

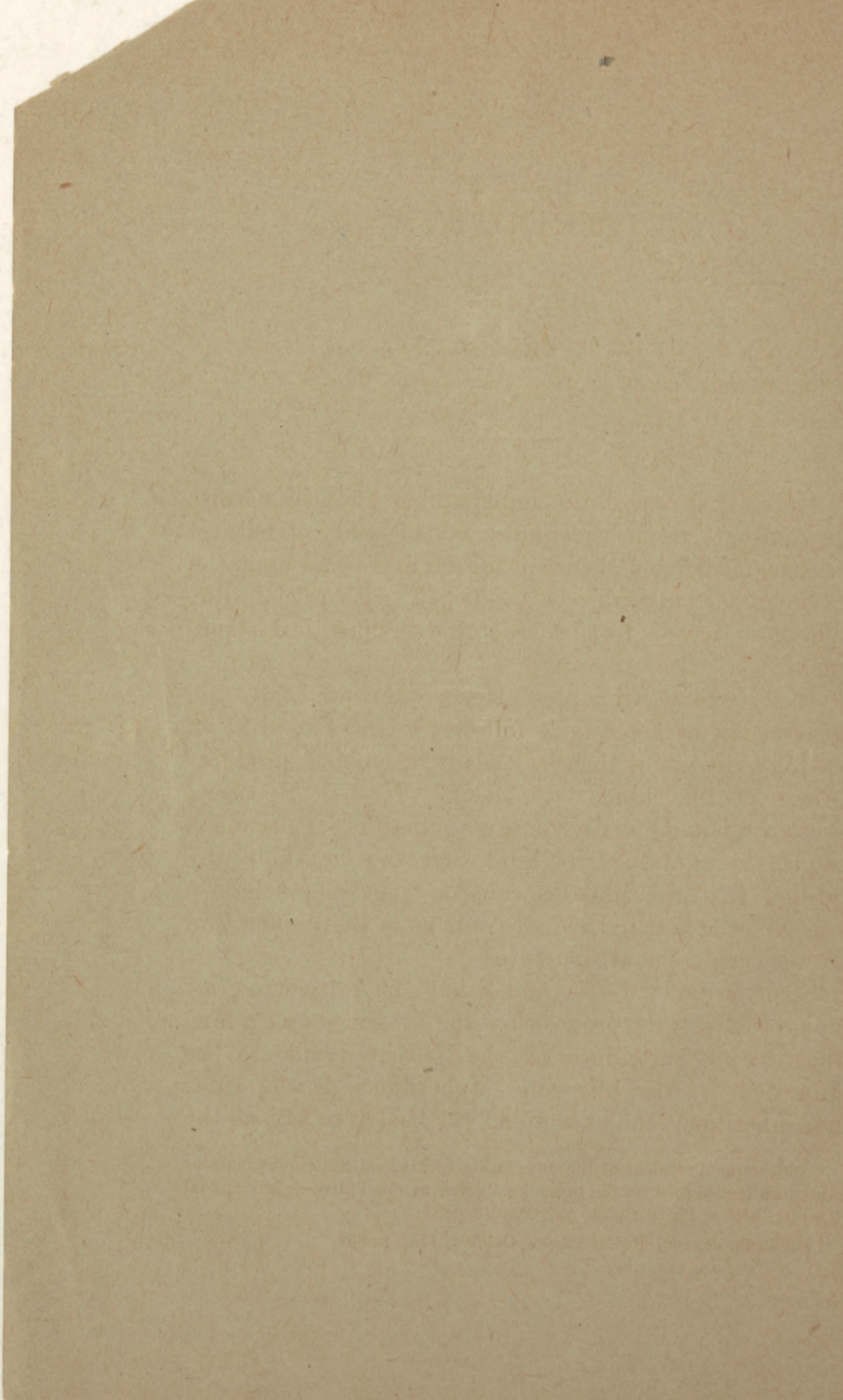
Gray (J. P.)

HEREDITY.

By JOHN P. GRAY, M. D., LL. D.,
Superintendent of the State Lunatic Asylum, Utica, N. Y.

[From the *American Journal of Insanity*, for July, 1884.]







HEREDITY.*

BY JOHN P. GRAY, M. D., LL. D.,
Superintendent of the State Lunatic Asylum, Utica, N. Y.

Heredity is one of the indisputable facts in nature. It confronts us at the outset, in the study of natural science, medicine and jurisprudence, and bears upon the most important subjects connected with social life, whether viewed from a scientific or practical standpoint.

In his "First Principles" Herbert Spencer states the general law of heredity as follows: "Understood in its entirety the law is that each plant or animal produces others of like kind with itself." Herbert Spencer's dictum amounts really to saying that every organism tends to re-produce its kind, and this he limits by adding that the likeness consists "not so much in a repetition of our individual traits as in the assumption of the same general structure."

Some writers (Mercier and Ribot), have tried to graft upon this simple proposition the statement as a law, that "every attribute of the parent tends to be inherited by the offspring. Inheritance is the rule; non-inheritance the exception." † That is to say, all the

* Address as President of the Association of Medical Superintendents of American Institutions for the Insane, delivered at the Thirty-eighth Annual Meeting, held at Philadelphia, Pa., May 13, 1884.

† MERCIER, *Journal Mental Science*, October, 1882, p. 337.

characteristics and peculiarities, however trifling, tend to be inherited, and will be, unless prevented by some opposing influence.

This is made to include what is called "morbid heredity," the characters of disease, as well as the structural and other physical traits. This morbid heredity is made to begin with the act of generation. "As far as the father's influence is concerned, any hereditary predisposition which may exist may be transmitted at the moment of conception; when the ovum is impregnated it is subjected to the mother's diseases or predisposition to disease."*

The same writer quotes Lucas as to the question whether this principle of heredity applies to disordered as well as healthy mental characteristics. Lucas says, "There is no pathological state of being where the intervention of morbid heredity is more remarkable and more remarked." He quotes also the declaration of Burrows; that while "mania and melancholia do not propagate their respective types,"—"one type only of mental derangement can be said to propagate itself—the propensity to suicide." He refers also to Moreau and other authors to show that "cerebral disorder may be transmitted by either parent."

We might add largely to this list and refer to the many cases that are cited to sustain this view. We have made these few quotations simply to show what is meant by the term morbid heredity. Cases are not only numerous given by authors, but the various facts collated as to variation and domestication of animals and plants are brought in to sustain this theory of morbid transmission as a principal factor in insanity; and even the chemistry of metals and gasses is applied

* Bucknill and Tuke, p. 66.

to the nervous system* to show the *rationale* of inbreeding, hybridism, and crossing of parentage.

Now, so far from its being true that every attribute tends to be inherited, we had supposed that even on the theory of evolution itself, by what Mr. Darwin has to call "some unknown law in the constitution of the organism," and for the protection of the species itself, there was an inherited tendency just the other way; that is to eliminate all unfavorable attributes of progenitors, whether by disease or otherwise, and whether acquired by accidents of environment or otherwise. We believe this to be the true law in nature. Disease is a "tendency" to death, to extinction. The "tendency" in *genera* and species is directly antagonistic to this—that is to life and perpetuation. Were it otherwise, were the law and "tendency" of nature to continue and intensify these destructive operations, its cumulative force would soon bring species to an end. The fact is, the whole force of an organism, as an organism, is set in array against any disintegrating influence, whether in the structure itself, or the environment. More facts can be gathered to show how unfavorable conditions in the structure, or morbid functions in the organism, have been neutralized or overcome in the offspring than can be adduced for any special morbid transmission. Indeed, what is often attributed to "morbid heredity" will be found to be due simply to parallelism or similarity in education and environment. Special characters are often due to unconscious imitation from infancy to manhood; a gradual process of education; like causes are apt to produce like effects, without the necessity of being handed down through natural generation. Indeed, this is accepted as a rule. If puerperal conditions, or grief, or the worry of failure in

* MERCIER, *Journal Mental Science*, January, 1883.

business or other nervous shock or excitement produces insanity, it is not because there is any inherent connection between these things and insanity, but because they all *may* produce a certain effect upon the brain in its circulation and nutrition, interfering with its normal physiological operations; and if this effect is seen more speedily in some physical structures than others, while it is proper enough to say that the structures were inherited, it is not proper to say that they carried in them the disease which was the result of external influences.

An "insane diathesis" is a pure verbal fiction. The frailest physical structure will not develop insanity without an external cause, and the causes, as observed under experience, are largely within the control of due precautions. It is not unusual that writers have allowed a mere theory to run away with them, and it would not be difficult to give examples of many exploded theories in connection with psychology and insanity. Ribot has whole chapters on heredity of imagination in poets, in painters, in musicians, in men of science, philosophers and economists, authors and men of letters.

Now, no one would like to lay down a law that the son of a genius shall never in any case be a genius himself, but we are willing to leave it to the verdict of history whether hereditary genius in literature or art is not rather conspicuous by its absence. Of course, in support of any theory whatever, associated with life, a quantity of facts may always be forthcoming, but any catalogue of facts that can be made will always leave a majority of *all* the facts still to be integrated in a final system.

The facts that relate merely to structural features, supernumerary members, variations of aspect, size, color,

&c., have nothing to do with the transmission of morbid processes, but are simply varieties of abnormal peculiarities. Might we not as well pretend that a bruised fruit or seed would perpetuate its bruises as that a human organism would transmit a wound or a disease? Heredity has its proper place in natural science, and is but the expression of the primeval law of species; but we can not admit that it is responsible for such a thing as a positive disease of the brain, which all admit is the only basis of insanity, the mental disturbances being but symptoms of such disease. Morbid affections of the human organism developed by causes *ab extra* are to be distinguished from those normal forces of the organism that are inherent and operate *ab intra*.

While recognizing the great importance of heredity and admitting that it deserves great consideration in its bearing upon the development of man and the determination of his physical traits, I am equally satisfied that undue importance is attached to heredity in connection with the causation of insanity. The transmission of a physical type, with more or less resemblance, we have said, is a law of nature, and this law tends to maintain and perpetuate races and families. This law is written on men and animals, on trees, flowers and vegetation, generally. It is a conserving, universal law in nature. The natural physical characteristics in families may in some members by intermarriage be intensified but not to any great extent. The nose, the mouth, and the eyes, more frequently than any other part of the organism may have significant family or race type, and be very strongly marked in certain members. Occasionally a monstrosity of structure may appear in the hands or feet, and be perpetuated through two or three generations, in some members of the family; such as

five or six fingers or supernumerary toes, but these monstrosities are deviations in excess and are not permanently held as in the type. No six-fingered or seven-toed family has ever been established. Double-headed or four-armed, and three and four-legged people have been born, and some of them have lived to adult life. There are no instances of transmission. Cross-eyed, near-sighted vision, and such other physical deviations as have been mentioned, it must be borne in mind, are not instances of disease. These organs are healthy, just as crooked legs may be healthy, and they can not properly be used as illustrations of the heredity of disease. Disease is not a law of our physical or mental being. No person has ever been born insane. No person ever became insane simply because his father or mother, or both, or his grand-parents were insane. No person ever became insane simply because of any impression arising from parentage upon either his physical or mental constitution. Every person who becomes insane, whether he has had insane parentage or not, becomes so by reason of some physical causes operating to change the physiological state of the brain. Whatever his parentage may have been, insanity in him can only be developed by the same causes which produce it in persons who have no insane parentage. Parentage can not impress upon offspring even a tendency, or a "pre-disposition to insanity." The most it can do is to transmit a physical structure or organization which will be more liable to the operation of ordinary causes that produce disease in any form in people generally, insanity included. Those who have insane persons among their ancestors in a direct line, can only become insane therefore, as other people do, by the operation of the same causes. There is no law in their members tending or dooming or predestinating them to

insanity. If they are as strong in system as people who have no insane among their parentage, as they generally are, they have only to take the precaution and care that people generally need, and if they are not as strong, they must take more care against the exposures of life, as all delicate people ought to. This is all there is of this question—the sum and substance of the matter.

Diseases are accidental states produced from causes originating outside of natural bodies and natural states. Disease is not transmitted by birth, as disease, except through blood poisoning of the parent, as in leprosy, syphilis, and, perhaps, cancer. However, in syphilis it ends in the first generation. The deteriorated child of a syphilitic parent can not transmit syphilis. If the child of syphilitic parents is born healthy, syphilis can not be developed in any of its forms as the result of parentage alone.

The sins of parents, it is said, may be visited on the children to the third and fourth generation, but this is in their temporal or external consequences.

No man, however, is compelled or impelled by natural or divine law to commit the sins of his fathers. No man is born a forger, a burglar, a thief, an assassin, a murderer, because his grandfather or father represented one or other of these classes of criminals. Such parentage does not either impose a criminal life or a criminal tendency except through the processes of education, any more than a man is born fated to farming or blacksmithing or shoemaking or any other calling by reason of any paternal occupation or bent of mind. Occupations or crimes that are found to run in families are simply the result of education and training. They are not born or inbred. It would not require much observation to show that the sons and daughters of such

persons are not only not destined by birth to the profession or pursuits of their fathers, but are often not inclined to them or competent for them. Good parents have children who grow up in vice and crime, and criminal parents have children who grow up to the most exemplary lives. If this were not so, religion and morality and laws and institutions having for their object the reformation and improvement of mankind, would be meaningless and futile.

The phrase: "Blood will tell," is true in a broad sense. But take the millions of European nationalities who have come to the United States within the past century, a large proportion of whom have through social and governmental conditions that prevail in their native land, been poverty stricken, uneducated, many of them debased physically from dietary causes, and degraded mentally. What of their generations? To be sure many of them have remained just where they were, in poverty and degradation, and their descendants with them, because they have continued in the same plane of life. But the vast majority of their descendants have risen above the generations behind them under the improved conditions which they have voluntarily sought or have drifted into. It is true that while harmonizing with their new surroundings the descendants are changed in modes of thought, social ideas, etc., yet they retain the strong race characteristics, the physical and mental type. All this means normal, natural, healthy transmission, influence for good or evil by circumstances and education. Race characteristics remain unchanged. Family types vary; this is the natural law.

We might illustrate this point by the example of Australia. That was at first a penal colony. The conservative law of heredity in operation for a few

generations has not only not retained a society of criminals, but has redeemed and elevated their progeny, eliminating the evil mental and physical conditions under favorable surroundings and education. The same is strikingly true of Pitcairn's Island.

Indeed, in our land, the Indians have retained their race attributes against all the resources of Christian civilization and the destructive agencies of governmental power.

I am inclined to think that the doctrine of morbid heredity, so strongly held by some, was derived from a period when philosophy had more influence in forming opinions upon such matters than the science of physiology and practical medical observation.

Perhaps few men are in perfect bodily health, that is, in a state in which every part of the organism is not only in a perfect condition itself, but in which the whole is in harmonious, rhythmical action. Ordinarily effective health is maintained with quite a swing of the pendulum between physiological extremes, and this is varied greatly in different individuals. But this varying state is not disease; nor are people liable to disease in proportion to general delicacy of structure.

A common method of showing "heredity," is to take some exceptional family, one in a thousand or ten thousand, where several members have been insane. The numerical method does not take into account the accidental or incidental circumstances which develop or intensify the causes capable of producing insanity in each member of the family, without reference to relationship. Again, a family is taken where peculiarities are strongly marked and general family decay has set in. Such persons usually live differently from other people, and finally become eccentric and from depreciated health may become insane. To say that such per-

sons become insane without the operation of the ordinary causes of disease, is unscientific, and these occasional families can not be taken as evidence of the existence of a law of transmission of disease. Such instances simply prove the accidental conditions already referred to. These cases really do not make any exception to the law of disease as a factor of insanity. I recall an instance where the father became insane and three of seven children. All the children were born before the insanity of the father. There was no insanity on either side of the house. The cause of the insanity in each case was entirely adequate to its development without any reference to relationship or descent.

Practically the whole question of heredity resolves itself into this: How far an attack of insanity may wreck the constitution of a parent, impair the functional energies and by reason thereof give the offspring an enfeebled physical structure, not a structure with a proclivity to insanity or to any other disease, but simply a structure more liable to give way under the common and ordinary exposures of life and the causes which set up morbid processes in the human system. In the same manner an attack of pneumonia, or typhoid fever, or a profound malarial attack may impair the constitution of the parent, and the offspring may be less vigorous, and the resisting power in the organism may be less active, and in all such cases they may be more liable to give way under exposures than if the parent had not suffered constitutional impairment from any of the diseases mentioned.

This, however, is not an inherited proclivity or predisposition to insanity or any other disease, but the child begotten of parents of impaired constitution may (not will) have a feebler structure with less resisting

power. If such a child is strong and healthy, it is in no more danger than if the parent had not had an attack of insanity or other disease.

The parents can not impregnate the child with germinal or peculiar cell structure predisposing to insanity or any other disease. If this were so, and there was transmission of disease, under such a theory the child would receive from the parent a fatal and inevitable proclivity to insanity. In that case, as a logical necessity, the child, whether it developed insanity or not, must retain the fatal power of communicating this proclivity to its offspring, and how is it to be obliterated? Indeed, all that would be necessary under such a theory to start a tainted family line would be for a parent to become insane. No matter what the conditions were that produced depreciation in health in the mother and finally developed insanity, she, having been insane, under such a theory would be endowed with the fatal power of communicating at conception the germ of an "insane diathesis." To be sure, writers put in certain guarding expressions as a caveat against such a logical issue. For example, Dr. Tuke says:* "virtuous and vicious tendencies would often *appear* to be hereditary; or, as congenital, are displayed from the earliest infancy in children subjected to the same educational influences." "The occurrence of insanity in a parent after the birth of the person affected can not be regarded as a certain proof of hereditary predisposition; at the same time such predisposition remains highly probable; its value may be judged of by the character of the attack under which the patient labored; whether, in short, it appears to have been accidental rather than exceptional." Does not this beg the question?

*Bucknill and Tuke, page 250.

The dread of heredity lies in the popular belief that it is a law of our being; that somewhere and somehow, lodged in us are the seeds of this disease, and while this has been taught in literature it comes down to us chiefly as a sort of legendary tradition. There are families who, when a member has become insane from legitimate causes, live in dread throughout their lives, covering ten, twenty and thirty years, and every illness and every condition of nervous depression wakes up a dread of insanity.

There is no reason why insanity should be especially selected, except for the mystery that has pertained to its history and treatment. There are other diseases of the brain, as apoplexies, paralyses, meningitis, &c., any of which *may* affect or impair the intellect. Natural death is where the physical machinery wears out; the morbid processes which we call disease may destroy the body and anticipate natural death. But these conditions are not self-developed, nor are they slumbering elements in the body. They come from external causes connected with life and its activities; the habits, the exposures, the vices, the accidents, the over-toil, the starvation, the excesses, the exhaustions—these and kindred causes induce physiological disturbances and set up the morbid processes which we call disease, and insanity is merely one of them, and, as we have said, one that is largely preventible.

Suicide is set down as among the tendencies inherited and, according to one writer already quoted, it “propagates itself.” It would seem impossible to conceive of the impregnation of an ovum with a predisposition to self-destruction. Suicide arises, not from impulse, or fatal inbred proclivity, but from illogical reasoning regarding the value of life, or a false personal estimate of its good and evil, by those who are brought face to

face with trouble. The suicidal thought comes to many when their experience reaches a point which leads them to ask, "is life worth living?" to others when they are brought to the verge of exposures in which their characters would suffer from their criminal conduct, to others when unjust accusations and slander come upon them and they stop to ask themselves the question if they can stand up against them; to others from mortification, disappointment and disaster, where their pride and self-love are deeply wounded. Again, it comes to others when owing to failure of health, they have delusional ideas of coming or present disaster to property, to family or reputation, or where under delusional ideas of their spiritual condition, they seek death as a relief from what they believe they can not endure; or because of the delusive idea that self-destruction is a command of their Maker to save themselves or to save others. Again, suicide is in a large number of cases simply imitation and morbid desire of notoriety, as in the instances of throwing one's self from dizzy heights of bridges, or towers, or precipices, or in other like ways; or it comes from the fatal notion that because some relative has committed suicide they are doomed to the same thing, and this is one of the evils, and one of the greatest evils, aided, if not countenanced, by this theory of inheritance.

Some years ago a person came from a distant part of the State in company with his wife to consult me in regard to his mental condition, he being in dread of suicide. He stated that his grandfather, uncle, father, one brother, older than he, had committed suicide at a certain period of life. He had reached that period and was in constant dread of the same fate overtaking him. He was an intelligent man; I explained the matter fully to him, pointed out the fallacy of such views, and

though he was satisfied he remained until the time had passed, then appreciated the subject and went home. I saw him several years afterwards in excellent health, and he said he had instructed his younger brothers and felt safe in regard to his children.

Careful examination of some thousands of suicidal cases reveals no instances beyond the classes I have cited. While writing I have a letter from a young man who some time ago attempted suicide. He gives this reason: "Unfortunately I became diseased. I applied to a physician and under treatment I was finally pronounced cured. Speaking with another physician upon the subject, he suggested that to be certain of cure I had better continue treatment, and he gave me a bottle of medicine. Revolving the matter over I thought 'perhaps I am permanently diseased; there seems to be no security.' After suffering a few days under this idea, I took the whole poisonous contents of the bottle, and came near destroying myself, simply to avoid the consequences of a revelation of my conduct."

Suicide is repugnant to nature and is in direct violation of the inherent law of self-preservation. It is condemned by both divine and human law. To dignify and excuse such an act by the plea of heredity is to play tricks with the common sense of mankind.

The question of inherited mental and moral traits is quite another field, and evidently outside of the range of disease. It is complicated and interwoven with the environment of the child from its birth; its domestic surroundings and the example of its parents from infancy, both through their own lives and the lives of their associates; in a word, the educational influences in the widest sense of the term. To this field belongs the so-called heredity of crime and intemperance.

These vices and criminal lives are simply the outgrowth of education, example, appetites and passions, and do not proceed from any inherited tendency.

Intemperance is set down as hereditary. Intemperance is not disease, however potent it may be in producing disease. Intemperance is simply vice. Few men of experience in the world but can recall families of drunkards. So we may recall families of smokers; it would be as logical to apply to this habit the doctrine of heredity in the form of an inherited tendency as it would be to the liquor habit.

In the plea of insanity for criminal acts, heredity, has, perhaps, figured more conspicuously than any other element or agency in defense of crime. It has been held up as a sort of underlying mal-influence, inherent in the very constitution, liable at any moment to break out; a general larvated state of body and mind, the "latent diathesis" liable to develop at any time; and this has too often been made to serve as a reason for the *possible* existence of insanity in any particular case. Heredity is strongly urged in what are called cases of moral insanity. According to its advocates a sort of moral scrofula pervades the emotional nature, dominating the sentiments and perverting or obliterating the moral sense. It is even claimed that the individual, under these circumstances is unconscious of this state of things; that his intellectual nature is not involved, but he does not recognize the "nature and quality of his acts," and of course "can not know that they are wrong." This plea has been urged in all kinds of cases and for a great variety of criminal acts, such as book stealing by ministers, pilfering by school girls and boys, shoplifting by women of respectability, or in cases of reputable persons shooting under jealousy and revenge persons who have despoiled their domestic life, or against whom

they have grudges, real or imaginary. Incendiarism, burglary, and even forgery have come under this category. In many of these cases the parents have not only not been insane but have led exemplary lives, and heredity can not be predicated.

Prof. Arndt* shows where the logic of such views may lead: "Morals and a sound psychological life," he says, "are inseparable. All immorality is a symptom of psychological disease," and declares "no person of sound mind ever commits a crime." Again—"each criminal is a diseased human being."

Even Dr. Clouston, in his able and interesting "Clinical Lectures on Mental Disease," recently published, seems (I am sorry to say,) to embrace all those artificial classifications of the various forms of what he would call "Monomania" and "Moral Insanity." In his description of the origin of monomania he thus states the first out of four different ways in which he claims it arises. "It is a gradual evolution out of a natural disposition, a proud man becoming insanely and delusionally proud, a naturally suspicious man passing the sane borderland with his suspicions. There is usually a hereditary predisposition to insanity in those patients. The disposition may, in fact, be regarded, as the nervous diathesis out of which the mental disease springs." (Page 201.)

It seems to be impossible to put scientific and intelligibly consistent meaning into such language as this. What is a gradual evolution out of a natural disposition in any physiological sense? How does a proud man become "insanely and delusionally proud" without the physical changes that imply the disease of the brain? For this is what he seems to insinuate when he says. "The (natural) disposition may in fact be regarded as

*Lehrbuch der Psychiatrie, 1883.

the nervous diathesis out of which the mental disease springs." He clings to the term "mental disease" with a tenacity worthy of the old days when insanity was regarded as an actual disease of mind. But if pride and suspicion and other unamiable traits are a "nervous diathesis," evolving into insanity, who is safe, and how are we to account for so large a proportion of cases in which the insanity first exhibits these traits preceded by no such "nervous diathesis?" How can a "disease" in any scientific sense spring out of a natural disposition, under the name of a "nervous diathesis?"

This "insane diathesis," or "insane temperament," as he elsewhere calls it, for illustrations of which he refers us to the "works of the modern psychological novelist," he differentiates from the German *Primäre Verrücktheit*, (or imbecility,) by saying that "the latter is an insanity naturally evolved in early life from the original constitution of a brain which may have been at first without peculiarity, but gradually, and inevitably and without any other cause than its own natural evolution, an unsound [state of mind] is developed without the preliminary explosion of brain storm in the shape of an attack of mania or melancholia." (Page 259.) Perhaps, however, the latter is not more fanciful than the former. It has not even been proved as yet that idiocy is any such evolution from hereditary "diathesis;" and what the words "gradually, inevitably and without any other cause than its own natural evolution," can really signify, other than a metaphysical speculation of the author, it would be difficult even to conjecture. The German writers on this subject exhibit a wonderful cleverness and ingenuity in word manipulation; but one of their number, conspicuous for cleverness and ability, Professor Arndt,* gives us a clue out of the

* *Lehrbuch der Psychiatrie*. Rud. Arndt 1883.

labyrinth of *Primäre Verrücktheit* when he says: "If a state of psychical debility is unmistakably manifest already during the evolution of physical life, or as commonly expressed, is congenital, it is called "congenital dementia" or "idiotism." Here then, we are brought face to face with an entirely different department, that of congenital defects, malformations or arrested physical development which are not classed in the category of active disease, and which, at least, have nothing to do with the positive access of the disease called insanity. A congenital defect, structural or otherwise, does not necessarily connote a morbid process. Hence the hospital practice of our day does not attempt to include the idiots and the insane under one system of care and treatment; that of idiocy being chiefly directed to such development of its subjects as is attainable by education and training—a school system with physical training. Insanity is always an acute or supervening disease, however speedily its character may become fixed, and it always has for its origin a definite point of departure. Natural defects may enter into medico-legal questions of personal responsibility, but it is not because they have any medical or pathological connection with the active or acquired disease of insanity.

In many such cases medical men have volunteered to appear before courts, and in other cases have been dragged in, to make medical science sustain such doctrines and modes of defense. Writers have endeavored to draw distinctive lines between ordinary wickedness and this "moral criminal state" by calling stealing "kleptomania," incendiarism "pyromania," murder "homicidal mania," drunkenness "dipsomania," etc., etc. In all such cases the insanity of a relative is a most precious boon, as affording an avenue of escape, for heredity gives them the "constitutional basis for the

perversed moral state." The history of cases in which such pleas have been entered and pressed would show that they have not been resorted to to shield only the weak-minded, the "half-witted," the natural born incompetents and unfortunates who really stand on the border line of imbecility, and approximate idiocy in their sense of responsibility. But history shows that it is the voluntarily bad, who happen to have means and friends to defend them, for whom this plea is raised; indeed the very infamy of their lives is paraded as evidence of insanity. It is an attempted stigma on the medical profession to boast "that doctors can always be found to expert such cases for a fee." It is perhaps true that in some cases doctors have gone on the stand for a fee, but in most cases they go on the stand really believing in such views of insanity, and supposing that it is possible to have the moral half of a man insane and the intellectual half sound; and so have given the most absurd testimony in good faith.

Still, it is equally true that lawyers are to be found for a fee to defeat justice and turn criminals loose on society. The answer of course is that it is the business of lawyers to work for a fee and make the worse appear the better reason. All that can be said on this subject is that lawyers and doctors are men, and men have their own "moral tone." From the standpoint of good morals, it is doubtful whether the lawyer who uses a false plea for a fee, is any better than the doctor who sustains it for a fee. If life is simply a game of cards, as has been said, cheating is only reprehensible when found out. On this subject an able attorney once said in my hearing, in a court room, "Science has no morals; it consists of facts and laws." "Yes," replied the judge, "but he who prostitutes Science is himself a criminal."

Heredity, I said at the outset, is an indisputable fact in nature. It is implied in the very words, "genera" "and species," according to which every organism is originated "after its kind." Nothing I have said questions or militates against the fact of the transmission of race types and characteristics of family, or tribal, or national traits. The hopes and destinies of modern civilization itself are in a measure wrapped up in the noble potentialities which a beneficent Creator has imbedded in the constitution of human nature, which it is the probation of mankind to develop, through successive generations. What I wish to combat is the notion of the direct transmissibility of disease, as such; the monstrous figment of scientific pessimism, that the abnormalities and lesions of the human organism can acquire any such persistent and stable character as its own *vivida vis* itself, that nature puts a destructive force on an even race with the constructive in any of her operations; an idea which ought to be contrary to any philosophic system of evolution itself. It is a law of all organisms to reject whatever is foreign to its own normal condition. If all that is claimed for "morbid heredity" be true, it would be a cumulative process which must eventually swamp the vital energies of the world. It seems philosophically absurd to assume that a force, opposed to organic life, can so seat itself in the constitution of an organism as to perpetuate itself by that organism's generating power. Nature rejects or eliminates the taint of death. No sooner do the decaying elements enter the earth than they are transformed into life-giving agents and "that which is corruptible puts on incorruption."

The earth itself, is not more surely the purifier of all corruption, than the stream of human vitality which shows its recuperative tendency to cast out and

eliminate the elements that are hostile to its own existence and welfare. It is a benevolent principle impressed upon the natural world, which, like its own indefinable beauty, appeals only to a being of god-like reason and imagination, and inspires the wistful hope of the poet—

“That somehow good
Will be the final goal of ill,
To pangs of nature, sins of will,
Defects of doubt, and taints of blood.”

Tennyson—In Mem.

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