

T H E

Journal of the American Medical Association.

EDITED FOR THE ASSOCIATION BY N. S. DAVIS.

PUBLISHED WEEKLY.

VOL. XI.

CHICAGO, SEPTEMBER 8, 1888.

No. 10.

ORIGINAL ARTICLES.

CHOREA.

Read in the Section on Diseases of Children, at the Thirty-ninth Annual Meeting of the American Medical Association, May, 1888.

BY GEO. WHEELER JONES, M.D.,
OF DANVILLE, ILL.

In calling your attention to the subject of my paper, I am aware that chorea is not exclusively a disease of childhood, nor one that may not find its victims in all ages of life, even to the second childhood of extreme senility; still, its manifestations in the majority of instances are so confined to the years of minority that it has taken rank as a disorder of the earlier periods of life. Nor am I less aware that there is perhaps no malady to which humanity is subject that has received more attention than this. Its literature is so full and voluminous, exists in so many languages, and extends over so great length of time, even from the beginning of medical observations, that it may be considered one of the earliest pathological crosses we have been called upon to bear and to consider. At one time ranked as purely psychical in character, it has again received the reputation of being a plainly physical expression of a local injury to clearly defined cerebral tissue. In the search for its character and origin it has seemed truly to be the ignis fatuus of the medical world, now almost within our grasp, and the next observation as far away as ever; dancing, as its name implies, all over the field of professional thought and speculation—having its primary source in the borderland of the unknowable—relegated for ages to the regions of psychological pathology the consideration and investigation of which was often undertaken at the risk of life or excommunication, it has proven so fascinating a topic as to command attention and careful study from the most thoughtful and observant of every generation.

Judging from the results of philological investigations the disease has always, at least until quite recently, been considered either psychical or sexual in origin and exhibition. The names of a number of saints have been coupled, as adjectives, with the unrythmical display of muscular contractions facetiously denominated dancing. Its

association with sexual abuses and irritations, especially about the age of puberty, has kept alive a popular belief as to its phallic source, a belief which perhaps has a larger foundation in fact than many another common notion, and which seems to be receiving much confirmation in the latest researches. Lest I might be misunderstood, perhaps I had better explain at this point what I mean by the last suggestion. Points and tracts of irritation are almost universally found in the basal ganglia of the cerebrum, in the genito-urinary tract of the cord, and near the seventh cervical vertebral region of the cord, all together suggesting marked irritation of the sexual system either as cause or effect, and in either case capable, through the reflexes, of sustaining an irregular motor action such as we see in this disease, the length of such sustentation depending largely upon the moral and medicinal forces brought to bear upon each individual case. The natural history of such cases as can be properly estimated and honestly studied seems to go far to establish the correctness of this view in at least a large number of instances.

This thought will be reverted to when considering the etiology of the malady. So fully has the life history of the disease been given by various brilliant writers, both professional and secular; so clearly defined and beautifully described have been the symptoms, diagnosis and prognosis, that it would be an act of supererogation on my part to attempt an elaboration of these points in a practical paper such as I wish to lay before you. Several eminent writers will occur to you as being high authority on these divisions, and as having left little or nothing unsaid; so that, referring you to them, I shall only mention such items under these headings as may be necessary to make clearer the short argument, with its conclusions, to which I ask your attention. Several theories in etiology have been advanced, but none thus far covering sufficient ground to prove a satisfactory solution of the various problems embraced in a discussion of the disorder. The following are given by different authors as the probable character of its causes—I give them in the order of their antiquity: Psychical, neurotic, embolic, cardiac (which is really a subdivision of the preceding), and rheumatic. Of these perhaps the embolic

has been the most fascinating theory of recent dates, and has attracted the attention of many of our best writers, who for a long time had matters their own way, until Dickinson's careful and conscientious anatomical researches rendered the occupation of this line of thought no longer tenable as a sole explanation of its factors in etiology. That inheritance has much to do in the matter is now no mere suspicion.

We find a certain class of cases arising in adults, and evidently appearing at a certain point in senile changes, which are parts of family histories. The New England cases on record will illustrate these. But that inherited physiological conditions, conditions bordering upon if not a part of degenerative processes, are at the base of a very large proportion of the cases of this disease, there would seem to be little doubt. And it is this fact with its obscure accompaniments, so difficult of investigation and analysis, that has made the credence in psychic forces so slow in disappearing from the popular mind. In our search for post-mortem appearances we have looked for those gross conditions palpable to the unaided senses, and we have been puzzled to find nothing at all commensurate with the symptoms we have combated during life. A few of the coarser evidences of congestion, with the necessary physical changes of appearance and function in the basal ganglia, and especially in the corpora striata, gave rise for a time to the preponderance of belief that organic changes in the latter were the chief causes of the morbid manifestations met with during life, and extremely plausible were the arguments brought forward to sustain such view; so convincing, in fact, that their application to the pathological conditions found in later investigations will be almost a matter of course.

While the theorizing of late French writers has shown, or rather suggested, the apparent relationship between hysteria above and epilepsy below as connected by the intermediate disorder of chorea, and while the latter seemed likely to be lost as a distinct affection in the subdivisions of the other complaints, the various "tics" and neuroses, the scalpel and microscope and patience of Dickinson has laid before us the facts connected with the pathological state of the entire central nervous structures as placed upon exhibition by fatal attacks of the malady now under consideration. According to Dickinson and those who have since had the opportunity of verifying his observations, there is a state of general hyperæmia, varying only in degree from the faintest trace of congestion to actual or immediately threatened disorganization in a large proportion of the gray matter, extending from the base of the cerebrum to the lower or sacral portions of the spinal cord. In the cord this especially involves the posterior roots, and within the skull the corpora striata, the latter of these being most seriously

affected. It is reasonable to believe that in the vast majority of cases of chorea we have only a very slight grade of hyperæmia of these structures, which, under careful management and rest, with nature's tendencies to rally from derangements of all kinds, will certainly recover within a specified time and without any apparent ill results; and that this general, or in many cases local, hyperæmia, with its hyperæsthetic accompaniments, is the only discoverable pathological element for consideration, is a fact seemingly too clear to need other argument for confirmation. Still, to believe that it is the only etiological factor for us to contemplate would indicate a grave and serious error of judgment. The results of post-mortem observations indicate that the disease has its primary origin essentially in atomic errors of nutrition antedating by years, it may be by generations, the patent outbreak which attracts the attention of family and physician.

A very large number in the list of causes of the disease are formal and not efficient, are potential but not primary in their action—*e. g.*, a long walk in the sun or a heated discussion is the active agent in determining an attack of mania, but the true *causes* are other, often obscure and extending over months and years of a previous life whose irregularities of thought and habit may never be known, and can only be surmised from the startling revelation which comes to the social circle and the saddened household as one of its number disappears behind the portals of a hospital for the insane. To carry the illustration a little further, and render still clearer what I have yet to say, were I bold enough to offer another name for chorea, and one, I believe, far more suggestive of its etiological probabilities, I should call it mania musculi—insanity of the muscles—with a primary origin in nutritive changes in the nerve tissues which would necessitate for its full elucidation and proper individual management, in the large majority of cases, a careful investigation of the previous family history "to the third and fourth generation."

The rapid spread of the so-called epidemic forms of the disorder as appearing in the Middle Ages, and more recently in the vagaries of thought and ritualism of various semi- and pseudo-religious sects in England and America, is hardly to be taken into consideration, as this form of neurotic disturbance is more closely allied to hysteria, and involves derangements of the higher nerve structures such as may be entirely absent in the great majority of cases of pure chorea as we now understand it. Still, as these mental and moral absurdities were and are to a great extent the result of influences extending over a great length of time, often in the direct line in succeeding generations, their careful study is worthy of our fullest effort as throwing much light upon both psychoses and neuroses, and all intermediate manifesta-

tions of deranged nerve function. A study of the political, social and religious conditions preceding and accompanying these outbreaks reveals to us a mental strain affecting a large class of ignorant and half-educated people, trained in none of the principles of self-control, and inheriting crude ambitions and spiritual aspirations utterly hopeless of fulfilment in any existence of which a healthy mind can conceive. Many an organization of to-day in the various fields of human effort has its origin and possible continuance in the unfortunate mental condition of those who seem as yet only on the borders of actual disease, but whose minute nerve tissues are abnormal in their action. The communist and anarchist in politics and society; the noisy, ranting, half-civilized religionist; the statuto-maniac, and the "Christian scientist," are all illustrations of the nervo-mental irregularities in question, and will all bear scientific investigation for the facts they furnish as bearing upon allied conditions of well established professional importance, and as illustrating the influence of inheritance and the pitiful struggle of degenerating organisms in their despairing battle along the lines of the unyielding law of the "survival of the fittest," a law the principles of which, in its application to the further propagation of our race, is becoming of more vital importance to each succeeding generation.

An intemperate, a syphilitic, a licentious, a passionate ancestor will lay the foundation in atomic changes in the nutrition of the finer forms of tissue which renders a subsequent generation especially disabled from resisting the degenerative processes which may be inaugurated by a hundred active agencies lying in the way of every human life. The harass and the worry of dismantled hopes, disappointed ambitions, political, domestic, and commercial failures, all conduce to the same end in the establishment of a substratum of physical error upon which to see developed the vagaries of the various psychoses, neuroses, and still grosser aberrations of evolution. By such full elaboration of this line of thought as is entirely beyond the province of and time allotted to this paper, we will be enabled to join together the numerous etiological views, and comprehend the correctness of the application from individual positions of observation, and the incorrectness of the claim that any *one* view is capable of satisfying the requirements demanded in a solution of the difficulties in the way of a full etiological settlement of the perplexing study before us.

We thus learn that the foundations for the disease, the possibilities of its development, are laid and established, in most cases, in the generations preceding the one in which its manifestation is made apparent; and that, with the endowment thus received from ancestral accumulations of abnormal nutritions, very slight are the causes which may finally rupture the ever strained relations be-

tween the guiding thought and the executive will which is loosened in its moorings; and thus a rheumatism, with all its pathological possibilities in cardiac changes, embolic contingencies and nerve degenerations, becomes an active factor in the development of a form of choreic display. The same may be said of a malaria in its manifold expositions, some of which will even go so far as to determine types of actual alienation, as seen especially in the forms of cyclical insanity. The harass and mental worry connected with many of the unfortunate features of our modern school system is a prolific exciting cause of a very large number of the cases now occurring, one writer stating that 20 per cent. of the school children in New York City are affected more or less with the disorder. The torture of companions and playmates, the consciousness of injustice and miscomprehension—for we must remember that most of these cases are in children who are previously over-sensitive and acutely alive to the consciousness of some personal peculiarity or characteristic variation—the reflex irritations of virile development and sexual congestions; anything, in fact, which will unfavorably impress a nervous system in which there already exists a congenital or acquired disarrangement of the ultimate molecular constituents which need not be disorganization nor even marked hyperæsthesia, which are far more likely to result in pronounced dementia or acute mania.

That a very close relationship exists between this and some other diseases there seems little doubt. Eczema and chorea are very often co-existing or interchangeable in exhibit. So is rheumatism, and that in a very peculiar way, the chorea alternating with the high temperature of the more acute types of the rheumatism—and this in the cases where we might often fear in the midst of the exalted pyrexia to see a development of convulsions, to which extent I have occasionally witnessed the advance of the nerve disturbance. Epilepsy, hysteria, the *tics*—are all more or less related to chorea, while it is found to complicate or be associated with a large number of diseases, either by accident or through the incidental influences of nerve degeneration; for the disorder is essentially one of exhaustion and irritation of nerve substance, and brought into active display by whatever disturbs the molecular balances.

Perhaps its most dangerous complication is pregnancy, but as that is beyond the province of this Section, I simply mention it as an illustration of the rarity of fatal consequences as the disease occurs in childhood, and for the suggestion the fact contains as to the foundation of the disorder in an inheritance which tends to a discontinuance in this connection of further race, or rather family permanence.

Relapses are very common, especially in one or two years, and have their origin perhaps more

frequently in fright or great excitement than anything else.

I believe that, in our changeable climate especially, the disorder is often associated with, if not many times dependent upon the nerve congestions and irritations accompanying nephritic disorders. In several cases of enuresis, when the annoyance was relieved and a partial suppression of urine obtained, the result has been followed by the development of choreic symptoms which promptly disappeared upon a return of the incontinence. Knowing the nervous disturbance which often accompanies the high arterial tension caused by the inactive kidney, I have conceived the idea that many cases of chorea may be dependent upon a state of subacute (if I may use the term) urea poisoning, sudden in development and temporary in continuance. The analysis of a number of cases rather confirms me in such belief, *e. g.*, chorea is a very common sequela of scarlatina, and a marked attendant of chronic Bright's disease, as illustrated in a case I now have under observation.

The disorder is said to be very rare in negroes, some writers claiming their complete immunity, and in two or three favored localities of the torrid zone the disease is unknown. Why this is the case is unknown, nor is the usual explanation of the lower grade of intellectual development entirely worthy of consideration, as the disease almost certainly occurs in the conditions of retrogression and "reversal to original types," not, as a rule, in the strong constitutions and vigorous mentalities of the victors in the advancing lines of progress. I should be much more inclined to believe that in the exempt races there is an undiscovered something in the regions of the corpora striata, the *parta perforata*, the gray matter generally, or their reflex connections, which made these people unimpressible and invulnerable in disorders containing a marked psychic element, and set them apart as distinct from the white race as is the donkey from the horse—not a lower people, but a distinct type of evolution. But then, neither anthropology nor ethnology is the subject-matter of this paper.

The terminations of chorea, except in pregnancy, are almost invariably favorable, the patient being restored to his usual health in a few weeks, and only requiring that care and consideration afterward which in all well regulated families is a result of the discovery of a weak or tainted spot in the special breed. The weak places are to be strengthened, the tainted ones to be cleaned, the family life and general environment often totally changed, and such crossing made in future propagations as to secure to succeeding generations a clearer blood and a stronger brain. The possibly permanent amyloid or fatty changes in the elements of the large central ganglia are such as to justify this view and this advice, especially as we meet with so many cases followed by a permanent

nervousness only too suggestive of those early senile changes which make the optimist look grave and reconsider the correctness of his positions. As illustrative cases, and to more clearly define some of the points I wish to especially emphasize, I offer you, in brief, the following:

Case 1.—Age 1 day. Marked left unilateral chorea. Nurse said she noticed it when she first dressed the baby after birth. I had observed some irregular movements while tying, and afterward in dressing the cord, but gave it no attention, as the movements of all, or almost all newborn babies are choreic in manner, although not in character. The sex is male. For five days the movements grew rapidly worse, involving both sides and being almost continuous, after which a steady subsidence of all symptoms took place, the child recovering entirely in two weeks, and remaining so as yet, *i. e.*, so far as the chorea is concerned. Its maternal grandparent is a dipsomaniac, its father a syphilitic, and its mother a physical wreck from excessive childbearing. One of its brothers died at 4 years of cardiac mitral disease, a second died in convulsions, a third has an obstinate tetter, and *this* child will probably die during the coming summer of failure of nutrition in some form or other. The family have moved to another county, but I shall keep them under observation.

Case 2.—Girl, *æt.* 10 years; thin, wiry, neurotic from birth. Had general chorea, especially manifest in lower extremities—a regular dancer, in fact. Is quick in all her muscular movements and bright in speech, but slow to learn at school. Disease came on gradually, lasted several weeks, and seemed to get well under treatment, when a relapse occurred, and six weeks was required to control the case. She is now quite well, but gets very nervous under the slightest observation. Her maternal grandparents died of obscure disorders illy defined as "consumption," her mother is suffering from an inherited taint unknown to herself, but readily defined by her medical attendant. The mother is very neurotic. The father's mother died of tuberculosis, and the father is very subject to "rheumatism." There is no cardiac disorder in the patient. The families on both sides are highly neurotic in character and several of them "queer," two uncles of the patient (maternal) having committed suicide, and almost all the immediate relatives having but one child if any, most of them having none.

Case 3.—Female, *æt.* 16, well-formed and plump, but mentally not strong. Very sweet disposition, but lazy and idle. Marked tendency to sexual excitation. Heart normal, other organs normal. Active cause of attack, fright. This girl was a tough case, resisting the united efforts of the practitioners of several "schools" for several months. Coming into my hands, I gave her no medicine, gave her full nourishment, outdoor

exercise, and brought high moral influences to bear upon her. She speedily recovered, but will always be a little "weak-minded." Her father is a "crank," his father ditto; his mother has been a chronic invalid for years, a "nervous failure." The patient's mother is a plump, healthy woman with no moral sense—little idea of right and wrong; her grandfather died of "consumption" venereal in origin, and her grandmother is a town gossip. Two brothers are dipsomaniacs. The patient's brother is a fit subject for the "home for feeble-minded."

Case 4.—Female, æt. 15; nice-looking, healthy appearing girl generally. Had a mitral cardiac murmur, general cardiac hypertrophy. General chorea, more marked on left side. Very anæmic when presented for treatment. Active cause of disease, sexual annoyance from a follower she did not like. She had menstruated but three months before the attack of chorea. Her environment was not conducive to an elevated grade of morality, and she was somewhat disinclined to engage in the occupation of her associates. Owing to the continued action of the exciting causes, her medical man made a failure and she was sent to me. I had her taken to the home of distant friends where everything was changed, and a few weeks' care, kindness and medication completely restored her to excellent ordinary health. In this case the father is a common drunkard, the mother worse, and a neurotic, one son a dipsomaniac, and every member of the family "off" in morals and health. The grandparents are unknown, if they ever knowingly existed.

Now I offer these as mere types of extreme cases to illustrate points in the argument. They are cases of medical friends not residing in my own vicinity, but with which I am thoroughly acquainted. In each of these families the retrograde changes are so fully established that the two succeeding generations will probably witness the extinction of the stock, unless in some particular individual who shall fortunately inherit an excess of the better elements, along with an endowment of greater vital force and a proper marriage, a long course of tender care and wise training should lay the substructure for a comparatively new lineage. Of course these illustrations are not offered as types of all families in which chorea is found, but as exemplifications of the final possible consequence of the causes and conditions which permit the development of chorea, and as warnings of the fact that a chorea is a danger signal pointing toward degeneration, and is to be promptly and largely heeded by all in whom is a love of family, and a desire for the perpetuation of line and race.

A few words as to treatment and I am done. I know that ours has been characterized as the "science of observations," and in the past of our profession deductions from seeming facts have

been always unsafe. But I think the trouble has been with our "facts." Reasoning by deduction from the *truth* is always safe and productive of the best of results to all mankind in all departments of knowledge, and in no age of the world is this more clearly seen than in our own day and generation; and thus we have only to be sure of our facts, to know certainly "what is truth," and the large knowledge and patient wisdom of the well-trained mind advances safely and triumphantly into the unexplored regions of thought open to human endeavor. If the views suggested in this paper are correct, that the primary causes of chorea are such as may produce a condition involving ultimate degeneration and nervous exhaustion, not necessarily associated with even hyperæmia, but implying a relaxation of the vital forces in the ultimate elements of nerve tissue, and in intimate relation to the disarrangements of malnutrition, we must look for those remedies whose tonic influence, recuperative powers and alterative properties are such as will kindly, gently, but steadily bring strength and order out of the weakness and threatened nervous chaos into which our patient is drifting, by which he is even now invested.

At the head of the list, and endorsed by every writer of any prominence, and I have consulted a very large number, is arsenic. Remembering the remarkable tonic properties of this drug, in medicinal doses, upon many other disorders of the nervous system, its wide usefulness in the neuroses of malnutrition and malassimilation, the advantage taken of its subtle sustaining powers by the experienced guides and dwellers in high altitudes, where long-continued exertion in a rare atmosphere tends to unsettle and demoralize the nervous economies, we are prepared to expect much from its potencies in chorea, and we will not be disappointed in the vast majority of cases, whether we use it as a result of observation, or a consequence of intelligent deduction. It should be given on these general principles, but to *each individual* as the special constitution requires, rapidly pushing the remedy to the point of full tolerance and holding it there as its effects will permit and the case in hand demands, carefully avoiding any toxic manifestation. In extreme and obstinate cases, especially of the inherited senile class reported from New England, the hypodermic administration of the remedy gives better results than any other course. Arsenic may be combined with anything else that the requirements of the case suggest as demanded.

This is one of the disorders in which the Hahnemaniacs have obtained considerable notoriety from the fact that, under the influence of removal from exciting causes, rest, nutritious food and general hygiene, the vast majority of cases of chorea recover without any medication; and as these fellows give "arsenicum" for almost everything, there is accidentally added to good

general management and nursing the most appropriate of remedies. As overwork and worry are powerful factors in determining an attack, rest, as absolute as practicable for a time, to be changed to gentle, passive outdoor exercise as soon as the symptoms commence subsiding, or from the first in mild cases, will always be in order. The various "food tonics," selecting the one most pleasant and best agreeing with the patient, should be given from the first, along with easily digested and highly nutritious food. I have found general daily inunctions and gentle massage excellent adjuvants and as seeming to have a decided influence in abbreviating the period of convalescence, the moderate and healthful stimulation of the peripheral branches having a highly beneficial effect upon the nerve centres. All sources of reflex irritation are to be thoroughly removed, and they will sometimes be found where least expected.

Iron, zinc, and the compounds of phosphorus, are very useful as auxiliaries to be introduced for the elimination or control of special symptoms, some of which are nearly always found. The same may be said of the bromides, chloral, ether spray to the spine, hyoscyamus, eserine, nitrite of amyl, skunk cabbage, cimicifuga racemose, cod-liver oil, cocaine, malts, and everything else which has been recommended, for the use of which there might be some temporary demand in an individual case. But every intelligent physician has favorite remedies of his own selection for the combat of symptomatic derangements. Phosphorus uncombined is an irritant and worse than no remedy, but the organic compounds of phosphorus are of great value as true nutrients. In conditions of actual hyperæmia of the cord especially, I have obtained excellent results from ergot, from ipecac in small doses, and from hydrastis, the two latter being remedies of greater potency than is generally known, seeming to act as direct tonics to the spinal and sympathetic nervous systems.

Strychnia, the "nux" of the "homos," is another agent of very great value in the treatment of chorea. The mistake in its administration consists in giving too large a dose. The $\frac{1}{1000}$ to the $\frac{1}{500}$ of a grain four times daily is sufficient to commence with in children of 8 or 10 years of age, which dose may be cautiously increased, or more frequently administered, if deemed desirable. In these minute doses it acts as a gentle tonic stimulant to an exhausted, depressed and irritable nervous system, producing no unpleasant effects so far as I have been able to discover. Where rheumatism is a prominent factor, I consider salicin with phytolacca decaudra and guaiaci as the very best treatment in most of cases. Electricity is coming to the front of late as another reliable remedy in the ordinary forms of the disease. It should be used in the form of galvanism and applied with caution to the brain, not using more than 3 milliamperes daily, so as to produce an anodyne or

soporific effect. Downward galvanization of the cord is the correct method of its application to the spine, where its soothing and steadying influence is often manifest to a remarkable degree. It is a remedy well worthy of trial in all cases the least violent in degree or obstinate in character.

I believe I have brought forward most of the points I wish you to consider. Chorea is largely on the increase, especially in this country, and many of the causes, both remote and active, are within the power of our removal. If I have offered a suggestion that will make our course plainer, and our duty more imperative, I am content, and shall sincerely rejoice if I have been in the least instrumental in throwing an additional glimmer of light upon a subject of so great importance to so many and of such deep interest to myself.

REVERSIVE ANOMALIES IN THE STUDY OF THE NEUROSES.

Read in the Section of Practice of Medicine, at the Thirty-ninth Annual Meeting of the American Medical Association, May 8, 1888.

BY IRVING C. ROSSE, M.D.,
OF WASHINGTON, D. C.

In studying the causes of nervous disease we cannot overlook neurotic inheritance and predisposition, and we are obliged to recognize the importance of reversive anomalies not only from a biological, but from a pathological, point of view. We often come across such terms as atavism, and teratology, in the more modern works that deal with the investigation of the nervous functions.

The subject of morphological and physiological retrogression not being well explained in any of the text-books that have come under my notice, it may be a sort of stumbling-block to some, as it was to me, until a short time since, when I sufficiently familiarized myself with enough of the details of the topic to prepare a systematic paper, lately printed in a standard medical publication.

Conservative heredity, displaying itself intermittently in the form and function of progenitor and progeny, has no doubt existed in all organic beings from time immemorial; but the idea does not seem to have taken verbal shape and embodiment until the botanist, Duchesne, created the word atavism to designate one of the proceedings of heredity. The tendency of living beings to reproduce in time a succession of individuals like their parents may manifest itself in a mediate, a *direct*, or a *collateral* form. This phenomenon has for its condition, first, variation; for, if living beings did not offer any variation in their type, heredity would be necessarily and always immediate, and atavism would be confounded with it. But the typical forms modify: in some measure and for some cause, whatever it be, they may transmit these modifications to their descendants.