

HALLUCINATIONS.

BY EDMUND GURNEY.

SYNOPSIS OF THE ARGUMENT.

Hallucinations of the senses are first distinguished from other hallucinations, by the fact that they do not necessarily imply any false belief.

A definition of them is then given which serves to mark them off on the one hand from true perceptions, and on the other hand from remembered images or mental pictures.

The old method of distinguishing the *ideational* and the *sensory* elements in hallucinations of the senses is criticised; and it is shown that the delusive appearances are not merely *imagined*, but are actually *seen* and *heard*—the hallucination differing from an ordinary percept only in the fact of lacking an objective basis.

The controversy as to the physiological starting-point of the phenomena is briefly sketched; and it is shown that the *creation* of sensory hallucinations, which is central and the work of the brain, is quite distinct from the *excitation* or *initiation* of them, which may be *peripheral* and due to some other part of the body that sets the brain to work.

This excitation may even be due to some objective external cause, as is shown by the fact that the view of an imaginary object may sometimes be affected, in just the same way as the view of a real one would be, by a prism or a mirror. The imaginary object becomes (so to speak) attached to some *point de repère*—some visible point or mark, at or near the place where it is seen—and is thus made to follow the course of any optical illusions to which the said point or mark is subjected. But this dependence on an external stimulus does not affect the fact that the actual sensory element in the hallucination is in these, as in all other cases, created and imposed by the brain.

There are, however, a large number of hallucinations which we must suppose to be *centrally initiated*, as well as *centrally created*. Cases are considered where the hypothesis that the hallucination depends on an external stimulus, if possible, is yet very doubtful; for instance, where the imaginary object is seen in free space; or where it appears to move independently of the eye. But there are many other cases where the said hypothesis is plainly excluded; and where the excitation or initiation, if it does not take place in the brain, can only be

due to some morbid disturbance in the sense-organs themselves. A variety of instances are adduced where the assumption of such a morbid disturbance would be gratuitous or impossible; as, especially, in auditory hallucinations; in hallucinations which conform to the course of some more general delusion; in hallucinations which are voluntarily originated; and in the so-called "psychic" hallucinations, of which a new explanation is offered. A further argument for the central initiation is drawn from the fact that *repose* of the sense-organs seems a condition favourable to hallucinations.

This discussion as to the *excitation* of hallucinations is followed by a discussion as to their *creation*—the cerebral process which is involved in their having this or that particular (and often elaborate) form. Where in the brain does this process take place?—in the particular sensory centre concerned? or in some higher tract? Reasons are given for considering that *both* places of creation are available; that the simpler sorts of hallucination, which are often also recurrent, may take shape at the sensory centres themselves; but that the more elaborate and variable sorts must be traced to the higher origin; and that when the higher tracts are first concerned, the production of the hallucination is due to a downward escape of current to the sensory centre.

Finally, an argument for the higher origin is drawn from the special class of *veridical hallucinations*; the nature of which often leads us to conclude that those tracts of the percipient's brain which are the physical seat of *ideas and memories* were the first to be abnormally affected.

1. *Definition.*

Is it possible to treat hallucinations as a single class of phenomena, marked out by definite characteristics? The popular answer would no doubt be Yes—that the distinguishing characteristic is some sort of false belief. But this is an error: in many of the best known cases of hallucination—that of Nicolai for instance—the percipient has held, with respect to the figures that he saw or the voices that he heard, not a false but a true belief, to wit, that they did not correspond to any external reality. The only sort of hallucination which is necessarily characterised by false belief is the purely non-sensory sort—as where a person has a fixed idea that everyone is plotting against him, or that he is being secretly mesmerised from a distance. Of hallucinations of the *senses*, belief in their reality, though a frequent, is by no means an essential feature; a *tendency* to deceive is all that we can safely predicate of them.

If we seek for some further quality which shall be distinctive of both sensory and non-sensory hallucinations, the most hopeful sugges-

tion would seem to be that both sorts are *idiosyncratic and unshared*. However false a belief may be, we do not call it a hallucination if it has "been in the air," and has arisen in a natural way in a plurality of minds. This is just what an *idée fixe* of the kind above-mentioned never does: A may imagine that the world is plotting against him; but B, if he spontaneously evolves a similar notion, will imagine that the world is plotting not against A, but against himself. Instances, however, are not wanting where the *idée fixe* of an insane person has gradually infected an associate;* and as contact between mind and mind is, after all, the "natural way" of spreading ideas, we can make no scientific distinction between these cases and those where, *e.g.*, the leader of a sect has instilled delusive notions into a number of (technically) sane followers. But again, hallucinations of the *senses* are also occasionally shared by several persons. Most of the alleged instances of this phenomenon are, no doubt, merely cases of *collective illusion*—an agreement in the misinterpretation of sensory signs produced by a real external object; but, as the result of wide inquiries, I have encountered several instances of genuine and spontaneous *collective hallucination*. If, then, sensory and non-sensory hallucinations agree in being as a rule unshared, they agree also in presenting marked exceptions to the rule; which exceptions, in the sensory species, are of a peculiarly inexplicable kind. The conclusion does not seem favourable to our chance of obtaining a neat general definition which will embrace the two species; and, in abandoning the search for one, I can only point, with envy, to the convenient way in which French writers are enabled not to combine but to keep them apart, by appropriating to the non-sensory class the words *délire* and *conception délirante*.

Let us then try to fix the character of *hallucinations of the senses* independently. The most comprehensive view is that *all* our instinctive judgments of visual, auditory, and tactile phenomena are hallucinations, inasmuch as what is really nothing more than an affection of ourselves is instantly interpreted by us as an external object. In immediate perception, what we thus objectify is present sensation; in mental pictures, what we objectify is remembered or represented sensation. This is the view which has been worked out very ingeniously, and for psychological purposes very effectively, by M. Taine;† but it is better adapted to a general theory of sensation than to a theory of hallucinations as such. To adopt it here

* See Dr. G. H. Savage's Note on the "Contagiousness of Delusions," in the *Journal of Mental Science*, January, 1881, p. 563; and the paper on "Folie à Deux," by Dr. Marandon de Montyel, in the *Ann. Médico-Psych.*, 6th series, Vol. V., p. 28.

† *De l'Intelligence*, Vol. I., p. 408, &c.

would drive us to describe the diseased Nicolai—when he saw phantoms in the room, but had his mind specially directed to the fact that they were internally caused—as *less* hallucinated than a healthy person in the unreflective exercise of normal vision. I prefer to keep to the ordinary language which would describe Nicolai's phantoms as the real specific case of hallucination. And I should consider their distinctive characteristic to be something quite apart from the question whether or not they were actually mistaken for real figures—namely, their marked resemblance to real figures, and the consequent necessity for the exercise of memory and reflection to prevent so mistaking them. The definition of a sensory hallucination would thus be a *percept which lacks, but which can only by distinct reflection be recognised as lacking, the objective basis which it suggests*—where *objective basis* is to be taken as a short way of naming the possibility of being shared by all persons with normal senses.* It may be objected that this definition would include illusions. The objection could be obviated at the cost of a little clumsiness; but it seems sufficient to observe that illusions are merely the sprinkling of fragments of genuine hallucination on a background of true perception. And the definition seems otherwise satisfactory. For while it clearly separates hallucinations from *true perceptions*, it equally clearly separates them from the phenomena with which they have been perpetually identified—the remembered images or *mental pictures* which are not perceptions at all.† It serves, for instance, to distinguish, on the lines of common sense and common language, between the images of “day-dreams” and those of night-dreams. In both cases vivid images arise, to which no objective reality corresponds; and

* I have indeed referred above to *collective* hallucinations; but they may fairly be excluded here, not merely because they are very exceptional, but because it is a nice question for Idealism to determine how far, or in what sense, they lack an objective basis. To put an extreme case: suppose all the seeing world, save one individual, had a visual percept, the object of which nevertheless eluded all physical tests. Would the solitary individual be justified in saying that all the others were victims of a subjective delusion? And if he said so would they agree with him?

† M. Taine's definition and mode of treatment become unsatisfactory here. Regarding perceptions as in essence hallucinations, he naturally regards mental images—since they are the shadowy representatives of former perceptions—as hallucinations of an *embryonic* sort. This metaphor commits him to showing how the embryo may develop into the full product—which will happen if the mental image be then and there externalised, as is often the case in delirium. The result of this transformation is inevitably a *false* hallucination; and a special connection is thus suggested between mental images and one particular sort of percept, namely the *incorrect* sort. But in ordinary experience, mental images are of course far more closely and constantly connected with *correct* percepts, M. Taine's *true* hallucinations, whose relics and representatives they are, than with *false* hallucinations, into which not one in a million of them is ever transformed.

in neither case is any distinct process of reflection applied to the discovery of this fact. But the self-evoked waking-vision is excluded from the class of hallucinations, as above defined, by the point that its lack of objective basis can be and is recognised *without* any such process of reflection. We have not, like Nicolai, to consider and remember, before we can decide that the friends whose faces we picture are not really in the room. We *feel* that our mind is active and not merely receptive—that it is the mind's eye and not the bodily sense which is at work; without attending to this fact, we have it as part of our whole conscious state. Dreams on the other hand are, as a rule, pure cases of hallucination, forcing themselves on us whether we will or no, and with an impression of objective reality which is uncontradicted by any knowledge, reflective or instinctive, that they are the creatures of our brain.

But, though our definition may be sufficient for mere purposes of classification, it takes us but a very little way towards understanding the real nature of the phenomena. It says nothing of their origin and, though it distinguishes them from mere normal acts of imagination or memory, it leaves quite undetermined the faculty or faculties actually concerned in them. And when we pass on to these further points, we find ourselves in a most perplexed field, where doctors seem to be as much at variance as philosophers. The debate, most ardently carried on in France, has produced a multitude of views; but not one of the rival theorists seems ever to have convinced any of the others. Still progress has been made, to this extent at any rate, that it is now comparatively easy to see where the disputed points lie, and to attack them with precision.

2. *The Dual Nature of Hallucinations.*

It was, of course, evident from the first that there was a certain duality of nature in hallucinations. In popular language, the *mind* and the *sense* were both plainly involved: the hallucinated person not only *imagined* such and such a thing, but imagined that he *saw* such and such a thing. But in the early days of the controversy, the attempts at analysing the *ideational* and the *sensory* elements were of a very crude sort. The state of hallucination used to be treated as one in which ideas and memories—while remaining ideas and memories and not sensations—owing to exceptional vividness took on the character of sensations. It was not clearly realised or remembered that sensations have no existence except as *mental* facts; and that, so far as a mental fact takes on the character of a sensation, it *is* a sensation. This was clearly stated, as a matter of personal experience, by Burdach and Müller; in the French discussions, the merit of bringing out the

point with new force and emphasis belongs to Baillarger.* He showed that when the hallucinated person says "I see so and so," "I hear so and so," the words are literally true. If the person goes on to say "You ought also to see or hear it," he is of course wrong; but when he says that *he* sees or hears it, his statement is to be taken without reserve. To *him*, the experience is not something like or related to the experience of perceiving a real external object: it is *identical* with that experience. To the psychology of our day this may seem a tolerably evident truth. Still it is easy to realise the difficulty that was long felt in admitting that any experience that was dissociated from the normal functions of the sense-organs could be completely sensory in character. Popular thought fails to see that the physical question which for practical purposes is all-important—whether the object is or is not really there—is psychically irrelevant; and a man who has been staring at the sun will, as a rule, think it less accurate to say that he *sees* a luminous disc wherever he looks than to say that he *fancies* it. The best corrective to such a prejudice is Delbœuf's experiment, which it will be convenient briefly to set forth, for the sake of subsequent reference.

Two small slits are made in a shutter, and one of them is filled with a piece of red glass. The opposite wall is therefore lit by a mixture of white and red light. A stick is now placed across the red slit; its shadow is of course cast on the wall; the part of the wall occupied by the shadow, though illuminated only by *white* rays from the other slit, appears—owing to the optical law of contrast—a bright green. † Let this shadow now be looked at through a narrow tube,

* In the long and rather barren debates which took place in the Société Médico-psychologique during 1855 and 1856, Baillarger, no doubt, insisted too strongly on an absolute gulf between percepts (true or false) and the ordinary images of fancy or memory. But his opponents made a far more serious mistake in so far identifying the two as not to perceive a difference of *kind*, at the point where the sensory element in the mental fact reaches such abnormal strength as to suggest the real presence of the object. Griesinger's statement (*Ment. Path. and Ther.*, p. 89) and Wundt's (*Phys. Psych.*, Vol. II., p. 353) seem too unguarded in the same respect. As long ago as 1832, the late Dr. Symonds, of Bristol, drew exactly the right distinction between images and hallucinations. (Lecture reprinted in *Miscellanies*, p. 241).

† Wundt (*Phys. Psych.*, Vol. I., p. 463) has described some experiments, on the analogy of which it seems to me that this first result should be explained. I at any rate cannot concur with Delbœuf's explanation of it, which M. Binet adopts. According to them, it is due to two things: to the fact that the rays which pass from the shadow to the spectator's eye are really grey; and to the spectator's knowledge of the further fact that the only colour which, seen through red light, looks grey, is green. They hold then that the sensation, though of grey, excites through association an image of green. To this there seem to be three objections. (1) Not one person in 20 possesses the supposed

which prevents any part of the wall external to the shadow from being seen. Nothing red is now in the spectator's view, so that there can be no effect of contrast: the red glass may even be removed; none but white rays are passing to his eye from the shadow; yet its colour remains green. And in this case the chances are that, unless previously warned, he will tell the exact truth; he will admit, and even persist, that what he sees is green. He will scout the idea that the green is a mere memory of what he saw before he applied the tube; he will assert that it is presented to him as an immediate fact. And such is assuredly the state of the case; but it is a state which, from the moment that he has put the tube to his eye, is kept up purely as a hallucination, and without regard to the facts of the external world. The delusion is of course instantly dispelled by the removal of the tube—when he perceives that the only light in the room is white, and that the shadow is grey; but for all that he will probably never doubt again that a genuine hallucination of the senses is something more than "mere fancy."

It is impossible to be too particular on this point: for high authorities, even in the present day, are found to contest it. When a person who habitually speaks the truth, and who is not colour-blind, looks at an object and says "My sensation is green," they contradict him, and tell him that however much he *sees* green, his sensation is *grey*. Whether this be a mere misuse of language, or (as it seems to me) a misconception of facts, it at any rate renders impossible any agreement as to the theory of hallucinations. For it ignores the very point of Baillarger's contention—that images sufficiently vivid to be confounded with sensory percepts *have become* sensory percepts.

When once the truth of this contention is perceived, it is also perceived that the previous speculations had been largely directed to a wrong issue; and that the *dual* character of a false perception is after all, no other than that of a true perception. A hallucination, like an ordinary percept, is composed of present sensations, and of images which are the relics of past sensations. If I see the figure of a man, then—alike if there be a man there and if there be no man there—my

piece of knowledge. (2) Even for one who does possess it, the moments in his life during which he has had experience of the fact that green seen through red light looks grey, are surely not sufficiently striking or numerous to have established an instinctive and inseparable association between the sensation of grey, occurring in a place where red light prevails, and the idea of green. (3) Even if this inseparable association could be conceived possible, one fails to see why the result should be the transformation, in the spectator's consciousness, of the *idea* green in to (what at any rate seems to him to be) the *sensation* green; that being the very sensation which, in the supposed moments of experience, has been conspicuous by its absence. On Delbœuf's theory, the lawn seen through red glass ought not only to excite the idea of green (which it perhaps may do), but to *look* green.

experience consists of certain visual sensations, compounded with a variety of muscular and tactile images, which represent to me properties of resistance, weight, and distance; and also with more remote and complex images, which enable me to refer the object to the class *man*, and to compare this specimen of the class with others whose appearance I can recall. If Baillarger did not carry out his view of hallucinations to this length, the whole development exists by implication in the term by which he described them—*psycho-sensorial*. The particular word was, perhaps, an unfortunate one; since it suggests (as M. Binet has pointed out) that the psychical element is related to the sensorial somewhat as the soul to the body; and so, either that psychical events are independent of physical conditions, or that sensations are not psychical events. *Ideo-sensorial* would avoid this difficulty; but the obverse term which M. Binet proposes—*cerebro-sensorial*—is on the whole to be preferred. For this brings us at once to the *physical* ground where alone the next part of the inquiry can be profitably pursued—the inquiry into *origin*. From the standpoint of to-day, one readily perceives how much more definite and tangible the problems were certain to become, as soon as they were translated into physiological terms. So far as the controversy had been conducted on a purely psychological basis, it had been singularly barren. In the vague unlocalised use, “the senses” and other ever-recurring terms become sources of dread to the reader. But as soon as it is asked, where is the local seat of the abnormal occurrence? and on what particular physical conditions does it depend? lines of experiment and observation at once suggest themselves, and the phenomena fall into distinct groups.

3. *The question of Central or Peripheral Origin: the difference between Creation and Excitation.*

In its first form, the question is one between *central* and *peripheral* origin. Do hallucinations originate in the brain—in the central mechanism of perception? or in some immediate condition of the eye, or of the ear, or of other parts? or is there possibly some joint mode of origin?

For a long time the hypothesis of an exclusively central origin was much in the ascendant. But this was greatly because—as already noted—Esquirol and the older writers did not recognise the sensory element as truly and literally sensation, but regarded the whole experience as simply a very vivid idea or memory. If the central origin is to be established it must be by something better than arbitrary psychological distinctions. Hibbert and Ferriar, going to the other extreme, contended that the memory was a *retinal* one; if a man *sees* what is not there, they held, it can only be by a direct recrudescence of

past feeling in his retina. "But," urged Esquirol, "the *blind* can have hallucinations of vision; the *deaf* can have hallucinations of hearing; how can these originate in the peripheral organs?" The obvious answer, that this did not necessarily thrust the point of origin back as far as the cerebrum, does not seem to have been forthcoming; and the opposite party preferred to fall back on definite experiment. They pointed out, for instance, that visual hallucinations often vanish when the eyes are closed; or (as Brewster first observed) that they may be doubled by pressing one eyeball. But though there was enough here to suggest that the external organs *participated* in the process, there was no proof that they *originated* it, even in these particular cases; while for other cases the observations did not hold. An immense advance was made by Baillarger, who maintained the central origin by really scientific arguments. He pointed out (1) that the external organ may often be affected by local irritants — inflammation, blows, pressure, galvanism—without the production of any more pronounced form of hallucination than flashes, or hummings; that is to say, the peripheral stimulation fails to develop hallucination, even under the most favourable conditions: (2) that there is a frequent correspondence of hallucinations of different senses—a man who sees the devil also hears his voice, and smells sulphur—and that it is impossible to refer this correspondence to abnormalities of the eye, ear, and nose, occurring by accident at the same moment: (3) that hallucinations often refer to dominant ideas—a religious monomaniac will see imaginary saints and angels, not imaginary trees and houses. Hence, argued Baillarger, "the point of departure of hallucinations" is always "the intelligence"—the imagination and memory—which sets the sensory machinery in motion. He naïvely admitted that how this action of an immaterial principle on the physical apparatus takes place passes all conception; but it might be forgiven to a medical man, writing forty years ago, if he had not fully realised "brain as an organ of mind," and so did not see that what he took for a special puzzle in the theory of hallucinations, is simply the fundamental puzzle involved in every mental act. Passing him this, we may say that his treatment of the question entitles him to the credit of the *second* great discovery about hallucinations. He had already made clear their genuinely sensory quality; he now made equally clear the fact that the mind (or its physical correlate) is their creator—that they are brain-products projected from within outwards.

This is a most important truth; but it is very far from being the whole truth. Baillarger saw no *via media* between the theory which he rejected—that the nerves of sense convey to the brain impressions which are there perceived as the phantasmal object—and the theory which he propounded, that "the intelligence" (*i.e.*, for us, the brain, as

the seat of memories and images) of its own accord, and without any impulse from the periphery, excites the sensory apparatus. It seems never to have struck him that there may be cases where the sense-organ supplies the *excitant*, though the brain is the *creator*—that irritation passing from without inwards may be a means of setting in motion the creative activity. He took into account certain states of the organ—*e.g.*, fatigue produced by previous exercise—as increasing the susceptibility to excitation from “the intelligence,” and so as conditions favourable to hallucination; but he got no further.

The facts of hallucination absolutely refuse to lend themselves to this indiscriminate treatment. Following the path of experiment, we are almost immediately confronted with *two* classes of phenomena, and *two* modes of excitation. We need not go, indeed, beyond the elementary instances already mentioned. Delbœuf’s experiment, where green was seen by an eye on which only white rays were falling, fairly illustrates Baillarger’s doctrine—the green being produced not by an outer affection of the eye, but by an inner affection of the brain. But in the case of a person who has been staring at the sun, the “after image” or hallucination can be clearly traced to a continuing local effect in that small area of the retina which has just been abnormally excited; and it will continue to present itself wherever the eye may turn, until rest has restored this area to its normal condition. A still simpler form of change in the external organ is a blow on the eye; and the resulting “sparks” are genuine though embryonic hallucinations.

Such cases as these last are, however, hardly typical; for in them the brain is not truly creative; it merely gives the inevitable response to the stimuli that reach it from below. They are moreover *normal* experiences, in the sense that they would occur similarly to all persons with normal eyes. Let us then take another instance, where the mind’s creative rôle is fully apparent, while at the same time the primary excitation is clearly not central. Certain hallucinations—as is well known—are *unilateral*, *i.e.*, are perceived when (say) the right eye or ear is acting, but cease when that action is obstructed, though the left eye or ear is still free. Now this in itself could not be taken, as some take it,* for a proof that the exciting cause was not central; it might be a lesion affecting one side of the brain. But very commonly, in these cases, a distinct lesion is found in the particular eye or ear on whose activity the hallucination depends; † and it is then natural to conclude that the hallucination was the result of the lesion, and that the one-

*Dr. Régis in *L’Encéphale*, 1881, p. 51; Prof. Ball in *L’Encéphale*, 882, p. 5.

†Dr. Régis in *L’Encéphale*, 1881, p. 46; M. Voisin in the *Bulletin de Thérapeutique*. Vol. XXXIX.; Dr. Despine, *Psychologie Naturelle*, Vol. II., p. 29; Krafft-Ebing, *Die Sinnesdelirien*, p. 25.

sidedness of the one depended on the one-sidedness of the other. The justice of the conclusion has been proved in many cases by the fact that the hallucination has ceased when the local lesion has been cured. Other cases which strongly suggest a morbid condition of the external organ are those where the imaginary figure moves in accordance with the movements of the eye. The visual hallucinations of the blind, and the auditory hallucinations of the deaf, would also naturally be referred to the same class—the seat of excitation being then, not necessarily the external organ itself, but some point on the nervous path from the organ to the brain. In the case, for instance, of a partly-atrophied nerve, the morbid excitation would be at the most external point where vital function continued.* It should be noted, in passing, that a distinct lesion, *e.g.*, atrophy of the globe of *one* eye, may give rise to *bilateral* hallucinations (*Vienna Asylum Report*, 1858), or to *unilateral* hallucinations of the *sound* eye—the latter being no doubt affected directly by the brain.

4. *External Excitation of Hallucinations.*

But we may now proceed a step further. The excitation may be external not only in the sense of coming from the external organ, but in the sense of coming from the external world. It may be due not to any abnormality of the eye or the nerve, but to the ordinary stimulus of light-rays from real objects. M. Binet is the first who has given the complete evidence for this fact, accompanied by a scientific explanation of it;† and in so doing, he has made a contribution to the learning of the subject second in importance only to that of Baillarger.

M. Binet's experiments were conducted on five hypnotised girls at the Salpêtrière, who could be made to see anything that was suggested to them; and also on an insane woman at St. Anne, who had a standing visual hallucination of her own. The experiments may be divided into two sets—those conducted with, and those conducted without, special optical apparatus. The results of both sets confirmed the rule first enunciated by M. Féré—that “the imaginary object is perceived

* Delusions due to visceral disturbances are often quoted as cases of hallucination excited from parts below the brain. Thus a woman dying of peritonitis declares that an ecclesiastical conclave is being held inside her (Esquirol, *Maladies Mentales*, Vol. I., p. 211). But here there is a prior and independent basis of distinct sensation; so that the experience would at most be an illusion. And it is hardly even that; for one cannot say that the false object is sensorially presented at all; no one knows what a conclave in such a locality would actually feel like; the conclave is merely a *délire*—an imagination suggested by sensation, but which does not itself take a sensory form.

† In the *Revue Philosophique*, April and May, 1884.

under the same conditions as a real one"; but to this M. Binet adds the further conclusion, that a sensation derived from a *real* external source occupying the same position in space as the imaginary object seemed to occupy, was an indispensable factor of the hallucination. The results obtained without special apparatus do not appear to me at all to justify this conclusion. They were (1) suppression of the imaginary object by closure of the eyes; (2) suppression of the imaginary object by the interposition of an opaque screen between the eye and the place where the object seemed to be; (3) doubling of the imaginary object by lateral pressure of one eyeball. M. Binet argues that the suppression in the first two cases, and the doubling in the third, depended on the suppression and the doubling of a real sensation, physically induced by rays from the direction in which the object was seen. But the fact that external objects are hidden from view by the interposition of our own eyelids or any other opaque obstacle, has become to us a piece of absolutely instinctive knowledge; and we should surely expect that an object which was but the spontaneous projection of a morbid brain, might still be suppressed by movements and sensations which had for a lifetime been intimately associated with the suppression of objects. And as regards the doubling by pressure of the eyeball, it can be perfectly explained on Baillarger's principles—by supposing that an excitation which has been centrally initiated spreads outwards to the peripheral expansion of the optic nerve.

When, however, we turn to the other group of experiments, the case is very different. The instruments used were a prism, a spy-glass, and a mirror. It would occupy too much space to describe the results in detail. It is enough to say that the prism applied to one eye doubled the imaginary object;* that the spy-glass removed or approximated it according as the object-glass or eye-piece was applied to the patient's eye; that the mirror reflected the object and gave a symmetrical image of it; and that the optical effect, as regards angles of deviation and reflexion and all the details of the illusion, was in every case precisely what it would have been had the object been real instead of imaginary. Here then we are fairly driven outside the patient's own organism; it seems impossible to deny that some point of external space at or near the seat of the imagined object plays a real part in the phenomenon.† To this point M. Binet gives the name of

* The observation was first made by M. Féré; see *Le Progrès Medical*, 1881, p. 1040.

† One reservation must be made. It is just conceivable that the changes wrought on the imaginary percept were *due*, not to the optical instruments but to *thought-transference*. For M. Binet and his assistants of course knew themselves, in each case, the particular optical effect to be expected. An experimenter who has not expressly recognised the reality or the possibility of thought-

point de repère; and he regards it as producing a nucleus of sensation to which the hallucination accretes itself. When the *point de repère* is in such a position as to be reflected by the mirror, then the imaginary object is reflected, and not otherwise; the object is, so to speak, attached to its *point de repère*, and will follow the course of any optical illusions to which its sensory nucleus is subjected. According to this view, the only truly sensory part of the phenomenon is supplied by the *point de repère*; all the rest is a "hypertrophied image" imposed on it by the mind.

These conclusions are entirely foreign to any former theory of hallucination. None of the contending parties, not even the early champions of a purely peripheral origin, had ever dreamt of excitants outside the eye itself. Oddly enough, M. Binet seems hardly aware of his own originality. He remarks that the general view now is that hallucinations are always the product of real sensation; and he divides them into two classes,—those where the sensation is initiated in the sensory organ by an external object ("*hallucinations à cause objective*"); and those where it is initiated by a morbid local irritation of the sensory organ itself ("*hallucinations à cause subjective*"). As practically the inventor of the former class, M. Binet is really the first person who has had a right to this "general view." But his modesty connects itself with a serious historical error. For he still retains Baillarger's term—*psycho-sensorial*—and actually refers to Baillarger as having meant the same by that term as he himself does. With Baillarger—as we have seen—the "sensorial" element was imposed or evoked by "the intelligence," not supplied to it; and was not an unnoticed peg for the hallucination, but its very fulness and substance. Baillarger explicitly lays down, as one of the prime conditions for hallucination, a "suspension of external impressions"; and gives as the definition of a psycho-sensorial hallucination "a sensory perception independent of all external excitation of the sense organs," including excitation morbidly initiated in the organs themselves.* The opposition is really complete. Of all the optical illusions described by M. Binet, the only one which Baillarger's doctrine would explain is the doubling of the

transference would never think of so arranging his experiment that he himself should not know, till after the result, which instrument was in use or what was its position; nor indeed is it easy to imagine how such a condition could in practice be carried out. The point seems worth suggesting, as it would be most interesting if a state of hallucination turned out to be one in which the "subject" is specially susceptible to "transferred impressions."

* Baillarger, *Des Hallucinations*, pp. 426, 469, and 470. A similar misreading of Baillarger, contained in a single sentence, is the one point from which I dissent in the extremely clear and concise chapter on the subject in Mr. Sully's *Illusions*.

object by pressure on the side of the eyeball; for this alone could be accounted for by supposing the retina to be excited from the brain. The novelty of M. Binet's own results is that they force us to regard the external impression as not only present but indispensable, at any rate at the moment when the optical instruments produce their characteristic effects.

But while admiring the manner in which M. Binet has marshalled his facts, and recognising that they have led him to a most interesting discovery, I cannot accept his conclusions beyond a certain point. He applies conceptions drawn from his special department of observation to the whole field, and considers that hallucinations are exhausted by the two classes just defined—*i.e.*, that there is no such thing as central initiation. Now even for the cases "*à cause objective*," to which the novel experimental results belong, it is important to observe that though the excitation comes from outside, the *hallucination*—the object as actually perceived—is still (as Baillarger taught) a pure product of the mind. Everything about it, including its false air of reality, is brain-created; and the occasioning or evoking cause has no place in it. But if this be so—and M. Binet himself has practically admitted it—we cannot consent to call the external excitation of the organ *sensation*. M. Binet so treats it throughout—as a sensation atrophied, indeed, and clothed upon with hypertrophical and delusive images; but still as sensation—as a psychical element in the result. Now in considering Delboeuf's experiment above, we objected to the notion that the spectator had a *sensation* of grey which he clothed with an *image* of green. The physical rays that met his eye were such as normally produce the sensation of grey; that is the only way in which the word *grey* can be brought into the account; psychically, no colour but green was present. Just the same objection applies to saying of the hypnotic "subject" that he is receiving from part of the table-cloth a "sensation" of white, which he clothes with an image of a brown butterfly; or of the patient in *delirium tremens*, that he is receiving from the wall-paper "sensations" of drab which he clothes with images of black mice. In neither case is there a "perturbation of sensorial functions" in M. Binet's sense. The sensorial elements, the brown and the black, spring from a new activity within; they are not the outcome of functions exercised on the table-cloth or the wall-paper—not a perverted transcript of white and drab.

Holding fast to this view, we can still perfectly well explain M. Binet's results, even in the hypnotic cases on which he chiefly relies. If the *point de repère* is not at, but close to the spot where the imaginary object appears (as seems to have been the case in some of the experiments), there is no difficulty. The *point de repère* is then itself part of what is all along perceived;

and in any effects produced on it by optical apparatus, it will carry the neighbouring object with it by *association*. If, however, the actual area covered by the object is sufficiently distinguished from its surroundings to act itself as *point de repère*, and no other possible *points de repère* exist in the field of vision,* the case is different, but can still be explained. It will not be disputed that a slightly longer time is necessary for the formation of the image of a suggested object and the conversion of this image into a percept, than for the experience of sensation from an object actually before the eyes. When therefore the operator points to a particular place on the white table-cloth, and says "There is a brown butterfly," we may suppose that in the patient's consciousness a real sensation of white precedes by an instant the imposed sensation of brown. So when the cardboard on which a non-existent portrait has just been seen is again brought before the patient's eyes, it is almost certain that the recognition of it as the same piece of white cardboard (known by its *points de repère*) precedes by an instant the hallucinatory process and the re-imposition of the portrait. That there is this instant of true sensation seems to be shown, indeed, by one of M. Binet's own experiments. The patient having been made to see an imaginary portrait on a blank piece of cardboard, this was suddenly covered by a sheet of paper. The patient said that the portrait *disappeared for a moment*, but then reappeared on the paper with complete distinctness. We may thus fairly conclude that an area which was actually seen before the hallucination was induced in the first instance, will also be actually seen for a moment when vision is redirected to it (or its reflexion), after the prism or spy-glass has been brought into play. During that moment, it will of course be seen under the new illusive optical conditions; and *association* may again cause the object which supplants it to follow suit. There can be no objection, however, to supposing that the supplanted area continues further to *provoke* the hallucination, in the same sense that the white rays provoked the green percept in Delbœuf's experiment. The rays which are lost to sensation continue to excite the sensorium physically; and what M. Binet says of the sensation only needs to be transferred to the *physical excitation*—which will have definite peculiarities, corresponding to the distinguishing marks of the area whence it comes. Double this excitation by a prism, or reflect it from another quarter, and the percept which it

* I cannot quite make out whether these conditions were ever exactly realised. In the case where an imaginary portrait had been evoked on a piece of cardboard, and this piece was subsequently picked out by the patient from among a number of similar ones, I gather that there was some recognisable mark external to the area of the portrait. It is said that lateral pressure doubled the image, even when the eyes were "fixed on the uniform surface of the wall." But this particular optical effect, as we have already noticed, does not imply the presence of *points de repère* at all.

provokes may naturally be doubled or seen in the new direction. So, if both eyes were employed in Delbœuf's experiment, might the green percept be artificially doubled.

I am aware that this substitution of the physical for the psychical term may appear very unimportant and even pedantic ; but in truth it is not so. For it is really his psychical expression of the external stimulus in these cases that has led M. Binet to regard hallucinations as simply a monstrous form of *illusion*, and to enunciate a general formula for them which—for all its attractive and original air—seems radically unsound. He considers them *the pathological—as opposed to the normal—form of external perception*. As in normal perception, we have a visual sensation which we associate with *true* images, so, he holds, in hallucinations we have a visual sensation which we associate with *false* images. The looseness of this analogy is surely obvious, and the apparent symmetry of the two cases quite unreal. In normal vision, the true images which (according to M. Binet's own account) we primarily associate with the visual sensation, are not *visual*, but *muscular* and *tactile* images, whereby we attach the ideas of weight, solidity, and distance to what we see. The process through which we get the perception of a real external object is thus primarily an association between psychical elements belonging to *different senses*—a visual sensation, which the brain receives, and non-visual images, which the brain supplies ; and if we convert the non-visual images into sensations by touching or pressing the object, we get a verification of its external reality. Now, if M. Binet's formula is to hold, and hallucinations are the pathological form of external perception, we ought to find that they are produced when for the *true* images of normal perception we substitute *false* images. Is this the case ? Suppose a hypnotic patient to be impressed with the idea that a piece of white paper is a red rose : would it be a right account of his hallucination to say that he receives a visual sensation, and then associates with it false muscular and tactile images ? Certainly not : what he does is to *see wrong* to begin with, to see false *form* and false *colour*—things quite distinct in character from ideas of weight, solidity and distance, and which might exist in the absence of any such ideas. It is true that when he has this visual experience, habit leads him to go on and connect it with false images of weight, solidity and distance ; but that is a secondary result. Hallucination does not depend on the falsity of those images ; and, indeed, the test of touching and pressing would often fail to demonstrate their falsity, owing to the frequent sympathy of several senses in hallucination. The essential fact is immediate, and consists simply in having a *visual experience which others cannot share*—in seeing what is invisible to a normal eye. This becomes clearer still, if we make the imaginary object correspond to a real object in everything

except colour. Let the patient be led to believe that a green stick of sealing-wax is a red stick ; then, whatever tests be adopted, he will share with normal persons every sensation except the visual ; but none the less will the process of hallucination be complete. This process, then, is no way parallel to that of normal perception. It is not, as that was, an association between psychical elements belonging to different senses ; and its sensory part, the essence of which is *redness*, is not—as in the normal perception of a red object—*received* by the brain, but is *imposed* by it. By what right can processes so different be represented as co-ordinate—as the healthy and the morbid exercise of the same function ?

5. Cases where External Excitation is Doubtful.

So far I have considered M. Binet's theory only in relation to his own cases—where it was easy to concede the *fact* of excitation from without, whatever be our view of its share in the phenomena. It remains to consider the numerous cases—the large majority of the whole body of hallucinations—where this excitation is itself doubtful, or more than doubtful. Let us take the doubtful cases first.

In the optical experiments it was, of course, convenient that the hallucination should be projected on a flat opaque surface ; and on such a surface the objective *points de repère* may be easily found. But it is quite as easy to make the patient see objects in free space—say, out in the middle of the room ; and such is the common form of spontaneous hallucinations, both of sane and insane persons, where human figures are seen. The eyes are then focussed, not on the real objects from which *points de repère* would have to be supplied, but on the figure itself ; which may be much nearer than the wall behind it, and may thus require a very different adjustment of the eyes. And here lies a difficulty for the hypothesis that the hallucination depends on some definite external excitation of the retina. For the real objects which are the supposed excitants, though in the line of sight, are not within the range of clear vision for eyes adjusted to the imaginary object. Can the *points de repère* be supposed to excite a percept whose position is such that, for it to be clearly visible, they themselves must cease to be so ? It is a good deal to require of them. Still, M. Binet's experiment with the insane patient is a very striking one. This woman, Celestine by name, had an imaginary attendant called Guiteau. Guiteau lent himself to scientific tests, and was doubled by a prism and reflected by a mirror in the most orthodox fashion. This undoubtedly implied *points de repère*—probably situated near, and not on, the area which Guiteau concealed. One would like, however, to know exactly how his figure was situated in relation to its background. The distance

between the two may have been inconsiderable; and in that case the fact of the doubling and the reflection would not prove the *points de repère* to have been an essential condition of the hallucination. For, when the patient is made to look attentively at the figure, as a preliminary to the optical tests, the very fixity of the gaze may then and there establish the *points de repère* which will enable those tests to succeed. It would be interesting to know whether Guiteau would be reflected when he was not being specially stared at, supposing that there was a mirror in an appropriate position.*

The supposed necessity of the external excitation might be otherwise tested thus. Suppose Celestine to be placed in a white spherical chamber, lit from a point directly above her head. Here there would be no *points de repère*—no special points of external excitation with which an imaginary object could be connected. The only excitant to the eye would be perfectly uniform white light; and this excitant would

* In the case of the hypnotic "subjects," a certain peculiarity in the fixed regard, such as might establish *points de repère*, is strongly suggested by the following fact. In some cases, after a screen had been interposed between the patient's eyes and the imaginary object, she continued to see not only that object (say, a mouse), but a *real object* (say, a hat) on which it had been placed. Thus the hat assumed the property—shared by the imaginary mouse, but unshared by any other real objects—of remaining as a percept in spite of an opaque barrier.

As regards reflexion, the following case from the Society's collection is of interest; it is from Mr. Adrian Stokes, M.R.C.S., of Sidmouth:—

"When I was living in Bedford Street North, Liverpool, in the year 1857 (I think), my wife roused me from sleep suddenly and said, 'Oh! Adrian, there's Agnes!' I started up, crying, 'Where? Where?' but, of course, there was no Agnes. My wife then told me that she had awoke, and had seen the form of her only sister, Agnes, sitting on the ottoman at the foot of the bed. On seeing this form she felt frightened; but then, recalling her courage, she thought if the figure were real she would be able to see it reflected in the mirror of the wardrobe, which she had in full view as she lay in bed. Directing her eyes, therefore, to the mirror, there she saw, by the light of the fire that was burning brightly in the grate, the full reflection of the form seated on the ottoman, looking at a bunch of keys which she appeared to hold in her hand. Under the startling effect caused by this sight, she called me to look at it, but, before I was awake, the form and its reflexion had vanished. It was not a dream, my wife is certain.

P.S.—When my wife saw her sister sitting at the foot of our bed looking at the bunch of keys, she (the sister) was clad in the ordinary indoor dress of the time. I remember the start of surprise with which I awoke and exclaimed: My wife has never, that I know of, experienced any hallucination or delirium; and is a woman of excellent sense and judgment. She never saw any other vision but that one."

Here, however, the expectant imagination of the percipient may have been adequate to conjure up the reflected figure, and the case does not therefore support M. Binet's theory.

remain identical, in whatever direction the eye turned. Consequently, if the external excitation be a necessary factor in the production of Guiteau, he ought, if seen at all, to be seen wherever Celestine looked ; there would be nothing to attach him to any particular spot. It is rash to prophesy ; but I strongly suspect that he would prove more amenable, and that Celestine would retain her power of turning her back on him. Such, in my view, would be the natural result : a figure spontaneously projected by the brain would be located as an independent object, and looked at or not at pleasure. It would be interesting to know, further, if Guiteau is ever seen in the dark. But it should be observed that light may favour and darkness hinder the projection of a phantasm, owing to the different effect of the one and the other on the *general physiological state*. The presence of light might thus be a necessity, quite apart from any distinguishable *points de repère*. In the same way the presence of light is occasionally found to be a condition of *auditory hallucinations*,* which even M. Binet would find it hard to compound out of a "sensation" of light and an "image" of sound.

But the difficulty of regarding external points of excitation as a necessary condition becomes even greater when the hallucination is a *moving* one. As to these cases, M. Binet can only say that the *point de repère* keeps changing ; that is, as the imaginary figure passes along the side of the room, in front of a multitude of different objects—pictures, paper, furniture, &c.—the very various excitations from these several objects act in turn as the basis of the same delusive image. We may surely hesitate to accept such an assertion, till some sort of proof of it is offered ; and it is hard to conceive of what nature the proof could be. The case of course differs altogether from that where the imaginary figure follows the movements of the eye, owing to some morbid affection of that organ which acts as a real moving substratum for it. Instead of the figure's following the eye, the eye is now following the figure in its seemingly independent course. What is there to produce or to guide the selection of ever-new *points de repère* ? To what external cause can M. Binet ascribe the perpetual substitution of one of them for another ? On my view—that the figure may be centrally initiated, no less than centrally created—none of these difficulties occur. Such a figure may

* Ball, *Leçons sur les Maladies Mentales*, p. 116. See also the very interesting case given by Professor F. Jolly in the *Archiv für Psychiatric*, Vol. VI., p. 495. His paper is on the production of auditory hallucinations by the application of an electric current in the neighbourhood of the ear. In one case, he shows good reason for attributing the hallucination, not to a stimulation of the auditory nerve, but to a transference to the auditory centre of the stimulus given to fibres of the *fifth* nerve. For the subjective sounds did not, as in all the other cases, correspond in a regular way to the opening and closing of the current, but appeared under all conditions in which *pain* was produced.

just as well appear in the empty centre of the room as on a piece of cardboard, and may just as well move as stand still. The same sort of argument applies to the case where the percipient is haunted by a figure which, however, can be seen only in one direction.* Thus Baillarger describes a doctor who could not turn without finding a little black cow at his side. The mind may locate its puppet according to its own vagaries; and this experience is very like a sensory embodiment of the well-known delusion that somebody is always behind one.

6. Cases where External Excitation is Absent.

So much, then, for M. Binet's hallucinations "*à cause objective.*" We turn now to the vast body of cases where excitation from the outer world is plainly absent. This class includes phantasms seen in the dark, and probably the vast majority of auditory hallucinations, which have so far been disregarded. To bring these under M. Binet's theory, it has to be assumed that in every case they are initiated by some morbid or abnormal condition of the eye or the ear. The assumption is, to say the least, a very violent one. We have duly noted the cases where hallucinations have been undoubtedly due to injury of the external organ; but this does not establish, or even strongly suggest, the existence of a similar condition in cases where it defies detection.† As a rule, where the

* Ball, *Leçons sur les Maladies Mentales*, p. 73; Baillarger, *Des Hallucinations*, p. 312. Another type of the moving hallucination is presented by Bayle's case (*Revue Médicale*, 1825, Vol. I. p. 34), where a spider used first to appear life-size, and then gradually to expand till it filled the whole room.

† The sweeping method seems as much in favour now as at the earlier stages of the controversy. As M. Binet has stated his case in a masterly way, I need not encumber the course of the argument by perpetual references to cognate statements. But there is one mode of presenting the rival views which seems so established in the recent French literature that it will be well to reproduce it here in a succinct form. Writers of authority (Prof. Ball in *L'Encéphale*, 1882, p. 6, and in *Maladies Mentales*, p. 111, &c., and Dr. Régis in his classical paper on unilateral hallucinations in *L'Encéphale*, 1881, p. 44), seem never to have conceived the theory of a purely central origin in any other light than as the "projection of an idea outwards"—a doctrine which they regard as now abandoned, and which they refer to only in its most antiquated shape. They start by treating the "mixed" or "psycho-sensorial" theory as if its point and purpose had been to assert that the *body* counts for something in hallucinations—in opposition to the former crudely "psychical" theory, which made "the imagination" act independently of any bodily affection. They then point to cases where hallucinations have plainly been due to a lesion or morbid irritation of the sensory apparatus; and they adopt this morbid condition as the bodily element or physical basis of the phenomenon—that which gives it its *mixed* character and makes it *psycho-sensorial* instead of psychical. Thence they assert, as an indispensable condition of every hallucination, that the imagination must be set to work by some "abnormal sensation" derived from some point of

abnormal condition has been made out, hallucinations have not been its only result. The ulceration of the cornea which initiates visual hallucinations has begun by affecting the vision of real objects. Illusions, or false perceptions of colour, often precede the appearance of more distinct phantasms.* So, in cases of more transient abnormality—such as the well-known *illusions hypnagogiques*—other signs precede the hallucination. The observer, whose eyes are heavy with sleep, begins by seeing luminous points and streaks, which shift and change in remarkable ways; and it is from these as nuclei that the subsequent pictures develop. Similarly one of the seers of "Faces in the Dark" (*St. James's Gazette*, February 10th, 15th, and 20th, 1882) described the frequent vision of a shower of golden spangles, which changed into a flock of sheep. Now, since our physiological knowledge leaves no doubt that the points, streaks and spangles are due to the condition of the retina, it is reasonable in such cases to regard this condition as initiating the hallucination. But it is not equally reasonable to conclude that the process must be the same for cases where the points, streaks and spangles are absent. I do not forget that even a normal eye is subject to affections which escape attention, until a special effort is made to realise them. But wherever the hallucination can be gradually traced in its development from more rudimentary sensations, these last are very distinct and exceptional things, unknown in the experience of most of us, and the vision itself is commonly of a changing kind—the features developing rapidly out of one another; often also of a swarming kind—detailed landscapes, elaborate kaleidoscopic patterns,

actual lesion. This is both confused and confusing. Hallucinations, as we have seen, are psycho-sensorial in virtue of their *nature*, not of their *origin*—because they present distinct sensory qualities—are things actually *seen* and actually *heard*—not because this or that starting-point can be assigned them. As for their physical basis, that can be nothing else than a concurrent state of morbid activity at certain cerebral centres. In some cases this activity is no doubt due to lesion at some point along the sensory track; in others, as I here contend, it may originate at the centres themselves and may be independent of any excitation previous to or other than itself. Whether right or wrong, this contention will certainly not be refuted by confounding it with the antiquated "psychical" view, which took no count either of a physical basis or of sensory qualities. As for the "projection of an idea outwards," that of course is an expression of the immediate *fact* of hallucination, apart from the question of the *excitant*. Why should it be abandoned? Is it not at any rate as well suited to its purpose as the only piece of information that Prof. Ball offers us in its stead—namely, that hallucinations are the creation of a brain predisposed to create them?

The advocacy of the "cerebral origin" must, of course, not be taken to imply that the condition of the brain is isolated from that of the rest of the body. The abnormal excitability of the brain may be intimately connected with morbid conditions elsewhere: all that is contended is that no immediate sensory stimulant is needed as a definite basis or peg for hallucinations.

* Dr. Max Simon in the *Lyon Medical*, Vol. XXXV., p. 439.

showers of flowers, lines of writing on a luminous ground, and so on.* Now, compare such experiences with ordinary cases of "ghost-seeing" in the dark. A man wakes in the night, and sees a luminous figure at the foot of his bed. Here the hallucination comes suddenly, single and complete, to a person whose eyes are open and unfatigued; it is not preceded by any peculiar affection of vision, is not developed out of anything, and does not move, or swarm, or develop fresh features; nor does it fulfil M. Binet's test of hallucinations due to the state of the external organ, by moving as the eye moves.† Such visions are commonly explained—and often, no doubt, with justice—as due to nervousness or expectancy. But nervousness and expectancy surely act by exciting the mind, not by congesting the retina; they work on the imagination, and their physical seat is not in the eye, but in the brain. Why, then, should not the brain initiate the hallucination? Why may not "visions of the dark," which vary so greatly both in themselves and in the general conditions of their appearance, vary also in their seat of origin?

The auditory cases are even plainer. For it is only exceptionally that the waking ear, like the waking eye, is subjected to marked and continuous stimulation from without, such as might serve, on M. Binet's view, as a basis for a prolonged hallucination. It is not even subject to border-land experiences analogous to the *illusions hypnagogiques*. The only alternative, therefore, to supposing the phenomena to be centrally initiated, is to suppose some abnormality in the external organ itself. Such an abnormality has often been detected; and even where not absolutely detected, it may sometimes be inferred from other symptoms. Thus, an enlarged carotid canal, or a stoppage which produces an unwonted pressure on the vessels, will first make itself felt by hummings and buzzings; hallucination then sets in, and imaginary voices are heard, and these then we should naturally trace to the local irritation that produced the former sounds. But why are we to treat in the same way cases where there are no hummings and buzzings, and no

* Galton, *Inquiries into Human Faculty*, pp. 159-163; Maury, *Le Sommeil et les Rêves*, p. 331.

† M. Binet treats all "ghost-seers" as so paralysed with terror that they do not move their eyes from the figure—which leaves it open to him to guess that the figure would move if their eyes moved. Having made a large collection of cases of hallucinations of the sane, I am in a position to deny this. To Wundt, also, stationary hallucinations that can be looked away from seem unknown as a distinct and fairly common type, and he inclines to regard them as mere illusions. Brewster's case of Mrs. A., and the well-known cases given by Paterson (*Edinburgh Medical and Surgical Journal*, January, 1843) would alone suffice, I think, to refute this view. See also Kandinsky's and Schröder van der Kolk's own experiences. (*Archiv für Psychiatrie*, 1881, p. 461, and *Pathology and Therap. of Mental Diseases*, p. 14.)

grounds for supposing that there is stoppage or lesion of any sort? Among a numerous, though much neglected, class of phenomena—the casual hallucinations of the sane—the commonest form by very far is for persons to hear their name called when no one is by. The experience is often remarkably distinct, causing the hearer to start and turn round. It is not at all connected with conditions that produce blood-pressure, such as lying with one ear closely pressed on the pillow; it comes in a sudden and detached way, and apparently at quite accidental moments. Again, among the insane a well-known form of hallucination occurs in the form of dialogue; the patient returns answers to the voices that haunt him, and is answered in turn. Are we to suppose here an *intermittent* abnormality of the ear, which always sets in by chance at the very moment when the imaginary speaker's replies fall due? It may be added that even where a distinct morbid cause can be traced, it is as often as not a *central* cause. After a long course of alcohol, a man begins to hear voices; but alcohol, while admittedly affecting brain-tissue, has no recognised tendency to affect the ear.

A further argument for the central initiation of many hallucinations of the more distinctly morbid sort may be drawn from the *course* which the morbid process takes. The first stage is often not a sensory hallucination at all; it is a mere delusion; the patient thinks that plots are being concocted against him. After a time his secret enemies begin to reveal themselves, and he hears their abusive and threatening language. We surely cannot ascribe the sensory experience here to a lesion of the ear which happens to occur independently, but regularly, at this particular stage; it follows, on the other hand, in the most natural way, if we regard it as imposed from within, as soon as the disease has gone far enough for the mind to clothe its imaginary fears in a more vivid form. Specially conclusive in this respect are the cases where voices begin to address the patient in the most internal way, without sound, and only after a time talk in a distinctly audible character.* But the most interesting of all the cases in point are those where one type of hallucination assails one side of the body and another the other. † They confirm what was said above—that the mere fact of a hallucination being *unilateral*, or peculiar to one side of the body, though suggesting a defect in the external organ, is by no means a proof of it. ‡ The double sensory experience follows with exactness the course of the delusions. The patient first suffers from melancholy and discouragement; this develops into a belief that he is surrounded

* Griesinger's *Ment. Path. and Ther.*, p. 89. The bearing of this fact on the theory of central origin has been noted by Mr. Sully, *Illusions*, p. 119.

† See Dr. Magnan's account in the *Archives de Neurologie*, Vol. VI., p. 336.

‡ Cf. Dr. A. Robertson in the *Report of the International Medical Congress*, 1881, Vol. III., pp. 632-3.

by enemies ; and he then hears insulting voices on the right side. To this unhappy stage succeeds in due course one of exaltation and self-esteem ; the patient believes himself to be the Son of God. And now encouraging and eulogistic voices present themselves, on the left side. "The good and the evil genii form a sort of Manicheism which governs him." Here the imagination, as its operations became more complex, and established an opposition of character between its creatures, took advantage (so to speak) of the fact that the body has two opposite sides ; it located friends and foes just as they might be located in a picture or play which represented an impending contest. It cannot surely be maintained that by accident the right ear began to be locally affected, just at the time when the development of the plot necessitated the entrance of the friendly power upon the scene. Another case involves the sense of touch. A man, after praying for a year that his actions might be divinely guided, heard a voice say, "I will save thy soul" ; and from that time forward he felt his left or his right ear touched by an invisible attendant, according as he was doing right or wrong.* Did the auditory hallucination coincide by chance with the commencement of local irritation in the *pinna* ? Dr. Magnan adds three examples of alcoholism, where abuse and threats were heard on one side, praise and consolation on the other. In these cases there were crises of fury, in which hallucinations of all the senses took place, involving both sides alike, and masking the more ordinary condition. On the decline of these crises, the opposed auditory hallucinations recommenced. It seems impossible to resist Dr. Magnan's view, that the poison, distributed through the whole brain, provokes at times a general crisis ; but that when this subsides, it localises its action at the weakest spot. Should this happen to be the auditory centre on one side, a single unilateral hallucination would be the result ; but if both centres remain affected, the projection may assume the complex two-sided form.

But the strongest cases of all in favour of a purely central initiation yet remain—the cases of hallucination *voluntarily originated*. Wigan's instance has often been quoted, of the painter who, after carefully studying a sitter's appearance, could project it visibly into space, and paint the portrait not from the original but from the phantasm. He ended by confounding the phantasmal figures with real ones, and became insane. Baillarger reports another painter, Martin, as having similarly projected pictures, which so interested him that he requested anyone who took up a position in front of them to move.† A still more

* Bodin, *Démonomanie des Sorciers* (Edition of 1850, Paris), p. 10.

† One of the seers of "Faces in the Dark" reported that he could produce the vision of the spangles and sheep at will. His case differs, however, from those given in the text. For, in the first place, his vision was one of old standing ; and, in the second place, his retina must have been pretty constantly in the abnormal

interesting case, recently reported by Dr. V. Parant, is that of an asylum patient who, when thwarted or annoyed, would go to special spots to consult imaginary advisers; the replies she received—it need hardly be said—always corresponded with her own desires and prejudices. Another insane woman used to play “odd and even” with an imaginary prefect of police, whose guesses were always wrong.* M. Binet will surely not maintain that in these cases the person first establishes, by an effort of will, some sort of peripheral excitation, and that this then reacts by provoking the hallucination. Such a circuitous route might with equal reason be imagined for any simple act of representation or memory.†

The only other group of phenomena that we need notice is one that all writers since Baillarger seem to have agreed to treat as a quite unique type. It is a class of which frequent examples have been observed among religious mystics and persons who believe themselves to be in direct communication with spiritual guides. Such persons describe a voice which is yet soundless, which utters the “language of the soul” inside them, and which they hear by means of “a sixth sense,” and without any apparent participation of the ear. Owing to the absence of a definable sensory quality, Baillarger distinguished this class as *psychic* hallucinations, in opposition to *psycho-sensorial*; and M. Binet himself is inclined to treat them as exceptional, and to grant them an origin from within. As one who holds that that is equally the origin of a large number of the undoubted

state. I should thus ascribe the phenomenon to a concentration of attention on actual visual sensations, which fell by habit into the familiar lines. It would be interesting to know whether, after the spangles had appeared, it was possible to check their development into sheep.

* *Annales Médico-psych.*, 6th series, Vol. VII., p 379; Ball, *Maladies Mentales*, p. 98. See also the cases described by Michéa, in the *Ann. Médico-psych.* for 1856, p. 389, and M. Sandras's own experience in the same journal for 1855, p. 542. It is odd to find *involuntariness* not infrequently taken as the distinctive abnormality in hallucinations (Falret, *Des Maladies Mentales*, p. 281, Buchez and De Castelnaud in the French debates of 1865-6); and the odder, inasmuch as not only may hallucinations be voluntary, but the mental pictures and memories, from which they are to be distinguished, are, of course, often involuntary.

† I should have been tempted to regard these voluntary cases as conclusive had I not found Prof. Ball (*Maladies Mentales*, p. 122) explicitly claiming them as hallucinations provoked by an “abnormal sensation.” He does not tell us what the abnormal sensation is, or what causes it. He contents himself with pointing out that hallucinations are very like dreams; that some dreams are (and therefore, apparently, all dreams must be) provoked by external stimulation—say a knock at the door; and that we can sometimes direct the course of a dream at will: *ergo*, it is easy to see how some people may start a hallucination at will. It would be more to the purpose if he would introduce us to a dreamer who can designedly start a pre-arranged dream by knocking at his own door.

psycho-sensorial hallucinations, I cannot recognise this exception; and to me the class in question is of interest, not as *distinguished* from the psycho-sensorial family, but as a true species of that genus presenting the sensorial element reduced to its very lowest terms. These "psychic" hallucinations appear to me as the first stage of a graduated series—the embryonic instance of the investiture of an image or representation with a sensory or presentative character. In proportion as the sensorial element in hallucination is attenuated and dim, or full and distinct, will the perception appear internal or external; and these cases are simply the most internal sort, between which and the most external sort there exist many degrees of *partial* externalisation.* This view has surely everything to recommend it. We can but take the patient's own account—that he has a distinct impression of words; and that this impression has an actuality which clearly separates it from the mere image or memory of words. How can this separation be conceived, except by recognising the presence of a genuine, though faint, sensorial element? Of what exactly this element may consist, is another question. Dr. Max Simon (in the *Lyon Médical*, Vol. XXXV., pp. 435, 486) has made the very plausible suggestion that what is felt is a muscular impulse to form the words, rather than the sound of them—an impulse exhibited in its extreme form in the irresistible continuous vociferation of mania. On this account Dr. Simon even refuses to regard the experience as hallucination at all. Here, however, I cannot follow him. For, however much a motor-current or impulsion towards speech be involved, the patient's sensation is of something other and more than this. For him, the words are not suggested or initiated, but actually and completely *produced*; in his description of the product we do not encounter terms of impulse or movement, any more than terms of sound. Here we surely trace the characteristic delusive element: what a normal person would recognise as purely subjective experience has assumed an objective reality. In what then does the experience fall short of hallucination? If we adopt Dr. Simon's view, so far as to regard it as hallucination of the muscular sense, it becomes of interest to note that it does not admit of any parallel of a *visual* sort; for no order of visible objects can at all rival language in the closeness and directness of its association with a particular set of muscular

* Our friend, the Rev. P. H. Newnham, of Maker Vicarage, Devonport, has described to us some auditory impressions of his own, which are interesting as exemplifying the stage just above that of the so-called "psychic" hallucinations. He has occasionally had experience of these "psychic" hallucinations, as of words which "seem to be formed and spoken within the chest." But he has also experienced a *soundless* voice which yet *seems to speak into his right ear* (he is deaf of the left ear)—and which thus produces the sense of externality, though not of actual sound.

movements. And this very fact—this absence of any *sightless* hallucinations to compare with these *soundless* ones—is perhaps the reason why the latter have passed as an isolated non-sensory class, with a separate mode of origin. I am concerned to substitute my own view of them ; for to admit a genuine sensory element in the most “internal” species of hallucination—which all agree to be centrally initiated—will practically be to admit a similar initiation for *other* psycho-sensorial hallucinations.

And this leads me to a concluding word of criticism on M. Binet's hypothesis. We have seen that it is violent ; may we not add that it is gratuitous ? He has himself most rightly insisted on the fact that images and sensations are not separated by an impassable gulf, but merge into one another ; and he will allow that in many hallucinations, the image—however evoked—gets charged with the whole fulness and vividness of sensation. But then how can it be treated *simply* as an image, superposed on a quite different sensation ? To recur once more to Delbœuf's experiment, or to the brown butterfly and the black mice, M. Binet will admit that *somewhere* in the brain activities corresponding to green, to brown, to black, are going on : he is not the writer to make “the imagination” bob in among physical facts like a *deus ex machina*. By what right, then, are these activities to be confined to *ideational* tracts, and excluded from all access to a true *sensory* centre ? What temptation is there to strain facts and theories in order to make out that the central initiation of sensation is impossible ? The hypnotic “subject” will smack his lips over the sweetness of sugar when there is nothing in his mouth—will sniff with delight at a piece of wood when told it is a rose : may not the brain do for sight and hearing what it does for taste and smell ? M. Binet seems really to have been led off the track by his own brilliant experiments with prisms and mirrors. Even in those cases, as he admits, the whole work of creation is done by the brain. Even for him the gist of the experience is not the atrophied external “sensation,” but the hypertrophied, brain-imposed “image.” We do but ask him to concede that the “image,” which can here do so much, can elsewhere do a very little more and, while charging itself with full sensation from within, can dispense with the atrophied contribution from outside. Why should it not ? There is nothing to lead one to suppose that images would assume the unwonted vividness of sensations specially at moments when the external organs of sense are occupied with *other* sensations ; rather the reverse. Is not the sort of day-dream which comes nearest to hallucination favoured by *repose* of the sense-organs ? When we want to call up the vivid image of a scene, to make it as real—as sensorial—as possible, do we not close our eyes ? And what are the seasons of life in which genuine hallucinations are

commonest? Are they not seasons of *sleep*? Are not *dreams* by far the most familiar instances of the projection by the mind of images that are mistaken for realities? It is just because they are *so* familiar, and waking-hallucinations comparatively so rare, that we are in danger of overlooking the essential similarity of the phenomena, and the light which the former class can throw on the latter. Indeed, if waking-hallucinations are to be taken as the pathological form of any normal function, much might be said for taking them as the pathological form of dreaming; and we might present the waking-dreams of haschisch-poisoning as a sort of intermediate link. The normal dream disappears when sleep departs; having been able to impose its images as realities only because in sleep our sensory faculties are to a great extent benumbed, and images cannot therefore be compared with actual presentations. Thus the normal dream cannot survive the corrective which the contact of the waking-senses with the external world supplies; it fades like a candle at sunrise; and its images, if they survive, survive as images and nothing more, emptied of all robust sensory quality. The hallucination, or pathological dream, on the other hand, does not require to be thus guarded from comparison with real presentations; its "hypertrophied images" are able to resist the normal corrective, for they are often as fully charged with sensory quality as the external realities which compete with them. But though we may thus regard hallucinations as a pathological form of dream, what is here more in point is the converse view—that dreams are a healthy form of hallucination. For it cannot but appear less likely that excitation of the external organs is a necessary basis for hallucinations, if hallucinations turn out to be most common at precisely those times when the external organs are least excited.

6. *The question of Cerebral Localisation.*

We may now proceed to an altogether different question—namely, at what part or parts of the brain the creative process takes place, and in what it can be conceived to consist. The distinction that has so long occupied us, between central and peripheral initiation, may henceforth be dismissed; for wherever *initiated*, hallucinations are assuredly *created* by the brain from its own resources. An initiating stimulus may probably come from any point on the line from the external organ to the central terminus, along which a nervous current passes in our normal perception of objects. But that stimulus will clearly not determine what the imaginary object shall be, or invest it with any of its qualities: it will merely set the creative machinery in motion; and the same stimulus—the same inflammation of the eye or ear—may set the machinery in motion a hundred times, and each time evoke a

different hallucination. Where, then, and what, is this creative machinery? It would be out of place here to attempt any minute account of the various theories, which have for the most part rested on anatomical observations; and the more so, that their details are still *sub judice*. But in a more general way the problem can be stated, and even I think to some extent determined.

If we begin at the beginning, we find agreement among the authorities up to a certain point. All are agreed in recognising *some* part or parts of the brain in which the nerves passing from the various sense-organs terminate, and where the impressions conveyed by the nerves produce the changes which are the physical basis of sensation, or—in the ordinary crude but convenient language—where “impressions are transformed into sensations.” As to the locality and extent of these parts, there is a conflict of views, which may be to some extent reconciled if we regard the process as taking place in several stages. Some (Luys, Ritti, Fournié) believe the principal scene of action to be the large central masses called the optic thalami; others (Schröder van der Kolk, Meynert, Kandinsky) would place the centres lower down—that of vision, for instance, in the corpora quadrigemina; others again (Hitzig, Ferrier, Tamburini) locate them higher up, in the cortex itself; and Goltz assigns them so diffused an area that the word centre becomes scarcely appropriate. But all are agreed, I imagine, that they are distinct from the tracts associated with the most highly-developed phenomena of consciousness—complete perception, ideation, memory, and volition; and even if the idea of local separation should come to be modified in the direction indicated by Goltz, the distinctions would be re-interpreted as differences of less and more complex activities. The authorities agree further in connecting the “sensory centres” in a special way with hallucinations. It could not, indeed, be otherwise when once the full sensory character of the phenomena is recognised; for that character can only be the psychological expression of changes at the sensory centres. Any particular activity of these centres which reaches a certain intensity will affect us as a particular sensation; whether excited (1) normally, from the sense-organ; or (2) pathologically, by local irritation of the sense-organ along the line of nerve from it to the centre; or (3) pathologically, but spontaneously, in the centre itself. In the first case the sensation will be a true one, *i.e.*, will correspond with a real external object; in the second and third cases it will not; but as sensation, it will be the same in all three.

Now for *one* view of the creation of hallucinations. these data are sufficient. We have only to suppose that, in cases (2) and (3), the agitation at the sensory centre falls readily into certain lines and combinations, so as not only to produce a large

variety of sensations—colours, if it be the visual centre, sounds, if it be the auditory one—but to arrange these elements in various definite groups. Everything will now proceed precisely as if these effects had been due to the presence of a real object. The excitation will pursue its ordinary upward course to the highest parts of the brain, and will lead to intelligent perception of the sensory group as an object; while by a yet further process (which will probably take place only in the most complete or “external” form of hallucinations), a reflux current will pass downwards to the external organ, and the perception will be referred to the eye or ear, just as though its object were really acting on those organs from outside.* There then is the full-fledged hallucination; and its creative machinery, according to this view, lies wholly in the sensory centre.

But there is another view. We have noted *three* ways in which the machinery may be set in motion; but there is a *fourth* possible way. The excitation may come *downwards* from the higher part of the brain—from the seats of ideation and memory. And clearly this sort of excitation will have a dominance of its own. It will have *its own* psychical counterpart—an idea or a memory; and when it sets the sensory machinery in motion, that machinery will not now produce or combine a group of sensations determined by its own activity; but will merely embody, or as we might say *execute*, the idea or memory imposed on it. Here, then, the only machinery which is in any sense *creative* is situated in the higher ideational tracts. And if we wish

* Krafft-Ebing, *Die Sinnesdelirien*, p. 11; Despine, *Etude Scientifique sur le Somnambulisme*, p. 328; Tamburini in the *Revue Scientifique*, 1881, p. 139. The mere subjective fact of this reference to the external organ would not prove (as Tamburini seems to assume) that the organ had been actually excited by the reflux current. But, in the case of vision, we have at any rate a fair amount of proof. First, there is the fact already noted, that pressure on the side of one eyeball doubles the phantom. It seems difficult to refer this result to association—the doubling of ordinary objects by such pressure being an infrequent and little noticed experience. Secondly, we have a case of *hemioptic* hallucination recorded by Dr. Pick, of Prague, where only the upper halves of imaginary figures were seen; and where it was ascertained that the upper half of the retina (to which of course the lower half of the figure would have corresponded) was anopic. Further, it has been noted by H. Meyer of “hypnagogic illusions,” and by Gruithuisen of hallucinations which consist in the surviving of dream-images into waking moments, that they can give rise to *after-images*; this, however, might perhaps not imply more than the brief continuance of excitation at the *central* cells.

Wundt (*Phys. Psych.*, Vol. II., p. 356) seems to think that this centrifugal retinal stimulation is excluded in the cases where the phantom does not move with the movement of the eye. But, there being a physical process corresponding to the idea of a stationary phantom, why may not that process extend to the whole carrying out of the idea, so as to include the turning on or off of the retinal stimulation according as the phantom is looked at or away from?

to identify the exact starting-point of the hallucination, as such, we must fix it at the point of contact between the ideational and the sensory activities. As long as the nervous activity is confined to the ideational tracts, though there is creation, there is no hallucination; that word is never used to describe the mere image or memory of an object. It is only when the activity escapes downwards, with such force as strongly to stimulate the cells at the lower centre, that sensation floods the image, and we get the delusive percept or hallucination. The force of this downward current may exhibit all degrees. It is probable that even for the barest idea or memory of an object there is some slight downward escape, with a corresponding slight reverberation of the sensory centre; and where, as in rare morbid cases,* the escape is wholly barred, all power of calling up visual images is lost. With every increase in the force of the escape, there will be a rise of sensory quality, and a nearer approach to absolute hallucination; and every stage will thus be accounted for, from the picture "in the mind's eye" to the phantom completely externalised in space. But whatever the degree of the delusion, its local origin is the place where the current, so to speak, bursts the sluice-gates which physically represent the distinction between ideas and percepts.

Here, then, are the two possibilities: (1) that hallucinations are produced by an independent activity of the specific sensory cells—the sensations which arise there being perceived as objects when the nervous current passes on centripetally to the higher parts of the brain; (2) that the part played by the specific sensory cells † is only a response to what may be called *ideational* excitation, propagated centrifugally from the higher tracts where the image has been formed.

In attempting to decide between these possibilities, we shall get little assistance from direct pathological and physiological observations. These have been mainly directed to an end rather the converse of ours—to utilising the facts of hallucination for fixing the locality of the centres, by inspection of the brains of persons who have been in life markedly hallucinated. But cerebral pathology, as Ball trenchantly remarks, has a way of lending itself to the demonstration of whatever one wants. Lesions rarely confine themselves neatly to specific areas. We find M. Luys, the chief advocate of the

* See the case quoted in the *Archives de Neurologie*, Vol. VI., p. 352. "Je rêve seulement paroles, tandis que je possédais auparavant dans mes rêves la perception visuelle." The *Progrès Médical*, July, 1883, has another interesting case.

† I eschew here the expression "sensory centres," merely to avoid confusion with the higher "centres" to which the words "centripetal" and "centrifugal" refer.

optic thalami as the primary seat of hallucinations, admitting the constant spread of lesions from the thalami to the cortex;* and Dr. W. J. Mickle† considers—as the result of a number of very careful necropsies—that in cases of hallucination “thalamic disease plays a less important part than cortical.” But on the other hand, he did not find that the lesions were definitely associated with the spots in the cortex which Ferrier and the advocates of restricted cortical localisation mark out as the visual and the auditory centres; while lesions at these spots—the angular gyrus and the first temporo-sphenoidal convolution—seem to be found in cases where no hallucination has been observed.‡ This want of correspondence will seem less surprising if we remember the vast number of casual hallucinations where nothing that could be called a lesion exists; and also that the more persistent hallucinations of the insane belong, as a rule, to the *earlier* period of *irritation*, rather than to the *later* one when marked lesion has supervened, and dementia is creeping on.§ Even if we take subsequent cortical lesion as a sign that the weak spot existed from the first in the highest part of the brain, this would be no proof that the specific sensory centre is cortical. If lesions are not bound to be locally restricted, much less are irritations; and there is nothing to refute the supposition above made, that, when the hallucination occurs, a current has passed downwards to the lower centre—the mischief in the cortex having been primarily an excitant of ideational activities only, and the hallucination being due (as Dr. Mickle well expresses it) to “a tumultuous disorderly reaction of disturbed ideational centres upon sensorial.” The same may be said of the *artificial* irritation of the “cortical centres” during life. Ferrier regards the movements which result when an electrical stimulus is applied to these areas, as an indication that visual or auditory sensations (*i.e.*, hallucinations) have been evoked. We may quite accept this interpretation, but still suppose that the primary seat of the sensation was not the spot where the stimulus was applied, but a lower centre on the path along which the irritation passed.||

* *Gazette des Hôpitaux*, Dec., 1880, p. 46.

† *Journal of Mental Science*, Oct., 1881, p. 382.

‡ *Journal of Mental Science*, Oct., 1881, p. 381, and Jan., 1882, p. 29.

§ Luys, *Gazette des Hôpitaux*, 1881, p. 276; Despine, *Ann. Médico-psych.*, 6th series, Vol. VI., p. 375; Tamburini in the *Revue Scientifique*, Vol. XXVII., p. 141.

|| It may be remarked, by the way, that what has been here said as to the relation of *hallucinations* to cerebral localisation will apply, *mutatis mutandis*, to *blindness*. We may suppose the action of lower centres to be *inhibited*, as well as abnormally excited, by stimulation from above. Thus the fact that blindness follows certain cortical lesions does not by any means establish the location of the principal sensory centres in the cortex. And as it happens, some of the facts of blindness seem absolutely adverse to that location—I mean the

We are thus thrown back on less direct arguments, derived from the nature of the hallucinations themselves. And I think the mistake has again been in imagining that one or other of two alternatives must be exclusively adopted—that either the lower or the higher origin of hallucinations is the universal one. All, I think, that can be fairly said, is that, while the first mode of origin is a *probable* one for some cases, the second mode is a *certain* one for others. Hallucinations produced at the will of the percipient *must* first take shape above the sensory centres. For it is indisputable that the *idea* of the object to be projected—the picture, face, sentence, or whatever it may be—must precede its sensory embodiment as a thing actually seen or heard; and the idea, as well as the volition, is an affair of the higher tracts; M.M. Luys and Ritti will certainly not locate either of them in the optic thalami. But if the advocates of the first mode have thus ignored an important class of cases, the advocates of the second have erred by adopting a quasi-metaphysical standpoint. Thus Dr. Despine, who has given an extremely clear account of the centrifugal process (*Annales Médico-psychologiques*, 6th series, Vol. VI., p. 371), argues that for a hallucination to arise, we first need an idea—“*an object which does not exist*”; and if in a way it is endowed with existence, this, as a purely constructive act, can only emanate from the seat of the highest psychical activities. There is some originality in extracting a physiological conclusion from the relation of the mind to the non-existent. But at this rate the image of the sun's disc on the wall would originate in a constructive act of the mind: it is as much “*an object that does not exist*” as the most elaborate phantasm. The non-existence of an object outside the organism is quite irrelevant to the course of nervous events inside; and whether we regard a psychic act, for any given case, as *constructive or receptive*, depends simply on whether the nervous excitation is spon-

phenomena of so-called “*psychical blindness*,” where cortical lesion has produced loss of memory and of the higher functions of *perception*, while *sensation* (according to Munk's view) remains intact, and may gradually give rise to new perceptions and new memories. The observations of Munk and Goltz as to the survival of vision, though not of intelligent vision, after extensive cortical injury, seem distinctly favourable to the theory of the *lower* position of the specific sensory centres. Nor need that theory conflict with the most extreme view as to the absence of circumscribed areas in the cortex. Goltz himself would not deny that *some* place or places on the paths of the optic and the auditory nerve are specially connected with the fact that the stimulation of the one corresponds with sight, and of the other with sound. It cannot be maintained that this psychical distinction has no local representative; for such a contention would logically lead to denying, *e.g.*, that the corpora quadrigemina in the lower animals have any particular relation to vision. Thus, whatever be the final issue of the vexed question of cortical areas of *perception*, a local distinction of genuine centres of *sensation* somewhere in the brain seems as certain as the distinction of the external organs themselves.

taneous, or is received from below. Now this may be applied, as we have seen, to the lower centres of sensation as reasonably as to the higher tracts of perceptive ideation; the former may *construct* as truly as the latter; that is to say, the configurations and activities of their cells may produce definite groupings of the sensory elements.

And for simple and recurrent forms of hallucination, much may be said in favour of this lower origin. It is in accordance with all that we know or conjecture as to nerve-tissue, that certain configurations and modifications of cells would be rendered easy by exercise; and thus the changes to which any morbid excitement gives rise might naturally be the same as have often before been brought about by normal stimulation from the retina or the ear. The elements would fall readily, so to speak, into the accustomed pattern. An object which has been frequently or recently before the eyes—a word or phrase that has been perpetually in the ear—these may certainly be held capable of leaving organic traces of their presence, and so of establishing a sort of lower memory. That this lower memory should act automatically, and independently of the will, seems natural enough when we remember how large a part even of the higher memory is also automatic: an unsought word, suddenly reverberating in the sensorium, is on a par with the images that emerge into consciousness without our being able to connect them with our previous train of ideas. Now it is remarkable how large a number of hallucinations are of this primitive type. I mentioned above that, among the sane, the commonest of all cases is to hear the name called; and even with the insane, the vocabulary of the imaginary voices often consists of only a few threatening or abusive words.* So of optical hallucinations. With the sane, a large number consist in the casual vision—an *after-image*, as we might say—of a near relative or familiar associate. More persistent cases are still frequently of a single object. I have mentioned the doctor and the black cow; similarly a lady, when in bad health, always saw a cat on the staircase.† And among the insane, a single imaginary attendant is equally common: our friend “Guiteau” above was an instance. Wherever such simple cases are not connected with any special *délire*, or any fixed set of ideas, they may, I think, be fairly (though of course not certainly) attributed to an activity following the lines of certain established tracts in the sensorium. We might compare this locality to a kaleidoscope, which when shaken is capable of turning out a certain limited number of combinations.‡

* On this subject, see Dr. V. Parant in the *Ann. Médico-psych.*, 6th series, Vol. VII., p. 384. These embryonic hallucinations often develop into more complex form; see Ball, *Maladies Mentales*, p. 67.

† Blandford, *Insanity and its Treatment*, p. 155.

‡ Charcot (*Le Progrès Médical*, 1878, p. 38) has noted a curious form of

But, on the other hand, the astonishing variety and complexity of other cases—whether visual appearances or verbal sequences—seem absolutely to drive us to a higher seat of manufacture; for they demand a countless store of elements, and limitless powers of ideal combination. The patient listens to long discourses, or holds conversations with his invisible friends; and what is heard is no echo of former phrases, but is in every way a piece of new experience. So, too, the number and variety of visual hallucinations which may occur to a single person, sometimes even within the space of a few minutes, is astonishing. The shapes and features of Dr. Bostock's apparitions were always completely new to him; the seers of "Faces in the Dark" who had in the course of their lives seen many thousand phantasmal faces, had never seen one that they recognised; Nicolai, who was never otherwise than perfectly sane and who eventually recovered, continually saw troops of phantoms, most of them of an aspect quite new to him; and in insanity such a phenomenon is common enough. Even in the casual hallucinations of the sane, what is seen is less commonly a mere revival of an object which the eyes have previously encountered than an unrecognised person. Here, then, we have an immense amount of high creative work—of what in psychical terms we should call *par excellence* the work of the imagination; and this is work which we have good grounds for supposing that the highest cortical tracts, and they alone, are capable of performing. From our experience of the number and mobility of the ideas and images that the mind in a normal state can summon up and combine, we know that the cells of the highest cerebral areas are practically unlimited in their powers of configuration and association; but we have no right to assume the same inexhaustible possibilities as existing independently in any specific sensory centre—we might almost as well expect a kaleidoscope to present us with an ever-fresh series of elaborate landscapes. And over and above all this, we can point to the constant connection between the delusions, the *conceptions délirantes* of the insane and their sensory hallucinations,* which makes it almost im-

unilateral hallucination, which occurs sometimes to hysterical patients on the side on which they are hemianæsthetic—animals, passing rapidly in a row from behind forwards, which usually disappear when the eyes are turned directly to them. Examined by the ophthalmoscope, the eyes of these patients appear absolutely normal. Charcot attributes amblyopia and achromatopsia, occurring in the same persons (as well as in non-hysterical cases of hemianæsthesia), to lesion at a point which he calls the *carrefour sensitif* in the hinder part of the internal capsule; and I assume that he would refer the hallucination to the same point. If so, he may be quoted as an authority for the infra-cortical initiation of simple and recurrent forms of hallucination

* Falret, *Op. cit.*, p. 269; Wundt, *Op. cit.*, Vol. II., p. 356; Krafft-Ebing, *Op. cit.*, p. 19; Griesinger, *Op. cit.*, pp. 95-6.

possible not to regard the latter as a particular effect of the more widely diffused cerebral disturbance. The conclusion seems to be that for many hallucinations the mode of origin can be no other than what I have called the *centrifugal*.

I have throughout tried to express what I have called the centrifugal theory in such terms that it might be accepted even by those who locate the sensory centres themselves not below, but in, the cortex. According to these physiologists, the whole *double* transformation of physical impressions into visual or auditory sensations, and of these sensations into complete perceptions and mnemonic images, would be practically referred to one place. It must be admitted that this view seems at times connected with the want of a due psychological distinction between sensation and perception. But even supposing a specific centre of sensation to be thus equally the seat of psychic functions higher than sensation, it would still be none the less liable to be stimulated by parts of the cortex external to itself; and the nature of many hallucinations would still indicate that they depend on this stimulation, and not on a mere spontaneous quickening of morbid activity in the centre itself. For instance, a girl is violently distressed by seeing her home in flames, and for days afterwards sees fire wherever she looks.* One must surely trace the hallucination to the *distress*, and so to an "escape of current" from the seat of ideas and images other than visual ones. Again, in the cases described above where the hallucinations faithfully reflect the changes of the whole moral and intellectual bias, the local excitement in the sensory centre would still be traceable to an abnormally strong irradiation from the regions where the highest co-ordinations take place—these regions being themselves, *ex hypothesi*, already in a state of pathological activity. The other hypothesis would be that the mere hyper-excitability at the centre itself made it impossible for images to arise without getting hurried on, so to speak, into sensations by the violence of the nervous vibrations. This seems to be what Wundt has in view when he speaks of hallucinations as originating, not in an actual *irritation*, but in a heightened *irritability*, of the sensory centres. But then, what should cause images belonging to one particular order of ideas—the *diseased* order—to be picked out for this fate in preference to any others? The hyper-excitabile centre in itself, as an arena of images, could have no ground for such a partial selection among the crowd of them which emerge during every hour of waking life. Among the endless and multiform vibrations involved, why should

* Griesinger, *Op. cit.*, p. 97, For an auditory case, *cf.* the account, in the *Lyon Medical*, Vol. XXXV., p. 437, of a young Frenchman who was rendered insane by the German invasion, and who was then haunted by the sound of guns firing.

the excessive amplitude that corresponds to sensation be confined to a particular set? A reason must exist. The unique agreement between the sensory hallucinations and the more general moral and intellectual disorder must have its particular physical counterpart; and for this "a strong downward escape of current" is at any rate a sufficiently comprehensible metaphor.*

7.—*Veridical Hallucinations.*

There is one topic which I cannot altogether pass over here, as it has a distinct bearing on the centrifugal origin of hallucinations. There is a class of phenomena, not yet recognised by science, and for which the evidence has never yet been presented with anything like convincing fulness; but which—I do not think it rash to say—will be accepted as genuine by a large number of persons who quite realise the strength of the *à priori* presumption against it, whenever the quantity and quality of the evidence shall be adequately realised; and which is accepted already by a considerable number of such persons as, at any rate, having a strong *prima facie* claim to attention. Readers of these *Proceedings* will hardly need to be told that I refer to the *telepathic* class—hallucinations of sight, sound or touch, which suggest the presence of an absent person, and which occur simultaneously with some exceptional crisis in that person's life or, most frequently of all, with his death. Visual and auditory phantasms occurring at such moments may be conveniently termed *veridical* hallucinations; for while they are completely delusive as far as the percipient's senses are concerned—while they completely conform to our definition, "sensory percepts which lack the objective basis which

* Kandinsky (in the *Archiv für Psychiatric*, 1881), agreeing with Meynert, denies this centrifugal influence, and regards the contribution of the higher (front) part of the cortex to hallucinations as something quite different—*i.e.*, the *remission of an inhibitory function* normally exercised by this part on the specific sensory regions. But he fails to make out even a plausible case. His argument that the higher part cannot initiate hallucinations rests on no better ground than his own inability, when suffering from hallucinations, to transform mental pictures into hallucinations at will; and on the further experience—which was decidedly exceptional—that his hallucinations did not correspond in any marked way with his more general mental delusions. Again, if one asks in what the effect of the supposed inhibitory function would normally be shown, it must surely be in preventing ordinary mental images from taking on the more vivid characters of hallucinations. Now Kandinsky himself admits that in normal acts of imagination the cortical sensory region is stimulated from the higher part of the cortex; hence he seems involved in the difficulty of conceiving stimulation and inhibition to proceed at the same moment from the same quarter. Nor, again, does he make any attempt to show why the supposed inhibitory function, if it is normally operative, does not equally inhibit the normal stimulation derived from the periphery, *i.e.*, normal perception of objects.

they suggest"—they nevertheless have a definite correspondence with certain objective facts, namely, the exceptional condition of the absent person. Such cases, if genuine, militate very strongly against M. Binet's theory that excitation from the external sensory apparatus is a *sine quâ non* of hallucinations. For here the occurrence of the hallucination depends on the distant event; that is what fixes it to take place at a particular time; and an occurrence thus conditioned cannot be supposed to be conditioned also by the accidental presence of real phenomena capable of supplying *points de repère*, or by an accidental morbid disturbance of the organ or the nerve. And if the brain be admitted to be the primary physical seat of the phenomena, there are, further, good reasons for supposing that its highest tracts are those first affected, and so that the hallucination is centrifugal. The chief reasons are two. (1) The phantasm is often bodied forth with elements of a more or less fanciful kind—dream-imagery, so to speak, embroidered on a groundwork of fact; and these elements seem clearly to be the percipient's own contribution, and not part of what he receives. (2) Cases occur where actual intercourse between the two persons concerned has long ceased; and where the supersensuous communication can only be supposed to be initiated by the quickening of long-buried memories and of dim tracts of emotional association. The hallucination in these cases would therefore be a complete example of the projection of an idea from within outwards; the sensorium reverberates to a tremor which must start in the inmost *penetralia* of cerebral process.

[NOTE.—I would specially point out that the argument in the last paragraph does not extend beyond the limits of the percipient's organism. It involves no physical expression of the fact of the *transmission*. If A is dying at a distance, and B sees his form, it is rarely that one can suppose any psychical event in A's mind to be identical with any psychical event provocative of the hallucination in B's mind. That being so, there will be no simple and immediate concordance of nervous vibration in the two brains; and that being so, there is no very obvious means of translating into physical terms the causal connection between A's experience and B's. The case thus differs from "thought-transference" of the ordinary experimental type, where the image actually present in the one mind is reproduced in the other; where, therefore, a physical concordance does exist, and something of the nature of a "brain-wave" can be conceived. This was quite rightly pointed out in the notice of the *Proceedings of the Society for Psychical Research* which appeared in MIND XXXVI. But it had also been pointed out by Mr. F. W. H. Myers and myself in the "Theory of Apparitions" there criticised. In our *rapprochement* of veridical hallucinations to experimental thought-transference, we are confining ourselves to the *psychical* aspect; we connect the phenomena as being in both cases affections of one mind by another occurring otherwise than through the recognised channels of sense. The objector may urge that if we have not, we ought to have, a *physical* theory which will embrace all

the phenomena—that we ought not to talk about a *rapport* between A's mind and B's unless we can establish a *bridge* between their two brains. This seems rather to assume that the standing puzzle of the relation between cerebral and psychical events in the individual, B, can only be stated in one crude form—viz., that the former are prior and produce the latter. For ordinary purposes such an expression is convenient ; but the convenience has its dangers. Still, as the converse proposition would be equally dangerous, a *crux* remains which we cannot evade. Since we cannot doubt that B's unwonted experience has its appropriate cerebral correlate, we have to admit that the energy of B's brain is directed in a way in which it would not be directed but for something that has happened to A. In this physical effect it is impossible to assume that an external physical antecedent is not involved ; and the relation of the antecedent to the effect is, as I have pointed out, very hard to conceive, when the neural tremors in A's brain are so unlike the neural tremors in B's brain as they must be when A's mind is occupied with his immediate surroundings or with the idea of death, and B's mind is occupied with a sudden and unaccountable impression or vision of A. I can only suggest that the action of brain on brain is not bound to conform to the simplest type of two tuning-forks ; and that a considerable community of experience (especially in emotional relations) between two persons may involve nervous records sufficiently similar to retain for one another some sort of revivable affinity, even when the experience has lost its vividness for conscious memory. But, however that may be on the physical plane, the facts of which we have presented and shall continue to present evidence are purely *psychical* facts ; and on the psychical plane, we can give to a heterogeneous array of them a certain orderly coherence, and present them as a graduated series of natural phenomena. Will it be asserted that this treatment is illegitimate unless a concurrent physical theory can also be put forward ? It is surely allowable to do one thing at a time. There is an unsolved mystery in the background ; that we grant and remember ; but it need not perpetually oppress us. After all, is there not that standing mystery of the cerebral and mental correlation in the individual—a mystery equally unsolved and perhaps more definitely and radically insoluble—at the background of every fact and doctrine of the recognised psychology ? The psychologists work on as if it did not exist, or rather as if it were the most natural thing in the world, and no one complains of them. May we not claim a similar freedom ?]