

13
New Journ.
April

THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES.

APRIL, 1890.

CHOREA IN THE ADULT AS SEEN AMONG THE INSANE.

BY THEODORE DILLER M.D.,
ASSISTANT PHYSICIAN IN THE STATE HOSPITAL FOR THE INSANE, DANVILLE, PA.

IN collecting data for the preparation of a paper upon hereditary chorea which appeared in the *JOURNAL* for December last, I found that chorea in adult persons was, irrespective of the feature of heredity, considered by a large number of writers as a rare affection. I, myself, had never seen a case except in this hospital, where there are at present six cases, three of which present very unusual features, viz.: one is a case of so-called hereditary chorea, another has chorea alternating with epilepsy, while a third is of peculiar interest because it is a congenital case.

In the article above referred to, I have spoken of the first two of these cases, the case in which direct hereditary transmission was traceable, forming the text for the discussion. In this paper I shall again refer to both cases, though briefly, together with the four unpublished cases. A search into the literature of the subject led me to believe that six adult choreics in an insane population of 900 was a large number; but, on the other hand, I felt that the rarity of the affection is not so great, at least among the insane, as is claimed by some authors.

Several writers have spoken of various moral, mental, and emotional deflections which were observed in choreics with long-standing histories of the affection. Clouston¹ as early as 1870 spoke of choreic insanity, and again in 1873² he called attention to "choreic insanity," which he says "is in every way allied pathologically as well as in its symptoms to the "rhenmatic insanity"—an affection to which Skae³ referred in

¹ *Journal of Mental Science*, vol. xvi. p. 210.

² *Ibid.*, vol. xx. p. 207.

³ *Ibid.*, vol. xx. p. 204.

his lectures in 1845. Graves early called attention to chorea in the aged. Clouston recognized the fact that insanity and chorea coexisted in a single individual, but appears to have regarded rheumatism as the sole cause of the trouble—*i. e.*, given a case of chorea with mental disturbance, there must have been an antecedent history of rheumatism. He quotes the opinion of Arndt, a careful German observer, who

“does not believe in the existence of chorea without more or less simultaneous affection of the intellectual faculties. The abnormal movements are mere symptoms of a much more extensive disorder involving the entire nervous system.”

After discussing the mental disorder observed in ordinary chorea of childhood, Clouston says :

“There is a form of insanity, or rather mental imbecility, that accompanies and results from a long-continued chorea. . . . It is, in fact, the ordinary dementia that follows all long-continued mental derangement.”

Thus we see that Clouston at that time recognized the facts that chorea was to be found in a chronic form, and that its existence so continuously in a person brought about a gradual impairment of the mental faculties which progressively increased and finally came to be actual dementia.

Bueknill and Tuke¹ pass the subject over after quoting Griesinger and Clouston. Griesinger² says very rarely chorea arises out of acute rheumatism, but that “sometimes, under the influence of accessory causes, we see prolonged melancholia with stupor, mania, mental weakness, etc., occur.”

Spitzka,³ after combating the idea that the mental faculties are ordinarily affected in chorea of childhood, discusses the subject of chorea in the chronic insane in these words :

“In protracted cases of chorea the mind suffers in the direction of actual insanity; in that case maniacal outbreaks, confused delirium, enfeeblement of the memory, rapid emotional change, and, in extreme cases, dementia may ensue. It is a psychosis with these symptoms which is designated choreic insanity.”

Savage⁴ relates a case of “multiple sclerosis,” of which he says :

“I have no doubt that a few years ago this case would have been looked upon as one of chorea with mental symptoms; and it was in many particulars like the disease, but there was sufficient evidence to make the diagnosis sure.”

Considering the element of doubt here introduced as to the diagnosis of this case, it is to be regretted that the distinguished author does not give us something which would make this point clear. To say that the patient had “all the peculiarity of head and limb movement which is common

¹ Psychological Medicine, pp. 377 and 378.

² Op. cit., Sydenham Society Translation, p. 189.

³ Manual of Insanity, p. 372.

⁴ Insanity and Allied Neuroses, p. 390. (Ed. 1885.)

in that disease" (multiple sclerosis) does not convey to the reader a very clear idea. Further, when he says "any attempt at movement was followed by irregular, spasmodic movements of all his limbs," I cannot feel, as does Dr. Savage, that the diagnosis is certain. On the contrary, from the description, it looks quite as much like a case of chorea as it does of multiple sclerosis. Savage states there were six choreics among 846 patients admitted to Bethlem. Intellectual weakness, he says, is common in these patients, but tells us no more of them than the mention of that fact.

M. Rosenthal¹ calls especial attention to the hereditary irritability of the coördinating apparatus. This disposition, he says, is not always shown by the direct transmission of choreic affections, but the existence of other nervous diseases in the parents or other members of the family. Wharton Sinkler² says chorea may occur at any age, and has himself recorded³ two cases in persons aged eighty-two and eighty-six respectively.

Speaking of psychological disturbances in chorea, von Ziemssen⁴ says they are "rarely absent, although in the lighter cases they are but little developed." Charcot⁵ satisfactorily demonstrates that chorea and ordinary senile trembling are essentially different conditions. The gesticulatory character of the one, he declares, cannot well be mistaken for the simple oscillatory movements of the other, which are usually confined to the head.

The coarse, irregular, incoördinate movements of the choreic are peculiar and distinctive. I myself have never seen a case of chorea which could be mistaken for paralysis agitans, locomotor ataxia, multiple or lateral sclerosis—the affections presenting symptoms which are nearest in character to those of chorea. Further, I am unable to notice any essential difference between the movements in these chronic cases of chorea with insanity and those observed in the ordinary chorea of childhood, except, perhaps, the movements in the latter case are, as a rule, more exaggerated.

We find occasional references to chorea in the adult by the early writers, a few of whom appear to have recognized and noted, though briefly, this interesting phase of the disease; but, for several years just prior to the appearance of Charcot's paper upon the subject in 1878, the disease appears to have been, by many, lost sight of or confounded with ordinary senile trembling, or one of the various scleroses. Its very existence was unknown or denied. Since the date of Charcot's monograph the affection has been noted and described by a sufficient

¹ Diseases of the Nervous System.

² Pepper: System of Medicine, vol. v. p. 441.

³ Journal of Mental and Nervous Disease, July, 1881.

⁴ Cyclopædia of Practice of Medicine, vol. 14, p. 438.

⁵ Medical Times and Gazette, 1878, vol. i. p. 245.

number of observers to make unnecessary, in this place, an attempt to establish the fact of its existence or an endeavor to go into the points of differential diagnosis. I do not mean to say that no cases are to be found which cannot be diagnosed readily—for such there may be; but I simply wish to say this, that ordinarily—in the great majority of cases—no difficulty in diagnosis is experienced.

I will next notice some reports of cases of chorea in the adult. Several of them are of great interest, and all, I think, are worthy of perusal in connection with the subject.

James Macfaren's¹ is the earliest report of a single case which I can find:

It is the case of an unmarried man, aged forty-six years, who was sober and industrious in his habits. Choreic movements noticed six years ago; slowly but steadily increasing. At time of admission to hospital "had constant choreic twitchings of his limbs, which were never still for an instant; was always swinging his head about and jerking it from side to side. When asked to put out his tongue could not do so for some time, and then suddenly protruded and withdrew it." The mental symptoms were slight. There was some enfeeblement of mind, and upon slight provocation he was often extremely irritable. No history of rheumatism. Heart examined frequently and found to be normal.

Sutherland² reports a case of "hysterical chorea" in a married woman, aged fifty-three years. Twenty-five years ago she had an attack of chorea caused by anxiety for safety of her husband, who was a soldier engaged in the Crimean war. Six months before she had had an attack of tetanus, immediately after which choreic movements were noted. The incomplete history of an attack of tetanus, and the fact that the patient had a "sham epileptic fit," led the author to believe this case to be admixed with hysteria.

G. Mackenzie Bacon³ relates the case of a female, aged fifty-eight years, admitted to Cambridge Asylum with maniacal excitement and severe choreic movements which had existed six months. She died in the hospital after rather a long residence there, having been choreic continuously up to the time of her death.

Octavius Sturges, in a painstaking article on "Statistics of Fatal Choreia," in which he brings together 80 cases⁵ of death in connection with the disease, draws attention to the striking fact that, although chorea is generally regarded as a child's affection *par excellence*, 48 of these cases were of persons over thirteen years of age, and the ages of two not being stated. As to sex, of 46 of these 80 cases (excluding from consideration the other 34 because particulars were not given) he finds 34 were females and 12 males, only 8 of the females being children; of the males, 9 were adults and 3 boys. The principal reason why these

¹ Journal of Mental Science, vol. xx. p. 97.

² Ibid., vol. xxv. p. 398.

³ Ibid., vol. xxvi. p. 253.

⁴ Lancet, July 17, 1880.

⁵ These cases were gathered from records of a great number of years, and are taken from the following sources: (a) 3 cases (quoted by Dr. Bright), Med.-Chir. Trans., 1839; (b) 11 cases (Dr. Hughes), Guy's Hospital Reports, 1846 (first series); (c) 7 cases (from same source), 1855 (second series); (d) 34 cases (Dr. Tuckwell), St. Bartholomew's Hospital Reports, vol. v.; (e) 22 cases (Dr. Dickinson), Med.-Chir. Trans., vol. lix.; (f) 3 cases (Dr. Peacock), St. Thomas's Hospital Reports, vol. viii.

statistics show such a great disproportion of deaths among adults as compared with children is because of the chronic character of the disease in the adult, and the almost invariably acute character in children. The adults usually died *of* chorea, while children died *with* the disease. Of the few deaths in children dying *of* chorea nearly all occurred about the age of puberty. This time of life is regarded by Sturges as a strong predisposing cause of death, the fatal cases, among the children, belonging almost exclusively to this period.

W. Bevan Lewis¹ reports in detail a case of post-hemiplegic chorea associated with insanity in a woman aged sixty-one years :

Eighteen months before, she was seized with paralysis affecting the right side of her face and right arm ; she was also deprived of the faculty of speech, but the right leg was unaffected, and she did not lose consciousness. Six months ago she began to lose control over the movements of the right leg, and about the same time the right arm, which had regained much of its former power, became the seat of characteristic movements which were present upon her admission to the West Riding Asylum. Coincidentally with the onset of choreic movements mental derangement was noticed. Her speech was notably choreic ; she was peevish, querulous, and obstinate, unable to concentrate her attention, and, at times, unable to make the slightest mental exertion.

The *post-mortem* examination revealed a superficial softened patch, involving the cortex of the posterior part of the left supra-marginal, anterior limb of the angular and second annectant gyrus of the left hemisphere ; similar softening involved both ascending parietals along their middle thirds ; cortex generally wasted and thin. Careful examination of the ganglia of both hemispheres showed no change beyond a minute hemorrhage of recent date, involving the posterior part of the left lenticular nucleus.

Charcot reports two cases of chorea (already referred to) both of the same age—seventy-one ; in one case the disease had existed twelve and in the other eleven years. He believes the affection due to emotional causes and not associated with rheumatism or heart disease, and that it is incurable but does not endanger life.

Robert Saundby² presents notes of three cases of his own, and adds brief summaries of eight cases already reported by others, making his paper a consideration of twelve cases in all.

CASE 1.—Man, aged sixty-six ; never had rheumatism ; does not attribute his illness to any emotional cause, but has been worried about business. Can walk half a mile. Movements which affected left side and chiefly the left upper extremity have much abated under observation. Has gouty pains in his legs ; has double aortic and a mitral systolic murmur.

CASE 2 (previously noted by Russell³).—Man, aged sixty-eight, who had been ill eighteen months. No heart disease or history of rheumatism. No signs of dementia.

CASE 3.—Man, aged eighty-seven ; no obvious dementia, but disease has existed only five weeks. Movements, which are constant, chiefly affect the arms, but the head and legs are not free from them ; no heart disease or history of acute rheumatism ; has enlargement of extremities of metacarpal

¹ Journal of Mental Science, vol. xxx. p. 256.

² Chorea in the Aged. Lancet, 1884, vol. ii. p. 948.

³ Medical Times and Gazette, 1878, vol. ii. p. 627.

bones; has suffered from rheumatism in all his joints, but was never laid up with it. Upon inquiry does not admit that he has any trouble and seems of a cheerful disposition.

CASE 4 is one recorded by Russell.¹—A lady, aged seventy-seven, who recovered after an illness of seven months. Movements mainly left-sided; no dementia; normal heart; never had rheumatism, or previously chorea.

CASE 5, by C. J. Devis.²—A man, aged seventy-nine; demented; chorea confined to left upper extremity and left side of face; no cardiac disease or history of rheumatism. He died under observation after chorea had lasted a month.

CASES 6 and 7 by Wharton Sinkler, and Case 8 by M. Bacon, have already been referred to in this paper.

CASES 9 and 10, by Graves.³—One in an apothecary, aged seventy, which was "severe and lasted many months." The other in a woman, aged fifty, who had family troubles; the attacks were intermittent, but when present did not leave her even during sleep.

Saundby thinks—and I concur in his opinion—that difficulties in the diagnosis of chorea arise principally from ignorance of the fact of the existence of the affection in adult and old persons. The ordinary senile trembling is not easily confounded with chorea when it is known that both affections are, without doubt, found at the same time of life.

J. C. McLearn⁴ notes the case of a gardener, aged fifty-six; good family history; no heart trouble; has never had rheumatism. Fifteen years ago he became "nervous;" staggered in walking. These first choreic symptoms continued to increase slowly until four years ago, when the death of his wife profoundly affected him. His choreic symptoms became greatly exaggerated. These movements affect arms and head more than trunk; there is cessation during sleep. He has difficulty in articulation; tongue protruded in jerky, irregular manner; irritable, easily excited by trifles, but he is not demented; cannot stand alone; gait shuffling and unsteady. He has had arsenic, iron, bromide of potassium, conium, sulphate of zinc, and, locally, ether to the spine. No improvement noted.

Sée has noted chorea in a woman, aged thirty-six, in another forty-four, and in a man fifty-one. Jeffreys in a patient sixty years old. Powell and Maton in another seventy years old. Bouteille saw a man aged seventy-two who was affected with it. Henri Roger, a case of chorea in a lady eighty-three years of age.

C. B. Radcliffe⁵ quotes 96 cases of chorea, the statistics of which were given by Ogle. Of these cases 19 were above fifteen years of age; 2 occurred at sixteen, 6 at seventeen, 2 at eighteen, 1 at nineteen, 2 at twenty, 2 at twenty-one, 1 at twenty-three, 1 at twenty-four, 1 at twenty-six, 1 at forty-three; and of these 19 cases only 3 were males.

Without pretending to notice all recorded cases of chorea in adults, I have endeavored to present in these more or less concise abstracts a sufficient number and variety of cases to illustrate the subject. I am

¹ *Ibid.*, 1878, vol. i. p. 459.

² *Ibid.*, 1879, vol. ii. p. 447.

³ *Lectures on Practice of Medicine*, 2d ed., vol. i. p. 537.

⁴ *Lancet*, 1885, vol. i. p. 337.

⁵ *Reynolds's System of Medicine*, vol. i. p. 698.

led to believe and hope, however, that few omissions to refer to records of notable cases will be found.

All the cases of hereditary chorea referred to in my paper on that subject in the December number of this JOURNAL can be properly included in this present consideration of chorea in the adult. I have, with a couple of exceptions, omitted reference to them because of the very recent date of that publication.

A desire to study the lessons that might be drawn from a considerable collection of cases of this rather obscure and illy understood phase of chorea, led me to address to the chief medical officers of a number of hospitals for the insane a circular letter asking for information upon the subject, with reports of any cases at present in these hospitals. From answers received to this circular I am enabled to publish notes of thirty-three cases besides those of six other cases from this hospital, making in all thirty-nine cases for consideration.

The plan which seems most convenient and systematic for the recording of these cases is to mention in succession all cases found in each particular hospital, first giving the following points of information about that hospital:

1. Name of hospital or asylum.
2. Population of same.
3. Number of cases of chorea among the population.
4. Name and rank of the medical officer by whom the notes were furnished.

Pennsylvania Hospital, Department for Insane, Philadelphia. Population 397. One case. John B. Chapin, Superintendent.

CASE I. *Mania lapsing into dementia.*—Female, aged twenty-five years. Affected with chorea at the age of twenty years, with insanity at twenty-four years. Chorea exaggerated just after the advent of the insanity. Patient is of neurotic temperament; no rheumatism or heart trouble.

Southwestern Lunatic Asylum, Marion, Virginia. Population 200. Two cases. E. T. Brady, Assistant Physician.

CASE II. *Post-hemiplegic chorea accompanying dementia.*—Miss Mary B., aged thirty-five years, white, unmarried. Three years ago had a stroke of apoplexy, which caused total paralysis of the right side and loss of speech. She has, however, gradually regained faculty of speech and control of muscles of right side, except the right arm, which is still weaker than the left; her speech has improved slightly, and she is now able to articulate, but has amnesic aphasia. The right arm is now choreic, the motion beginning in the fingers and hand, and rapidly extending to the forearm and arm, pectoral and scapular muscles. Voluntary effort increases the jerking; motion does not entirely cease during sleep. The contractures, which usually follow long-standing hemiplegia, are beginning in this case, the hand being flexed slightly, but constantly on the forearm. No family history of insanity or chorea.

CASE III.—Luther K., male, white, aged twenty-two years. Fairly well developed; general health good; an imbecile; father demented; grandfather and uncle on mother's side insane; no history of chorea in parents or relatives. The choreic symptoms ordinary in character and general in their distribution—increased on voluntary effort, never altogether ceasing during waking hours. There is entire rest during sleep.

Lunatic Hospital, Boston. Population 190. Two cases. Theodore W. Fisher, Superintendent.

These cases represent no special form of insanity. Both are irritable or maniacal at times; emotional, hysterical, and noisy; no delusions.

CASE IV.—Female, aged fifty-six years; movements began five years ago; insanity about the same time; no history of heredity, but family history unknown. Patient had rheumatism, but there is no heart trouble.

CASE V.—Female, aged forty-three years. Was congenitally weak; date of beginning of insanity unknown, but is known to have been insane thirteen or fourteen years; chorea began many years ago; gets much excited, especially at the menstrual period.

Mississippi State Asylum, Jackson, Mississippi. Population 475. Two cases. T. J. Mitchell, Superintendent.

CASES VI. and VII.—White woman, aged thirty-five years, and colored man, aged sixty years. In both cases date of advent of chorea as well as of the insanity is unknown. No family histories. Both are free from organic heart trouble. Neither has had rheumatism.

Eastern Michigan Asylum, Pontiac, Michigan. Population 891. Three cases. C. B. Burr, Superintendent.

CASE VIII.—Man, aged sixty-five years. Choreia appeared coincidentally with insanity about eleven years ago following hemiplegia, which was ascribed to exposure in the water; his movements are very exaggerated, and interfere with locomotion; no family history; no heart trouble or history of rheumatism.

CASE IX.—Woman, aged forty-eight years. Has been choreic eighteen years; insanity has existed about the same length of time. Movements are so aggravated as to interfere with locomotion. Her mental and nervous trouble followed disappointment in marriage; mother and maternal grandmother were neurotic and father intemperate; no heart trouble or history of rheumatism.

CASE X.—Female, aged fifty-nine years. Admitted to the asylum three and a half years ago, suffering at that time from confirmed mental impairment. Choreia had not been perceived previous to her admission, but it was doubtless present. It has increased in severity slowly ever since she came under treatment. Mother died of apoplexy, and father of consumption. No heart trouble or history of rheumatism.

Illinois Central Hospital for the Insane, Jacksonville, Illinois. Population 920. One case. H. F. Carriel, Superintendent.

CASE XI.—Female affected with dementia; nothing known of her ancestry; said to have been taken from an orphan asylum when seven years old.

Arkansas State Lunatic Asylum, Little Rock, Arkansas. Population 408. One case. P. O. Hooper, Superintendent.

CASE XII.—A negro, aged thirty years. Dementia; no active symptoms; a slight degree of right hemiplegia; patient thinks chorea began eighteen months ago, probably since he became insane.

Alabama Insane Hospital, Tuscaloosa, Alabama. Population 1006. Three cases. E. D. Bondurant, Assistant Physician.

CASE XIII.—Male, aged forty-eight years. Admitted in 1862 suffering from chorea and melancholia with delusions; is now demented and in feeble health; choreic movements are still well marked; no history of rheumatism; no heart disease; no history previous to admission.

CASE XIV.—Male, aged forty-five years. Admitted in 1878, then suffering from chorea, and being far advanced in dementia. Unable to give an account of himself; history previous to admission unknown; has valvular heart disease.

CASE XV.—Female, twenty-three years old; melancholia, with delusions and dementia; chorea developed three years ago; has had rheumatism, and now suffers from cardiac valvular insufficiency. Father insane.

Insane Asylum of Louisiana, Jackson, Louisiana. Population 494. One case. G. L. Perkins, Superintendent.

CASE XVI.—Female, aged forty-six; no history.

Iowa Hospital for the Insane, Independence, Iowa. Population 800. Two cases. Gershom H. Hill, Superintendent.

CASE XVII.—Matilda B., widow, aged seventy-two, mother of eight children; husband was a physician. She has been choreic fifteen years and insane during the last five years; fair general health but nervous and timid; exercises daily and is able to feed and dress herself; father and mother were insane—the former for ten years; brothers and sisters are very nervous, but it is not known that any member of the family was choreic.

CASE XVIII.¹—Mary S., aged fifty-five, married, but has never borne a child; chorea began insidiously twelve years ago and has steadily increased, until she is now hardly able to walk, feed or dress herself; mental impairment, first noticed two years ago, has slowly increased up to the present time. An uncle is afflicted with chorea, and a brother is seriously threatened with the same disease.

Dr. Hill thinks that the hearts in both these cases are, to some extent, affected.

¹ Referred to in a paper on Hereditary Form of Chorea. AMERICAN JOURNAL OF THE MEDICAL SCIENCES, December, 1889.

State Lunatic Asylum, Utica, New York. Population 643. One case. G. Adler Blumer, Superintendent.

CASE XIX.¹—Female, aged fifty-six, unmarried; insanity began in 1884, and was coincident with the appearance of chorea. On admission, mental condition was that of melancholia; she has since become somewhat demented. Choreia has gradually increased since insanity began. Patient's mother and maternal cousin had chorea. In the case of the mother the chorea came on during the last years of her life (a number of years after the birth of the patient). She has no heart trouble and never had rheumatism.

State Asylum for the Insane, Stockton, California. Population 1604. Three cases. Hiram N. Rucker, Superintendent.

Dr. Rucker makes the following observations on these three cases: They are all females, aged respectively, twenty-two, thirty-nine, and thirty-seven; none has heart disease. The following notes are from the commitment papers which accompanied the patients upon their admission to the hospital:

CASE XX.—Female, single, aged twenty-two, admitted June, 1888. Evidence of insanity; leaves home and wanders around aimlessly; weeps without cause; imagines she and others are to be killed; suicidal; has been insane two and a half years; mother was insane.

CASE XXI.—Female, single, aged thirty-nine, admitted in 1876. Refuses food; unable to care for herself. She has been more or less afflicted since childhood; father died in an insane asylum.

CASE XXII.—Female, married, aged thirty-seven. Wild and incoherent in talk and actions; insanity increasing; an aunt insane. Cause of insanity is stated to be chorea.

Northern Michigan Asylum, Traverse City, Michigan. Population 625. One case. James D. Munson, Superintendent.

CASE XXIII.—Male, aged sixty-five; was subject to epileptic fits during a period of five years between the ages of fifty-four and fifty-nine. He was admitted October 26, 1887, since which time he has been free from convulsions; antecedents unknown. No information in regard to cause and duration was obtainable; no heart disease or history of rheumatism.

Minnesota Hospital for the Insane, St. Peter. Population 967. One case. J. H. James, Assistant Physician.

CASE XXIV.—Male, aged fifty-five; chronic mania; duration ten years; had an attack of insanity at the age of thirty-six. Symptoms of chorea are gradually disappearing since his admission; has had rheumatism, but there is no organic heart disease.

Kansas State Insane Asylum, Topeka, Kansas. Population 729. Four cases. B. D. Eastman, Superintendent.

CASE XXV.—Male, aged forty-four; chronic delusional insanity, with violent homicidal propensity. He was first affected with chorea

some time during his service in the late war, and he has never been free from the affection since that time; the disease is regarded as being due to exposure. He first became affected with insanity four years ago. Chorea has become exaggerated since the existence of the insanity. He married after he became choreic; may have had rheumatism while in the service; no heart trouble.

CASE XXVI.—Female, aged fifty-six; chronic melancholia, with considerable degree of dementia at the present time. Insanity of five years' standing. Chorea has existed a good many years—not definitely known—but much longer than the insanity. Has had rheumatism; no heart trouble.

CASE XXVII.—Male, single, aged thirty-one; chronic mania, with dementia. Insanity of some eight or nine years' duration; no information as to how long affected with chorea. No history of rheumatism; normal heart.

CASE XXVIII.—Female, aged forty-two; chronic melancholia, with suicidal propensity; chorea of ten years' standing; insanity of some three years' duration. Chorea existed before the marriage of patient and came on at the time of, or shortly after, an attack of acute rheumatism. Paternal aunt, uncle, and cousin insane.

Dr. Eastman tells me that there is a young man in the institution who had an attack of acute rheumatism last winter, during which he was choreic, but with the recovery from rheumatism the choreic condition disappeared.

This, I take it, must have been very like the acute attacks of chorea often seen in children who are suffering from rheumatism, or who have about recovered from it.

State Hospital for the Insane, Danville, Pennsylvania. Population 900. Six cases. C. B. Mayberry, Assistant Physician, first three cases; Theodore Diller, Assistant Physician, second three cases.

CASE XXIX.¹—Male, aged sixteen years. Had chorea for ten years; brought to hospital because of excitement; during excited periods had but very slight manifestations of chorea. There are periods of varying length, during which he is free from chorea, but subject to frequent epileptic seizures. Never has a fit during the time the choreic symptoms are active. No family history of chorea, but history of nervous temperament and insanity. No heart disease; never has had rheumatism.

CASE XXX.—Male, aged twenty-three years. Imbecile with excitement; choreic since early childhood; movements very marked at the time of admission. Family of a nervous temperament, and with a history of insanity. No heart disease or history of rheumatism.

CASE XXXI.—Male, aged fifty-three years. Dementia secondary to mania. Family history shows insanity. Chorea commenced about twenty-four years ago following typhoid fever and rheumatism, which he contracted in the army.

CASE XXXII.—Female, aged twenty-six years. Imbecile; father an "alcoholic"; mother died of consumption; said to have been "loose" in

¹ AMERICAN JOURNAL OF THE MEDICAL SCIENCES, December, 1889.

morals. Patient has been feeble-minded and choreic since early childhood. She became unmanageable at home on account of petulant, quarrelsome nature, and was disposed to seek improper male companions. She has small physique; receding forehead. Two sisters died of phthisis. Four sisters and four brothers living, one sister being a patient in this hospital—admitted in 1878 at the age of twenty years and is now a case of chronic melancholia with phthisis.

Our patient is markedly choreic—movements typical—all muscles affected and equally. Speech is difficult and halting. Cessation of movements during sleep; says she cannot remember when she was not affected with the “nervous movements,” and that she was unable to walk until she was six or seven years old.

CASE XXXIII.—Female, aged forty-one years. Dementia secondary to melancholia attonita. Supposed cause of insanity: loss of two children within six days. Her mother was insane, the malady being of a periodic type. Upon admission (in 1878) she was a case of melancholia, but subsequently became excited, destroying clothing, bedding, etc. At present she is well advanced in dementia. She was slightly choreic upon admission, but how long before that time the condition existed is not known. Choreic movements not noted when patient is lying down quietly. Any voluntary action is executed with difficulty and in style peculiar to choreics. The movements are well seen at meal-time as patient conveys food to her mouth. Movements are entirely suspended during sleep.

— CASE XXXIV.¹—Female, aged forty-seven years. Weak-minded; mother of four children; has been affected with chorea for the past six or eight years; rather spare frame, and somewhat above average height. Father, grandfather, brothers, sisters, and a son choreic. Physical condition is fair; chorea well marked; cessation during sleep.

Indiana Hospital for the Insane, Indianapolis, Indiana. Population 1530. Five cases. C. E. Wright, Superintendent.

CASES XXXV., XXXVI., XXXVII., XXXVIII., and XXXIX.—Three males, aged respectively fifty-five, forty-seven, and forty-six years; two females, aged respectively fifty-three and thirty-seven years. They are all cases of dementia. No exaggeration of choreic symptoms noted immediately before or just after the advent of the insanity. Duration of disease and family histories in these cases are unknown; hearts in all five cases affected, and all have histories of rheumatism.

State Lunatic Asylum, Fulton, Missouri. Population 500. No case. W. K. Rodes, Superintendent.

Longview Asylum, Carthage, Ohio. Population 797. No case. C. A. Miller, Superintendent.

State Asylum for the Insane, Warren, Pennsylvania. Population 686. No case. John Curwen, Superintendent.

Central Hospital for the Insane, near Nashville, Tenn. Population 430. No case. John Collender, Superintendent.

Maine Insane Hospital, Augusta, Maine. Population 600. No case. H. B. Hill, Superintendent.

¹ Ibid.

Iowa Hospital for the Insane, Des Moines, Iowa. Population 707. No case. H. A. Gilman, Superintendent.

In 23 hospitals for the insane, distributed over a wide extent of territory and containing a population of 16,499 insane persons, we find there are 39 cases of chorea, of which 16 are males and 23 females. Exclusive of Case XI., where the age is not given, we find the youngest person is 16 years old and the eldest 72 years. The average age is $43\frac{2}{3}$. The average age of the men is $44\frac{1}{6}$, that of the women $43\frac{1}{2}$. 29 of the cases are of persons 35 years of age or over, and of these 29 we find 13 are 50 years of age or over. In 14 cases there is a family history of insanity or a tendency to nervous affection, and in 3 of these we find chorea has been directly inherited.

Among thirty-two cases, in which the form of insanity is recorded, we find there are eighteen cases of dementia (Cases I., II., X., XI., XIII., XIV., XV., XIX., XX., XXVI., XXVII., XXXI., XXXIII., XXXV., XXXVI., XXXVII., XXXVIII., XXXIX.), of which three (I., XXVII., XXXI.) are secondary to mania, five (XIII., XV., XIX., XXVI., XXXIII.) to melancholia, and nine (X., XI., XIV., XX., XXXV., XXXVI., XXXVII., XXXVIII., XXXIX.) to forms of insanity the names of which are not given, and one to hemiplegia. Four (III., XXIX., XXX., XXXII.) are recorded as cases of imbecility. Two (IV., XXXIV.) are noted as emotional, childish, and feeble-minded. Two (VIII., XII.) might be considered cases of post-apoplectic insanity, and one (XXV.) as a case of chronic delusional insanity. Two (XXII., XXIV.) are cases of mania—one chronic and one acute. Two (V., XXI.) are congenital, and one (XXVIII.) is a case of melancholia.

In 28 cases, in which either or both the questions in the circular relative to rheumatism and organic heart disease are answered, we find that of 14 cases a negative reply is given to both questions; of 7 both questions are answered in the affirmative; of 3 the first received an affirmative and the second a negative answer; and of 3 more the second question is answered in the affirmative, while the first is unanswered; of 1 case the second receives a negative reply, while the first is unanswered.

39 cases of chorea in a hospital population of 16,499 insane persons would give a proportion of 1 choreic among every $423\frac{2}{3}$ insane; say, roughly, 1 to every 425.

Considering the number of asylums located in all parts of the country from which these cases are taken, it seems to me it would be reasonable to infer that the proportion of 1 choreic among every 425 insane would hold good of the entire insane population in hospitals in this country.

Considering the 16 cases, in which the length of time which the patients were affected with chorea is stated, we find the shortest period

	Name of Hospital.	Hospital population.	Number cases of chorea.	Age.	Sex.	Form of Insanity.	Length of time affected with insanity.	Length of time affected with chorea.	Family history of insanity.	History of direct hereditary transmission of chorea.	History of Rheumatism.	Presence of organic heart trouble.	Remarks.
I.	Pennsylvania Hospital, Department for Insane, Philadelphia.	397	1	25	F.	Dementia secondary to mania.	1	5	.....	.....	No	No	Patient of neurotic temperament.
II.	Southwestern Lunatic Asylum, Marion, Va.	200	2	35	F.	Post-hemiplegic dementia.	...	...	None.	No	...	...
III.	Do.	...	...	22	M.	Imbecility.	...	...	Maternal uncle and grandfather insane, father demented.	No	...	...
IV.	Boston Lunatic Hospital	190	2	56	F.	No special form; patient is erratic, emotional, irritable.	5	5	.....	.....	Yes	No	
V.	Do.	...	...	43	F.	Congenitally weak-minded.	13-14	Long time	.....	.....	...	...	Gets much excited, especially at the menstrual period.
VI.	Mississippi State Lunatic Asylum, Jackson, Miss.	475	2	35	F.	.....	...	...	No history	.....	No	No	Colored person.
VII.	Do.	...	...	60	M.	.....	11	11	.....	.....	No	No	
VIII.	Eastern Michigan Asylum, Pontiac, Mich.	891	3	65	M.	Insanity came on after an attack of hemiplegia.	11	11	.....	.....	No	No	
IX.	Do.	...	...	48	F.	.....	18	18	Yes.	.....	No	No	Movements very exaggerated.
X.	Do.	...	...	59	F.	Dementia.	3½	Long time	Mother died of apoplexy.	.....	No	No	Choreic movements slowly increasing.
XI.	Illinois Central Hospital for the Insane.	920	1	...	F.	Dementia.	Long time.	Long time.	.....	.....	...	...	Said to have been taken from an orphan asylum at the age of seven.
XII.	Arkansas State Lunatic Asylum, Little Rock	408	1	30	M.	Apoplectic.	...	1½	.....	.....	...	...	Had right hemiplegia.
XIII.	Alabama Insane Hospital, Tuscaloosa.	1006	3	48	M.	Dementia secondary to melancholia.	27	27	.....	.....	No	No	Movements well marked.
XIV.	Do.	...	...	45	M.	Dementia.	11	11	.....	.....	Yes	Yes	
XV.	Do.	...	...	23	F.	Dementia secondary to melancholia	...	3	Father.	.....	Yes	Yes	
XVI.	Insane Asylum of Louisiana, Jackson, La.	494	1	46	F.	.....	...	...	.....	.....	...	...	No history.
XVII.	Iowa Hospital for the Insane, Independence, Iowa	800	2	72	F.	.....	5	15	Father and mother insane.	No	...	Yes?	Brothers and sisters nervous.
XVIII.	Do.	...	...	55	F.	.....	2	12	.....	Uncle and brother.	...	Yes?	Chorea steadily increasing.
XIX.	State Lunatic Asylum, Utica, New York.	643	1	56	F.	Dementia secondary to melancholia	5	5	.....	Mother & maternal cousin.	No	No	Chorea gradually increasing.

Case No.	Asylum	Age	Sex	Diagnosis	Onset	Family History	Course	Outcome	Cause
XX.	State Asylum for the Insane, Stockton, Cal.	1694	3	F.	Dementia (secondary). Congenital.	...	...	...	...
XXI.	Do.	...	39	F.	Mania.	Father.	...	...	...
XXII.	Do.	...	37	F.	Mania.	Aunt.	...	...	...
XXIII.	Northern Michigan Asylum, Traverse City.	625	1	M.	...	...	No	No	Cause of insanity, heredity.
XXIV.	Minnesota Hospital for Insane, St. Peter, Minn.	967	1	M.	Chronic mania.	Chorea.	Yes	No	Cause of insanity, chorea. Had epileptic fits between ages of 54 and 59.
XXV.	Kansas State Insane Asylum, Topeka, Kan.	729	4	M.	Chronic delusional insanity; very homicidal.	...	...	No	Chorea exaggerated since advent of insanity.
XXVI.	Do.	...	56	F.	Dementia secondary to melancholia	Much longer than insanity.	Yes	No	...
XXVII.	Do.	...	31	M.	Dementia secondary to mania (chronic).	...	No	No	...
XXVIII.	Do.	...	42	F.	Melancholia with suicidal propensity	Paternal aunt, uncle, and cousin.	...	...	Chorea appeared immediately after an attack of rheumatism.
XXIX.	State Hospital for the Insane, Danville, Pa.	900	6	M.	Imbecility.	Yes.	No	No	Epileptic convulsions noted when choreic movements cease.
XXX.	Do.	...	23	M.	Imbecility.	Yes.	No	No	...
XXXI.	Do.	...	53	M.	Dementia secondary to mania.	Since early childhood.	Yes	Yes	Chorea came on after attack of rheumatism.
XXXII.	Do.	...	26	F.	Imbecility.	24	No	No	Family history of phthisis
XXXIII.	Do.	...	41	F.	Dementia secondary to melancholia	Congenital. Longer than 11 years.	...	...	Cause of insanity, loss of children.
XXXIV.	Do.	...	47	F.	Emotional, feeble-minded.	8	No	No	Movements well-marked; cessation during sleep.
XXXV.	Indiana Hospital for Insane, Indianapolis, Ind.	1530	5	M.	Dementia.	Grandfather, father, and brothers, and sisters, son.	Yes	Yes	...
XXXVI.	Do.	...	47	M.	Dementia.	...	Yes	Yes	...
XXXVII.	Do.	...	46	M.	Dementia.	...	Yes	Yes	...
XXXVIII.	Do.	...	53	F.	Dementia.	...	Yes	Yes	...
XXXIX.	Do.	...	37	F.	Dementia.	...	Yes	Yes	...

Population 500 (report of 1882). No cases of chorea.
 " 797. No cases of chorea.
 " 686. " " "
 " 430. " " "
 " 600. " " "
 " 707. " " "

State Lunatic Asylum, Fulton, Mo.
 Longview Asylum, Carthage, Ohio.
 State Hospital for Insane, Warren, Pa.
 Central Hospital for Insane, Nashville, Tenn.
 Maine Insane Hospital, Augusta, Maine.
 Iowa Hospital for Insane, Des Moines, Iowa.

given to be a year and a half, the longest twenty-seven years, and the average nearly twelve years.

In 18 cases the length of time in which insanity was supposed to have existed is given; the shortest period stated is one year, the longest twenty-seven years, and the average about eight years.

The congenital cases are not taken into consideration in calculating either of the above averages.

The difficulty of obtaining accurate histories in these cases, the large majority of which are pauper insane, must not be overlooked. I have no doubt that, owing to this difficulty, many of the figures given as to length of time of duration of chorea and of insanity are inaccurate, but with certain reservations the figures above given may be accepted. I believe that if it were possible to collect exact data on these points a greater difference in these figures than that here given would be found to be true.

It is a significant feature of this part of the table that in no case is it recorded that the insanity existed before the chorea, although in several cases (IV., VIII., IX., XIV., XIX.) the two affections appeared coincidentally.

It will be observed that while no large number of choreics is found in any one hospital for the insane, yet there are comparatively few hospitals that have no case of this kind among their populations.

If these 39 cases teach anything, they surely teach that in long-standing chorea there is a strongly marked tendency to active insanity or mental impairment of some sort, both of which ultimately terminate in a condition of dementia. The evidence supporting this proposition is the fact of the existence of 1 case of chorea among every 425 insane people. This proportion of choreics to insane persons must be many times greater than that to be found in the general population outside of hospitals the country over.

The chronic form of chorea must, I infer, be of exceeding great rarity among our ordinary population, else we would not find such meagre accounts of it, or its existence wholly ignored by systematic writers on nervous and mental disease.

Coming now to consider the sex in these cases, we have seen that 16 are males and 23 females—about two-thirds as many of the former as the latter. This is probably not far from the proportion of one sex to the other, as seen in the ordinary chorea of childhood.

There is much to consider in the forms of insanity affecting these cases. Dementia, we have seen, is the mental condition found most frequently, and in the majority of cases it is recorded as being secondary to other forms of insanity. In one of Brady's cases (II.) there are noted symptoms of mental deterioration, common after an attack of apoplexy and with the complication of *local* choreic movements. Cases VIII. and

XII. are not stated to be cases of dementia, but it is not unlikely they will terminate in that condition; but in both these cases the insanity was due to an attack of apoplexy, and most likely the chorea too. Four cases are imbeciles. Several others are congenital cases, and it is a significant fact that we find only two cases of mania, and one of these in the chronic form—probably with some degree of dementia. There is but one case of melancholia.

From the table it would appear chorea existed on the average about four years before symptoms of insanity were noted. The long time one or both these affections—insanity and chorea—have existed in many of the cases makes it fair to conclude that chorea, superadded to insanity, does not have a marked effect in shortening the life of the individual, but, on the contrary, the condition is compatible with a fair length of life with a moderate degree of physical health. In only one case is it noted that the choreic movements are decreasing, in all others they are slowly increasing or stationary.

A family history of insanity in these cases is probably found about as frequently as we find it among the ordinary population of hospitals for the insane.

In the majority of the cases the cause of the chorea and insanity is not given. Of the causes stated we find a considerable variety. Cases XXVIII. and XXX. coming on immediately after an attack of rheumatism would probably come within the meaning of the term rheumatic insanity as used by Clouston, Bucknill and Tuke, Griesinger, and others. It would correspond to the chorea arising in children during, or just after, an attack of rheumatism, with this difference and addition, that in these two cases the chorea became chronic and mental symptoms ensued.

Eastman's case, in which chorea attacked an adult who was suffering from acute rheumatism and terminated in a short time, would seem to be identical with the chorea of children.

In only three cases do we find a direct hereditary transmission of chorea to have occurred, but Dr. Hill notes that two patients have been inmates in the Iowa Hospital, in which this hereditary transmission of the affection appears to have taken place. I have not included these two cases in the table, because they are not residents in the hospital. In only one case (XXII.) is chorea given as the cause of insanity, but it seems reasonable to conclude that in all these cases chorea alone, or in conjunction with other etiological factors, operated more or less powerfully in the causation of the various mental defections. I maintain this deduction principally from the fact, that in these cases, without exception, the insanity never appeared before the chorea. In a few cases the two were noted coincidentally, but in the large majority of cases the mental disorder became apparent only after the patient had been choreic a considerable length of time—the average length of this period,

as shown by the table, being about four years. Why should not a person become insane who is subject to this distressing affliction? The embarrassments, the feelings of helplessness and despair, the constant attention to self—the constant dwelling of the mind on the affection—ever present—these, together with the feeling of despondency in the knowledge that his usefulness in life is over, and that he is only an object of pity, charity, and care for his friends would seem to me to be potent factors in bringing about gradually a certain mental impairment or enfeeblement of the mind which would progressively increase, and finally end in dementia.

In cases of post-hemiplegic chorea, it would seem most plausible to account for the movements, as well as the mental symptoms, on the hypothesis that there is a coarse irritation or destruction of some portion of the motor area of the brain or the motor tracts, proceeding from that region. In cases where the choreic movements are localized, and confined to the side or the single limb which had been paralyzed at the time of the apoplexy, this, I believe, to be the only conclusion which can be supported logically.

W. Bevan Lewis's careful report of a case of localized paresis with choreiform movements is of great interest in this connection. The finding of local cortical disease *post-mortem* made his record complete. I believe, however, that in all cases of chorea an organic lesion of the brain (and in some cases, perhaps, of the cord also) exists. This lesion may be gross or fine, and would in some cases be easily demonstrated *post-mortem*, while in other cases it might defy detection by our present means of investigation. Of course, only careful *post-mortem* investigations can establish the truth or the falsity of this theory.

In my first paper I expressed my adherence to the view which, I think, is now commonly accepted, that chorea is a disease of the brain, and essentially of the motor apparatus—whether of the ganglia or the associated nerve-tracts. However, if a general sclerosis of brain and cord should in a given case be the particular lesion present, it would not be unreasonable to believe that the same diseased process operating on the analogous parts of the cord would intensify or exaggerate, in a measure, the choreic movements above what they would have been had the brain alone been the seat of disease. That the cord is primarily or essentially the seat of disease does not, in the light of our present knowledge of the subject, seem to be a view which can be consistently upheld. The evidence upon which rests the theory that the lesion is primarily in the motor apparatus of the brain is ingenious, but cannot well be discussed in this place.

In the causation of insanity among choreics it would appear, generally, that two causes operate principally, namely, the psychological causes I have enumerated, *plus* some organic lesion—coarse or fine—of the brain.

We have seen that one-third of the cases have family histories of insanity. This would seem to show that in persons with malformed, impaired, or aberrant brain development there is a peculiar susceptibility to chorea. Among 16,000 insane persons there must be several hundred cases at least, in which a family history of insanity can be traced. Only the comparatively small number of 13 have developed chorea. What is the peculiar susceptibility or especial vulnerability in these cases having a family history of insanity? The correct answer to this query might go far in the way of shedding light upon the cause of insanity itself. The two cases (XXIII. and XXIX.), in which epilepsy and chorea existed in the same person, are of especial interest in this connection, as showing a close connection between these two diseases of the motor apparatus of the brain.

Let us now give some attention to rheumatism as a cause of chorea and insanity. We have good authority for the statement that rheumatism may act as the direct cause of insanity (Clouston, Griesinger, Bucknill and Tuke). The evidence that rheumatism is a direct cause of chorea in children is so overwhelming that the subject need not be discussed here; the points in dispute, at present, being as to the relative frequency with which the cause operates, and the *modus operandi* by which rheumatism, or product thereof, produces chorea. The claims made by some that as many as from 20 to 50 per cent. of chorea in children is due to rheumatism is not sustained by the most careful of the recent investigations in this field. Probably 8 per cent. or 10 per cent. will be found to be the proportions which would represent the ideas of the later authorities. Broadbent and Hughlings-Jackson, and others who have labored so well in this field, have maintained the theory that chorea is caused by many minute emboli which are detached from the valves of the heart during or soon after an attack of rheumatism. The evidence adduced in support of this proposition consists of macroscopic and microscopic appearances in a number of cases, and we find to-day the theory accepted by the great majority of the profession.

Now, on the other hand, I think it is proven beyond the peradventure of a doubt that chorea may arise in children who have been free from rheumatism in any form, and who possess normal hearts. Some of the earlier investigators, in their enthusiasm, erred in pushing too far the application of the "embolic theory"—some, indeed, going so far as to say that this was the sole cause of chorea.

In our table ten cases are reported as having had rheumatism, seven of whom now have heart disease. In two of these cases it seems most probable that rheumatism and heart disease were the causes of the chorea, and the chorea in turn of the insanity. In some, indeed all the other eight cases, the rheumatism may have been the cause of chorea also; but it must be borne in mind that rheumatism is a common disease,

and that it is by no means certain that in a case of chorea with history of having had rheumatism, that the chorea has been caused by the rheumatism, or resultant heart affection. An eminent writer has gone so far as to maintain that as many as 20 per cent. of the general population have had rheumatism. This being about the same proportion as he found in his collection of cases of chorea, the conclusion was drawn that rheumatism acts not at all as a cause producing chorea.

The large number of cases in our table in which the patients are free from heart trouble and have negative histories as to rheumatism, makes the conclusion inevitable that in the majority of the thirty-nine cases rheumatism or heart trouble does not figure as an etiological factor. Probably the proportion of rheumatics among these cases would not differ greatly from that found among the same number of children. In this respect the hereditary form of chorea differs, as we have seen before, from other forms of the disease found among adults in that rheumatism is seldom an antecedent.

It would appear, from all that can be gathered from the reports of these cases, that a considerable variety of causes may operate to produce chorea; that in many cases two or more causes act together. These causes could be divided into predisposing and exciting. Inherited mental or nervous weakness or deterioration being the most prominent under the first head, and rheumatism, with heart disease, apoplexy, fright, physical distress, exposure, etc., being some of the more conspicuous examples in the second division.

Many, or, indeed, most of the causes which will produce chorea are also among the common causes of insanity; but chorea itself is a cause of mental disease. Hence it would be only logical to expect insanity to ensue in these long-standing cases of chorea.

CONCLUSIONS.—1. There is to be found among the insane in hospitals and asylums in this country 1 choreic among each 425 of population.

2. In all long-standing cases of chorea there is a more or less marked tendency to mental deterioration which, in many cases, progressively increases, and finally terminates in dementia.

3. Many cases, even when there exists a considerable degree of mental impairment associated with chorea, enjoy fair physical health and apparently live almost as long as they would have done had they been free from the mental and nervous affections.

4. The proportion of male to female adults is in about the same ratio as is found to exist between the sexes in children affected with acute chorea.

5. The same causes that are known to produce chorea in children are found to operate in causing the disease in adults; but in the case of the latter, additional causes peculiar to adult life, such as apoplexy, anxiety, etc., are capable of producing the disease.

Emotional causes may produce chorea when operating on a person already predisposed to the affection.

A person having a family history of insanity, chorea, or epilepsy, or, indeed, any nervous affection, is predisposed to an attack of chorea.

Persons popularly known as "nervous" are especially predisposed to an attack of chorea; but when the disease is noted to exist in phlegmatic robust persons it is probably the result of rheumatism or coarse brain lesions.

6. Persons of adult years are sometimes, though rarely, attacked with chorea while suffering from rheumatism—the disease being of about the same character as that commonly observed in children, but more likely to become chronic.

7. As to the pathology, the following appear to be reasonable conclusions:

(a) A number of cases arise from, and are caused directly or remotely by, an attack of rheumatism.

(b) In the majority of cases heart disease is absent and there is a negative history as to rheumatism.

(c) Coarse lesions, acting as irritants to the motor cells of the brain or the tracts proceeding therefrom, are in some cases the prime cause. Such lesions most commonly are clots recent, organized, or broken down.

8. Chorea is to be found at all ages.

9. Persons may inherit the disease directly.

10. The disease may be congenital.

11. Chorea and epilepsy are intimately related to each other. Epileptic convulsion (Jacksonian) may be confined to a single member; the same is true of choreic convulsions.

I wish to thank heartily all the gentlemen who so kindly and promptly replied to my circular. Many of the letters were of considerable length, and the preparation of most of them necessitated the expenditure of a good deal of time and labor. Some of the reports are very brief because little or nothing was known of the patient's history, but each is of some value, as illustrating at least a few points of interest in connection with the subject.

For valuable assistance in correcting proof I am indebted to my colleagues, Drs. G. R. Trowbridge and Hugh B. Meredith of this hospital.

THE PLACE OF THE SEA VOYAGE IN THERAPEUTICS.

BY JAMES ALEXANDER LINDSAY, M.A., M.D.,
 PHYSICIAN TO THE ROYAL HOSPITAL, BELFAST; CONSULTING PHYSICIAN TO
 THE ULSTER HOSPITAL, BELFAST.

THE fact that travel is a powerful agent for the restoration of health was well known to the ancients. In a celebrated ode the poet Horace addresses the ship which was about to convey his friend Virgil to Greece for the benefit of his health :

Navis, quæ tibi creditum
 Debes Virgilium, finibus Atticis
 Reddas incolumem, precor,
 Et serves animæ diudivium meæ.

Among the precepts of Galen we find the statement, amply verified by the experience of subsequent generations, "In morbis longis solum vertere conduit." Yet the sea voyage, as we understand it when advising the invalid to try its efficacy, is an essentially modern idea, which has only been rendered practicable by the progress of navigation, by discovery, and by the application to travel of the comforts and conveniences of an age of science and civilization.

By a sea voyage the ancients would have understood a journey by ship around the shores of Italy, Sicily, or Greece, or, at most, a more adventurous cruise to Tyre or Alexandria or Massilia. To them the Bosphorus, on the one hand, and the Pillars of Hercules, on the other, marked off the limits of civilization and of practicable navigation, beyond which were darkness, peril, and barbarism. In the Middle Ages, before the discoveries of Columbus, Vasco di Gama, Tasman, Magellan, and other heroes of the ocean, the range of a sea voyage was hardly more extended. Even when discovery had opened up the path to the great Western world and to the Antipodes, it was long before distant voyaging became sufficiently familiar, safe, and comfortable to tempt the invalid from his home. Within the memory of persons still living the voyage to the Australian colonies was usually made in ill-founded little vessels of two hundred or three hundred tons burthen; five, six, and seven months were commonly required for the passage; the staples of diet were salt beef or pork and mouldy biscuits, and every gale involved great discomfort and often severe privations. Under such conditions the voyage for health was not likely to become popular. Now all is changed. The progress in ocean navigation during the past thirty years almost exceeds belief. Not a day passes without some magnificent steamship or stately clipper leaving our ports for the most distant parts of the earth. Two thousand tons for sailing vessels and four or five thousands for steamers is the usual burthen; the speed attained is frequently from twelve to fifteen knots per hour,