

The Nature & Affinities of Chorea.

The evidence that Chorea is a disease of neurotic origin is I think well founded and convincing. In this thesis I propose to adduce evidence to show that it is a mild psychosis or a disturbance in the emotional substratum with motor accompaniments or resultants having close affinities to epilepsy and hysteria.

The common element to all the so-called neuroses is an undue irritability of nerve cells whereby on excitation there is a disengagement of nerve energy in excess of economical requirements.

ProQuest Number:27552896

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



ProQuest 27552896

Published by ProQuest LLC (2019). Copyright of the Dissertation is held by the Author.

All rights reserved.

This work is protected against unauthorized copying under Title 17, United States Code
Microform Edition © ProQuest LLC.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

h

This, I premise, as the physiological or possibly the pathological definition of a neurosis. The causative ^{element} is therefore considered to be identical, while the symptomatic element is dependent on the area first involved and on the area of the distributed discharge. This definition aids us considerably in forming a conception of the hereditary relationship, transmutability, or interchangeability of the various neuroses. Convulsions in childhood, pavor nocturnus or chorea at 7 years of age, megrim, asthma or epilepsy,

3.
at 14, hysteria or adolescent
insanity at 18, may be viewed
as but different phases in the
neurotic cycle. The disappearance
of asthma where hysteria or
epilepsy supervenes, the substitution
of mania transitoria for an
epileptic convulsion, or the fusion
of chorea with hysteria prove
those affections to be relative
quantities and their individuality
to be sometimes masked or
lost. This transmutation is
conspicuous from the hereditary
point of view. Epilepsy does
not necessarily beget epilepsy;
it may be genetically responsible

4

for asthma, megrim, chorea,
hysteria or insanity.

The comparative study of the symptoms
or groups of symptoms of chorea
and epilepsy establishes an
apparent kinship. Acute wild
delirium, varying degrees of
dementia or at least of mental
enfeeblement, transient hemiplegia
or hemianesthesia, speech difficulties
or aphasia are alike common
to both diseases. Chorea major,
a true convulsive explosion, is
an approximation to the Status
epilepticus; and I have frequently
noticed in Aogluem practice

that purposeless or choreiform movements are frequent after an epileptic fit. Epilepsy has been known to supervene on Chorea.

Hysteria simulates or even passes into genuine epilepsy. There is a reflex epilepsy and a reflex chorea: the former may be caused by foreign bodies in the ear, nasal polypus &c; the latter by intestinal irritation.

"Chorea is sometimes eventually lost sight of in hysteria pure and simple" Add to those clinical facts the contagious element in those affections

(1 Sturges: Chorea p. 64)

and their transmutability and interchangeability by heredity, and the evidence that their causes are similar in nature may be reasonably entertained.

I have collected notes of 20 cases of chorea that I have seen in general practice during the last two years. The families are all personally known to me. Eighteen were females between the ages of 7 and 15 years, the other two were males (one a boy of 8, the other a man of 40.) They were all without exception highly nervous and excitable.

7
so that I would be justified
in inferring that chorea is
remarkably partial in its choice
of subjects. There were 7 cases
of dipsomania in the male
parentage. The associated
diseases in the direct and
collateral lines were infantile
convulsions, convergent strabismus,
chlorosis, epilepsy (in two),
migrain and hysteria.
Rheumatism was known in
four of the families, but rheumatic
fever only attacked two of my
choreic patients.

The condition of the palate
deserves careful attention as



Shape of palate
in man aet. 40
(Chorea)



neurotic palate
(Chorea)



neurotic palate
of a woman, aet. 25
(Chorea)



neurotic palate
(Chorea)



slightly deformed
palate in a child
(Chorea)

Shapes of 5 Palates
from cases of Chorea

I think it helps us to identify Chorea as a neurosis, or at least to strengthen the probability of it having such an origin. Clouston having pointed out the frequency of this deformity or abnormality in idiots, in adolescent insanity, and in some other developmental diseases, it occurred to me that Chorea, assuming it to have the same nosological status, ought to or might be expected to show this deformity of the hard palate. I therefore examined all the palates of my patients and took their shape very carefully

and found that 12 out of the 20 had a well marked 'neurotic' palate and that 6 others were slightly 'deformed'. To draw a universal inference from my small number of cases would be rash and illogical; but at the same time it is instructive that so far as I have had opportunities of pursuing the inquiry the percentage of abnormal palates is as high as Clouston has found it to be in congenital and in adolescent insanities. Regarding the morphological significance of this sign Clouston says:—"We

" We must refer the high palate to a bad initial neurotic heredity... The vaulted palate and altered dental arch must be taken with other changes in the head, and especially in the face expression, as one of the morphological indications that show a tendency in the person to whom it belongs and in his family towards developmental neurotic diseases, notably idiocy, congenital imbecility, deformity, epilepsy, adolescent insanity and that organic lawlessness and lack of mental inhibition or weakness of mind that

11

distinguish the criminal classes.

It thereby is one of the marks of a family that is tending towards mental death and extinction.

Taking all the facts into account it seems proved that the condition of the palate may be a most important index of brain development and of liability to the "developmental neuroses".¹

We may therefore with reason accept this as an additional argument for chorea being relegated to the group of neuroses.

Among the predisposing causes of chorea I have been led by an intimate acquaintance

(1 Clouston: Neuroses of Development. p. 51)

12.

with my own patients to the conclusion that a nervous temperament is a *siue qua non*. If not overt in the subject it is easily demonstrable in a parent or other near relative. What is the fundamental and physiological significance of a nervous temperament? Is not its dynamical equivalent the definition already given that it is an abnormal excitability of nerve cells in virtue of which a stimulus occasions a disengagement of nerve energy in excess of economical requirements? Does this not help us to understand why in such

Subjects a fright or other emotional disturbance should upset muscular control? To substantiate this it may be advisable to review the physiological correlatives of emotion as affecting the muscular system. The word emotion itself, as connoting movement, implies that muscular contraction is its correlative or dynamical equivalent, and shows the profound and ineradicable influence emotion has on the organic life. A faint wave of pleasurable feeling reveals itself by the wrinkling

of the skin at the outer angle of the eye by the orbicularis palpebrarum and the retraction of the angles of the mouth by the risorius: as the feeling rises in intensity the muscular response becomes more diffuse *pari passu*, involving the other facial muscles, the laryngeal, the forced inspiratory & expiratory, until perhaps the whole system is convulsed in laughter.

The sportiveness and dancings of joy, the inability to sit still after the receipt of welcomed news, the weeping

and wailing of grief, tearing
the hair from fury agony or
despair, the dilated nostrils,
the frowning, the set teeth, the
clenched fists or the stampings
of anger or of pain, the
screaming of fright, the trembling
of fear or of rage are but
a few illustrations of the
organic connection between
the emotions & the muscles.

" To all appearances a violent
emotion may act sometimes
in the same way as a
strong physical shock to the
nervous system, for it may

produce in some instances
convulsions, fainting, loss of
sensation paralysis & deafness"¹

The general paralytic, a person
of great emotional excitability,
is in perpetual motion day
and night. The influence
of emotion on the vascular
system is no less marked.

Expectancy or suspense increases
the frequency of cardiac pulsation,
whilst grief has an opposite
effect. Vaso-motor paralysis,
fainting, or fatal syncope
may also be the consequences

(¹ Maudsley: Physiology of Mind p. 350)

of emotional disturbance.

It seems clear therefore that an excitation in the emotional substratum must, as an organic necessity, find expression in muscular movement.

Prior to the onset of Chorea there is usually an apparent depreciation of the general health. All my cases showed some degree of anaemia - Ten of them markedly so. This anaemia probably plays an important rôle in the induction of Chorea. It is a well known fact that

anaemia causes many minor mental symptoms e.g. apathy, inaptitude for work, irritability, depression &c. Indeed an anaemic person has a decided proclivity towards emotional disturbance. If anaemia becomes extreme it causes convulsions - as in haemorrhage. If loss of blood can produce general convulsions is it wonderful that a certain degree of anaemia or nutritive deficiency of the blood should produce or tend to produce motor disturbance especially if it should act along with

19.
fear or fright or other emotion
which we have seen to have
such essential influence on
muscular movement?

Another predisposing cause
perhaps of some importance (not
to mention age, sex or rheumatism,
is the great relative weight
of the brain to the body in
children. The brain has
obtained its full growth up
to a few ounces at the year
year. We may reasonably
assume then that its dynamical
equivalent is relatively greater
than in the adult. This is

Supported by the instinctive fidgetiness and restlessness of children. A child from a neuromuscular point of view is a very unstable quantity only yielding to the tyranny of its organisation in perpetual romping.

The confinement and strict regime of schools tend to inhibit this physiological outlet of nerve energy and by so doing probably act as a predisposing cause of chorea

"It is to be remarked that children away from civilisation and who are suffered to grow up in their own way

with little or no training are ^{21.}
indisposed to take Chorea "1

Further, forcing a young brain into
a too highly evolved activity by
relatively difficult- or advanced
lessons must have a deleterious
effect on the development of
the highest centres and an
evil reflex effect on the emotions.

There is no doubt that
fear or fright is one of the
most efficient causes of Chorea.

It was the alleged cause in
12 of my 20 cases. I was
careful not to suggest such

(1 Sturges: Chorea p. 31)

a thing to the parents so that ^{22.}
it was spontaneously given.

Its modus operandi is perhaps
not difficult to understand.

Conceded in physiological terms a
fright is an explosive lesion
in a special area of the
emotional substratum.

" Nervous stimulations and
discharges consist of waves of
molecular change that chase
one another rapidly through nerve
fibres. Each set of waves while
itself caused by the decomposition
of unstable nerve matter is
a means of decomposing other.

23.

unstable nerve matter, so generating further and often stranger sets of waves which similarly chase one-another into many and distant parts of the nervous system"²

This appears to me to be a concise and philosophical description of the proximate pathology of Chorea. The initial explosion (as by fright) is the means of decomposing other unstable nerve centres in the emotional substratum, the physical correlative of this cyclical molecular movement being

(² Spencer's Principles of Psychology Vol. I p. 95)

that now one set and now ^{24.}
another set of muscles is affected,
the muscular response varying
quantitatively as the strength
of wave. Nerve current
always travels along the
line of least resistance;
consequently we find those
muscles most involved
where there is least inertia
to be overcome. In harmony
with this the facial muscles
in adults are always
conspicuously affected, indeed
sometimes the only ones that
are so. This is a clinical

fact of great significance in studying the etiology of choreiform movement. The fact that the muscles of expression - the muscles of emotion par excellence - are always involved in the adult - is a *prima facie* argument in favour of the initial lesion being in the emotional substratum. On the other hand the fact that in young children these muscles often escape is not incompatible with the hypothesis, because at an early age the muscles.

of expression are not in co-ordinated correspondence with the emotions.

Further, if an affected group of muscles be held at rest the movement will be transferred to some other muscle or group of muscles. This, if duly considered, seems to show, not that the lesion is in the nerve centre presiding over the particular muscles in question but in a still higher centre, the discharge following the line of least resistance. As further corroborative evidence of the theory that the primary

disturbance is not in the muscle centres but in the emotional, is the fact that the leg muscles are never affected alone. If embolism were the determining cause of chorea would it not be reasonable to expect that the motor area for the leg would sometimes be the only part disturbed by the embolus? Why should an embolus have such a constant and unvarying predilection for the facial muscles ^{in adults} and have no such selective affinity in young children? Why are

28
idiots so notoriously immune
from Chorea? Do they enjoy
immunity from Embolism?
Is it not more satisfactorily
explained by the emotional theory
that in their less evolved
mentation, in their abortive
emotional development, the
causative substratum in idiots
is wanting. It is true that
idiots are prone to sudden
outbursts of passion, but
these again are relieved
by convulsive explosions.
Is Embolism not responsible
more for paralysis than for

the contraction of muscles?²⁹
Why do coma, hemiplegia or
aphasia not occur with greater
frequency in choreic children?

As a second attack of chorea
always resembles the first
in its muscular distribution
how happens it that the
emboli always block the
same arteries at the same site?

Further, it might reasonably
be asked if recovery could
be so complete after such
a gross lesion as embolic
plugging?

The fact that fright makes

a lasting impression on a nervous child is irrefragable, so that it may be a considerable time before the nerve cells regain their equilibrium.

The mere re-presentation of the fright in the child's mind may serve to make the disturbance persist. Though fright appears to be a very frequent and efficient cause of chorea there are evidently other causative agents alike in kind but varying in degree. Grief, anxiety, worry, depression, &c if long continued

and acting in conjunction with
anaemia and the nervous
temperament, may each produce
that irritability or explosiveness
in nerve cells which presumably
is the causa causans of Chorea.
One of my patients a married
woman, aet. 25, in the
early months of a first pregnancy
& suffering from a first
attack of Chorea, imputed
the cause to the depressing
and worrying influence of
the coal-strike as it threw
her husband out of employment

and made their living precarious.

I find that an emotional disturbance of varying degree to be the invariable precursor of the choreic movements.

I have always satisfied myself on this point. The child's disposition is changed. She has become fretful, capricious, peevish or unusually timid; sometimes she is irritable; she cries on slight provocation; she is fond of being petted (perhaps the analogue of the longing after sympathy by hysterical females)

She does not take the same lively interest in childish amusements; she is more taciturn than she is wont to be; her power of attention is often impaired. One of my patients a girl of 9 and a smart girl at school had quite forgotten the simplest elements in her multiplication tables. Do not these symptoms justify me in diagnosing a mild affective insanity?

To explicate the final cause of this emotional disturbance is

well-nigh impossible in the present imperfect state of cerebral pathology.

The organic conditions necessary for the healthy action of a nerve cell, the quantity and quality of nutrition, the cause and chemical products of the disintegration of nerve matter, the cause & nature of molecular motion are so imperfectly known that, in the want of knowledge of physiological processes it is impossible to fathom the causes of pathological processes. We must therefore be contented with proximate causes.

It appears to me that the necessary conditions for the development of chorea are a certain degree of nervous temperament, the superposition of anaemia and consequent on this, perhaps from deficient nutrition, emotional irritability productive of the motor symptoms.

It is a universally recognised fact that chorea may be contracted by contagion. This surely militates against an embolic or thrombotic genesis! We can find the rationale of its action if we but reflect on the imitative tendency

of children; indeed of the whole human species. "When we fix the countenance in the expression or the body in the attitude which any passion naturally occasions it is certain we acquire in some degree that passion, and if we try while the features are fixed in the pattern of one emotion to call up in the mind a quite different one we will find it impossible to do so"¹

Is not this its psychological explanation? The mere imitation of facial expression or attitude

¹ Maudsley: Physiology of Mind p. 387.

occasions an emotional response which in a predisposed subject may become deflected in choreiform movement.

Why should Rheumatism produce Chorea? An attack of rheumatism is attended with great and acute suffering. The natural expression of pain is muscular movement - frowning, biting the lip, setting the teeth, stamping the feet &c. When several joints are affected the patient's natural motor outlets for the relief of pain are very much curtailed. He feels there is a great tendency for the affected limbs to be

39
moved by reflex action alone -
the points of irritation being in
the joints. He also knows that
the slightest movements cause
extreme suffering, consequently he
must exercise inhibitory powers
to prevent reflex movement. This
must cause anxiety. Fear,
lest the limb should be
moved and great arthritic
pain co-operate to give the
initial emotional disturbance
which, according to our hypothesis,
may be causative of Chorea
in a predisposed subject.

The tendency to rheumatism
is inherited: if there is a
choreic tendency also what is

more natural to expect than 40
that chorea should assert itself
at a critical time when the
emotional equilibrium is upset.

This modus operandi is conceivable
and credible. Why rheumatism
should complicate or follow chorea
is a much more difficult question
to answer than the former,
inasmuch, the etiology of
rheumatism is not definitely
known. In only 2 of my
20 cases did rheumatism
supervene on chorea (both in
the 3rd week) and, mirabile
dicitur, those were the only
cases that had previously
been confined indoors so that

41

there was no exposure to account
for the onset of rheumatism. As
far as my experience has gone I
have noticed that rheumatism
is a much more frequent
complication of chorea in hospitals
than in private practice. The question
immediately suggests itself whether
close confinement to the house or
to bed has any thing to do with
the appearance of rheumatism.
My other 18 cases had regular
out-door exercise & there was
no such complication in any
of them. If we assume that
Rheumatic fever is caused by some
organic element in the blood
it is possible to construct a

rational hypothesis. If rheumatism,⁴²
as is alleged by many, is produced
by disturbances in the nutritive
and eliminatory functions
with the consequent development
and retention of lactic acid
or other similar organic irritant in
the system, have we not those
conditions fulfilled in Chorea?

There are digestive disturbances, the
excretories act sluggishly, the
perpetual muscular movement
implies the production of a
considerable detritus containing a
large percentage of lactic acid;
Similar products result from the
disintegrating processes going on in
the nerve cells. As the eliminatory
organs are working perfunctorily
there probably is a retention in

43.

the system of some metabolic product which we have assumed to be the efficient cause of rheumatism. This would explain the greater tendency for rheumatism to show itself in those cases which are closely confined, as want of open air exercise would retard still more the eliminatory functions. Whether there must be a rheumatic predisposition to determine the result I cannot say, but in both the cases of Chorea under my care complicated with Rheumatism there was such a family taint. On the other hand it is held by some that rheumatism has its origin in the nervous system. As remarked by Clouston the neurotic affinities of rheumatism have yet to be worked out.

44

Until that is accomplished it will be impossible to reconcile the frequent concurrency or interdependency of chorea and rheumatism from a neurotic point of view.

The prophylactic treatment of chorea merits attention. A family physician thoroughly cognisant of the proclivities of his patients and their relatives can often detect in a child's disposition the conditions tending towards the development of chorea. He would thereby recommend much outdoor exercise and amusement, short school hours and no hard cramming lessons. In short the indication is to prevent mental overwork

to subdue precocity, to encourage childish sport and every other healthy outlet for that abundant energy so conspicuous in children.

Those iniquitous and ubiquitous ghost stories should be rigidly interdicted. Neurotic children are bad companions for one another.

As regards therapeutic agents iron is indicated in the vast majority of cases. It has more influence over chorea than any other separate drug that I have tried.

The general health soon improves after its exhibition, and it appears to expedite recovery.

In a chronic case of over a year's duration the regular administration of Bromide of Potassium for 2 months seemed to ameliorate and finally to remove all the symptoms. This drug is perhaps well worth a trial in the treatment of Chorea.
