes hallucinations in general and dream hallucinations in particular appear real, objective?" The solution is given in the question itself. We have shown in our analysis that hallucinations are essentially peripheral and sensory in character and do not differ in their make-up from sensation and perception in general which furnish the very foundations of our sense of reality. Hence hallucinations are real and objective, because of the constituent sensory elements. Strictly psychologically considered, percepts do not differ from hallucinations as far as process is concerned. Normal percepts differ from hallucinations mainly by the fact that the former are the habitual, the customary, confirmed by other systems of sensory elements and that in the struggle for life, they proved to call forth the fittest reaction.

Dream hallucinations, like hallucinations in general, are initiated by peripheral stimulations; even the so-called 'central' hallucinations are really peripheral in origin, the dream hallucinations naturally falling under the same category. The entrance of external peripheral stimulations being difficult in proportion to the depth of sleep and extent of hallucinatory dissociation, the internal sensations predominate in the functioning systems of dream life. For in sleep the activity of the internal organs, though depressed, still goes on uninterruptedly; the glands continue their function of secretion and excretion, the heart continues to contract and dilate, the blood goes on circulating through arteries and veins; the liver, the spleen, the stomach, the intestines, the lungs and other organs carry on their functions without a moment's arrest; the whole sympathetic nervous system, the vasomotor, the spinal cord, the medulla and other basal ganglia, all, contributing to the vast mass of internal sensations, can hardly be regarded as being asleep. All these peripheral internal sensations go to form nuclei of primary sensations around which secondary sensory elements become crystallized and organized and give rise to hallucinatory percepts—to dreams. To these must be added the external peripheral sensations coming from touch and pressure of bed clothes, from changes in the muscles, joints, ligaments, and synovial surfaces, from changes in the superficial temperature of the extremities from chemical changes in the olfactory and gustatory organs, from summation of minimal acoustic stimulations, and above all from changes in the visual apparatus and especially from the masses of light in the retina and macula lutea.

With the obscuration and dissociation of the mind the internal sensations along with the external peripheral minimal sensations come to the foreground of mental life. The dreaming consciousness stands in closer relation to the bodily functions than the waking consciousness, absorbed as the latter is with the intense stimulations coming from the external environment. The intense external peripheral sensations of waking consciousness obscures the weaker, but more constant internal sensations, as Hobbes puts it, much 'as the light of the sun

obscureth the light of the stars.' This intimate relation between internal sensations was clearly seen and pointed out by Hobbes; 'and because' he says 'the brain and nerves which are the necessary organs of sense, are so benumbed in sleep as not easily to be moved by the action of external objects, there can happen in sleep no imagination and therefore no dream, but what proceeds from the agitation of the inward parts of man's body; which inward parts for the connection they have with the brain and other organs, when they be distempered do keep the same in motion.'

Dreams often reveal in a symbolic form and frequently in phantastic and grotesque images the conditions of bodily function, conditions which the waking consciousness cannot detect, because they lie in the subconsciousness and cannot overstep the threshold of waking consciousness. It is here in the deeper regions of cœnæsthesis, that we have to look for those 'prophetic' dreams which seem to foretell some future event, some future state of the organism. An incipient irritation of the nerve endings in the teeth, an irritation not yet felt in the waking consciousness, may become the nucleus of a dream and give rise to a dramatic vision of sitting in a dentist's chair and being operated upon, a prevision that may actually become fulfilled soon after. The growth of a malignant tumor may be represented in a dream under the form of a savage dog making an attack and setting his teeth into the place where the tumor is to develop. An incipient affection of the stomach may appear under the vision of being eviscerated alive, or of having swallowed a mouse which gnaws at the intestines. Incipient organic affections, not yet felt in the waking consciousness, may thus become the starting point of a highly dramatic prophetic dream. Dreams of such a 'veridical' character often appear highly mysterious and their fulfilled prophecy seems nothing short of the miraculous and supernatural. There are many such cases on record, but the following may be regarded as typical.

A lady, a relative of mine, had a very vivid vision which proved 'veridical' and seemingly could only be accounted for on supernatural grounds. One evening, on being left in a room

all alone, she suddenly saw the apparitions of her deceased parents. The lady became very much frightened, but the parents quietened her and told her not to be afraid as they came to bring her good tidings. "You will give birth to twins, a girl and boy, name them after us, they will be strong and healthy." With this the apparitions vanished. The lady became very much agitated and, although she did not suspect to become a mother, still, being religious and a firm believer in spirits, she had implicit faith in the actual appearance of her parents, who appeared to her in order to bring her glad tidings from another world, and naturally she even began to prepare clothes for the promised twins. As this happened in a remote country place this prophetic vision soon circulated among all the neighbors and expectations were aroused as to the fulfillment of the prophecy. It soon became apparent that at least a portion of the prophecy was being fulfilled. The lady soon discovered that she was going to become a mother—the sceptics were somewhat confused, still they maintained their front, but they were completely silenced, when after a few months the lady gave birth to twins and that a boy and girl. The vision then did prove to be of supernatural origin.

If, however, we analyze the vision somewhat more closely, we find that it can easily be resolved into elements which admit of a perfectly natural explanation. The vision first of all occurred during the state of repose and was really a dream hallucination. Still this does not explain the fact that the hallucination appeared in such a dramatic form which turned out to be so strikingly prophetic. On further examination of the lady's history it was found that she lost both her parents but a few months before the occurrence of the hallucination and that this loss deeply affected her. This mental system was an important factor in shaping the course and development of the hallucination. At the same time there was another factor at work in the elaboration of the dramatically effective dream hallucination. The lady before she gave birth to the twins was already a mother of fourteen children. It is quite possible that, although in her waking state she did not suspect of being pregnant, still in her dream state, being cut off

from the intense external stimulations, she could more easily realize her condition from symptoms and changes in the internal organic sensations which now alone reigned supreme in the dream consciousness. These symptoms and changes in the organic sensations during the incipient stages of pregnancy could all the more be easily appreciated by the lady as she had ample experience of them before. Some special changes in the organic sensations such as the arrest of the menses, changes in the circulation, in the metabolism of the generative organs and other changes of similar nature served as so many peripheral stimulations which, in states of dissociation such as occur in the light states of sleep, favored the occurrence of a dream hallucination that took the form of apparitions of the deceased parents, because of the subexcitement of this particular system and because for the time being the system played a dominant rôle in consciousness. Moreover, the organic changes differed greatly from the previous experiences of similar kind, and it was therefore quite natural that the dreaming consciousness should suspect the coming of twins, a circumstance which connected itself all the more closely with the formation of the dream and was no doubt a factor in the determination of the appearance of the apparitions of the parents, which in turn, helped her further to confirm the intuition that she was to be a mother of twins. All this was represented in the dramatic form characteristic of dissociated states in general.

#### V.

States of dissociation, light sleep and especially the intermediary states occurring in the course of falling into deep sleep or coming out of it are especially favorable to the formation of hallucinations. Such conditions occur in abnormal mental states in hypnosis, in somnambulism, in hypnoidal and hypnoidic states, in the so-called psychic equivalents of epilepsy, in pure psychic epilepsy, and, generally, in states of functional psychosis. In the intermediary states between waking and sleeping, dissociated systems awake and become accessible to the influence of external stimuli. This is clearly shown in the hypnagogic hallucinations, as well as in the frequent dreams often taking place in the lighter sleep states usually before waking.



I have often observed in myself, when being fatigued and becoming drowsy and closing my eyes, how fast phantoms and scenes flit before the mental gaze, most of them being formed by the flitting masses of light in the field of vision. Often in closing my eyes and keeping quiet, so as to become somewhat drowsy, and watching the field of vision, not directly, but, so to say, from the corner of the eye, animals, figures, faces, can be seen forming and dissolving into mist. These phantoms can be directly traced to specks of light and masses of color coming from the retina and especially from the macula lutea. In many psychopathic cases, not only vision, but also sounds and voices are experienced as in some of my cases that have hypnagogic auditory hallucinations of voices. The dimly lighted up regions that lie on the borderland of sleep and waking states are peopled with phantoms, ghosts and apparitions.

Statistics seem to confirm this point of view, since about 50 per cent. of cases of hallucinations may be classed as 'borderland hallucinations.' Some recent critics in this field of inquiry strongly favor the view that hallucinations occur in dream states, hallucinations being nothing else but vivid dreams, the percipient not being conscious of having fallen asleep. This view is not new, it is favored by Hobbes. 'The most difficult discerning,' Hobbes tells us, 'of a man's dream from his waking thoughts is then when by some accident we observe not that we have slept.' Many cases no doubt admit of such an explanation. I myself had an experience of such a character. While sitting and studying one evening, I felt myself suddenly transported into my father's house and looking out of the window, seeing the scenery characteristic of the locality and hearing the voices of my parents in the next room, but I could not discriminate the words. The vision was so real that I was surprised to find myself again at my book and in a place hundreds of miles away from home whither my hallucinatory state had so suddenly transported me. The hallucination was so strong and real that had I not critically analyzed the conditions of its occurrence I should have been fully certain that the hallucination appeared in the waking state. As a matter of fact, I was fatigued from my studies and dropped off. The actual surroundings, the room, the

table, the book, the voices of my friends present, all disappeared from my view during the intermediary state, and when I came out of it I remember the start I gave in realizing once more the actual situation. According to records, hallucinations take place when the percipient is in bed, just after retiring, or about to wake up, or after waking. The percipient is really asleep, only he is not aware of it, so brief is the state and so intense and vivid is the hallucination. It may, therefore, be maintained with some show of truth that hallucinations are dreams and take place in sleep states.

We must guard, however, against carrying a generalization too far. This contention that hallucinations occur in dissociated dream states is somewhat overstated. It is true that hallucinations require states of dissociation, but this does not necessarily mean sleep states. Not all states of dissociation are dream states taking place in sleep, although it may be safely asserted that all dissociative states have many traits in common and are at bottom of the same nature. Hallucinations and dreams may be analogous, may be of the same structure requiring the same general conditions, but it does not for that reason follow that they occur in the same states, in sleep states. Dissociation with consequent hallucinations may also take place in waking states. Those who have studied hallucinations in different forms of mental diseases know that most of the hallucinations occur under widely different conditions and they further know that it is precisely in the waking states that hallucinations are most commonly present, while in the sleeping states they are more frequently absent. Insanity may be *compared* with dream states, but they are by no means *identical*. The important condition requisite for the occurrence of hallucination is dissociation and this condition often occurs in waking states, such as the hallucinations found in many forms of insanity, as for instance paranoia, hebephrenia, katatonia, general paralysis and other states of mental aberration. Even hypnotic and post-hypnotic hallucinations can hardly be claimed to have been really induced in dream states. They who have devoted time and labor to hypnosis know that the hypnotic state can by no means be identified with sleep and that in the very deepest stages

of hypnosis the subject is to all intents and purposes fully awake ; he is full of activity, his eyes are open, his senses are on the alert — he is far more awake to external stimuli than even in his normal state. The mind is very active and the subject carries on long trains of reasoning, argumentations and discussions with the people around him ; in short, the subject in the deep somnambulic state is in a condition the very opposite from that of the sleeping state. Hallucinations occur both in the waking and sleeping states and require dissociation as an indispensable condition.

## VI.

If we inspect more closely the relation of the stimulus to the hallucination, especially to the dream hallucination, we find that the intensity of the content is disproportionate to the intensity of the initiating stimulus, to the peripheral sense impression. A comparatively slight stimulation often gives rise to a dream of a highly dramatic character. This exaggerated character of the dream hallucination is well known. Thus a prick of a pin may give rise to a dream of being attacked by robbers and finally being run through by a thrust of a dagger. The application of a warm bottle to the feet may develop a dream of ascending a volcano and walking on molten lava, while a cold stimulus may give rise to a dream of participating in a dangerous expedition to the North Pole. Pain in the head, impeded respiration and pressure in the region of the neck may develop, as in the case of a friend of mine, the horrible dream of being dragged into a narrow dungeon and then beheaded.

To explain this dream exaggeration a theory is advanced based on dissociation. It is claimed that dissociation tends to convert the physiological 'ideational currents' into sensory 'currents' and intensify and exaggerate the psychic states. Before discussing the theory it may not be amiss to examine the facts which the theory is called to explain. It is questionable whether the general relation of dream stimulus is quite correctly stated. It appears that the generalization is stated somewhat in the form of the well-known question: Why do great rivers flow by great cities? It is by no means generally true that the characteristic of dream consciousness is to exaggerate

stimuli received and work them up to a pitch so as to convert 'ideational into sensory currents.' The relation is far simpler. The dream does not necessarily as a rule exaggerate incoming stimuli and make of them exciting and sensational dream hallucinations. What happens is this: the commonplace non-exaggerated, unaffective dreams tend to fade away almost immediately on waking, while the impressive dreams are usually remembered. I have observed a number of dreams in my own case as well as in others and have found that the number of ordinary commonplace dreams far predominates over the striking and extraordinary dreams. Even in psychopathic cases in which subconscious dream life is often well developed, even in such states I have found in the cases which have been under my observation and experimentation that the commonplace dreams far predominate over the dramatic and extraordinary ones. The only way to convince oneself of it is to try to write down the dream immediately on waking. I find that the ordinary dream is very hard to hold in memory, it is elusive and is constantly slipping away from us, a special effort of attention is requisite to hold on to them; they are usually hazy, vague and confused. On the whole, the indifferent dreams really predominate, but it is only the impressive ones that remain in memory. Even the freshness and recency of the dream do not save it from falling into oblivion. Now while commonplace and indifferent dreams are forgotten older dreams, but more impressive, more awakening our emotions, especially emotions of fear, will be clearly and vividly remembered.

Still the fact that exaggeration and intensification of the sense impressions received by awakening a greater volume of secondary sensory elements and representations more often than in the waking state requires an explanation. This intensification may partly be due to the fact that in sleep sensory impressions often enter consciousness suddenly. This brings about a shock, awakening emotions which are conducive to a greater stimulation of a greater volume of secondary sensory elements and their accompanying representations. Even in the normal waking state sense impressions suddenly introduced into consciousness may cause a shock and give rise to an illusion, the

object appearing as something strange and formidable. We can often observe it in ourselves, when falling into a drowsy condition, a slight stimulus which we otherwise ignore will give us a sudden start. I often observed in myself when in a drowsy state and 'dropping off' how an ordinary stimulus such as a cough, for instance, will produce a shock affecting the visceral organs, the feeling being somewhat similar to the condition commonly described as a 'sinking sensation in the pit of the stomach'; the shock seems to reverberate all over the organism.

To this must be added another important factor, namely, the emotion aroused. When an object is perceived under conditions that do not permit its recognition or its assimilation and consequently its customary reaction, an emotion of fear, or that of fright is produced. Such is the case, for instance, when some objects impress us in the dark or when we get hold in the dark of some slimy, slippery and especially of moving objects. These two factors often work together inasmuch as an object suddenly introduced into consciousness is also not speedily assimilated so that the shock and emotion due to non-recognition or non-assimilation go together. Now in sleep stimuli entering into consciousness effect it in a sudden way and from the very nature of the sleeping consciousness the external stimulation is but imperfectly assimilated; both factors, shock and emotion, due to non-assimilation are present and sometimes give rise to a highly wrought up emotional state which is so apt to transform objects by arousing different systems of elements and at the same time to impress the memory powerfully.

It is claimed that the very fact of dissociation brings about an intensification of ideational states converting them into sensory states. Physiologically, the assumption is made that the sensory nerve cells can be set into activity not only by peripheral stimuli, but also by central 'currents' going from center to periphery. The sensory centers are like a bucket with water, the upsetting of the bucket being likened to the upsetting of the sensory centers, giving rise to sensations. This upsetting can be affected by peripheral 'currents.' Small intracellular ideational currents flow freely through the centers without upsetting

them. Now when an obstruction occurs in the sensory centers the ideational currents which otherwise flow out and disperse may accumulate, and aided by a chance activity of central character may upset the nerve cell in the same way as our bucket may be upset by the accumulation of water from the small incoming currents (like the ideational currents), when the holes and interstices through which they usually flow out are stopped up. The hypothesis as far as explanation goes is good enough, the drawback is that it explains too much. For it is hard to understand why intense dreams of this character do not occur more often.

Besides it is hard to realize how an idea can give rise to a sensation of any intensity by the mere agency of ideas, the sensation and its intensity being entirely a function of peripheral stimulation and consequent sense impressions. An idea, a representation, may be very vivid, but does not become a presentation or sensation. A sensation is not an 'intense' idea, nor is an idea a weak sensation. A series of sensations arranged in ascending or descending gradation of intensity may be likened to the continuous series of the spectrum in which there is a qualitative difference from line to line, a difference that admits of no substitution. A sensation the intensity of which is changed is a fallacious percept, a hallucination. A thunder clap perceived as a whisper, a whisper perceived as a thunder clap may be equally regarded as fallacious perception as any other change in the content of the percept. The rustling of leaves perceived as an explosion is as much of fallacious perception as when the paranoiac, for instance, hears in it curses and threats of his enemies. Sensations and percepts cannot change in content or intensity without giving rise to illusions or hallucinations. The changes that may occur in regard to sensations and percepts without their being qualitatively changed and becoming fallacious can only be in vividness belonging to the representative elements which cluster round the primary and secondary sensory elements. A less intense sensation may be more vividly represented than one of greater intensity. A weak sound, a pale color, a light pain may be more vividly represented than the ones the intensity of which is far greater. This vividness, however, is not at all a characteristic attribute of the sensory ele-

ments, it is rather an attribute belonging to the functioning system of representative elements into which the given sensory elements enter as constituent nuclei.

Keeping to facts as closely as possible we may venture without much risk on the following generalization which may be regarded in the light of a working hypothesis. Just as sensory primary or secondary sensory elements vary in intensity and can be arranged in a continuous series of gradations of intensities, so do the representative elements vary in vividness and may be arranged in a continuous gradated series of vividness. *Sensory elements have intensity, but no vividness, while representative elements have vividness, but no intensity.* Representative elements may refer to the same presentative content with different degrees of vividness. Vividness of representative elements like intensity of sensory elements may pass through all degrees of variation from *maximum* to *minimum* and finally reach a vanishing point. In this respect vividness is like sense intensity and as a matter of fact the two are usually interrelated.

Under ordinary conditions of psychic activity sensory intensity and representative vividness vary together. An intense sensation is vividly represented and a weak sensation less so, the vividness varying directly with increase or decrease of sensory intensity. This direct variation, however, is not always constant; there are conditions under which the two may part company such, for instance, as are found in states of distraction or in states of dissociation. Under such conditions a strong stimulation giving rise to sensory elements of great intensity may give rise to representative elements of but slight vividness. In states of distraction as well as in various states of mental dissociation sensations of great intensity may meet with so little vividness in the representative elements as to fall so to say below the threshold of consciousness, may be submerged into the twilight region of the subconscious and 'not be perceived at all.' From this standpoint we may say that the depth of dissociation varies inversely as the degree of vividness. When vividness is at its *minimum*, dissociation is at its *maximum*, and inversely. *Briefly stated, dissociation and vividness are inversely interrelated variables.*

## VII.

*Functional psychosis*, the basis of which is dissociation, *may also psychologically be regarded*, according to the gravity of the psychopathic affection, *as a decrease or even loss of vividness of representative elements*. The diminution or total loss of vividness may be of different systems of representative elements and will thus give rise to various forms of psychopathic amnesias, which play such an important rôle in functional psychosis, which in the main is a disease of representative life consisting in a decrease of functional activity of representative elements and which from the present point of view may be regarded as *the tendency towards a minimum of the most important attribute of ideational elements, namely, vividness*.

From this standpoint, the degree of vividness of ideational elements can no more confer on them sensory intensity than the idea of riches, however vivid, can confer upon one the power of wealth. Dream hallucinations, like hallucinations in general, are sensory in character, not because of the intensive nature of the central elements or ideas, but because of the primary and secondary sensory elements present, directly and indirectly peripherally initiated, as it is in the case of all sensory and perceptive processes. Hallucinations are peripherally induced and are started either in the same sense organ, or indirectly in some other sense organ, the secondary sensory elements form so to say the hypertrophied portion of the hallucinatory percept, but *they are always sensory in character and peripherally initiated*. The more closely one investigates hallucinations, the more he learns to trace cases of supposed mysterious hallucinations to external peripheral sources. A pure central hallucination is as rare as the fabulous phœnix. A central hallucination means an unanalyzed psychic state. Whenever an analysis of such hallucinations is made, the peripheral sensory character, primary and secondary, stands out distinctly in the foreground. In the so-called 'purely central hallucination' the nuclear primary sensory elements remaining in the background of consciousness cannot easily be traced to their appropriate peripheral sense organs and their external stimuli and are on that account regarded as 'centrally initiated.' Dream hallucinations, hyp-



notic, hypnagogic and pseudo-hallucinations, if closely analyzed, can be clearly traced to peripheral origin, — to peripheral stimuli that give rise to primary sensory elements that form nuclei round which secondary sensory elements become organized as cytoplasm.

These so-called central hallucinations form the stumbling block of the psychologist and the psychopathologist. To account for them the theory is commonly advanced that the irritability of the ideational centers may reach such a pitch as to give rise to such intense ideational states as to amount to a full-fledged sensation or perception and thus bring about a pure central hallucination. It is strange that such a theory should be maintained at all and that it should gain currency. The theory does not accord with the facts, and its very principle disregards facts. For no matter what strength an idea may attain it is still far from becoming a sensation. An idea of a bell does not sound and an idea of a blow does not strike. The fact is, as we have pointed out before, ideas or representations are qualitatively different from sensations; an idea can as little be converted into a sensation as the sour taste of vinegar can be turned into violet color of the spectrum. Ideas and sensations differ fundamentally, they differ in kind and no amount of ideational activity can ever be made to become sensory in nature. A higher pitch of ideational activity will make an idea more vivid, but can nowise confer upon it sensory qualities, just as all the immensity of space and infinity or eternity of time can not make them weigh as much as a grain.

A further modification of the same theory is given by those who maintain that central hallucinations are due to the irritability of the higher ideational centers from which 'ideational' currents are propagated to the lower sensory centers. In other words, it is not the idea that becomes by its intensity or by its vividness directly transformed into a sensation, but an intense or vivid idea may give rise to a corresponding sensation without the presence of an external stimulus, or of a peripheral sensory process. Psychologically as well as biologically regarded, the theory is untenable. For it is not in accordance with observed facts that an idea, however vivid, should give rise to a corre-

sponding sensation or percept. Were that the case the course of internal and external worlds would have become confused and confounded, man would have become the dupe of his own ideas, the world a gigantic madhouse, and the process of ideational activity would have long ago become eliminated in the struggle for existence.

From a physiological standpoint, the theory can hardly be considered, inasmuch as it is in direct opposition to the known physiological laws. Sensory excitation, ideational processes and motor reaction form, so to say, a sensory-ideo motor arc, — the excitation going from peripheral sense organs to central systems and thence to the muscles. Now the conditions postulated by the central theory are such as to have the processes reversed. Sensory processes work upward, from periphery to center, while motor processes work downward, from center to periphery. On the modified central theory, the sensory process in hallucinations is reversed, it goes downward instead of upward. There is not a particle of evidence for such reversal, the assumption being in contradiction to the principles of physiology. The claim of special structures for effecting such a reversal is entirely unfounded. As far as can be ascertained, the neuron works 'cellulipetally' in the direction of the sensory ganglia and central neuron systems, while the neuro-axon works 'cellulifugally' that is from sensory ganglia and central neuron systems to the periphery to the muscular apparatus. There is on the other hand not the least bit of evidence that the functions of neuron systems can be reversed in their course.

The central theory then cannot stand the test of critical examination as it is neither in accord with the facts it is called to explain, nor does it fall in line with the facts and principles of physiology. We are therefore forced to fall back on the peripheral origin of hallucinations under the condition of central dissociation. According to the theory advanced in this paper, the origin, and structure of hallucinations, of dream hallucinations as well as of pseudo-hallucinations and hypnotic hallucinations do not differ in the least from those of normal perception, a difference unwarrantably claimed by the theories of central origin of hallucinations. *Hallucinations are peripherally*

*initiated, hallucinations are abnormal percepts occurring under the conditions of central dissociation with primary and secondary elements as their central nuclei.*

### VIII.

The phenomena of so-called 'double thinking' are extremely interesting from our point of view. The patient hears his own thoughts uttered aloud. He has the hallucination of his thoughts uttered when engaged in writing or in reading, though loud reading may check the hallucinatory voices. These hallucinatory voices may be of an imitative character and simply repeat what is spoken or read by the patient; or they may be of an anticipatory character and utter the patient's thoughts before he himself utters them. The usual explanation of such cases is found in the theory of the so-called 'overcharged centers.' Where the voices follow and repeat the patient's words and phrases, it is assumed that the auditory centers are highly irritable and overcharged so that stimulations from other centers bring about a discharge into the 'ideational' auditory centers and auditory hallucinations result. In the case of reading, for instance, the visual image of the word awakens also an auditory image, but when the auditory centers are overcharged the visual images awaken directly an auditory image before the spoken word takes place. Now this auditory image is so intense, on account of overcharge, that it becomes an auditory hallucination and the patient hears his own thoughts uttered aloud. This reflex action from one 'ideational' center into another occurs while the patient reads or writes, and that is why he has the experience, the hallucination that there is a voice often regarded as 'inner' which repeats his own words and phrases. Cases where the voice utters the words and phrases before they are written are explained on the hypothesis that the central discharge into the overwrought auditory centers occurs before the words are written down or before the motor discharge takes place. When, however, the patient hears the voice repeat the phrases soon after he has uttered them, the phenomena are explained on the supposition that the centripetal currents from the speech centers into the auditory centers give rise to the voices, the patient hear-

ing his own words shortly after he has uttered them, the efferent discharge from the graphic centers into the auditory centers will give rise to an auditory hallucination of hearing the words and phrases he has just written. In the phenomena of 'double hearing' the patient has the hallucination of hearing his own voice while talking or reading aloud, and then again another voice due to the centripetal discharge from the speech centers to the overcharged auditory centers. Thus in some patients these hallucinations of hearing are brought about by the voluntary suppression of speech, the patient then hears a voice uttering his own thoughts. This is claimed as confirming central initiation—the currents from the word images in the speech centers not having a free outlet run into the overcharged 'ideational auditory centers' and give rise to inner speech heard by the patient.

In opposition to this central theory of double thinking or of 'inner speech' held in various forms by psychologists and psychopathologists, there are some who maintain the view that these 'double thoughts' hallucinations are not of central, but of peripheral origin, being due to hyperæsthesia of the centripetal paths. The apparatus employed in speech carries out not only the requisite delicate movements, but also forms the sensitive apparatus for information of the movements executed. The sense of movement may be regarded as originating in the muscles, especially in the joints and articular surfaces. Sensory stimulations coming from these structures to their appropriate central systems give rise to kinæsthetic sensations and motor ideas. Now if the peripheral sensory tracts of the muscle sense or of kinæsthetic sensations become hyperæsthetic, kinæsthetic sensations and motor ideas are aroused automatically and may give rise to hallucinations of positions, movements and acts; movements which have not been performed are thus experienced. If now the centripetal sensory tracts of the speech centers are hyperæsthetic then involuntary kinæsthetic sensations and respective ideas arise which go to form the hallucinations known as 'double thought.' The patient experiences 'inner' speech, a voice repeats after him his own thoughts, his own words and phrases. When the speech centers are overcharged

and give rise to automatic centrifugal discharges, then the hyperæsthetic centripetal paths bring it back in the form of spoken words and the patient experiences his own thoughts uttered by an inner voice which is foreign to him. In speaking the inner voice comes after the speech and reverberates like an echo and persists as an 'after image' of the spoken word or phrase. When the patient is engaged in writing, the voice usually precedes the written phrase, because the spoken word image precedes the written word image, the inner voice thus anticipates the patient's writing by uttering his thoughts. This theory seems further to be confirmed by cases in which such hallucinations take place. If one observes closely cases of 'double thinking' or of 'inner speech,' he often finds 'involuntary whispering' present—the patient whispers to himself. These whispers come back to him, on account of the hyperæsthesia of the peripheral paths he hears it as speech of some inner voice.

A close examination of the two theories, of the central and of the peripheral, reveals their inadequacy. The central theory, as it is generally put forth and commonly accepted, may possibly be regarded as the more inadequate. For the central theory rests on the psychological fallacy, so prevalent in psychopathology that it may be regarded as the psychopathologist's fallacy, namely that an idea may reach such a high pitch of intensity as to become sensory in nature and give rise to a percept. The percepts formed by the visual perception of reading awaken, according to this theory, also accompanying ideas of sound intimately related associated with visual word reading, and it is these ideas that reach such a high intensity as to give rise to hallucinations of hearing, the words are read aloud, as if by a strange voice. This explanation, as we have already pointed out, is psychologically incorrect and rests on the fallacy that ideas have intensity and that an intense idea becomes a sensation, or that a sensation is but an intense idea and an idea is a weak, a faint sensation. To modify this view and assume that an intense idea stimulates and gives rise to the formation of a percept is to assume a supposition not warranted by facts that an idea is equivalent to the action of external stimuli or objects with their requisite physical structures and processes. In either case, the

central theory as it stands is not in accord with psychological and physiological data and, as such, cannot possibly be accepted at least in the shape as it is usually put forth.

Furthermore there is an inherent difficulty in the central theory itself. For if it be correct, as the theory claims, that the visual image calls forth an intense auditory image amounting to a hallucination, the hallucinatory voice should precede and not follow the patient's reading. In order to explain the hallucinations of double thinking or of double hearing in the case when the voice follows the reading, it would have to be assumed first that the visual image of the written or printed word stimulates the speech centers, which, innervating the muscular apparatus of speech, give rise to reading, which in turn stimulates the peripheral auditory apparatus, awakening activity in the auditory centers, giving rise to the hearing of the read words, and that then only do the indirect stimulations of the visual image coming from the visual centers awaken once more the same central connections, thus bringing about a repetition of the self-same words heard. We have to assume that the action of the visual centers in stimulating the motor speech centers with the resulting acoustic stimulations and functioning activity of the auditory centers are enacted before the direct central stimulations from visual center to auditory center take place; in other words we must *assume central retardation*. Now what does this central retardation mean? It means that the phenomena of double thinking or of double hearing are brought about by some form of central inhibition, of central blocking of pathways as it is usually put: in other words, the requisite condition of double thinking is reduced to the psychopathological state of central dissociation.

The inadequate side of the central theory as it is commonly advanced lies in the supposition of its referring auditory hallucinations in the phenomena of double thinking or hearing to the intensification of the auditory image or idea, but no straining of an auditory image can get a sound out of it. Moreover, were the central theory correct it would really involve a double auditory hallucination, one preceding and the other succeeding the reading. For in the process of reading the visual image of

the word awakens the auditory image along with its kinæsthetic image, stimulating the centrifugal motor apparatus and giving rise to the spoken word. Now this awakened auditory image preceding the spoken word, on account of the assumed irritability of the auditory centers and the consequent 'intensification' of the stimulated auditory images, should necessarily give rise to a full-fledged hallucination. When the voice also follows the reading, a dissociation of the visual from the auditory centers is assumed, a dissociation that gives rise to a secondary succeeding hallucination of the words and phrases read and spoken. The fact that the central theory requires the presence in all phenomena of double thinking that the voice should necessarily precede the reading; that when the voice follows the reading, another hallucinatory voice must have also preceded and that there is also a double stimulation from the visual into the auditory centers, that the hallucination first appears under conditions of association of visual and auditory centers, while the succeeding hallucination occurs immediately under the opposite conditions, namely dissociation, — all these assumptions make the central theory wholly unsatisfactory and unacceptable.

## IX.

The peripheral theory of double thinking is on general grounds more acceptable as it falls more in line with psychological and physiological principles and facts. Unfortunately the special facts which the theory is called for to explain do not exactly tally with it and may even be said to contradict the hypothesis. For if the hallucinations of double thought are due to hyperæsthesia of the centripetal sensory-motor tracts, then reading aloud should intensify the hallucination, but the case is quite the reverse, — reading aloud makes the hallucinatory voice to disappear altogether. On this theory again, the voice should follow the reading. We are thus confronted with the opposite difficulty met with in the central theory. On the central theory the hallucination should precede, while on the peripheral theory the hallucination should follow the reading. The central theory cannot account well for succeeding hallucinations, while the peripheral theory does not account well for pre-

ceding hallucinations. On the central theory there should be double hallucinations in cases where the voice follows reading, while on the peripheral theory there should be double hallucinations, when the voice precedes the reading. Besides 'hyperæsthesia' alone should rob the perception of its hallucinatory character, the patient should be the more conscious of his own utterance.

A closer examination of the peripheral theory discloses a fundamental fallacy which it primarily involves, a kind of *ignoratio elenchi*. The theory is probably correct in principle, but it misses the essential point of the whole problem; it may be an adequate explanation for motor, but not for auditory hallucinations. Hyperæsthesia of the central motor speech tracts would at most give rise to pure kinæsthetic hallucinations. The patient may have hallucinations of action, tension, or of movements in his peripheral speech organs, but he will have no hallucinations of hearing. To have an auditory hallucination, as to have an auditory perception in general, the auditory peripheral and central apparatus should be stimulated. No other organ but the acoustic apparatus can possibly supply sensations and percepts of an auditory quality, unless the hallucination be of a reflex secondary character, but then it may be induced through any other peripheral source than that of kinæsthesia of the speech organs.

Although each theory taken by itself proves to be inadequate and leads to contradictions and puts us out of accord with facts, still the two may be regarded in a certain sense as supplementing each other, if modified by supplementary conditions. Now the central theory emphasizes the aspect of the central character of the phenomena, while the peripheral theory lays stress on centripetal factors; both, however, can be brought in line with facts, if assuming centripetal factors of kinæsthetic and specially auditory hyperæsthesia we also refer to the central conditions of dissociation. The patient in double thinking is subject to subconscious states, to states of dissociation; this dissociation is of central character and specially affects the visual and kinæsthetic systems. Impressions, on account of dissociation and peripheral hyperæsthesia, are subconsciously received and sub-



consciously reacted upon. The visual impressions of the written and printed characters are subconsciously perceived and subconsciously uttered in a whisper and sometimes quite loud, as I had occasion to observe in a case of mine. This subconscious utterance, unperceived by the patient, comes back to him as a strange external voice proclaiming the patient's thoughts or repeating his words and phrases. The hallucinations of 'double hearing' are due to subconscious whispering which comes back to the patient as an auditory hallucination. I had the occasion to verify this phenomenon of subconscious whispering in a case in which functional dissociation was quite marked and in which auditory hallucinations and double thought were quite persistent.

In cases where the auditory hallucinations precede the reading or writing it is the subconscious whispering along with kinæsthetic and auditory hyperæsthesia that give directly rise to the phenomena of 'double thought,' or of 'double hearing.' The dissociation being in the kinæsthetic systems the patient does not experience consciously the peripheral incoming sensations due to his subconscious whispering. More often the patient continues to whisper subconsciously what he has just read consciously. Such a habit is common with many people in the normal state and is due to the result of the persistence of the peripheral sensory impression, to a kind of verbal after-image. The absence, however, in the normal condition of dissociative states prevents the formation of subconscious whispering with its consequent auditory hallucinations partly due to hyperæsthesia of the auditory tracts.

If cases of 'double thinking' are closely examined one finds in them the presence of subconscious states with their psychomotor reactions, the patient in walking on the street, for instance, may hear a voice telling him words and phrases that can be traced to signs and advertisements which he has read subconsciously though he himself has not been aware of it. What happens in such cases is this, the patient whispers or even utters aloud the words he subconsciously sees on the signs. It is this subconscious whispering that comes to him back as an auditory hallucination of a voice. In one of my cases in which

the patients suffered from auditory hallucinations I found on close examination the phenomenon of unconscious or subconscious whispering, which became very much aggravated in proportion to the state of distraction in which the patient was, ranging from an almost inaudible whisper to a loud talk, the patient being entirely ignorant of it and could not be made aware of it, even when the attention was fully called to his talking. One of my patients suffering from pronounced auditory hallucinations, but in whom the dissociation is not deep, aptly describes his experiences as 'autovocalization.'

Similar conditions can be induced in hypnosis thus confirming our point of view by experiment on otherwise normal people. If a post-hypnotic suggestion of subconscious whispering is given, the subject experiences an hallucination analogous to that of 'double thought,'—the subject hears a voice telling him the words and phrases which he himself whispers, but of which he personally is entirely ignorant. The peripheral character of the 'double thought' or hallucination under condition of central dissociation may thus be regarded as an efficient working hypothesis in accord with facts.

From the whole course of our discussion it appears that we remain more closely in touch with facts, if we accept the view that hallucinations require states of dissociation as central condition and that they are primarily peripherally initiated having secondary sensory elements as their main content; in other words, hallucinations are *dissociated secondary percepts*.