China, in relation to America

by Wm. M. Meredith

An excellent statement of the relation, if not specifically mentioned.
On Chorea, in its relation to Rheumatism.

Of the many spasmodic or convulsive diseases to which childhood is liable, chorea, or as it has been somewhat quaintly termed "insanity of the muscles," is perhaps by no means the least interesting. For, although rarely fatal in its ordinary form, it is, to say the least, a very disagreeable and unpleasant disorder to suffer from, and one that occasionally lead to very dangerous results. It is essentially a disease of the nervous system, characterized by frequent jerking, irregular, and almost uncontrollable contractions of the voluntary muscles, and accompanied, in general, by a state of extreme debility and imperfect muscular
development. Unlike the nervous system in diseases, consciousness usually remains
unimpaired, but the power of the will
over the muscular apparatus is apparently
diminished, while there is at the same time
an augmented and persisted activity of the
sensori-motor centres.

But before proceeding to the consideration
of the pathology of chorea properly so called,
we may refer shortly to a modification of
it, which, though hardly worthy of being
regarded as a disease, is nevertheless ex-
tremely interesting as a matter of history.

During the middle ages, and especially
about 1350, when the "black death" had
just swept over and decimated Germany,
there arose among an ignorant and super-
stitious populace, overwhelmed with terror
and consternation by the dreadful ravages
of the pestilence, a species of religious,
or rather fanatical, enthusiasm which
manifested itself under the form of a
dancing mania known as "the dance of
St. Berg," and which, in spite of the pro-
scriptions and interdicts of the Pope,
spread with alarming rapidity throughout the land. The subjects of this extraordinary malady, apparently inspired by an insatiable necessity or by the force of example, would dance for hours together with surprising energy and perseverance, until, as Hecker describes it, they fell to the ground breathless, exhausted, foaming at the mouth, groaning as if in the agonies of death, and threshing the boots, standing to swathe them in cloths. Evidently, as M. Pic remarks, to counteract the effects of the tympanities induced by their exertions.

For some years this affection continued to spread throughout Germany and Belgium with such rapidity and to such an extent as to render it the curse and dread of the entire community. Its common name, St. Biter's or St. Boy's dance, was derived from an endemic affection of this kind, which existed at Durlheimen in the district of Ulm in Swabia near that city. There was a chapel dedicated to St. Beilt, where on his annual festival, many persons, especially women,
used to assemble and dance together night and day in Fentany and in a sort of delirious insanity. And many similar instances of epidemics of chorea like the preceding are on record. Some of them due to so complicated with religious mania, others not. By these, we may mention one which occurred in Lanarkshire in 1740; another rather more recently in Kentucky and Tennessee; another in Zetland in 1774; and then in Angus-shire, known as the leaping ague; and one in Wales about 1795. All these affective states, however, little else than the name in common with what is usually understood by chorea. They are referable to a state of disordered emotional excitement in which one particular tendency acquires a dominance over the rest, and produces an absolute diminution in the power of volitional control, without the necessary existence of any cerebral lesion. They are, in fact, due to a very harmless kind of that form of monomania which is known as delusional insanity, the victim
of which, though generally perfectly conscious, believes himself impelled by necessity that he cannot resist to the performance of whatever action happens to predominate in his mind for the time being. The chronic properties of the subjects of the epidemics described above belong to the excitatory class, and are analogous to those of the true spinal system, being equally involuntary, but differing in that they are excited by impressions made on the central, instead of on the peripheral, nerves.

But we may now pass to the consideration of chorea properly so called.

Chorea then is, as has already been stated, a disease of the nervous centre, in which, in consequence of an impaired and disordered condition of the volitional powers, the muscles of some parts of the system are thrown into a state of involuntary activity, and their proper duties are performed spasmodically and imperfectly.

"The fault does not consist in a perversion of the will, as has sometimes erroneously
been supposed, but in a diminution or abolition of it, the eccentric movements of choreic patients being caused, as Haeusler has noticed, not as much by a want of co-ordinating power, as by the interpolation of involuntary motor impulses among the voluntary ones; to which, unless they will be called very strongly into action, they are superior in energy. In consequence of the unfailing powers of the will, the susceptibility of the system to the influence of reflex action becomes unduly increased and causes, which in a healthy state of the nervous system would produce little or no disturbance in the regular discharge of its functions, now come into play as sedatives of the characteristic reflex or automatic movements of the chorea patient. It is most frequently met with between the ages of ten and fifteen, or during the period that elapses between the second dentition and puberty, and is much more common in girls than in boys, as the subjunctive table, taken from Dr. West's "Diseases of Infancy and Childhood," shows.
Of 180 cases collected by Hufz in Paris, 138 were girls and 57 boys. And according to statistics published by Dr. Zaschmann, (see Lancet, 1848) of 100 patients affected with chorea 73 were females, 27 males. And in his experience the proportion of females as affected increased remarkably towards the period of puberty. For up to the age of 11 years, of 33 cases, 21 were girls; from 11 to 15 years, of 45 cases, 34 were females; and above 15 years of age, of 22 cases 17 were females.

It is not, however, entirely confined to the period of life here mentioned, being seen, though much more rarely, in the adult. The fact of the greater rarity of chorea in early infancy than afterwards may perhaps be due to the circumstance that as the system becomes more fully developed and
the strength better established, the nervous system also becomes less impressionable, and causes which in the infant would probably have induced a convulsive attack, are no longer sufficient to excite such serious results. But although incapable of producing unconsciousness, or of endangering life, they are still strong enough to exert so great an amount of influence upon the powers of the will over the motor system as to produce chorea. And its more frequent occurrence about the period of puberty is, in all likelihood, due to a certain amount of exhaustion of the nervous forces consequent upon the important changes that take place in the system at that period. This view may also explain the greater frequency of chorea in the female than in the male sex, in the former of whom puberty generally occurs earlier and more rapidly than in the latter, and is accompanied by the commencement of the catamensial discharge, all of which circumstances necessarily induce a consider-
system naturally weaker and less able to bear it than the hardier and more vigorous constitution of the boy. And this idea of impaired nutrition of the nervous system in this disease is confirmed by the general history of chorea patients. They are usually weak, ill-nourished, anemic people, often badly clad and badly fed, and very often more or less infected with the matter of scrofula or rheumatism, or perhaps with some morbid matter peculiar to chorea itself. They are also in many cases exposed to the morbid agencies of cold and damp. And it would appear that climate and temperature exercise an inconsiderable influence upon the occurrence of this disease. Dr. Hughes found it to be more frequent during the six months of winter than during the six summer months in the ratios of three to two. And Nolting remarks that the disease becomes more and more rare as we approach the equator, and is almost unknown in the region of the tropics.

Chorea is very frequently found associated
with other diseases, as anemia, chlorosis, irregularity of the menstrual functions, hysteria, paralysis, and rheumatism. And it is to its complication with the last of these that our attention is to be more especially directed in this paper.

The occasional coexistence and association of chorea and rheumatism has, from time to time, been observed and noted by various authors, but it was not until attention had been specially drawn to the frequent complication of the former with inflammation of the pericardium that their intimate connection came to be recognised by the medical profession. Dr. Copland, Dr. Bright, Dr. Seckelmann, and several other authors had observed and recorded cases in illustration of the connection of the two diseases, and several theories were advanced to explain it. In 1847, Dr. Begbie, of this city, read a paper before the Medical Chirurgical Society, in which he showed that the coincidence of the two diseases was by no means so rare as had been imagined, and directed attention to the fact, that, in all
probability, they depended upon the same morbis diathesis. And in 1849, M. Sée, in his able essay upon Chorea, published in the Mémoires de l'Académie de Médecine, says, that out of 109 cases of Rheumatism admitted into the Hôpital des Enfants in Paris during four years, there were no fewer than 51 in which the disease was complicated with Chorea, giving a proportion of one case of that disease to every two cases of Rheumatism. Since then, numerous other cases have been recorded, all tending to show that the two diseases present, in many respects, a striking analogy, and are probably very often dependent on the same modifying influences.

On the other hand many observers, as M. M. Billard and Burnthez, state that the complication of the two diseases has proved in their experience extremely rare. In their valuable work on the Diseases of Children, these gentlemen observe that while Rheumatism is very common at Geneva, Chorea is exceedingly rare, and the former of these states, that in his private practice during ten years, he had
seen but two cases of chorea, neither of which was complicated with rheumatism, although many children affected with that disease had been under his care. Mr. Lombard too states that during a long course of practice in Geneva, he had only once seen a case of rheumatism in which the complication with chorea co-existed. And Dr. West, and other writers of deserved authority, have advanced opinions to the effect that "although these two affections have been observed together too often for their to have been the result of a mere coincidence, the exceptions are far too numerous to warrant any hypothesis which regards rheumatism in either an acute or chronic form as the ordinary cause of chorea." But notwithstanding these objections, and in spite of the great diversity of opinion that prevails upon the matter, an impartial observer can hardly help becoming concluding that the great majority of evidence tends to show that the two diseases are at least very intimately and remarkably connected.

Several theories have, from time to time,
been brought forward with a view to explain the co-existence and connection between chorea and rheumatism; but before entering upon the consideration of any of these, we may first glance shortly at those more important features which especially indicate the analogy between the two diseases.

And the first point that attracts attention is the great number of instances recorded in which the two diseases either co-existed or the one affection succeeded upon the other. For, in addition to many individual and scattered cases, mentioned by various authors, as Copland, Picard, Bright, Abernambie, Babington, Boyce, Constant, Baedelengeer, Bazin, and others too numerous to name, we find in M. See’s paper already quoted, in which the connection of the two diseases is particularly and carefully worked out, a record of 109 cases of rheumatism, in which it assumed its chronic form, of which 49 were cases of simple uncomplicated rheumatism, while the remaining 60 were cases of simple uncomplicated chorea; this gives, as the proportion in which these occurred.
application of the two diseases existed, rather more than one of every two cases of rheumatism; or, to state it otherwise, if every two cases of cholera, not at least may be considered to be due to the rheumatic diathesis. And this proportion is, as Mr. See justly observes, the more remarkable when we reflect that, among children, rheumatism is an almost extremely rare disease, so rare indeed as to have been believed to be incompatible with syphilitic poison. And when it does actually make its appearance under such circumstances it is rather referred to the effects of too rapid growth or some such abnormal physiological condition, than to its true cause, namely, the first manifestation of the rheumatic diathesis. And Dr. Hughes, in his Report on Cholera, published in Guy's Hospital Report for 1846, says that out of 104 cases in which special inquiries were made respecting rheumatism and heart affections, there were only 15 in which the patients were born free from cardiac murmurs, and had not suffered from a previous attack of rheumatism.
Dr. Keenies makes mention of 36 cases, in which chorea was observed in connexion with either articular rheumatism or cardiac affection. And many other instances might be quoted, but these are amply sufficient to show that at all events there is a very intimate connexion between the two diseases.

The choreic affection is, for the most part, preceded by the rheumatic attack, but occasionally the two diseases are found to be co-existent. Thus M. Sté found 71 cases of chorea preceded by rheumatism, in 44 of which the disease was acute, and in 30 chronic, and characterized by pains in the joints; while in only 15 did he find the two diseases to co-exist. In many cases it is complicated with both articular and visceral rheumatism, that is to say, with rheumatism of the joints and of the heart and its membranes, or some part of the internal fibrous nervous structures, as the pericardium or peritoneum, while it is occasionally seen to exist without any external rheumatic affection at all. In very many instances the tendency to the chorea rheumatic diathesis, if we may so term it, makes its appearance
by an attack of rheumatic arthritis, presenting its ordinary phenomena of pain and swelling of one or more of the joints, generally the larger ones. This is succeeded by a few days by an attack of chorea which develops itself apparently indiscriminately in either the unaffected or the affected limbs.

In these circumstances the disease is, in general, of short duration and readily amenable to treatment. At other times it appears under a more obstinate and persistent form; and occasionally presents a marked disposition to shift its place, appearing in one side or one limb for a day or two, then leaving it and making its appearance suddenly in another limb, and perhaps returning again to the one originally affected.

This tendency of the rheumatic affection to visit a past naturally recalls to mind a very interesting and dangerous and unfortunate but uncommon feature in rheumatic fever. This the intimate connection of rheumatic arthritis and chorea supervening upon it is rendered more evident by the consideration of cases, many of which
are in recrudescence, in which every new attack of chorea is preceded by a new attack of rheumatism. Patients who have once suffered from rheumatism are ever liable to its recurrence. A first attack is generally followed by a second, and a third, and even a fourth, similar to, or less severe than, the first. So it is with chorea. He suffers from it, labors under the liability of seeing his disease break out again and reappear from time to time under the influence of the slightest causes, so he not infrequently finds the two diseases alternating in his own person, rheumatism making its appearance at one time and chorea at another. And as the tendency to rheumatism is hereditary, so apparently is the tendency to chorea. Occasionally also the two diseases are seen to exist in the same family, chorea developing itself in one member of it and rheumatism in another. This circumstance, to which attention was first directed by Dr. Begg, in his paper already referred to, has since been fully confirmed by the observations of many practitioners.
and it goes a great way to establish the connexion of the two diseases and their dependence on the same morbid diathesis. Again the chronic complication may, and often does, occur along with an attack of internal or visceral rheumatism, either with or without the co-existence of any external affection. In such cases any of the fibrous structures, as the arachnoid, the pleura, the pericardium, the endocardium, or the peritoneum, is liable to be affected. And as rheumatism generally attacks the joints and the heart and its membranes in preference to the other fibrous connective tissues, so also chronic rheumatism apparently chooses the same tissues, and in the same order. Thus Mr. Lee has recorded 66 fatal cases in which, on inspection of the body, distinct evidences of arthritis were found in 16 cases; of peri-carditis and pleuro-pericarditis combined in 11; of peri-carditis or pleuro-carditis alone in 12; of hypertrophy of the heart in 8; of arachnitis in 6; of oesophageal induration of the windings in 3; of pleuritic effusion in 6; and of peritonitis in 6.
And Dr. Hughes, in his report already alluded to, informs us that of 14 cases examined after death from chorea, disease of some sort was observed within the cranium in 10, while the brain and its membranes appeared quite healthy in 4.

Among the most frequent accompaniments of chorea, and especially in those cases in which the complication with rheumatism exists, signs of disease in disorder of the heart are very generally recognized. These signs consist chiefly in irregularity of the rhythm and inequality of the force of the heart's beats, sometimes associated with a systolic murmur at its onset; or in the murmur alone, which varies much at different times in intensity and force; or lastly, in the distinct evidences of pericarditis or endocarditis. That irregularity of the rhythm and inequality of the heart's action as occurs in chorea is undoubted; but they are comparatively rare; a murmur of one kind or another being much more common. Indeed it seems probable that no case of chorea whatsoever is altogether
Free from the existence of a murmur during some period of its course. And these murmurs are apparently of three kinds, known as functional, dynamical, and organic.

The first of these occurs synchronously with the heart's first sound, is heard most distinctly over the upper part of the sternum, is propagated along the course of the cervical vessels, and is, in all probability, associated with and due to the same cause as the so-called venous murmur or "breath of the diaphragm" so often observed in the neck.

It is, in short, due to an altered and disordered state of the blood, dependent on the anaemic condition of the patient, as shown by his general aspect, history, and symptoms, and by the gradual diminution and ultimate disappearance of the murmur under a course of tonic treatment.

The second, or dynamical murmur, accompanies the first sound of the heart, is heard most distinctly towards the apex, and is evidently due to chronic derangement of the muscular apparatus of the organ. As Dr. Halashe, in his work on the Diseases
of the lungs and heart, says of such murmurs, "they cannot be referred to inflammation or organic change of the mitral valve; they have not the usual accompaniments of a harsh murmur; but they do seem plausibly attributable to a disorder in the muscular apparatus connected with the valve." They often continue for a considerable time, and though they sometimes outlast the chronic affection, yet as a general rule, they gradually disappear under proper treatment as it declines.

The third kind of murmur, the organic, is one that occupies a far more important place and gives a far more unfavorable prognosis than either of the preceding. For it is always indicative of the occurrence of serious organic changes in the vascular structure of the central organ of the circulation. It is always universally present in those cases in which the complication with rheumatism manifests itself, and is due to the inflammatory process in the latter disease attacking and permanently injuring the valves of the heart by the
development of fibrinous exudations upon their edges. Dr. Hughes states that of 16 cases examined after death during the existence of chorea, the organs within the chest were not mentioned in 2; were reported to be healthy in 2; and were more or less diseased in 12. In 11 of these 12, the sigmoid or the auricular ventricular valves of the heart were in a diseased condition. In 5, if not in 6, of these cases, the disease consisted of vegetations upon the edge of the mitral valve; and in 1, similar vegetations were present upon the tricuspid valve. As the result of the deposition of this fibrinous material upon them, the motion of the valves is interfered with, their closure is effected imperfectly, and the consequence is, in the majority of cases, the development of a mitral stenosis or regurgitant murmur.

In many cases, too, where the complication of the two diseases is met with, pericarditis is found to exist. Its presence is usually indicated by the occurrence of an acute febrile attack, severe pain in the precordial region, and the development of a two- and four-syllable friction sound. The pericardial affection is, however, by no means so common as the endocardial.
From an analysis of 36 cases in which oedema was observed in connexion with aricular rheumatism alone, with acute cardiac disease alone, or with these two diseases in combination, D'Erckes deduces the following conclusions. The rheumatic symptoms are often associated with endocardial than with pericardial disease, and are most likely to arise when aricular rheumatism and disease of the heart exist together, than when either of those affections occurs separately.

Again, the condition of the urine in the two diseases is deserving of notice. It is found in both to be in general turbid, highly acid, of high specific gravity, sometimes as high as 1035, and occasionally it deposits a deposit of urine acid crystals.

The peculiarly acid state of the saliva and perspiration in rheumatism is well known, and it is not improbable, that a similar condition will be found to prevail during the existence of the chronic affection.

Such is a short and imperfect sketch of the principal features that the two diseases have in common. We will now consider shortly their
In conclusion, and here, as in most constitutional disorders, we have to deal with two aetiological elements, the predisposing and the exciting or determining causes. Among the former, the first that attracts attention is the almost universal existence in chronic patients of what has been termed nervous idiosyncrasy. They are, usually, excellent examples of the nervous temperament, the peculiarity of their constitution being a remarkable tendency to generate an excess of nerve force, which, under ordinary circumstances, when the will is strong enough to control unusual muscular movements, asserts itself in emotional manifestations in activity of body, or in intellectual efforts. Such a constitution is essentially a weak one; it is easily worn out and exhausted, and its energy is soon spent. This is an.

Another important cause predisposing to chronic in the great majority of instances, the subjects of this disease are females in whom, in addition to the existence of the nervous temperament referred to above, there is naturally a greater excess of nervous energy than in the opposite sex. Among the other predisposing causes of headache may be mentioned hereditary tendency, constitution.
al debility; exposure to cold and damp; bad and unwholesome diet; weakness of the digestive and assimilative viscera; neglected state of the bowels; precarious excitement of the nerves and affections; and the existence of the rheumatism, phthisical, and rheumatic diatheses.

The exciting causes are not always readily ascertainable, but they are all referable to abnormal or increased susceptibility of sensory stimuli. They produce their effect either by influencing the peripheral extremities of the nerves, or by acting directly on the nervous centres.

Among the former, are those cases which are dependent upon a disordered condition of the uterine functions; upon the establishment of catamenial discharge; upon the accumulation of morbid matters, in the presence of worms, in the alimentary canal; or upon the occurrence of the first or second coition. Of these which act directly upon the nervous centres, flight, or the sudden and violent emotion of fear, were the most according to common experience, a very high place. "His mother Spenser is analogous to that of shock in concussion of the brain, lowering the tone of the whole nervous system, lessening
the power of the will, and brings into undue prominence automatic modes of action. At one blow it breaks up the delicate equilibrium of the nervous system, depresses the power of the will, and leaves on the brain an impression which acts as long as lasts as a constant stimulus to those automatic impulses of which the diminution of the will facilitates the establishment. Other exciting causes, similar in nature, but inferior in intensity to fright, are found in anxiety, the dread of impending occurrences, concealed mental impressions and moral emotions, and the influence of imagination, particularly morbidly exercised imagination in connection with sexual desire, jealousy, and envy, all of which involve the existence of a fixed idea or emotion as the source of the involuntary impulse. With regard to rheumatism as an exciting cause of chorea, the probability is that the blood poison of the former acts both indirectly through the peripheral nerves in the organs with which it comes in contact, and directly upon the nervous centres themselves. But this is still an open question.

Passing now to the consideration of the
peak of the disease, we have no difficulty in seeing that the nervous system is primarily affected in chorea. the muscular system being implicated secondarily, and participating in a depraved nutrition which renders it more liable to sympathise with the irregularities of a debilitated and disordered nervous system. That this is the case appears from the facts that fright is one of the most common exciting causes of the disease, and that the nervous system is evidently peculiarly exible, the chronic jaundice being in general greatly augmented by the presence of strangers. And that the brain rather than the spinal cord is the seat of the disease is shown by the hemiplegic character of partial chorea, by the frequent origin of the disease from a mental cause, and by the readiness with which sleep controls the choreic convulsions, sleep being undoubtedly an affection of the brain. And the part most probably implicated is the corpus quadrigemina and the large mass of nervous matter which constitutes the greatest part of the mesencephal, and forms the common bond of union between the
hemispheres of the brain above, the medulla oblongata below, and the cerebellum behind. An affection of this part of the brain may, from its extensive connections, induce all the phenomena of chorea, either partial or general.

But what is the nature of the muscular process in chorea? Experience shows that the muscular process in the brain is not such as to produce lesions recognizable by our means of observation as sufficient to account for the phenomena of the disease, and clinically experience shows that the disturbance produced easily admits of repair by natural means, and may be completely controlled by sleep. In addition to this the movements are precisely those of an asthenic state, not unlike what are seen under circumstances of great debility, as the subsidence of typhus, the paralytic shaking of old age, or the tremblings of the habitual drunkard; all of which indicate a feeble and irregularly developed nervous force, and a poor and depraved condition of the blood. This then brings us more immediately to consider what is the nature of the muscular process in chorea associated with rheumatism.
And there can be little doubt that the common source of irritation in these two diseases is a tonic one, as was originally suggested by Dr. Beeby. For Dr. Copland's doctrine of metastasis or extension of the rheumatic affection to the membranes of the spinal cord is inadequate to explain the occurrence of cases in which, on inspection of the body after death, the cord and its membranes have been found quite healthy. Neither will it explain the occurrence of rheumatism in one member of a family and share in another. And moreover the possibility of any such thing as metastasis has lately been called in question, and is by some considered to be extremely doubtful. Nor is the theory propounded by Dr. Bright, in which he ascribes the affection once of the chiesia affection to irritation produced by lesions within the chest and communicated to the nervous system through the phrenic nerve, apparently much more satisfactory. And Dr. Babington's idea that the disease is due to irritation of the pleura and fascia that surround the heart; and Dr. Burnoux's theory that the muscular action
nerve is in fault as well as the phrenic; and Dr. Watson's modification of the views given above, namely, that some mobile condition of the membranes of the spinal canal may have arisen simultaneously with the inflammation of the pericardium, so that the cardiac disease may operate by some ill-understood influence upon different nerves of the end, as an recent cause of the irregular movements. These are all insufficient to account fully for the various phenomena of the disease. For, as Mr. Bond, in a paper in the Brit. and For. Med. Chir. Rev. 1860, in the pathology of Chorea, says, "that it does not depend upon the cardiac lesion is shown by the occurrence of chorea in patients who have suffered from rheumatism, in whom either vascular disease or pericarditis alone may have been present; by cases where neither of these lesions can be detected, and the patients have not previously suffered from rheumatism, although that disease occurred at a subsequent period; by the occurrence of rheumatism in some members of a family and chorea in others; and by the cure of
Chorea in patients with persistent valvular disease. The true theory, then, and the one that best explains all the phenomena already alluded to, is that suggested by Dr. Begbie, and supported by Dr. Tred, namely, that the association of the two diseases depends on the morbid condition of the blood which is now generally admitted to exist in the rheumatic diathesis. That this morbid condition of the blood is pathological chemists have not yet absolutely determined. The prevailing idea at present seems to be that it is due to an excess of uric acid in the blood. But whether it be so or not, there is every reason to believe, that the same poison, or at least a modification of it, will be found to exist in the blood of the chorea patient, in whom there is a tendency to the rheumatic diathesis. And this explanation, as Dr. Begbie observes, will apply equally to chorea occurring in individuals or families inheriting the rheumatic diathesis, to chorea occurring in connection with rheumatism, but without the cardiac complication, and to chorea associated with pericarditis, or endocarditis, or both.

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