BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 23 1939

THE SIGNIFICANCE OF AUDITORY AND VISUAL HALLUCINATIONS*

BY

P. K. McCOWAN, M.D., F.R.C.P., D.P.M.

Physician-Superintendent, Crichton Royal, Dumfries

As the subject of hallucinations covers the whole field of psychiatry it is clearly impossible to deal with more than certain aspects which lend themselves to subsequent discussion. Faulty perception is such a striking phenomenon that it is not surprising that it early attracted the attention of mental pathologists. For many generations psychiatrists have written profusely on the matter, but because of its many unsolved problems it continues to be a common subject for study and comment. My observations in this paper are psychological rather than neurological, and probably more theoretical than practical.

Definition ; Relation to Illusions

The mental act of perception is a complex phenomenon necessitating the assimilation of the qualities of what is seen or heard with certain memories pertaining thereto. Faulty assimilation, or the addition of extraneous detail, results in faulty perception or illusion. Illusions may be normal, as in the interpretation of a few deft strokes by an artist as a human figure (creative synthesis of Wundt), or in the misinterpretation of distant or vague objects—for example, seeing the man in the moon or pictures in the fire (paradoileas). Alert attention and the absence of disturbing emotions are important for correct perception. Thus strained expectation, fear, and anxiety are common causes of illusions. The frightened individual walking along a lonely lane after dark is very prone to illusory interpretation of what he sees or hears. Esquirol (1772–1840) was the first to distinguish clearly between illusions and hallucinations, and the present-day differentiation of these two phenomena follows the lines laid down by him. An illusion may be defined as a subjectively distorted perception of a real object; an hallucination as a mental image projected outwards as a perception in the absence of an external stimulus. Hallucinations, however, often make use of external objects—for example, passing footsteps, shadows on the wall—as their starting-point. Again, as no sense organ is ever entirely free from stimulus, it is theoretically possible that every hallucination has a peripheral stimulus. Thus positive scotomas are invariably present in the visual hallucinations of delirium tremens (Morel, 1932, 1933), and entotic sounds such as tinnitus are often the basis of auditory hallucinations. It follows that illusions and hallucinations usually differ little in significance, but in

some cases it is important prognostically to differentiate between the two. Hallucinations in the manic-depressive are usually regarded as a schizophrenic admixture of bad prognostic significance, but a manic patient may have illusions of the paradoileas variety which are of no more significance than the normal seeing of pictures in the fire. For example, a young female manic was much pre-occupied with lions prowling around her, which on investigation proved to be illusions originating in shadows on a bank outside her window.

Hallucinations in the Sane

While persistent hallucinations are a certain sign of grave and profound mental disorder, the experience of an occasional hallucination is by no means a rarity in the sane. Probably a third of us have such an experience at some time in our lives (Society for Psychical Research, 1894 report), the hallucination usually being of the hypnagogic variety—that is, in the state between sleeping and waking. The greater frequency of hallucinations in the sane in former ages and in primitive races is largely explained by the attitude of the times to such occult phenomena as spirits, witches, etc.—as are the hallucinations in susceptible communities commonest at times of religious ecstasy.

Many artists have a strong visual creative faculty which not infrequently results in frank hallucinations. Goethe relates how he could hallucinate at will an unfolding flower which he regarded as the archetype of all flowers; and it is related that the painter Montagna would ask those to step aside who got between him and the hallucinatory scene he was painting—possibly an example of eidetic imagery. Shelley, Byron, Tasso, and Schumann are examples of the many prominent personalities who are known to have had hallucinatory experiences, some of which were undoubtedly psychotic, while others seem to have been isolated phenomena. Similarly, many religious mystics—among others, Moses, St. Paul, Luther and his opponent Loyola, Joan of Arc, and George Fox the founder of the Quakers—have been subject to hallucinations. It is surely gross presumption to affix a psychiatric label to such people, and even to dub their experiences as hallucinatory is superficial nominalism. Is it possible that the deeply religious, in ecstatic moments, recover the clairvoyant powers formerly possessed by man, feeling and thinking in pictures in a manner unusual in these days of abstract thought? In

* Read in opening a discussion in the Section of Neurology and Psychiatry at the Annual Meeting of the British Medical Association, Aberdeen, 1939.

this connexion it is highly significant that the concentration on a single group of ideas invariably associated with the ecstatic hallucinatory state is a profound preoccupation with those ideas, but without any abstract thought concerning them. The study of mythology leaves little doubt that at one time man understood his relation to Nature and his fellow-men by a process of intuition which he experienced by visions or pictures, whereas to-day he understands the same relations through a process of observation, experience, and thought, and appreciates such understanding by a process of abstract thinking. In this change over from perception through the spirit, or intuition, to perception through the senses and abstract thought, man unfortunately has lost the former method of experiencing. As this is probably a loss from disuse it is quite possible that man may yet regain it. If this surmise be correct our hallucinated poets, philosophers, and religious ecstasies, far from being psychotic, should be regarded rather as supermen capable of using both forms of experiencing—a conclusion, I submit, which their lives and works strongly support. Psychologically their hallucinations can be understood as a regression to a more primitive but not necessarily less efficient mode of experiencing.

Under hallucinations in the sane may be mentioned those interesting studies of hallucinations in hypnotic subjects. Hallucinations can be suggested in hypnosis and the post-hypnotic state, and crystal-gazing may induce visual hallucinations in certain healthy and hysterical subjects. It was a study of such hallucinations that led Morton Prince to enunciate his theory that visual hallucinations are the emergence into awareness of imagery belonging to subconscious thought and that auditory hallucinations are the similar emergence of subconscious verbal "images" or thoughts. Lundholm (1932), working with the conditioned-response method in post-hypnotic conditions, enunciated a hormic theory of hallucinations on the ground that the meaning of an object is determined by the conative attitude of the observer towards it.

Elementary Hallucinations

The simplest form of hallucination is the so-called elementary hallucination, consisting, in the case of sight, of flashes of light, colours, glare, etc., and, in the case of hearing, of vague sounds, noises, music, etc. The following is an interesting example of the rare phenomenon of the transformation of "noises" into music. A paraphrenic artist, during a course of triazol therapy, had distressing "noises" converted into operatic and orchestral music more perfect than he had ever experienced in reality. He was quite lacking in insight, and could not be persuaded that we, his friends, were not arranging wireless performances to drown the "noises" made by his enemies. Such hallucinations of music and singing are comparatively rare, except in some confusional states, particularly delirium tremens.

Aetiology and Psychopathology of Hallucinations

In this connexion it is important to differentiate between the acute hallucinations arising in a confused state and the subacute or chronic hallucinations arising when consciousness is clear.

(A) ACUTE HALLUCINATIONS

Perceptions are ordinarily distinguished from mental images by their objectivity, substantiality, and perceptive actuality (Wernicke), but it would seem that full consciousness is necessary for this differentiation. In states of

acute confusion the mind exhibits dissociative phenomena similar to those met with in sleep; judgment and reasoning are in abeyance, associations are uninhibited, thoughts are incoherent and out of touch with reality. It is a strange fact that whenever this state arises mental images take on a sensory vividness which gives rise to hallucinations. Such hallucinations tend to be variable and dream-like, to affect several of the senses, and to result in a confused and fantastic experience. These hallucinations need bear no close relation to the ego, so that in delirium tremens the patient may even regard his visual hallucinations as a play put on for his amusement. Dreams with their hallucinatory vividness, hypnagogic hallucinations, and confusional hallucinosis are probably very similar. Neurologically they can be regarded as a release phenomenon, the cortical levels subserving consciousness being out of action, with resultant uninhibited activity of lower cortical and subcortical (most probably hypothalamic (Lhermitte, 1932)) levels. Ewald suggests that the prevalence of visual as opposed to auditory hallucinations in such conditions may be due to the localization of the ocular centres in the mid-brain near the waking centre. On the other hand, Ammann (1930) describes several cases of pseudo-hallucinations in eye disorders which he attributes to stimulation of the calcarine zone. Psychologically dissociation can be regarded as the causal mechanism, the conscious personality's possession of the stream of consciousness having been usurped by the subconscious with its lack of criticism of environmental happenings. Most recent Continental workers—for example, Schröder (1936), Claude, Ey—enunciate the rather extreme view that the clouding of consciousness is all-important and the sensory aspect of the hallucinations negligible, visual hallucinations in such cases being merely visual images wrongly interpreted as such by the impaired judgment. Schorsch's (1934) more general conclusion is that hallucinations arise when those biological processes which inform us about environment are suppressed by subjective factors.

(B) CHRONIC HALLUCINATIONS

While dissociation is still the important mechanism, there is not the profound cleavage of consciousness of the confused state. Instead, certain complexes are dissociated from the main stream of consciousness, and it is in connexion with these that hallucinations arise. That dissociation is all-important is shown by the absence of the hallucinations when the patient is occupied with reality, and their presence when attention slackens and the patient begins to day-dream. This day-dreaming is characteristic of the schizophrenic with his incessant preoccupation with certain obscure fears, suspicions, or presentiments. The primary factor is a changed affectivity which gives rise to a morbid egocentricity with associated complexes. Reality becomes of less interest than his self-centred preoccupations, and a struggle goes on within him between the life of reality and imagination till a state of distraction arises, a splitting of his personality, otherwise dissociation. To this emotionally aroused dissociation is added an overstimulation of the sense organs of sight and hearing by what can best be regarded as auto-suggestion (Gadelius, 1933). Just as strained expectation and fear may facilitate illusions, so here, under the prolonged influence of the egocentric affect, they keep the senses on the alert and ultimately deceive them by the formation of hallucinations. Thus it is that the hallucinations are really dissociated fragments of the patient's own complexes, his most hidden thoughts, his fears, anxieties, and suspicions, his repressed erotic desires, his dreams of greatness. Unlike acute hallucinosis, there is here a close relation between the

hallucinations and the patient's ego. This explains the compulsive power of some hallucinations which make the patient carry out actions that he would disregard if ordinarily commanded to do them.

A deaf paraphrenic artist with grandiose delusions "heard" the bell in the church belfry tolling "Climb higher, climb higher." The symbolical significance of this command is easily understood, but the patient took it literally, and proceeded at much risk to scale the church. I pointed out to him afterwards that there was no bell in the belfry, that bells did not speak, and that he was so deaf that even if a bell had been ringing he could not have heard it. He shook his head sadly, and remarked: "I must be going mad," but after due reflection, as described later, he gave delusional explanations of his impulsive act in accordance with the usual inability of the critical faculty of such patients to penetrate the hallucinatory complex in terms of reality.

From the practical point of view the most important aspect of all hallucinatory states is the effect on the patient's conduct. This renders it imperative that we should learn the content of his hallucinations and his attitude towards them, so that we can anticipate his behaviour and take the necessary steps to guard against any dangerous propensities to himself or to others.

Comparison of Visual and Auditory Hallucinations

Generally speaking, visual hallucinations are characteristic of the acute, and auditory hallucinations of the chronic, psychoses, and, owing to their greater tendency to become chronic, the latter are of more grave prognostic significance.

Visual perception is the principal means by which we appreciate and orient ourselves to our surroundings. This means that visual hallucinations appearing to a person with clear consciousness are usually palpably incongruous and abnormal. His belief in their reality is unlikely, unless fear, anxiety, or anticipatory desire is present, clouding his consciousness and destroying his critical faculty. Darkness encourages visual hallucinations and renders them less incongruous, so that in the psychoses without confusion visions are much more common at night. In confusional states the clouded consciousness appears to accept the visions as reality, and the patient reacts accordingly. When consciousness clears in such conditions it is usual for the visions to disappear, although auditory hallucinations if present may continue. This is seen in certain cases of delirium tremens, which pass into alcoholic hallucinosis or paranoia.

Things heard are much less differentiated from their surroundings than are things seen, so that to the patient, even with clear consciousness, auditory hallucinations are not necessarily incongruous or abnormal. It is much easier for the patient to explain away any incongruity of auditory hallucinations. For example, if no one else hears the "voices" it is because the patient has better hearing, or the "voices" are due to wireless, telepathy, etc.

It is doubtful whether auditory hallucinations in a clear setting have the objectivity, reality, and substantiality usually ascribed to them, or whether they are not rather in the nature of pseudo-hallucinations or psychic hallucinations. It is certainly very noticeable how often the patient who says he hears "voices" can give the meaning of what is said, but cannot repeat the actual words used. The deaf paraphrenic artist already mentioned argued with me that the hearing of "voices" by a deaf person was no more a sign of mental abnormality than the fact that to him colour was form, and beauty merely secondary to form. It merely meant that his powers of hearing and sight differed

from the so-called normal. This example lends no support to the theories of such writers as Schröder, that the "voices" are just vivid mental images or thoughts detached by "passivity feelings" or "estrangement" of thinking; or of the French authors Claude and Ey (1932), that faulty belief in the reality of the hallucinations is the fundamental factor. Rather does it support the view of Mayer-Gross (1928) that the sensory elements in the hallucinations must also be regarded as of primary importance. The above patient was experiencing some novel auditory sensations which he could not find words to express; the best he could do was to say that bells were ringing out a message to him. This is very like the example cited by Mayer-Gross of the patient who could only describe as "pins and needles" the sensations he felt in a phantom limb. Morel's finding (1936) that patients are unable to compare the pitch and intensity of their "voices" with the sounds of the audiometer, though they can in the case of elementary hallucinations, is further evidence that such "voices" differ from ordinary hearing.

This objectivity of auditory hallucinations, whatever its nature, is not the principal reason for their overpowering effect on the patient. Compared with the visual sense, language, and therefore the spoken word, has a much closer contact with our inner life, our thoughts, our emotions, our desires, and endeavours, and it provides the most intimate contacts with the minds of our fellows. These are important factors in making auditory hallucinations highly significant to the patient, but most significant of all is the fact that the hallucinations are a final confirmation of long-harboured fears, suspicions, or hopes. These moods, as already explained, have in fact been largely causal of the hallucinations, and as they in turn are intensified by the hallucinations a vicious circle is set up, which goes a long way to explain how these hallucinations and associated delusions are impervious to reason and tend to persist.

In conclusion, I would like to report a case which has points of interest as regards both visual and auditory hallucinations. The patient is a woman aged 32, suffering from paraphrenia phantastica, who denies that she hears "voices" but states that much of what she says and thinks is repeated by a "voice" behind the top of her breast-bone. She maintains that this "voice" belongs to a "Jim Walker," who, with several others, lives in her chest, and whose heads she can actually "see" there. The visual hallucinations are of the extracampine variety in that the location given by her for the "seen" heads is usually quite outside her range of vision. I suggest that when the patient says she "sees" such heads and denies that she only thinks she sees them, she is using the word "see," for want of a better, to describe some abnormal visual sensations she experiences; in other words, she illustrates that, at least in chronic visual hallucinations, the sensory element can be important. Apart from some cases of senile melancholia and senile dementia, the "thought resonance" type of auditory hallucination met with in this patient is only found in schizophrenia. It was originally described by Séglas (1895) and Cramer (1889) as a muscle sense or motor speech hallucination. In support of this theory they pointed out that the thought word is often accompanied by innervation of the centre for the spoken word, so that many people move their lips involuntarily when thinking, and physiologists have since shown that the laryngeal muscles are stimulated during thought; in other words, thinking is a form of subvocal talking. I would correlate the site of the present patient's hallucinatory voice "behind her breast-bone" with the innervation of her laryngeal muscles in her subvocal thinking.

Summary

Hallucinations and delusions are defined and their relations to each other discussed.

An account is given of hallucinations in the sane and of elementary hallucinations.

In surveying the aetiology and psychopathology of hallucinations emphasis is laid on the importance of differentiating between the acute hallucinations arising in a confused state and the subacute or chronic hallucinations arising when consciousness is clear.

Comparison is made between visual and auditory hallucinations: an illustrative case shows the importance of sensory elements.

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NEUROLOGICAL ASPECT OF VISUAL AND AUDITORY HALLUCINATIONS*

BY

MACDONALD CRITCHLEY, M.D., F.R.C.P.

Neurologist, King's College Hospital; Physician to Out-patients, National Hospital, Queen Square

The neurologist encounters clinical states of hallucinosis—either episodic or habitual—in a variety of pathological circumstances. One can briefly divide the aetiological factors into lesions which are focal and those which are diffuse. On the one hand there are the circumscribed lesions as represented by tumours and less often by vascular disease and injury. Perhaps, too, we should include here those cases of epilepsy and of migraine where hallucinations are conspicuous. Among the diffuse cerebral causes of hallucinations we may mention a number of toxic-infective states, such as delirium (associated with general infections, high fever, exhaustion, starvation, thirst), various drug intoxications, hypoglycaemia, etc. Outside this workaday grouping will lie a number of other neurological states where the genesis of the special sense phenomena is obscure. Here belong the interesting examples of hallucinations associated with narcolepsy (as well as with the manifestations of sleep in normal subjects), and various of the organic psychoses, as instanced by chronic epidemic encephalitis and by dementia paralytica.

Lastly, there are the so-called "hallucinations of the sane," which will include a diversity of phenomena. The neurologist is perhaps intruding into other provinces when he evinces interest in such obscure though important matters as veridical and telepathic dreams and hallucinations, phantasms of the dying and of the dead, collective or mass hallucinosis. He will be concerned, although

perhaps remotely, with those subjective states which lie on the borderland of hallucination—such as, for example, the questions of hyperacute mental images, eidetic images, synaesthetic associations, "thought forms," "number forms"—especially as they concern those deprived of sight or hearing.

Cerebral Tumour

Hallucinations are not uncommon symptoms in patients with cerebral tumour, whether as preludes to epileptiform incidents or as isolated events. The nature of the hallucinations; their special sense quality; their size, projection in space, degree of complexity, vividness, constancy, are all aspects which merit attention in case-taking, for these are factors which may at times have localizing significance. In very broad terms it may be said that the postero-inferior third of the cerebral hemisphere seems to be of the greatest significance when tumoral hallucinations are concerned—that is to say, the regions closely associated with the end-stations of the special sense pathways. Clinically we may therefore say that hallucinations are likely to be of importance in the diagnosis of lesions of the temporal or occipital parts of the brain.

It is not necessary to enter into details with regard to such a banal subject as the nature and frequency of hallucinations in cases of tumour involving this lobe or that. One may perhaps be content to recall that the hallucinations vary in degrees of complexity or crudity, though usually constant for the individual. With occipital tumours the hallucinations are generally visual in type, coloured, but otherwise relatively simple or formal. Flashes of light, balls of fire, stars, spots, zigzags, are fairly characteristic. They are usually projected into the contralateral visual field, which more often than not is a blind one.

When the tumour is situated more anteriorly the visual hallucinations may be far more complex, and may be associated with auditory phenomena. Thus in the case of a temporo-occipital growth recorded by I. M. Allen the patient said: "I see gold stars falling in front of me . . . then I see sort of wings flapping. Also I hear a sort of 'ha-ha'-ing in the ears; and sometimes a voice, a strange voice like nothing earthly, saying, 'Why have you not told me before? Why did you not tell me long ago?' Sometimes I see an old woman with a hood coming towards me. Then I feel a strange heavy sinking sensation in the pit of the stomach. Then I lose myself."

Visual hallucinations may also occur with temporal lobe tumours, possibly—as Cushing has thought—from damage to the optic radiations. Horrax noted visual hallucinations of a more or less definite and complex nature in twelve out of seventy-two cases of temporal lobe neoplasm and of a less defined character in another five.

Auditory hallucinations may also occur with temporal tumours, and may comprise crude akasmic noises such as buzzing, roaring sounds, bells ringing, and the like. Elaborate sounds—for example, voices or music—occur rarely, and then usually in connexion with uncinate epileptic attacks. Kolodny noted an aura of "horrible noises" once only in his series of thirty-eight temporal tumours. In Cushing's clinic, auditory hallucinations occurred four times among ninety-nine temporal lobe tumours and, it is interesting to note, six times among ninety-nine frontal lobe tumours.

It would be irrelevant to discuss the complicated psychosensory phenomena which may accompany discharging lesions of the uncinate lobe, and which are familiar under the term "dreamy states." The special sense involvement

* Read in opening a discussion in the Section of Neurology and Psychiatry at the Annual Meeting of the British Medical Association, Aberdeen, 1939.