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PART 1.—ORIGINAL ARTICLES.

A Chapter on some Organic Laws of Personal and Ancestral Memory. By T. LAZCOCK, M.D., &c., Physician in Ordinary to the Queen for Scotland, and Professor of the Practice of Physic and Clinical Medicine in the University of Edinburgh.*

I propose to show that organic memory consists in cerebral processes, regulated by the laws of evolution and reversion, and common as vital processes to both plants and animals.

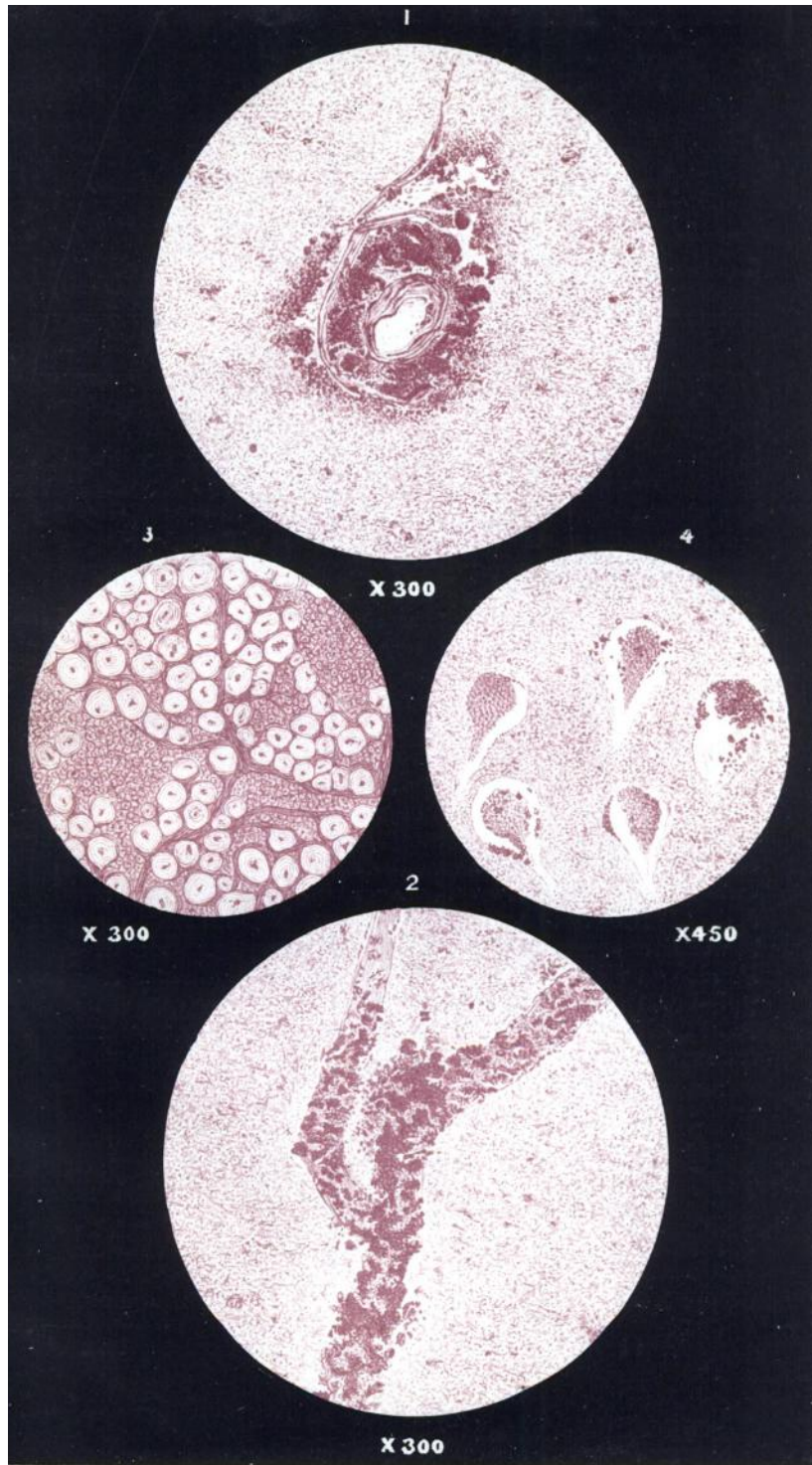
I.—The origin of acquired habits, instincts, and capabilities, and their transmission hereditarily as atavism are now too well known to need special illustration. What I now would affirm is, that the manifestation of these according to the laws of heredity is better understood if considered as a reversion to antecedent vital processes in parents, and to be classed with memory. On the other hand, that higher development of the brains which coincides with increase of knowledge, is a manifestation of the great law of evolution. But loss of memory, dependent on the defective brain-nutrition of old age, when evolution ceases, is not uncommonly associated with a return to the thoughts and habits of early life, being a reversion to that which the individual had inherited from his own childhood and youth, and so analogous to ancestral reversions, or heredity proper.

The problems to be solved may be considered from other points of view. Organic memory, as a whole, includes two distinct processes. The one consists in the brain-changes which follow upon an act of attention, and constitute the record of mental states; these are the result of physical impressions received by, and acting on the brain at the

* This paper is the substance of a chapter written in 1872 for (as yet) an unpublished work.

moment of attention, which is the present. The second cannot occur unless the antecedent process—the record—has been completed, because it consists in a reversion to that process. Now, in the atavistic transmission of instinct and of other capabilities, whether in plants or animals, the end is attained by means of a microscopically small particles of living matter endowed with the property of evolution or development. In the formation of this particle there is both a record of ancestral qualities and a reversion to one or other of the primary forms of living matter. A simple analysis of the leading facts of organic memory serves to show that evolution of the primordial germ is analogous to evolution of brain and of mental power. In the two parental elements which, when integrated, constitute the primordial cell, there is a storing up, or record potentially, of the organic capabilities of each of the parents; so also there is a like storing up of capabilities in the molecular encephalic tissues. And just as the primordial cell is capable of evolution and development under fitting conditions, so are the latter. These apply equally to reversion, which is the correlative of evolution. In the formation of the primordial cell there is a reversion to one of the simplest and most elementary forms of life. What, therefore, is termed heredity is an evolutionary reversion potentially to antecedent modes of activity, manifested in parents and ancestors, as in like manner reminiscence is an evolutionary reversion to antecedent modes of activity manifested in the individual. Again; just as acquired ideas and notions dependent upon memory tend to evolve, concurrently with brain evolution, into more comprehensive notions so as to develop systems of thought; so, consequent on the contact with new external conditions, the evolving organism acquires and transmits new instincts and capabilities, and enters upon wider external relations. We may, therefore, assume as to these general laws, that the vital processes whereby all is attained that is included under cerebral development and mental activity are comparable with certain vital processes in the lowliest organisms.

That definite tissues of the brain and combinations of brain-cells and molecules subserve definite vital processes in memory and reminiscence is now an unquestioned fact. How the results of these processes become a part of the transmissible elements of the primordial cell, formed by the integration of the sperm-cell and the germ-cell, remains to be elucidated;



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but the fact is certain, and can be made the basis of important generalizations. We can affirm, for example, that the record, which is the first step in memory and in cerebral evolution, is analogous to that process by which the genetic cells are endowed with the modes of manifestation of vital energy that are, or have been, ancestrally realised in time and space. And these words *time* and *space* imply fundamental elements in the mental processes included under memory, as knowledge; for the element, time, is essential to reminiscence, and the element, space, to perception and a knowledge of events as having happened in time past. Immediate reversion is the reminiscence of the last record or latest evolution.

It is to be noted, too, as to the ancestral endowments manifested in all organisms, whether they be plants or animals, and whether manifested as energies or functions or states of consciousness, that being potentially conserved in these microscopic particles of living matter, they can become new starting points of evolution. The process not only secures the conservation of the type or species (or the specific identity corresponding to personal identity), but also governs those departures from the type which result from the adaptations of organisms, whether plants or animals, to new external conditions, and which are the most facile in the lowliest and smallest organisms. Hence just as the processes of memory subserve to a knowledge of wider relations in the individual, so this process serves to the acquisition of wider relations in the species, in the form of new instincts and special hereditary adaptations to new conditions. If these wider relations be so extensive as to change the characteristics of the species in the progeny, then it is said that new species, or at least varieties of the species, are evolved.

According to these views I assign a much more important position to the encephalon in the nutrition and development of the body generally than is attributed to it by the great majority, if not all, of the school of cerebral physiologists. These, by restricting the functions of that organ to the operations of the mind, so called, meaning thereby all that comes under conscious states, are at a loss to understand why the convolutions vary so much in different animals with like degrees of mental activity, while, on the other hand, animals with a *minimum* of mental activity—as sheep—have convolutions as multiform and numerous as other animals with much higher endowments. The influence of

the mind on the body in popular phrase, which means scientifically the trophic reflex functions of the brains, is also a perplexing problem from the ordinary point of view, whereas the theory that the brains regulate the functions of viscera, the composition of the fluids, the nutrition of tissues, and the growth and development of parts, or of the whole body, enables the inquirer to have a clearer view of the facts. The disfiguring influence of blindness and of various forms of insanity is an illustration of the theory. The brains unify.

II.—The first element, then, in organic memory, according to the views just stated, is the record. So far as I know, this fundamental organic process has received no name. A general term, expressive of an abstract scientific conception, is essential to further research by means of that conception. A good illustration of this rule is afforded by the use of the words, analysis, synthesis, dialysis, and affinity in chemistry. It seemed to me, therefore, of importance to name that organic process by which knowledge is conserved and retained, so that evolution of brain-tissue shall result with correlative reversion. After consultation with classical friends, I adopted the old Greek work *synesis* (pronounced *sinnesis*) to denote the process; *synesy* to denote the result; and *synetic* as the adjective. When this organic process is morbidly defective there is *asynesia*; when it is abnormally intense there is *hypersynesia*. Both these conditions are very common; in the aged *asynesia* may coincide with a vigorous remembrance of long-distant events. Usually the term *amnesia* is used vaguely to denote defect of either record or of remembrance, but there may be a *hypermnnesia*,* manifested as abnormally vigorous reminiscence, with *asynesia*. So also in the insane there may be *hypersynesia* as the cause of permanently fixed ideas with defective reminiscence or amnesia. *Asynesia* is very common in epilepsy and other disorders affecting the basilar region of the brain; also in injuries to that region.† The union of the sperm-cell and germ-cell is *genetic synesis*.

It will help to understand the nature of this process if we bear in mind the primary meaning of the word *synesis*. As used by Homer it denotes the intimate union or integration

* Feuchtersleben uses this term, but vaguely, and rather to denote record than reproduction.—See *Medical Psychology: Trans. of Sydenham Society*, p. 237.

† See for illustrative cases my paper "On certain Organic Disorders and Defects of Memory," *Edin. Med. Journal*, April, 1874. See also an exposition of these ideas in "Mind and Brain," 2nd edition, vol. ii, p. 407, sqq.

of two rivers ; as used in philosophy it meant the bringing of outward objects into union with the inward sense, or, in modern phrase, the combination of the perception with thought. Hence Plato defined memory to be the union of the body and the soul in perception. *Synesis* thus came also to denote intelligence, understanding, the faculty of comprehension.

Physiologically, *synesis* may occur under varying states of consciousness ; and reversion, as reproduction may, and often, indeed, does take place without any consciousness whatever. That there shall be reminiscence of events (which is reproduction or reversion with knowledge either of time past or of place) that state of brain which coincides with perception is essential to *synesis*. In thinking, the senses may be recipiently, but not percipiently, active, and yet *synesis* or evolution as to outward impressions will go on. Those are the so-called unconscious influences of surrounding objects, of which the assumption of colours of such objects by insects and fishes is an illustration. When such *synesies* occur under moral influences, as those of example, or from so-called suggestion, imitation, and the like (all which are reflex cerebral phenomena of the trophic kind), and reproduction takes place, there is not necessarily reminiscence. In any case, however, it seems certain that for this kind of encephalic *synesis* a state of brain that implies consciousness of some kind is an essential condition.

III.—Before applying these views specially to memory, whether personal or ancestral, it will be useful to indicate their bearing generally on encephalic nutrition and evolution, on vital energies, on the origin of species and varieties, and on those points of variation in which men differ from each other, and every man from himself, in successive periods of life. The law of continuity (which I cannot stop here to define) is the guide to the elucidation of their connection with evolution and reversion. This law is to vital phenomena what the first law of motion is to physical phenomena. A series of synetic changes having once begun under certain conditions, they tend to continue unchanged until new conditions arise, when a new, or, at least, a varied, series of synetic changes begin to follow the same course, and in their turn to be varied only by new conditions. Thus, with each change in the conditions, we have to consider both the primary direction which evolution is taking and the se-

condary direction fixed synetically or by experience in adaptation to the new conditions. It is evident that the latter will be represented by what, in physics, is caused by a composition of forces. But two other fundamental facts are to be considered. Firstly, every organism is a unity made up of many parts, and its parts vary under new conditions in adaptation not only to external conditions, but to each other. Secondly, each evolution in a new direction, when completed by synesis, has its own stages of completion, reversion, and decline. Hence literally the infinite diversity in species and individuals.

It is in these varied relations to outwardness, succession, and continuity that vital energies differ from the molecular forces of ponderable matter. They cannot be estimated by so much horse-power or pound-lift per foot; nor is there any direct relation between the brute weight of living matter and its evolutional capabilities. The sperm-cell of a mouse is, in fact, much larger than that of a man; and although size is of importance in estimating the general brain-power of like animals, it is of doubtful value as to the comparative capabilities of brain-matter, even in the same brain. Further: in studying the phenomena of evolution and reversion it is of importance to discriminate between the two chief factors of the processes. Firstly, there is the organic basis, or *substratum*, the result of synesis, either personal or ancestral; secondly the physical energy—as motion—by which the organic bases become energetic. These physical energies, commonly derived from external things and conditions, are called external impressions, but there are many which are purely internal. Such, for example, are the impressions reaching the brain, independently of consciousness, from viscera and organs of the body, and more especially those which reach it from the nerve-centres. To this latter class belong all those molecular changes in the hemispheres which correspond to so-called associations of ideas, motives, and the like, and which are reducible to molecular motions.

Synesis as evolution, and reminiscence and reproduction as reversion, depend alike upon the reaction between the motor energies termed impressions, and the molecular energies proper to each *substratum*. In what this *substratum* consists physically is a problem to be solved (if it can be solved) by the methods found available for the solution of similar problems as to inorganic matter. Of the molecular

constitution of brain-substance, or even of that of the simplest protist or protozoon, we know little. The chemical and physical hypotheses deduced from atomic theories are conflicting and vague; in truth, all atomic theories are but the results of thought regarding the continuous divisibility of matter. We can continuously divide matter actually up to a certain point, and thence can continue the division in thought *ad infinitum*. It is only the necessities of thought which stop this continuous divisibility and end the process with the indivisible, or atomic, particles. Hence the atoms of the philosopher rest on brain work. Even the mathematical demonstrations of their existence are nothing more than results of brain-evolution.

In adopting the term *substratum* to denote the organic basis on which physical energies act, whether that be in the simplest forms of living things or in the brain of man, I only follow a like logical necessity. The word *substance*, now used to indicate that which is opposed to mind and to what is spiritual, was formerly used in a like sense as to mental phenomena, as this word *substratum* can be used in regard to vital phenomena. Its primary use was to denote the spiritual basis of mind, and it is so used in the Athanasian Creed, where Christ is affirmed to be "God, of the substance of the Father." All we can do as to vital phenomena is to observe and generalize as to the reactions between the so-called impressions and the *substrata*. And it may be said generally that there is just the same law of relation between the tissues of the sensitive plant and the impression or the touches which make its leaflets contract, as there is between impressions on the senses and the brain-tissue. In short, there is a law of trophic reflex action running throughout all those phenomena up to the highest mental manifestations.

Forty years ago the phenomena of reflex action were restricted by Marshall Hall to the "true spinal system," and the brain was solemnly relegated to the dominion of "the soul." When, therefore, I extended the general deductions from admitted facts as to the spinal cord, and endeavoured to elucidate the functions of the brains by the law of reflex action, I was obliged to give a name to those conditions of the brain-tissue upon which, whether in thought or in action, adaptive reactions to adapted impressions depend, and designated them the *substrata* of psychical phenomena.* I divided

* Essay on Reflex Function of the Brain in Brit. and For. Med. Rev., Jan., 1845, p. 308.

them into two classes corresponding to the motor and sensory tracts of the spinal cord, naming those the *ideagenic* which, when acted on by sense-impressions led up to thought and ideation, and those the *kinetic* which subserved when acted on by other impressions and by ideation to motor and volitional activity.

The etiology of these substrata is obviously an all-important problem of modern philosophy. As to this, it will be seen on reference to my essay on the reflex function of the brain, that I formularised both evolution and reversion, and their manifestation in molecular organization then as now; affirmed the principles of adaptive relation; and gave various illustrations of evolution and reversion of habits and instincts both in mankind and in lower animals. Even the gasp of the hydrophobic patient at the touch, sight, sound, or thought of water, was referred to antecedent synesies under the name of substrata. I explained the gasp experienced when cold water is dashed on the body, and of which the hydrophobic gasp is a spasmodic exaggeration, by an ancestral substratum formed in an amphibious state of existence, in which closure of the glottis is one of the conditions of living under water, and would occur as a reflex act so soon as the animal's head and nostrils were submerged. I am not so clear now as to the validity of this explanation, but it is perhaps worthy of record. "Thus," I added, "the kinetic and ideagenous, or sensorial textures [tissues] of the ganglia of all animals are interwoven with those of the human organization."

Evolution of the brain, then, coincident with increase of knowledge and skill, means the constant addition of synesies and substrata either kinetic for skill or ideagenic for thought. This is personal memory. The capability of reproduction or re-evolution of transmitted substrata is ancestral memory. Taking these generalisations as a basis of inquiry, we can conclude that impressions of new external conditions acting upon the substrata of either personal or ancestral memory will give rise to new substrata, and thus infinite variations in corporeal characteristics and mental endowments will arise in adaptation to these new conditions, and so new species and varieties of species are constituted. In like manner new experiences and increased knowledge of the phenomena and laws of nature alter the human body and brain and mind in races and in individuals, but always with a tendency to revert to antecedent synesies or ancestral substrata, when the prior conditions arise and the new

external conditions cease to influence brain-function and development.

I would wish to guard this statement, however, from its being taken as admitting *in toto* the lineal hypothesis of Darwin. That seems to be admissible as to civilised races of mankind, in descent from savage tribes, but it is not so certain as to man's direct lineal descent from the great stem of organized life through anthropoid apes. If we assume that a point of reversion to ancestral substrata may become the starting-point of a new evolution, it is obviously possible theoretically for anthropoid apes to be the descendants of degenerate ape-like men. In this event such apes would carry with them some ancestral human potentialities and manifest human characteristics in some degree. Nor is the notion so very remote a deduction from facts as appears at first sight. When we remember that the prognathous physiognomy and other marks of degeneration towards savage men seen amongst our own countrymen are probably due to defective conditions as to food, clothing, housing, and surroundings like what may be termed uncivilized life, it is not surprising that prognathous tribes of men have reasoned in like manner as to the origin of apes from their degenerate kindred. If the theory of lineal descent be admitted (which, however, has yet to be established, there are so many residual phenomena) then it is obviously applicable in the direction referred to. Of this Professor Huxley quotes an instance as to the human origin of the chimpanzee. "It is a tradition with the natives generally here (Cape Palmas, Bight of Benin) that they (the chimpanzees) were once members of their own tribe; that for their depraved habits they were expelled from all human society, and that through an obstinate indulgence of their vile propensities, they have degenerated into their present state of organization."*

I will now give illustrations of reversions to antecedent substrata or synesis under the two divisions of kinetic and ideagenic, being those which, when they are encephalic, subserve to ideation and to volitional activity respectively. Of the latter class are such habits or acts, as writing and speech; of the former the thoughts and feelings, of which gestures and spoken and written language are the signs. These represent in the individual, as well as in the race, the highest attained mental capabilities designated practice, skill, experience,

* Dr. Savage in "Boston Journal of Natural History," Vol. iv., 1843-44, p. 343, quoted by Prof. Huxley, in "Man's Place in Nature," p. 45.

education. Concurrently with the production or reproduction of these are the feelings known as the pleasures and pains of memory.

IV.—Cerebral pathology of the individual affords the most direct and conclusive illustration of the organic laws of reversion, since the facts are more completely under our observation. They are of two classes, viz., those which are due to defective nutrition of the higher substrata of the hemispheres, so that the lower come thereby into activity, and those in which the lower substrata, by over-excitement of the circulation or of the nutrient activity of the corresponding brain-tissue, become over-active and dominate the less active and perhaps more feebly nourished higher substrata.

The defective nutrient activity of old age offers obvious illustrations. It is not uncommon to meet with aged persons in whom the brain has ceased to evolve, who have abnormally vivid reminiscences of the events of childhood, yet in whom synthesis is so defective that they cannot remember what happens from day to day. Such cases have an important bearing on questions of legal capacity of the aged. The hypermnnesia appears to be due to an "erethism" or abnormal excitement of the substrata of childhood and early life. And the old man is a *laudator temporis acti*, because the past with its pleasurable reminiscences is more with him than the present. For a like reason, a man sometimes returns at the very close of life to the feelings, pleasures, and hopes of his youth.

Cerebral defects characterised by gradual decay from above downwards, and the mental states which correspond to these, such as general paralysis, certain kinds of dementia, and more especially the senile dementia termed dotage, variously elucidate the laws of organic memory which I am endeavouring to formularize. The development of brain-tissue as to knowledge goes on concurrently with the evolution of that which subserves to the sign-making or semeiotic faculties of drawing, writing, speech, gestures, and mimicry. The capability of representing abstract ideas by the signs known generally as speech or language, enables man to evolve into that higher culture which other animals cannot attain, except in a limited degree as to those animals which are his companions and are taught the use of signs by him. Of course the semeiotic faculties, considered as due to kinetic substrata, include not only speech and writing, but also music, painting, sculpture and architecture. So that in these arts

the law of correlative evolution and reversion is manifested both in health and disease. I accordingly seek in the rude arts of children and demented for the analogues of those of uncultured men, and observe that in brain-diseases of men of high culture there is a reversion to the substrata of childhood, ancestors, and uncultured man. The arts of music and architecture, at least of lower animals, can also be brought into this category; and if, setting the doctrine of lineal descent aside, we take the philosophy of ideas as our guide, we can include the forms of plants.*

As an illustration of reversion from the high culture of manhood to boyish art and hand-writing, with erethism of a kinetic art-substrata, I give examples of the hand-writing, drawing, and art-composition of an artist who died of general paralysis. (See figures 1, 2, 3, and 6.) The patient was under the care of my valued friend, Dr. W. A. F. Browne, who several years ago favoured me with the originals. The case is very specially interesting, as showing that in general paralysis (so-called) the motor substrata of the hand may be wholly unaffected by palsy; there is not even the tremor observed so commonly in that disease. The hands being thus free to execute, we have a transcript of the organic ideational changes going on in the hemispheres, as manifested by the correlative reflex motor impulses, even when the disease was advancing to utter incoherence. Figure 1 is a pen-and-ink sketch of a landscape made in December, 1855, at a time when the artist may be said to have been "in love," as certain letters show, with a lady named; whether the lady was an imaginary person or not, is not known. The sketch is picturesque, and of the "meet-me-by-moonlight" class as to sentiment. It illustrates the evolutionary influences which excitation of the nerve-centres subservient to the sexual instinct exercises over the brain-tissues or "organs" subservient to the higher art faculties and the higher sentiments. The physiology and pathology of this last class of cerebral phenomena (those of "falling in love") have been little considered scientifically; they have been rather thought to be eccentricities and follies than scientific phenomena. They are, however, developed according to general organic laws, which I have illustrated elsewhere.† They may be classed under the

* I here refer to my doctrine of Ideas as Causes. "Mind and Brain," 2nd edit., Vol. i., p. 271 to end.

† "Mind and Brain," 2nd edition, Vol. i., p. 419, and Vol. ii., p. 123.

term *orectic imagination*, being derivatives of desire or appetite.

Figure 2, sketched later than figure 1, is a reversion to the rude comic ideas and execution of boyhood.

The hand-writing in this case illustrates the like law of reversion. Figure 3 shows the style and ideas in December, 1855; in figure 6, written a year later, there is a reversion in thought to birth and to the style of hand-writing of boyhood; whether at any time the patient wrote exactly in that style could not be ascertained.

The effects of sudden mental shock on the brain may be manifested by a like scriptorial reversion. A lady, well known to me, experienced, at the age of 20, a severe grief from the death of a clergyman to whom she was shortly to be married. He contracted fever and died within a week. The bride-elect suffered much mentally, and finally became, as she is now, a Protestant Sister of Charity. At this time her hand-writing changed from the usual current style of feminine writing (as her mother tells me) to one of straight strokes. An illustration of this is given (figure 4), and also the hand-writing of the same lady ten years subsequently (figure 5), when it will be seen there was a recovery to the continuous style of hand-writing.

Much has yet to be observed as to the influence of brain-states on the hand-writing; my own observations lead me definitely to the conclusion that it varies much in the same person with varying states of brain, and that changes in it may foreshadow brain-disease as distinctly as alterations in speech. In children bad writing is not always the result of idleness, as the schoolmaster ought to know.

Do ancestral styles of writing occur? That fact is not easily observed, because the son may be expected to imitate the father. There are, however, instances on record in which there was reversion to an ancestral style, independently of imitation. Viewed as a habit, the hereditary transmission may be expected to be manifested in ancestral reversion. The reversions to infantile modes of speech and to ancestral phonetic substrata, is not uncommon in cerebral diseases, and in defects of cerebral development. The reversion to an ancestral style of writing has its counterpart in the reversion to ancestral or racial pronunciations of letters and words, in those who lisp, and in certain so-called "cockney" modes of speech. Certain uncultured races, as the Hurons, are said to be unable to pronounce the labials. In certain cerebral

diseases with "aphasia," acquired languages are quite lost, and the language of childhood only spoken; or else foreign languages acquired in childhood or early youth are reproduced. It may be observed, too, that aphasiacs are sometimes unable to pronounce the labials.

A similar class of phenomena occurs in cases of cerebral palsies, in which whole classes of words are lost, and to which my friend Dr. Browne has called special attention. "Most frequently," he observes, "this loss is confined to nouns and proper names, while verbs and other parts of speech are preserved; and where aphasia is progressive, the [noun] substantives which we acquire first disappear first, and the other vocables follow. . . . It must be observed that in the dialects of certain nations one word not only represents a vast number of objects but that whole groups of words familiar to us are not to be met with. In North America the Tinné Indians have no word for 'dear' or 'beloved,' and the Algonquin language is stated to have contained no verb meaning 'to love,'" &c.* Dr. Brown lucidly observes that it must not be concluded that these races have not the ideas and feelings for which their language affords no signs, but rather that there is poverty and feebleness of that power by which signs are invented and applied. In short, from my point of view, there is defective brain-evolution, and therewith less abstraction and differentiation. So that, in the kinds of defective memory of words referred to, the brain condition is that of reversion to earlier or ancestral phonetic substrata. The same law may be observed in the education of deaf-mutes, who, as to the acquisition of language, offer the brain-condition of infants. The experience of M. Etard supplies illustrative facts.

There are, moreover, cases in which the whole of the sign synesies as to a language are swept away by some acute or sub-acute disorder, in which the nutrition of the hemispheres is affected in a particular way. Dr. Browne relates the case of a young married lady which came under his own observation, who, "on recovery from the dementia and stupor succeeding what would now be designated hysterical paralysis, was found to have retained no knowledge whatever of any of the events or acquisitions, including languages, writing, music, &c., of her previous life, [nor] even of her marriage. She [again] learnt the alphabet, and the language so long used

* On Impairment of Language the result of Cerebral Disease, West Riding Hospital Reports, Vol. ii., 1872.

by her, writing, knitting, &c., as [if she were] a child, but with much greater rapidity and facility than a child could have done, and never regained the same command of the vernacular as she formerly displayed. Her caligraphy, as well as her disposition differed widely from those characteristics of her original condition; and she never resumed nor even recognised the ties and engagements contracted in that state." (*Op. cit.*, p. 12.) It would have added to the interest of this interesting case of Letheal amnesia if the mental state which the defect in cerebral nutrition developed was like that of any ancestor. The facility of regaining language she manifested may be held to be analogous to the facility which the descendants of those speaking a particular language are said to manifest in acquiring that language.

From these and numerous like facts, it may be deduced as to language that the organic process which I have named synesis takes place in particular portions of the tissue of the hemispheres according to an order in time; that the reproduction of the results of this process (the synesies and substrata) take place in the same portions; that the intensity of the process and the extent of reversion in time past depend upon the nutrient and evolutional energies of the brain-tissues involved; and that both processes are manifested according to laws of evolution and reversion.

V.—Sleep and dreaming are states of brain closely allied to morbid conditions. The state of dreaming essentially consists, as to its fundamental elements, in abnormal reminiscences and reproductions when at the same time there is either imperfect perception or no perception whatever of the external world (*ante* p. 159). The delusions of the insane are to be classed with dream-delusions, both as to natural history and seat. It is probable that a fixed delusive idea is often nothing else than the synesy of a dream. In cerebral conditions induced by mesmerism or other "isms" of the class, and in somnambulism there are analogous synesies and reminiscences. And in those states associated with palsies and brain-fevers, when reminiscence of a long-forgotten language and events occur there is a like dynamic condition. With these may be mentioned the memories of old age.

The origin of fixed and insane ideas during sleep is too important a fact in mental pathology not to have special notice. It will therefore be discussed in another chapter. Here I would only endeavour to show—1. That the synesies of habitual actions may occur during sleep. 2. That

reproduction may recur only during sleep. And 3. That substrata may be transmitted to offspring to be reproduced in them only during sleep. An example of this class of memories is to be found in a history communicated by Mr. Galton to Mr. Darwin as proving the "inheritance of habitual gestures." A gentleman was observed by his wife to strike his nose when he lay fast asleep on his back in bed, by raising his right arm slowly in front of his face and then dropping it, so that the wrist fell heavily on the bridge of his nose. The act did not occur every night, but occasionally only, and never except during sound sleep. Sometimes it was repeated incessantly for an hour or more, and the bridge of the nose, which was prominent, often became sore. Many years after his death his son married, and the wife found that he practised with his right hand the same action as his father. It does not occur in him when he is half-asleep, as for example when dozing in his chair, but the moment he is fast asleep it is apt to begin. It is also intermittent in him as it was in his father, sometimes ceasing for many nights, and sometimes almost incessant during a part of every night. A granddaughter of the first, and a daughter of the second instance, of tender age, a "girl" and "child" performs the same action under the same conditions, with this difference, that the palm of the half-closed hand falls over and down the nose, striking it rather rapidly, and not the wrist.* In this case it is probable the order of events was thus:—During waking the grandfather or his parent practised the act of stroking the chin or face; this was reproduced as a reflex act during a sleep in which there was more synetic impressibility than usual, and so the synesis was intensified. Then, when the same condition recurred, being in some degree morbid, the acts would recur. Hence as the quasi-morbid brain-state intermitted, the action in sleep would intermit, and as the concurrence of the brain-state of sound sleep was necessary to the morbid activity, the acts would not recur during the half-waking condition.

Like phenomena occur in analogous morbid states of consciousness. I attended a glass-blower with typhus, who was delirious and who could not be got to drink, because the moment the cup or glass touched his lips he began to blow from peripheral reflex action. An analogous case of centric reflex action has been published by Dr. Hughlings Jackson. A

* The Expression of the Emotions in Man and Animals, by Charles Darwin, M.A., &c., &c., p. 33, note.

man deeply comatose from hæmorrhage frequently raised his left arm and with his hand would curl or twist his moustache with remarkable "grace and regularity." On inquiry this was found to have been a confirmed habit when in health; he was a militia sergeant.* Here the substrata were left untouched by the cause of the coma.

These considerations point out the need of discriminating the conditions under which synetic reversion occurs. In ordinary recollection there must be the association of ideas, so-called, which is in fact the state of consciousness which corresponds to the successional reproduction of associated synesies, and these must be induced by the impact of some external or internal affinitive impression. To this end it is necessary that the ganglia which are the recipients of impressions, be more or less capable of functional activity. Now, in sound sleep the senses are closed, and no impressions are active, while in half-sleep they are so far closed that the perception of external things, the sources of external impressions, is not induced, and therewith dreaming results. But internal impressions, which are equally causes of activity of brain-tissue, are freely received from the viscera, from the blood, and from things contained in the blood, and thus automatic cerebral activity is induced, when external impressions are shut out, with the motor and ideational results which characterise ordinary dreaming, but without production of reminiscent synesies. Hence it is that dreams are not remembered unless immediately reproduced on waking, and thought over during the full-waking state.

There still remains, however, the inquiry why dreaming is so completely a state of delusions and hallucinations closely resembling those of the insane and the delirious. The laws of evolution and reversion may help to an understanding. In true sleep there is cessation of evolution, or else cessation of cerebral activity in the more highly, which means the last evolved, substrata, unless the sleep be in the morning after waking from the true sleep, when the higher substrata are often the more active. In proportion as the higher substrata are inactive the lower and antecedent will be energetic if they be kept awake and active by any impressions reaching from either without or within, and the sleeper dreams accordingly. But at this time, the senses being inactive, there is no perception of time or place, or fitness, such as

* "Med. Times and Gazette," May 15, 1875.

belongs to the higher substrata. Consequently when earlier long past substrata are reproduced, or associations of recent substrata are thrown into new forms or imaginations, the absence of perception renders comparison impossible, and so there is no reminiscence, and no teaching that the whole series of thoughts, images, and the like, are phantasmal.

Hence the hallucinations and delusions of the mesmerised, the dreamer, and the insane have a common origin in a defective comparison of what now is with what is organically anticipated as an imagination or a foreboding, or reproduced as a reversion. The same law applies to perceptions of lapse of time, and of extent of space as to events and forms of things, and to the "me" and the "not me," or personal identity.

We can also say conclusively that if the brain be intensely active with some present thoughts, there will be little or no synesis as to present external things or associated reversion to past substrata, and thus a defect of memory, such as attends on dreams, will occur during waking-thought. On the other hand, if at any time during waking from any conditions of brain-tissue external conditions are less intensely active, as in sleep, there may or will be a going back or reversion to a lower and earlier range of substrata developed under other and different external conditions. We may, therefore, reasonably conclude that when men or animals manifest impulses of an unaccountable character, and experience pleasures, and sympathies, and pains, and antipathies which seem to be out of relation to their culture and personal experience, or to the culture of the family or the race, whether in dreams or when waking, the source of these must be found in long-past or ancestral memories reproduced according to the law of reversion; but being out of relation to the external conditions of the individual, and not, therefore, developed by reflex action due to external impressions, they are not revived as knowledge.

VI.—The pleasures and pains of memory have often been discussed. Painful synesies are apt to become very permanent, and may be continued in the individual for a life-long period, as likes and dislikes, as well as bodily griefs and joys. They may be transmitted also as substrata from remote ancestors. Time (during which evolution takes place) is the great healer of griefs, and however closely the grief may be hugged it finally vanishes beneath later synesies.

“ Lo, for a little while a burning pain ;
 Then yearning unfulfilled a little space ;
 Then tender memories of a well-loved face
 In quiet hours ; and then—forgetfulness.”*

It would seem as if with evolution of brain, when succeeding events are added to organic memory with pleasure or with pain, the dynamic changes occur normally in the latest evolved synesies, and so the past with its feelings has to yield to each succeeding present as in its turn it becomes the past. Should, however, any morbid or *quasi* morbid condition (such as sleep) sweep over the more recent substrata then the distant in time will re-appear, and reminiscences of the past be produced, with their hopes, and fears, and feelings.

Pleasurable and painful reminiscences will be manifested according as the state of brain is vigorous or not. Pain and grief mean defective energy, and therewith not unfrequently the bodily health is affected. Painful reminiscences are apt to occur in that state of cerebral health known as “low spirits,” “depression,” and the like, and which is induced by numerous bodily disorders, as by over-fatigue of brain or of body, by defective food-supply, want of sleep, even by too deep sleep, and exposure to a high atmospheric temperature ; in short, by any conditions which depress the vital power in general, and that of the brain in particular. The case of Miss B., quoted in the Report of the Royal Edinburgh Asylum for 1871, is an example of this recurrence in insanity. She became insane for the first time about the age of twenty, and her insanity was then attributed to the mental agitation induced by a disappointment in her affections. From this attack she quite recovered, and remained well for nearly thirty years, at the end of which period she again experienced much bodily fatigue and mental anxiety on account of certain business reverses. She again became insane under these circumstances, and while insane reverted to her former early grief, bewailing the disappointment she then experienced. In this instance the patient died, her strength being worn out by the supervention of bronchitis on a constitution exhausted by mental and nervous disorders.

But there is a form of reminiscence which is not due to strictly pathological conditions, because it occurs in what may be termed a physiological or natural order.

In this class of cases there are usually definite reminiscences as to ideas, feelings, and events ; but there may be

* William Morris, in “Bellerophon at Argos.”

reproduction of synesies without perception of the associated events, that is to say, without reminiscences, but with pleasurable or painful feelings. Abundant illustrations might be given of this kind of reminiscence from all departments of mental life and culture. Such, for example, are those returns to the faith of childhood shown in later years, and when dying by persons who, in the prime of intellect, have changed their beliefs. Such, also, are the proverbial returns to the first love or the pursuits of youth shown by many. As to purely intellectual work, it is very well known to authors. An author intimately known to me had, in his younger days, worked out a subject, written fully upon it, and published his views in an unsigned article of a quarterly review. In after years, when he re-perused his writings, he had no recollection whatever that they were his own. All that he experienced in the re-perusal was a feeling of gratification, and often of approval of the excellence of the composition, the justness of the arguments, and the clearness of the ideas. He was, in truth, the heir of his own synesies, and was thus constituted the unconsciously prejudiced judge of his own works. In his old age Linnæus took pleasure in reading his own works, but, forgetting that he was the author, frequently exclaimed, when so engaged, "How interesting! How beautiful! I wish I had written that!" One evening a lady on a visit at Abbotsford sung a song, which pleased Sir W. Scott very much, and when she had finished he went to her to express his delight with the words, and to ask the name of the writer. It was one of his own songs from "The Pirate." The memory of Walter Savage Landor was peculiar in this respect. He sold a fine family estate to buy that of Llanthony, in South Wales. Some years afterwards, while looking at a very beautiful spot on the banks of the Trent called Carwardine Spring, he exclaimed to a friend at his side, "Why the deuce did not I buy this place, and build my house here instead of that confounded Llanthony?" "Rather," said his friend, "why did you *sell* this place, which had been in your family for centuries?"* Here the process is the same as in the preceding: there was a pleasurable reminiscence, but simply as approval and not with reminiscence as to the knowledge of "mine" antecedently. There are, however, failures of memory as to both the mine and the not mine. Landor often denied that he was the author of what he had written,

* "A Book of Memories of Great Men and Women." By S. C. Hall, F.S.A., vol. x., 1871, p. 212.

but, on the other hand, he was in danger of appropriating the writings of others as his own. He was wholly unconscious that he had ever read his brother Robert's three tragedies published in 1824; yet in his "Andrea of Hungary" he has manifestly reproduced events, scenes, and characters of his brother's as his own invention.*

A living man of science seems to have this infirmity, and charges of plagiarism are undoubtedly incurred from time to time because of this combination of defective reminiscence of *tuum*, and intense synesis as to *meum*. There is "unconscious cerebration" in the form of unconscious assimilation. Nor is it peculiar to poets, authors, and scientific inquirers. Doctrines and facts in politics, at first stoutly questioned and repudiated, then hesitatingly admitted, are finally appropriated and declared to have been well known and approved before. An officer in conversation with President Johnson told him that it was industriously circulated in the Democratic clubs that he was going over to them. He laughingly replied, "Major, have you never known a man who for many years had differed from your views because you were in advance of him, claim them as his own when he came up to your standpoint?" The officer remarked, "I have often." Johnson said, "So have I."

These facts and generalisations necessarily raise the great question as to the organic conditions upon which pleasure and pain depend; and more especially as to the relations of these conditions to memory, whether as synesis or reproduction. A few words may help to elucidate the question. There are two classes of organic conditions considered as *substrata* and *synesies*. Upon the one associations of ideas depend; on the other, associations of muscular acts or habits. Now it is found that if we restrain the manifestation of the latter, or introduce into them disorder, we cause the state of consciousness termed painful, although there is no *perceived* feeling of pleasure at the time of performance. On the contrary, there may be no consciousness whatever, yet restraint will still cause a painful feeling. Hence we may conclude that the frequent recall (or repetition) of encephalic *synesies* will, even if they were originally rather painful than pleasurable, be accompanied by a pleasurable feeling, although there be no reminiscence or knowledge. It must always be remembered, however, that the recall or repetition never occurs spontaneously, that is to say, volitionally; it is always automatic

* See "Landor's Biography." By J. Forster, vol. ii., p. 365.

and reflex, and needs therefore the impulse of affinitive impressions.

It seems probable, however, that synesies associated with foresight and with feelings of pain in regard to self and anticipation of injury, do not become pleasurable habitual, how often soever they may be repeated. This is seen in the acquired instincts for self-preservation. All that may be said to result is comprised in the proverb "familiarity breeds contempt." This kind of synesis and of recall often occurs in individuals as vague presentiments of evil, but with no reminiscence of the events or trains of thought by which the anticipation of evil was reached. Sometimes it is an unaccountable feeling of antipathy. There have been thoughts as to the future founded on facts and circumstances, but there has been no sufficient synesis as to these, and so there is no reminiscence. Not unfrequently, however, if attention be directed energetically to the recall, then these latter may at last be remembered. That such states of consciousness may be due to ancestral reversion is shown by various facts. Many years ago I learnt from keepers in Wombwell's menagerie that the straw used for bedding the lions and tigers could not be used for horses, because the odour terrified them when introduced into the stables. Many generations of domestic ancestry must have succeeded each other since the wild horse, from which we may suppose the domestic animal to have descended, was exposed to the attacks of these felines. The descendants of an eminent philosopher lately deceased are known to inherit a causeless foreboding of this class. "A strange fear of drowning had pervaded Dr. [Sir D.] Brewster's life. He always believed that he himself was to perish in that way, a fear which strangely enough was discovered to haunt the minds of more than one of his descendants, even when too youthful to be prepossessed by any knowledge of others having felt the same."*

No explanation is given of the foreboding felt by Sir David himself, but it was probably due to a synesis of a dream, either of drowning or of an anticipated danger to life from water. That such forebodings and numerous delusions and hallucinations of the insane arise in this way is, I think, certain. In many individuals the reminiscent reversion to waking synesies occurs only during special conditions of brain-tissue, such as characterise sleep and

* "The Home Life of Sir David Brewster, by his Daughter (Mrs. Gordon)." 869, p. 137.

dreaming, somnambulism, mesmerism, and insanity. Hawthorne relates an instance of foreboding giving rise to "instinctive" caution during dreaming. "A person while awake and in the business of life was accustomed to think highly of another, and placed perfect confidence in him, but to be troubled with dreams in which this seeming friend appears to act the part of a most deadly enemy. Finally, it is discovered that the dream-character is the true one. The explanation would be the soul's instinctive perception."* The physiological explanation is that the dreamer either thought out the problems during sleep, or else during waking, without reminiscence of having thought. To the same class may be referred another story Hawthorne relates of instinctive antipathy (vol. ii, p. 67).

It seems more than probable that certain vague pleasurable and painful states may be due to ancestral reversion, although definite perceptions and notions may not. Thus the sight of any particular object or class of objects may be pleasurable or painful, because they were so to ancestors. Hence mountains and hills may be pleasing to descendants of highland ancestry, and plains and broad rivers to the descendants of tribes that have long roamed over broad plains, or dwelt by broad rivers. It is not necessary that such external conditions should be absolutely beautiful or pleasurable. There is a law of habit in feelings as well as in actions, so that impressions habitually felt by the individual become at last pleasurable; even although they may not have been such primarily, nor are such in their nature. Many illustrations of this law might be adduced. I subjoin one as to ancestral reversions. "Now we began to feel that we were really in Lapland, for ahead of us on the other margin of the lake lay tall hills, the boundary, as it were, of the fjells; you have but to ascend them to come to the great tract of country covered almost entirely with perpetual snow, on which the Lapps rejoice to be, and on which alone, surrounded by desolation and snow, they are happy.†

Similar statements in support of ancestral reminiscences are to be met with in books. Thus Captain Hutchinson, R.A., remarks in his "Try Cracow and the Carpathians" that "the Hungarian differs equally from German and Slav. Like his Asiatic ancestor, the Hun, he hates the mountains, and will live only on the plains where there is plenty of room for

* Passages from the American Note Book of Nath. Hawthorne, vol. i, p. 268.

† Up in the North, by Thomas Shairp, 1872, p. 116.

him to gallop about on his horse" (p. 173). Again, "As a rule, Hungarians never go up mountains; they hate them. Immense plains are their admiration. . . . The general opinion [of Hungarians] was that England must be very ugly on account of the land being cut up by gentlemen's parks, fields, &c. (p. 189). In this way many prejudices, antipathies and æsthetic sentiments are due to ancestral substrata.

A fact drawn from the influences of the external conditions of a great city on an individual may contrast usefully with this. It is to be found on p. 243 of Mr. Shairp's book. "My friend (in Switzerland) himself lost in admiration of some grand prospect, the only disturbing influence being the murmur of a distant force, was recalled to a recollection of his 'native heath' by the following dialogue:—*First Cockney*, 'I say, Bill!' *Second Cockney*, 'Well, Arry?' *First Cockney*, 'Don't that noise remind you of a 'bus rolling down Cheapside?' Doubtless, the reminiscence was as pleasant to the speaker, as that of snowy fields would be to the Lapp, and of his native hills and heather to the relater."

Numerous illustrations of this law of correlative evolution and reversion might be adduced. Some ancestral synesies recur only in infancy or youth, that is to say, previously to complete evolution of brain. Mr. Darwin, discussing the habit of shrugging the shoulders, so much more common with continental people than the British, mentions the case of a little girl communicated to him by a medical professor and excellent observer, who was observed to shrug her shoulders at the age of between sixteen and eighteen months, her mother exclaiming at the time "Look at the little French girl shrugging her shoulders." The habit gradually ceased, so that when a little over four years old she was never seen to shrug. She practised also a similar action when she impatiently wanted something, viz., she holds out her hand, and rapidly rubs the thumb against the index and middle fingers; now her paternal grandfather frequently performed the same act under the same circumstances, and being a Parisian the shrugging was attributed, and correctly, to her descent from him. Her maternal ancestors were all of British nationality.*

In this history another law is indicated, viz., that of reversion to synesies under emotional states. I knew intimately a very highly intellectual man, who in childhood and youth spoke vernacular broad Scotch, but who, by

* Darwin, *op. cit.*, p. 265.

diligent culture, had overcome the habit. When, however, he was *emotionally* argumentative, he invariably expressed his dissent by an emphatic "Na! Na!" instead of his usual "No!" This kind of emotional reversion is very common in those cases of cerebral disease, in which the semeiotic or sign-forming tissues are involved, and speech is affected, lately named *aphasia*. A very striking example of general reversion under emotional states is seen in danger of death from drowning, or under other conditions, in which death and the future life to follow are immediately anticipated. The emotionally anticipated future is said to be connected with a reversion to the whole past life.

VII.—It is, however, in those forms of hereditary tendency to defective nutrition of the higher convolutions with, at the same time, an insane and inexplicable reversion to lower and animal substrata that the law of correlative evolution and reversion is most strikingly illustrated. Evolutional mental energy is only normally possible with correlative nutritional energy, and this last may be, and often is, exhausted by excessive culture of the higher sentiments, feelings, and faculties. Such an imperfect nutritional energy is sometimes transmitted to offspring, and then the son of a genius is little better than an imbecile. This evolutional defect is common to all kinds of defective nutrient energy of organs and tissues. Thus Mr. Darwin mentions the fact that the progeny of two top-knotted canaries are generally developed with heads quite bare of feathers. Again, if that part of the brain subservient to the animal and lower appetites and passions be well-nourished, while the portion subservient to the moral sentiments be defective in nutritional energy if developed, or else imperfectly developed, then there will be a predominant manifestation of the lower instincts. Hence, not only are genius and goodness not hereditary, except under fitting conditions of brain-work of parents, but if both parents have put too great strain by culture on the nutrition of any portion of the convolutions subservient to higher mental evolution there may be a want of that culture in their children. It thus happens that the union of persons of high religious culture by ancestral descent, and the intermarriage of religious families so strangely end in the production of children totally devoid of moral sense and religious sentiment—moral imbeciles in short. What, however, is only a temporary defective state of nutrition in the parent may be a hereditary tendency to

defective nutrition in the offspring. So that high culture of the brain, of the nerves, and even of the body, tends, when carried beyond a certain point, to defective evolutionary energy and to correlative degeneration, or reversion to an ancestrally lower, or prior type. That this is a cause of insanity in many cases of the hereditary class is amongst the most certain facts of etiology. The lower or animal instincts and appetites are reversionally active, and are unrestrained, because the higher sentiments are evolutionally defective.

The facts of immoral dreaming are confirmatory of this view. Few persons who dream are ignorant of the fact that acts are done in dreams of the most grossly immoral character, without reproof of conscience, or a perception of their immorality during the dream. These come on awaking, so that I have been consulted more than once by persons of a highly religious turn of mind, because of these, to them, hideously immoral dreams. But the cause is not far to seek. During sleep the substrata of the higher sentiments are inactive in the dream; hence no corresponding association of ideas can arise organically to inhibit the immoralities due to the excitation of the lower instincts. In these dreams the state is temporary; in the morally imbecile it is permanent.

The reversions thus due to defective evolution and nutrition may be traced beyond immediate ancestors to substrata of the race acquired during savage life in long-distant ages; when the conduct is that of uncivilized man. Or if it be assumed that the origin of the early races of man is from lower animals (vertebrates) through anthropoid apes, then the degenerate men may be said to manifest simply brute habits and instincts. That there are idiots and imbeciles of this kind is certain, so that I formerly distinguished them by the term *theroid*—*θηρ*, a brute animal, the root of the German *thier*, and of our *deer*.*

These theroid idiots are most illustrative when there is a reversion to brute-like characteristics of form, as well as of mind. There are, however, theroid imbeciles, who offer no signs of reversion morphologically. In like manner, there are cases of insanity in which the dominant aberrations are theroid. These occur chiefly in persons predisposed hereditarily to defective cerebral nutrition, and in whom a moral shock has been the exciting cause. This class of degenerations are characterised by insane impulses, or tendencies to abandon

* See this question discussed in my lecture "On the Naming and Classification of Mental Diseases and Defects," "Journal of Mental Science," July, 1863.

society and to seek society of the lowest grade; to wander in woods and wild places (wandering melancholia); to live as hermits in caves, unwashed and unkempt; to follow savage impulses, as cannibalism and sanguinary mania; to imitate ferocious instincts, as lycanthropia, vampyrism, and the practices of men like the Agharee caste of Hindoos, who are said to go naked, eat filth, and pick the flesh from a human skull.

This class of reversion bears closely upon a social problem of great difficulty and importance, viz., that of the dangerous classes of great cities. That many, if not the majority of these criminals are moral imbeciles is certain, but besides these there is a mass of degenerate beings in civilized communities, who, without being criminal *ex confesso*, are savages in all but speech, dress, and name. In these similar causes are at work, as in individuals, so as to arrest on the one hand the higher evolution, and on the other develop reversion, but they are, perhaps, more physical—drunkenness and starvation being more common as causes, combined with the absence of stimuli to activity of the higher sentiments.

The permanence of the substrata of savage life is well illustrated by the ready return to savage life of men who have been educated from infancy in all the habits and requirements of civilization. I formerly gave an illustration of this in the case of an educated Indian missionary when witnessing an Indian war dance.* The like has been experienced in cases of educated Africans and Australians. M. Huc† remarks that the Lamas or Buddhist monks drawn from the Tartar Mongols, whenever set free from the constraint and confinement of the Lamanesque life revelled in the independent life of nomads in their tents. So strongly were the nomadic impulses excited in many of these Tartar monks, that even fixity of tent was insupportable, and they would take it down, and set it up again many times in a day. In these examples we have an illustration of the frolicsome vivacity of healthy young persons when, away from civil life and work, they come into contact and converse with nature. It is the incidence of nature's external conditions, which revives the ancestral relations to nature. In this respect—*i.e.*, as to the presence of excitants of the reflex acts, the cases differ from those in which the desire arises internally for the performance of the acts or impulses. It is to the latter that the rule

* See appendix to my Essay on the Reflex Function of the Brain for this and other illustrations.

† Travels in Tartary, Thibet, &c., vol. ii, p. 88.

of culture applies more especially—culture standing for higher development.

VIII.—As to all the preceding phenomena we can observe, record, compare, and deduce from facts within the reach of observation. The laws which determine the evolution and culture of a plant and its reversion to its wild or uncultivated state, apply to the lower animals and to mankind. It is clear, too, that certain states of feeling, as of pleasure and pain, antipathies and sympathies, prejudices and prepossessions, occur in consequence of the reproduction of ancestral substrata, but without that knowledge of pre-existence upon which reminiscence depends. The question arises, however, whether there can be reproduction with such a feeling of ancestral personal existence as will give rise to the notion of a *continued* pre-existence, or, in other words, that notion which constitutes personal identity or “the ego.”

In seeking for, and classifying suitable facts, it is necessary to bear in mind that the brain-tissue involved is that upon which not only consciousness, as the ego of the metaphysician, but all true thought depends. Such thought deals with generalisations, which are abstract ideas, and *quâ* the individual thinker have no existence except in his consciousness. Time and space, and matter and force may exist as apart from the thinker, but to him as ideas they can only exist as *he* thinks by his brain. Consequently, it is evolution of the hemispheres, in regard to abstract ideas of time past and time future, of person, number, events, and causes, that we have to consider if we would solve the problem of reversion to ancestral modes of thought. The facts have, therefore, to be sought—not in definite ideas, but in obscure feelings and intuitions as to some distant existence mentally in the past, which can serve to the evolution of ideas, and of philosophical systems as to the origin and existence of the individual and his surroundings in the past. Dr. J. D. Morell has illustrated how this may happen in his chapter on “Preconscious Mental Activity,”* in which he considers facts and doctrines like those stated *ante* as proving preconscious mental activities, and concludes that they are due to an “unconscious soul,” which comes into existence as a “distinct individuality” at the moment of conception (p. 53). There is no reason *à priori* against the conclusion that definite notions derived from

* “An Introduction to Mental Philosophy on the Inductive Method,” 1862, p. 46.

ancestral substrata may arise; the recurrence of habitual acts, and of forebodings like that of Sir D. Brewster, are not less improbable. The difficulty is to prove the recurrence as a fact by tracing their origin back to ancestors.

The occurrence of vague notions of a past mental existence is very common, and the majority have probably their origin in dreams or in forgotten thoughts, but not being traceable to the present life they are referred to some state of mental life passed through by "the soul" before birth. This, indeed, is so common a conclusion, and has been so often thought out, that numerous and widespread systems of religion and philosophy, and especially the doctrine of the pre-existence of the human soul, has been evolved in all ages. It is still current in India, where it pervades the popular belief, and it obviously gave rise to the question put to Christ when he was asked, "Master, who did sin, this man or his parents, that he was born blind?" For the man could only have sinned in a previous state of existence. Mr. Dallas, who adopts the doctrine, observes* that he who in modern times has most emphatically expressed this idea is Wordsworth, who not only held to the pre-existence of the human soul, but to its origin from God. He remarks in the finest of his poems—

The soul that rises with us, our life's star,
Hath had elsewhere its setting, And cometh from afar,
Not in entire forgetfulness, And not in utter nakedness,
But trailing clouds of glory do we come
From God, who is our home.

In thinking out these various problems man seems to have concluded, at a very early period of philosophy, that a continuous future life must necessarily be connected naturally and not supernaturally with past terrestrial life. Two systems of religious philosophy arose out of this fundamental principle, which (it is plain) is soundly logical; one which, taking into consideration the obvious similarities between mankind and brute-kind, reincarnated the departing souls in the bodies of animals, thus establishing the hypothesis of transmigration; whereas, the other, restricting the re-incarnation to mankind exclusively, adopted the hypothesis that the soul at death passed into the bodies of infants. The former dogma implied that animals are endowed with souls. I have referred to that doctrine elsewhere.† It was by the converse of this doctrine, viz., that animals had not souls—a soul being held to be the exclusive endowment of man—that Descartes

* The "Gay Science," vol. i., p. 220. † Mind and Brain, vol. i. p. 68.

explained the automatic action of the brain. What Dr. Carpenter attributes to a "self-determining power," named the will, Descartes attributed to "the soul."

It is a fact of singular psychological interest that there is at the present time in France a reversion to the ancient doctrines of metempsychosis, and of the evolution and transmigration of souls. They are propagated by a school of theologians sufficiently important to be denounced in 1857 to the Papal chair by a council of French prelates; previously to which date a priest named Jean Reynaud, in a work entitled "Terre et Ciel," eloquently developed a system of religious philosophy, which is avowedly a reproduction of Druidical metaphysics. Like others who have speculated on these questions, and whose knowledge is more astronomical or cosmological than biological, he mingles his speculations with the hypothesis of a plurality of inhabited worlds. Camille Flammarion is, perhaps, the most popular writer of this astral or universe-school. His treatise, "*La Pluralité des Mondes habités*," is now (1872) in its seventeenth edition, and his "*Les Mondes Imaginaires et les Mondes réels*" is in its tenth edition. The most concise, learned, and readable book on the whole subject is that of a French advocate of Lyons, named André Pezzani, entitled "*La Pluralité des Existences de l'Ame, conforme à la doctrine de la Pluralité des Mondes; Opinions des Philosophes anciens et modernes, sacres et profanes, depuis les Origines de la Philosophie jusqu'à nos Jours*." Fifth Ed. 1872.

When the facts of biology more predominantly occupy the thoughts of the speculator, the law of vital continuity evolves and the doctrine is developed that a future life is of necessity continuous with terrestrial life. Monads, germs, and other things capable of evolution are the continuing means of one class of biological pre-existences. St. Paul, an eminent philosopher of his day, explains the resurrection as the continuance of terrestrial life through a germ, out of which the new body will evolve. Amongst modern philosophers of this school may be named Charles Bonnet, one of the most penetrating and sagacious intellects of his age, who promulgated a modified biological doctrine of Palingenesis.* According to the ancient doctrine, if the ashes of a plant or an animal be treated according to certain rules, there will be seen in the smoke its soul, produced as the colour and form of the

* "*La Palingenesis philosophique: ou, Idées sur l'Etat passé et sur l'Etat futur des Etres vivans*." 2 Tom., 8vo. 1769.

plant or the animal. Again, if the ashes of a plant be frozen, the soul-form of the plant will be exactly represented in the ice. This was termed a re-birth or re-generation of the plant or animal—*palin*, again; *genesis*, birth. In his "*Palingenies philosophique*," Bonnet, setting aside these fables, gives the notion a biological basis by assuming that in every animal there is a microscopic indestructible germ to which its soul is united, and which contains and maintains the personality of the animal, just as the egg or seed contains the future body, and which enables it to enjoy a future life—a view obviously and intended to be applicable to the philosophy of the resurrection of mankind, as taught by St. Paul. The future body of the animal will be wholly different from its past and grosser body, being a superior mechanism, and requiring less repair. This improvement will take place according to a law of evolution to greater perfection; so that in the "restitution" of animals, as Bonnet terms it, man, having attained to a higher perfection, elephants and apes with their Newtons and Leibnitzs will take his place; beavers with their Perraults and Vaubans, &c. The germs might also undergo a sort of transmigration; for Bonnet says that they may enter into a body and remain there until the moment of decomposition, then pass without the least change into another body, from this into a third, &c. "I can very readily conceive," he says, "that the soul-germ of an elephant may first be lodged in a particle of earth, thence it may pass into a bud of fruit, thence into the thigh of a mite," &c. Bonnet also held most clearly the doctrine of soul-evolution and development, and of plurality of existence to their utmost limits. There were many worlds, and in each world scales of existences. But each existence was in itself a scale of existence, "et toutes ne composent qu'une seul suite qui a pour premier terme, l'atôme, et pour dernier terme, le plus élevé des chérubims."*

This hypothesis of evolution from germ-atoms through terrestrial life into a celestial and invisible sphere of existence ("the unseen universe," as it has lately been termed in a remarkably speculative book, in which the idea of the evolution and conservation of energy is the starting-point),† has had its fullest development in Louis Figuer's book, "The Day after Death."‡ Figuer advocates the doctrine of the re-incarnation

* "Contemplation de la Nature," vol. i., p. 29.

† "The Unseen Universe; or Physical Speculations on a Future State." 1875.

‡ "Le Lendemain de la Mort: ou, la Vie futur selon la Science. Ouvrage accompagné de 10 Figures d'Astronomie." 2nd Ed. 1872.

of impure souls in the bodies of infants. He shows also the origin of a soul that animal germs are contained in plants and zoophytes, which pass at the death of the latter into the body of the organisms next in the scale of development, and so onwards in ascending succession, the rudimentary soul becoming more and more developed at each stage, until, emerging from the body of a mammal belonging to the superior species, the soul passes into the body of a newly-born infant. If the infant dies, aged under one year, its soul passes to another newly-born infant. When an adult dies with his soul sufficiently pure, it rises through the earth's atmosphere to the ether, to enter into the body of an angel or "super-human being." In this stage it undergoes a fresh series of evolutions, through an archangel or "arch-super-human being," until it becomes a "spiritualised being." This stage ends by its dissolving into its elements in the sun, whence they descend as emanations of its essence in the form of "animated germs," ready to enter plants and zoophytes, and go through the series of successional changes in their order. If the soul of an adult man be not sufficiently "ennobled and pure" at death, it must re-enter a newly-born child as often as need be. Plates illustrative of recent researches in Solar Science elucidate the text.

It would be easy to multiply illustrations of this kind of brain-work to any extent. Those given will suffice for my purpose, which is to show how the evolutionary development of an abstract idea gathers around it all the knowledge available to that evolution, or, rather, all the substrata which correspond to the knowledge in the individual. So that the ancient theory of living things being developed out of the mud of the Nile, and those now current which begin with elementary atoms, or with an infusion of hay are evolved according to the same cerebral process. It is by a similar process, therefore, that the morbid brain will work on the intuition of a previous existence. Since the two cases I subjoin were of persons with biblical knowledge we have in them the evolution taking a corresponding form.

1. Dr. Skae informed me that he had a patient in the Royal Edinburgh Asylum, a naval captain (and Dr. Clouston confirms the facts), who believed he had had a continuous existence of many thousands of years. He was formerly well acquainted with Methuselah, Noah, and other patriarchs and historical persons. He fluently described the characters of these persons as known to him when they were in life. He

knew Noah, for example, from his boyhood, who was a most genial fellow, but unfortunately he carried his geniality a little too far and fell into dissipated habits. He held also the doctrine of metempsychosis, and could tell persons then living through what animals their souls had passed. This conclusion was evidently founded upon some animal resemblance he perceived. Thus (as Dr. Clouston informs me) one of the assistant-physicians, who had a somewhat long and sloping nose, had to the patient's knowledge previously passed through life as a snipe. He had frequently changed his personal identity. Was formerly Alexander the Great, was lately the author of the Waverley novels, which he wrote several centuries ago to amuse his children, and finally Tiberius Cæsar, "Lord of Rome." He dealt with millions and increased the length of his past life as his mental disorder advanced. He commanded an army of 70,000,000, fourteen thousand years ago, and fought an equal number of the Macedonian army in Persia. A wound received many hundreds of years ago is still unhealed, and he had not had a good night's sleep for 1,200 years. He mixed up cosmological events with his personal histories; being 20,000 years old, he described the pre-historic periods of the earth, and knew of three floods greater than Noah's. He died of apoplexy, after 27 years' residence in the asylum.

2. Dr. Clouston introduced me lately to a gentleman under his care, who informed me that he is the prophet Elias, but was re-incarnated in the belly of his mother fifty-five years ago, when he was born as W— A— G—. He had been also other biblical prophets, as Malachi, &c. His conversation was incoherent, but he made reference to his biography which had been distributed through the earth and the heavens, indicating that cosmical ideas were being evolved with the others. The subjoined writing was elicited as an order to the General Assembly of the Church of Scotland then sitting; it gives an idea of the organic association of ideas:—"Executed to day 20th May, 1875. Royal Asylum, Morningside. At the Divine Earthly Hierarchy * * * 1. Execute to the 2 Gods, the 2 Christs, human born of the Virgin Mary, viz., W— A— G—. Prophet Elias, &c., &c. Divinity, Divinity, and to S— P— M— alike Prophet Elias, Divinity, Divinity, to each personally a gift for 3,000,000,000,000 (Three Billions) of times, 11,000,000 (Eleven Millions) of times, 46 times one Million, Eight hundred thousands Trillions of times, the value of every

gift," &c. 2. "Then disburse this gift order to all classes of persons of The Universe 2 Worlds, so called, at grades rank, a gift to each personally, a gift also to the Spiritual Divinities according to their grades rank, &c." "By order as prefaced W— A— G— Prophet Elias, &c., &c., Prince, &c., and Duke of Bordeaux of France, Rex William 5th of Great Britain and Ireland absent on sick leave. King of Kings, Lord of Lords, and God of Gods of the Holy Bible," &c.

If this patient had had his attention directed to his reminiscences instead of to his powers as the Prophet Elias, a more instructive transcript of brain-work would probably have been the result. Comparing it with that of the case of general paralysis detailed *ante*, it is seen that while in the latter the reversion was to birth, with theological and cosmical ideas, and infinity as to numbers (Fig. 6), in this case it transcends birth ideationally. In the first case the feeling of pre-existence evolved the idea of continuous existence; how far cosmical and infinitesimal ideas were associated is not on record.

In comparing the phenomena of reversion as seen in bodies of men and in nations, the element of race is of primary importance, because the reversions will be to racial modes of thought. Thus the avowed return to metempsychosis and the grafting of Druidical metaphysics on Christian theology and modern science observed in France, must be taken in connection with the attempted return by the French Communists to tribal and dissevered communities as the best social organisation. In both the theology and the politics we recognise mental characteristics of the inhabitants of ancient Gaul and perhaps of the Celtic races generally.

Beyond all these accumulated racial characteristics and their manifestations from time to time, as evolutions and reversions, the laws of cerebral development common to every race have to be considered. This would, however, lead to a discussion of the principles upon which systems of philosophy and of social organisation are evolved, and of the reason why history repeats itself in both philosophy, theology, and national growth—a subject too large for a short essay. It is enough to say here that such discussions would show that the organic laws of personal and ancestral races may apply equally to these general phenomena of the human mind.