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ILLUSION, HALLUCINATION
AND DELUSION.

*A Differential Study for Forensic
Purposes.*

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St. Louis, Mo.

Reprint from

THE ALIENIST AND NEUROLOGIST,

St. Louis, July, 1881.

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Illusion, Hallucination and Delusion—a Differential Study for Forensic Pur- poses.*

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ONE of the catch questions not infrequently propounded by lawyers to the psychological medical expert on the witness stand, is the distinction between hallucination, †illusion and delusion. It is the elucidation of this aspect of the subject, which is to principally occupy our attention in what follows:

The term illusion, in medical language, means an erroneous, imperfect or *mistaken* perception, while hallucination signifies an entirely *false* perception of those centers in the brain, where the external impression made upon and transmitted from the eye, the ear, the nose, or lips, or tongue, or skin, is recognized and individualized or differentiated. The person having an *illusion* sees, or feels, or hears, or smells, or touches, or tastes *some-*

*Read before the Missouri State Medical Association, May 18th, 1881.

†It is to be regretted that *Briere de Boismont* and other French writers make no distinction between hallucination and delusion, since there does really exist a demonstrable difference and a practical need for a distinction between them.

thing, but the impression received within the brain is different from that of the natural external object, or as the person himself naturally perceives it. It is not the real object, for no one else sees, or feels, or hears the same impression, and formerly he did not. Conditions within the brain, not normally existent in the person's brain, or in the brains of mankind in general when in a state of mental-health, make upon the illusion-impressed person a different internal perception from that realized by himself formerly or by others. For example, a cloud in the heavens, which to every other person appears as but a cloud, to the illusioned may seem a winged monster, or "very like a whale;" or the familiar whistle of a locomotive may, upon the morbid auditory centers of the illusioned, sound unearthly, like the trump of resurrection's morning; or the bite of a mosquito may awaken impressions of the serpent's fang; the aroma of the rose, by reason of the disease in the pathway of the impression towards the center where mind takes cognizance of and appropriates it, may become the odor of a corpse; and similarly the warm clasp of friendship's hand may seem like the clutch of a foe. These are illusions, *mistaken perceptions* arising by reason of disease along the sensory tracts that lead to those convolutions of the brain cortex where mind resides and receives and assimilates them.

An *hallucinated person* neither sees, nor hears, nor feels, nor touches, nor tastes, nor smells *anything* in reality. *No external objects whatever excite his deranged impressions.* They arise solely within the brain, and are constructed there exclusively and entirely without external excitation. The phenomena, though apparently objective to him, are solely *subjective*, and the mind, while cognizant of the apparent reality of these images, yet reflects and knows that they cannot be, and are not real. Appearing to be real, they are still realized as the baseless fabrics of which visions are made.

Such, then, are illusions and hallucinations. They may exist, for a time, and the mind remain a curious spectator

of them, still unaffected in its balance. The well-known hallucination of Ben. Jonson, of Turks, Roman Catholics and Tartars desperately fighting about the arm of his chair, which the poet witnessed complacently, seeing the moving forms of the contestants as though they were real objects, yet knowing they were not, is an apt though oft quoted illustration, and, likewise, Nicholai, the bookseller, of Berlin, who, in a "state of mind completely sound, saw a vast number of human and other forms, and even heard their voices." He did not believe in their reality.

Delusions, as compared with illusions and hallucinations, are *erroneous* or *false judgments* formed by the mind; as distinguished from the foregoing erroneous or false *perceptions*, the mind does not recognize its unreal perceptions, but believes in and acts upon them as verities, and they so dominate the thoughts, feelings and actions of their unfortunate possessor as to change his individuality as compared with his former and natural self, and thus to make him insane. The morbid condition here is not alone along the tracts of sense perception, but in the centers of the brain cortex, where impressions are evolved into thought, and unreal perceptions become, to the mind diseased, real existences. To the mind which still retains its sanity, the image of an illusion or hallucination is as perfect as when it has, in the more profoundly morbid state, merged into the delusion of the maniac, but the intellect being yet untouched by disease of its special seat in the brain, recognizes the apparent reality to be but a shadow instead of the substance.

Bear in mind that we are here taking no note of erroneous *objective* impressions on the retina, etc., such as mirages, phantoms, the London ghost and other optical illusions arising from certain conditions in the refraction and reflection of light, which deceive only through ignorance of natural science and the possibilities of an adroit employment of its laws so as to mislead the eye.

To the physician, illusion, hallucination and delusion, arising from subjective sensation, without objective

impression communicated from without, either upward through the senses or downward through the intellect, have always a morbid basis either in disturbed brain cell action or qualitative or quantitative blood change within the brain and its results; structural change. Let us now see how near we can come to an intelligent understanding of these subjective impressions which simulate objective appearances, and those strange conclusions of the reason, which, though brought about by no external cause, yet so dominate the mind as to lead it to regard them as veritable truths, and give it the impress of mania, or insanity. When we shall have done this our task for the night will be ended.

Take, for illustration, the familiar function of an afferent and efferent nerve and their connecting ganglion. When this anatomical machinery acts normally, no efferent message is sent to the periphery from the ganglionic center without some afferent impression having been received there. And, when a central impression is made, a certain definite and natural movement takes place in the ganglion, the peripheral expression of which (if the central movements be expressed in external motion) attests by its definite and natural character, the healthy state of the central terminus of nerve *impression*—the ganglionic factories, where peripheral impression is worked up, transformed or manufactured into expression, if expression is required by the nature of the transmitted impression.

In spinal or cerebro-mental disease, as in convulsions and *delirium tremens*, for instance, the case is different. An order may be sent without one being received, or an impression felt when none is made. Limbs and ideas are thrown into disordered action without normal excitation, or, if the excitation be normal, the responsive thought or action are abnormal.

If we look in upon the brain with a microscope, we find it composed of myriads of cells, ranging in diameter from $\frac{1}{300}$ to $\frac{1}{3000}$ of an inch, and of almost every

ceivable shape—spindle-shaped, a-polar, bi-polar, multi-polar, radiate and triangular, etc., with still smaller bodies called nuclei and nucleoli packed within each other like the layers of an onion, and these cells are connected with each other by still smaller nerve filliments, ranging from $\frac{1}{1500}$ to $\frac{1}{100000}$ of an inch in diameter, around and between these are the albuminous granules of protoplasm, and pigment granules and the blood which flows everywhere among these atomic bodies.

It is by reason of the infinite number of these corpuscles—as infinite in number as the stars are in the firmament, and as infinitely grand in function—that the motions of thought and perception go on and impress the material world without and are in turn being impressed by it. Every impression going to, or thought proceeding from, the mind or emotion excited in it, is accompanied with motion in the molleculles of the brain. Some of them are in perpetual motion, and with this motion is associated the ceaseless processes of waste and repair, so that it is only when life ceases that they are at absolute rest, and even this rest is another kind of motion—the chemical movements of decay and death. What a wonderful thing is life! The world upon which we live is in constant motion revolving on its axis, and in its appropriate sphere in space, whilst our bodies constantly move upon it, and within our bodies those little cells, no less than the great planets of boundless space, keep ever on the move.

What a wonderful thing is motion!

“Mr. W. R. Grove* arranged a box filled with water, in which he placed a prepared daguerreotype plate, a gridiron of silver wire, a galvanometer coil, a Brequet’s helix and a set of needles in such a way that, when the light struck the plate, chemical action begun in them, evolving electricity which circulated through the wires, magnetized the coil, heated the helix and *moved* the needles.” What began as an image on the plate became motion in the needles. So, in the process of vision,

* From Dr. Edward H. Clark’s “Study of False Sight—Pseudopia.”

what begins as an image caused by the light on the retina ends in the movement of the cells concerned in mental perception and conception, or the display of thought in the brain.

No one can tell from the investigation of science, solely, what it is that thinks, but the conditions of thought are plainly enough revealed in *motion*, and, in regard to the soul of man, it is here that science serves to reveal the necessity of a higher revelation. Science cannot put its finger yet upon any cell or group of cells wherein resides the soul, the ego, the me, the distinguishing personality, though, by physiological experiments—electrical excitation and ablation of successive portions of the brains of animals, and by the teachings of circumscribed disease within the cranium—much of the function of different parts of the brain has been discovered.

Centers of motion and sensation have been quite definitely located, and these centers are composed, like the rest of the brain, of groups of infinitely small bodies called corpuscles-cells, with their inclosing nuclei and nucleoli, interlacing nerve fibres, and connecting nerve tissue called neuroglia, like the other parts of the brain. A community of interest and actions govern these microscopical members of the cerebral state, like that which exists among the diverse and distant, but connected, individuals of the body politic. When health exists, all move on in their respective spheres harmoniously, the higher ganglia watching over and restraining the lower, and all together, working out the brain's normal destiny. But when disease enters the domain of mentality, the phenomena of insurrection and rebellion appear. The psychomotor centers begin to act independently of the will, and display their disloyalty in convulsive movements, or failure of movement, which the will cannot control, the centers of sight, or touch, or taste, or smell, one or all together, send up false telegrams, never received from without, to the monarch enthroned above them, and excite unusual movements of thought, emotion and impulse. So long

as the higher centers of the brain, where thought resides, preserve their integrity, the mind is still rational, just as the king may remain undisturbed and undamaged upon his throne after a portion of his subjects, ungoverned by his commands, have foresworn allegiance, and are carrying torch and sword and spreading destruction through portions of his realms. In the nervous organism, as in the complicated machinery of state, there may be treasons and stratagems against the central head of the government, while that head still maintains its hold upon the throne.

It is commonly supposed that we see with our eyes, hear with our ears, and so on. But it is the brain and the mind which really sees, and hears, and feels. These organs of special sense are merely the apparatus by which the form or sound or other sensible property of objects are received from the world without, and the beginning of their transmission to the proper sensory centers in the brain, where sights, sounds, etc. are first perceived and distinguished from other sights and sounds.

In the mechanism of sight, for example, we have first the eyes, with their *irides*, lenses, chambers, fluids, retinae and optic nerves, continuous into the brain. Then we have the tubercular quadrigemina—four twin nervous bodies at the base of the brain in direct communication with the optic nerves, where the impression of light and external objects is first appreciated within the head. Then the centers of vision in the hemispheres—the angular gyri, probably—where distinctness and differentiation of vision takes place, and objects are recognized, registered and remembered in the proper form, with their characteristic difference from other external objects.

The apparatus of the eye may be likened to the *camera lucida* of the photographer, where the first impression is made, but there is no consciousness in the instrument, the consciousness is in the operator who stands behind it, and who, so soon as an impresson is made on the prepared plates in the box, becomes cognizant of

it, takes it away and hands it over to his associate artist in the laboratory to be "developed" or brought out in all its distinguishing lineaments, after which an errand boy takes it to the proprietor, and the proprietor makes the final disposition of it.

Like unto this process is that of human vision. The first operator that takes cognizance of the picture when it is obscure is the four tubercles already mentioned, it is then passed on to the angular gyrus or visual area in the hemispheres of the brain, where it is more clearly distinguished, laid away in memory for future use, or action may be taken upon it at once by the centers of ideation or thought, and will.

The three steps are, therefore, impression upon the *retina*, perception in the *corpora quadrigemina*, and *perfected* perception transformed into *conception* in the visual centers of the convolutions—the *pli courbe* or angular gyri and contiguous portions of the cortex. This is sufficiently approximative for medico-legal purposes, though it is probable that the internal distribution of the optic nerve fibres embrace a much greater area of the gray cortex. This is proven by the slicing experiments of *Monk* to demonstrate the optic area of the cortex, and the testimony of *Stilling*. It is not within the scope of this paper to review the utterances of *Ferrier*, tending to the abandonment of his former view, that the angular gyrus is the sole sight center, or those of *Dalton* in support of *Ferrier's* original proposition. The novel attitude of these physiological gladiators is, however, very interesting reading. Besides all this, additional encephalic movements, other than conception, called emotion and psycho-motor impulse, usually take place before the completed result of an object imaged upon the retina and transmitted in cell changes along the channels of the visual apparatus, is reached in the normal brain. If a pebble dropped into the vast ocean, may disturb its surface to its uttermost bounds, how like unto this is the phenomena of the course of a visual or other special sensory impression on its way in

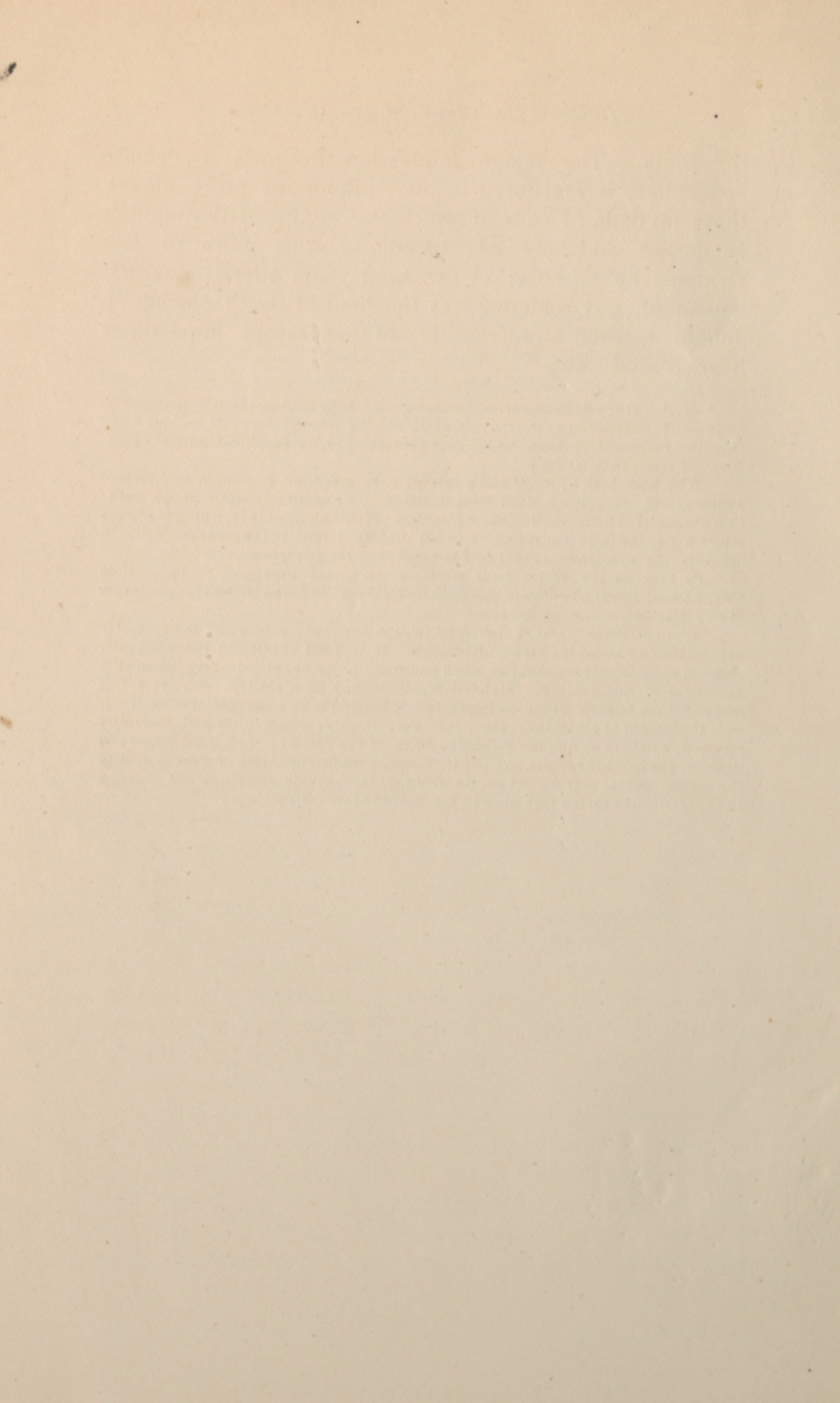
the brain. The image impression becomes a definite conception, is registered in its appropriate place among those myriads of cells of which the organ of the mind is composed, and may be reproduced with more or less vividness by an effort of the mind years after it was first implanted, and sometimes at the hour of death coming up unbidden, when more recent and evanescent impressions have passed away.*

* *M. A. Brierre de Boismont*, without distinguishing hallucination from delusion, describes hallucination as the "outer garment—the daguerreotype of an idea being only the corporeal portion, while *pure conception* is its psychical part." (*Rat. Hist.*, of Hal., 1853, p. 252.)

With him, both a *percept* and a *concept* were essential to what is now termed hallucination as distinguished from delusion. We incline ourself to the belief that a completed hallucination has a transient psychic element in it, which is always secondary to the false perception, and but lightly joined to the concept, while in delusion the *conception cannot be dis severed from the perception*.

So long as the precise *locus menti* in the cortex continues to be as it is now, an anatomical *latitulum* some latitude for theory as to the ultimate composition of an hallucination may be conceded.

As to whether illusion and hallucination are solely sensory or momentarily psycho-sensory, need not here be discussed. It will not invalidate these distinctions to concede that the surprise of an unusual illusory or hallucinatory impression momentarily impresses the higher cortical centers as a reality. The real fact being that the false or erroneous impression is first made on some special sense tract, and, if accepted at all by the reason, it is evanescently, wonderingly and *doubtingly* received, and only during the formation stage of the *percept*. In hallucination and illusion, the psychic centers are not impressed a sufficient length of time to modify the normal mental actions, while, in *delusion*, the psychic activities are changed and conformed in their expression to the morbid sense impressions.



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