## *The Data of Alienism.* By Charles Mercier, M.B. (Lond.), F.R.C.S.

### I.

If I fix a square peg into an oblong hole, the fact that they do not fit is instantly perceptible; but it is manifest that the several percepts of the peg and of the hole must precede the perception of the relation of non-adjustment subsisting between them. Furthermore, if I want to determine how much the peg lacks in size, I must measure separately both the peg and the hole before I can calculate the amount of the hiatus between them. What is true of this simple case of adjustment is true of the complex case of the adjustment of the organism to its environment. However rapid and apparently immediate may be the cognition that a patient is insane—is unadjusted to his environment—yet that cognition must be preceded by a previous knowledge both of the organism itself and of the environment with which his adjustment has failed. The truth of this statement, which is involved in the definition of Insanity, may not be at once apparent, but a little consideration will render it clear. It is manifest that before pronouncing a man insane, we must first know something about him, but that we must also take into account his environment is, perhaps, not so self-evident.

If a man states that he is worth a large sum of money, and talks of his palaces and gardens, we cannot regard this as evidence of insanity until we have discovered whether or no he is in actual possession of these things; in other words until we have investigated his environment. If a man complain that he has had boiled beef for dinner every day for twenty years, we consider his statement *primâ facie* evidence of insanity; but if upon inquiry we find that, under a stupid military system, it is actually true that he has been so dieted, we learn the necessity of taking account of our patient's environment before concluding that he is insane. In a case of homicide we inquire the relation of the victim to the murderer. If he is a harmless stranger, and the aggressor could not gain by his death, we consider the act that of a madman. If the homicide is in dire want, and the victim is known to have a large sum of money about him, the act is not considered the outcome of insanity. In other words, before deciding the question of sanity we investigate the en-

vironment. In a case of delirious mania, where a patient is stripping himself naked, yelling and rushing about in an objectless manner, it may be said that no reference to the environment is required, but it is just because such exaggerated actions are unsuited to his surroundings that they are considered insane. Children about to bathe, brimming over with spontaneous energy, often exhibit very similar conduct, without any question of their sanity arising. So in every case, the separate consideration of the organism and of its environment must precede the decision of the sanity or insanity of the patient.

Furthermore, just as the determination of the amount of misfit between the peg and the hole required to be preceded by an accurate measurement both of the one and the other, so the determination of the degree of non-adjustment between the organism and its environment, and the description in detail of the particular elements of the failure, must be preceded by a skilled and detailed investigation of the organism on the one hand, and of the environment on the other. Only when we have an adequate knowledge of each term are we able to obtain an accurate concept of the relation existing between them.

Since, as so often stated, the province of the alienist is the process of adjustment of the organism as a whole to its environment, as distinguished from that of the physician, which is the adjustment between the processes going on within the organism, it follows that, in regarding the first term of this relation, the alienist is concerned with the organism in its totality, leaving the investigation of its internal correspondences to the physician. It is true that the alienist must be acquainted with the condition and the results of these internal correspondences, the bodily functions, but these results are not to him, as to the physician, final results. Having received them at the hands of the physician, or having investigated them for himself, it is his business then to use them as data, and, combining them with other data drawn from other sources, to look on them as a starting-point only, from whence he may reach the conclusions proper to his specialty. As the conclusions of the physicist become the data of the physiologist; as the conclusions of the physiologist become the data of the physician; so the conclusions of the physician become the data of the alienist.

The first term, then, of the relation which constitutes the domain of alienism, is the affected organism; but the behest

to contemplate it separately is met at the outset by this objection, that it is impossible to contemplate the organism at all except with some reference to its environment, for it cannot be conceived at all except as having some support, nor conceived as alive except as breathing air; nor is it possible to examine it for the purposes of the alienist without some reference, actual or tacit, to its adjustment to the environment, for the very object of such an examination is to ascertain the fitness of the organism to environmental conditions. For instance, the observation of the non-apposition of the thumb to the fingers has no meaning, except as expressing its fitness to grasp objects in the environment. The observation of a shrunken cerebral convolution has an interest to the physician, irrespective of all reference to the environment, as affecting the power of the patient to appreciate certain impressions or to perform certain movements; which are matters affecting the adjustment of parts of the organism to one another. But the observation of the same pathological fact is of interest to the alienist, as such, only in so far as it affects the power of the patient to entertain certain ideas, or to do certain acts, both of which relate to his adjustment to the environment. If, then, the organism can be studied, for the purposes of the alienist, only with reference to its adjustment to the environment, what, it may be asked, is the difference between the study of insanity itself and the study of its preliminaries? The difference is, that, in contemplating the process of adjustment of the organism to its environment, we contemplate these terms in their dynamical aspect, or as acting and reacting on each other; while in contemplating them separately we consider them in their statical aspect only, or as existing at rest, not indeed as existing simply, but as existing with reference to each other.

Fully stated, then, the first term of the relation with which the alienist has to deal is the Organism at Rest, or considered Statically with reference to its Environment. That is to say, the first step in the investigation of a case of insanity is to examine the structure and functions of the patient, with the view of determining what potentialities he possesses of adjusting himself to his environment. It is clearly advisable to know how far adjustment is possible before inquiring how far these possibilities are fulfilled.

Now the sum total of the characteristics of any organism at any given time are the product of three factors:—the Inherited Organization, the Individual Variation, and the

wear and tear, that is to say, the physiological and pathological changes and deteriorations that occur as life advances.

THE INHERITED ORGANIZATION.—The importance of the influence of Heredity in cases of insanity was recognised almost as soon as the subject began to be studied, and this recognition has become increasingly prominent and formal down to the present day. Every systematic writer on insanity has insisted on it; family groups of the most remarkable character have been recorded; and statistics have been accumulated in abundance. On aggregating all the figures of all the observers whose opportunities for gathering these statistics were fairly favourable, I find the general average of cases in which an undoubted hereditary influence was traced in the direct line, to be one-third (nearly) of the total number of cases observed. In collecting these figures I have, of course, omitted all reference to the ordinary statistical tables published in asylum reports, as the circumstances under which pauper patients are admitted to asylums render even approximate completeness impossible. When it is remembered what a very small proportion of the population know anything whatever about their grandparents, to say nothing of more remote relations; how many know little or nothing about one or both parents, and how strong the feeling is which induces people to conceal the existence of insanity in their own family; it may be safely concluded that the number of discovered cases of hereditary influence are widely discrepant from the total number, even when gathered by those who have the best opportunities of observation. The actual proportion has been variously estimated at from one-fourth to six-sevenths of the total number of cases of insanity, but as accuracy in this matter is impossible, so it is for our purposes immaterial. It is sufficient to know that the proportion is a considerable one, and is probably greater than in any bodily disease except gout.

In estimating the facts of heredity, there are two very distinct influences to take into consideration, and only one of these has hitherto received attention from alienists. There is, first, the influence of the existence in a parent, or progenitor, of qualities having a direct connection with, or an indirect reference to, insanity, which qualities may be transmitted to the offspring, either immediate or remote, in an identical or an allied form; and there is, secondly, the effect on the offspring of the mingling or combination of the quali-

ties of the parents, qualities which may have no direct connection or association with insanity, and yet whose combination may be an important factor in its production.

The universal consensus of opinion as to the importance of the facts of heredity, or at any rate of those of the first order, render unnecessary any prolonged or emphatic insistance on this point, but since no subject can be profitably or intelligently investigated by a mere random accumulation of facts, it is expedient to enumerate the chief laws of heredity as they have been empirically established, in order that the inquirer, knowing clearly what he has to look for, may proceed on definite lines of investigation. I do not undertake to prove these laws. That has been done by far abler hands than mine, and with an accumulation of facts, in nature overwhelming, and in number infinitely multitudinous. But I will adduce under each heading, not in evidence, but as illustrations, a few instances of its application. These instances will, as far as possible, concern the human organism and bear reference to the purposes of the alienist, but since the immense majority of the facts of heredity have been gathered from observations on the lower animals and on plants, occasional illustrations will be drawn from the same sources. Those who accept the doctrine of evolution will need no apology for this course, and those who are opposed to that doctrine will be so fundamentally at variance with the system here advocated, that it is needless to attempt to justify to them a point of minor importance.

*The Law of Inheritance.* The first and most fundamental law of heredity is, that *every attribute of the parents tends to be inherited by the offspring.* Inheritance is the rule, non-inheritance the exception.* It is not said that every attribute is inherited, which would be manifestly false, but that every attribute *tends* to be inherited, and will be unless some opposing influence counteracts this tendency.

As to the general truth of this law, and especially as to

* The law is here stated nearly in the form, and I think almost altogether in the sense which was arrived at by the great biologist whose recent loss the world deplores. Mr. Herbert Spencer states it differently, as follows:—"Understood in its entirety, the law is, that each plant or animal produces others of like kind with itself, the likeness consisting not so much in the repetition of individual traits as in the assumption of the same general structure." It appears to me, however, with much deference to this great thinker, that the form in which I have stated it is more in harmony, not only with the actual facts, but with Mr. Spencer's own expansion (using this term in the mathematical sense) and illustration of the law.

the truth of the more limited form as enunciated by Mr. Spencer, it is not only generally admitted, but it has, to use his own words, "been rendered so familiar by daily illustration as almost to have lost its significance. That wheat produces wheat—that existing oxen have descended from ancestral oxen—that every unfolding organism eventually takes the form of the class, order, genus, and species from which it sprang, is a fact which by force of repetition has acquired in our minds almost the aspect of necessity." But that the same law is true of the smaller attributes down to the most trivial details of structure and function is not so generally admitted, and is even widely disbelieved. As, however, the transmissibility of insanity or of the nervous arrangements which underlie insanity, which is what we are here concerned with, is universally accepted, there is no need to adduce illustrations of this part of the subject. When it is found that so highly specialised a nervous process as that which produces a curiously peculiar movement of the hands when pleased, or that which produces a peculiar attitude during sleep, or a peculiar gait or gesture, is hereditarily transmissible; when it is found that so highly complex a nervous arrangement as that which produces a peculiar handwriting is hereditarily transmissible; it need be no matter of wonder that the comparatively gross and comparatively simple deviation of nervous arrangements which underlies insanity should be similarly transmissible.

When the tendency to the transmission of special parental attributes is interfered with, so that the reproduction of them in the offspring is incomplete, certain uniformities in their appearance can still be traced. The following propositions express the results of the partial operation of the first law of Heredity:—

*An attribute which appeared in the parent at a certain period of life tends to appear in the offspring at a corresponding period of life.* The successive stages in the development of every organism present abundant instances of this rule. The embryo of every organism resembles the embryo of the parent, and the successive characters assumed at successive stages appear at the same age in the new being as they appeared at in the old. Thus, the caterpillar emerges from the egg, undergoes repeated moults, changes into a chrysalis and then into a moth; and each of these changes occurs at an age corresponding with that at which it appeared in the parents. In this case the attributes have occurred in a long

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line of ancestors, but the same rule holds with attributes which appear *de novo* in the parents. "In the family of Le Compte blindness was inherited through three generations, and no less than twenty-seven children and grandchildren were all affected about the same age." This rule is especially true of insanity, and many cases have been recorded; thus Piorry tells of a family, every member of which became insane at the age of 40. Esquirol relates a case in which the grandfather, father, and son all committed suicide when in or near their fiftieth year.

*When the same attribute appears in several generations, but is not congenital, it may appear at an earlier age in each successive generation.* Gout has an evil notoriety for this peculiarity. Dr. Roberts says that gout is rarely met with under 30 years of age, *except in hereditary cases.** This peculiarity is known to occur in cancer also. In one family the grandmother became blind at thirty-five, her daughter at nineteen, and three grandchildren at thirteen and eleven; and cases have been recorded showing a similar advance in the inheritance of insanity.

*Attributes pertaining to one parent (especially those that appear late in the life of the parent, when the reproductive functions are active) tend to be reproduced in that sex alone.* Thus the hæmorrhagic diathesis is often transmitted to males alone. This peculiarity is so marked that in some families scarcely a single male arrives at maturity. In the Lambert family, known as the "porcupine men," the skin disease was transmitted for four generations, and was strictly limited to the male sex, seven sisters in one of these generations being free. Colour blindness is much commoner in males than in females, but in one instance in which it first appeared in a female it was transmitted through five generations to thirteen individuals, every one of whom was a female.

*Attributes pertaining to one parent are sometimes transmitted to the offspring of the opposite sex only.* A remarkable instance is given further on under the head of Reversion, as occurring in cases of hæmorrhagic diathesis.

*The attributes peculiar to one parent may be most apparent at one period of the life of the offspring, and those of the other at another.* Girou states that calves, the offspring of a red and a black parent, are, not rarely, born red, and subsequently

* The italics are mine.

become black. Mr. Darwin crossed several white hens with a black cock, and many of the chickens were, during the first year, perfectly white, but acquired during the second year black feathers; on the other hand, some of the chicken which at first were black became during the second year piebald with white. That this principle is true of facial characters in the human race is corroborated by common experience, and the universal practice of mankind tacitly admits that facial characters accompany and indicate other, and especially mental qualities. This principle may afford an explanation of some apparently causeless outbreaks of insanity.

*From the possession by the offspring of one attribute peculiar to one parent, we may infer the possession of other attributes peculiar to the same parent.* Thus I crossed an albino mouse with a common brown mouse. Of a litter of six, two were albinos, and inherited the tameness and gentleness of the mother, while the other four were brown and of untamably wild disposition, and would bite savagely when handled. Moreau indeed asserts, but as it seems to me on insufficient evidence, that in the case of inherited insanity, the facial characters tend to be derived from the parent from whom the insanity was *not* derived. Sedgwick says that "There is a definite connection between the development of the external ear and different forms of insanity, and both the forms of the ear and the insanity may be hereditary. It is remarkable that in former times our ancestors used to cut off the ears of criminals, not at first as a punishment, but *lest they should produce their like.*"

*An individual ancestor may import into a race mental characteristics which persist for many generations after all trace of the physical characters introduced by the same ancestor have disappeared.* Lord Orford crossed his greyhounds, which were lacking in courage, with a bulldog, and after the sixth or seventh generation, "there was not a vestige left of the form of the bulldog, but his courage and indomitable perseverance remained." It is unnecessary to point out the importance of this proposition from the point of view of the alienist.

*Latency and Reversion.* Among the most remarkable of the many remarkable occurrences of heredity are the complementary phenomena which are known as Latency and Reversion. When a peculiar attribute exists in an individual, is absent in his offspring, but reappears in the third or some

subsequent generation, it is said to be *latent* in those generations in which it does not appear, and the individual in whom it at length appears is said to *revert*, in so far as that attribute is concerned, to the ancestor in whom it was present. Thus, a grandfather has six digits on each hand, his children are normally constituted, but his grandchildren have, like himself, supernumerary digits. In such a case the grandchildren are said to revert to the grandfather, and the attribute of possessing supernumerary digits is said to be latent in the intermediate generation. Instances of latency and reversion are very common in every class of organisms. Mr. Darwin gives the following highly characteristic examples :— "A pointer bitch produced seven puppies; four were marked with blue and white, which is so unusual a colour with pointers that she was thought to have played false with one of the greyhounds, and the whole litter was condemned; but the gamekeeper was permitted to preserve one as a curiosity Two years afterwards a friend of the owner saw the young dog, and declared he was the image of his old pointer bitch Sappho, the only blue-and-white pointer of pure descent he had ever seen. This led to close inquiry, and it was proved that he was the great-great-grandson of Sappho." In another instance a calf reproduced accurately the very peculiar markings and colouring of its gr-gr-gr-gr-grandmother, all the intervening generations having been black.

In the human race the influence of reversion is not so easily proved, but it is certainly active. It is seen in the inheritance from the maternal grandfather of diseases peculiar to the male sex. For instance, it is common in the transmission of the hæmorrhagic diathesis for the children of the affected individual to escape altogether; all the children of the sons and the female children of the daughters also escape; but the sons of the daughters are commonly affected. A very striking instance of the reversion of both physical and mental characteristics, and one evidently reproduced from experience, is described by Hawthorne in "The House with the Seven Gables."

Under certain circumstances, and especially under the influence of crossing, an animal may revert to an indefinitely remote ancestor, as the domestic pig to the characters of the wild boar, the highly modified and specialised breeds of domestic fowl to the remote ancestral *gallus bankiva*, &c.

A particular case of reversion requires special mention. It is the assumption, under certain conditions, of the secondary

characters of one sex by individuals of the other. "It is well known that a large number of female birds . . . when old or diseased, or when operated on, assume many or all of the secondary male characters of their species." A duck ten years old has been known to assume the perfect winter and summer plumage of the drake. A hen which had ceased laying has assumed the plumage, voice, spurs, and warlike disposition of the cock; and the same thing occurs, *mutatis mutandis*, with the other sex. It is important to notice that not only structural peculiarities, but habits, such as that of incubation, and mental characters, as that of courage, are among the qualities which may be both gained and lost in this manner. And moreover this peculiar form of reversion is sometimes accompanied by the simultaneous production of long-lost characters proper to some ancestral form. The occasional assumption of the secondary male characters, as, for instance, the beard and the masculine character of the voice, by women who have reached the climacteric, is well known, and the especial frequency with which this occurs among the insane is worthy of remark. I have at present under care, certificated as lunatics, two men who have the secondary sexual characters of the opposite sex.

The causes of reversion are obscure. Mr. Darwin, who gave great attention to this subject, believed that crossing, that is to say the union of two racially or specifically unlike forms, produced a strong tendency in the offspring to revert to some long-antecedent form, as, for instance, when a white pigeon and a black pigeon produced a slaty-blue offspring, one, that is to say, having the colours of the original ancestor of all pigeons, the blue rock, from which it was nevertheless separated by hundreds or perhaps thousands of generations. Another cause of reversion, although one whose influence Mr. Darwin believed to be greatly exaggerated, is the return of a domesticated animal or plant to a wild state. This would be, in other words, the influence of a very wide alteration in the conditions of life.

*Prepotence.* Such attributes as are alike in the parents will tend to be accurately reproduced in the offspring, but, since no two individuals are precisely alike, there will be in every case a certain residuum of attributes which are unlike, and there will be among these a struggle for possession of or precedence in the offspring; and the power which either parent has of obtaining preponderance of its qualities in the offspring is called the *prepotence* of the parent. The term is

also applied to the qualities which obtain predominance. Like the other modifications of the first law of Heredity, this of prepotence appears to be most capricious in its application. Some qualities, such as certain colours, are strongly prepotent in some animals, and not at all in others. Or a character may be prepotently transmitted by one sex, but not by the other. Not one of the observed rules of prepotency applies to all animals. Whatever the laws of its application, however, prepotence certainly exists in the human race. "The Bourbon nose" appeared so constantly in the family as to pass almost into a proverb; and since this obtained in the French stock which intermarried with women of widely different families, it must have been strongly prepotent. The characteristic Napoleonic features have been prepotently transmitted from some common ancestor of Napoleon Bonaparte and his brothers to at least the fourth generation. It is obvious that if insanity becomes prepotent in a family, as it evidently was in the cases referred to above, the consequences will be especially disastrous, and the discovery of its prepotence will justify the adoption of the most stringent measures against the marriage of the members of such a family.

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*The Knee-jerk in General Paralysis.* By WM. JULIUS MICKLE, M.D.

A study of the so-called reflexes, both superficial and deep, is of considerable interest in general paralysis of the insane. Of these the knee-phenomenon, knee-jerk (Gowers), or patellar tendon-reflex, is one so easily examined, so well known, and of such valuable import, that what follows will mainly be devoted to the consideration of this physiological phenomenon.

The knee-jerk may be normal, or may be increased, diminished, or absent, in general paralysis.

By examining all cases carefully in the same way with regard to the attitude of the body, the position and arrangement of the legs, the manner in which the one percussed is swung as a lever, the nature and amount of its freedom of movement, the force, manner, and place of impingement of the stroke, the avoidance of voluntary muscular contraction and stiffening and of other sources of fallacy, I have ascertained what I view to be the more usual range of health,

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