divisions and on the farm, but was rather incoherent in his replies, and laughed in a silly fashion when spoken to. Stated he laughed because he saw two girls passing at the moment, and also at his own folly.

January 10th, 1892.—Dull and confused; confessing that he has been masturbating frequently during the past few weeks. Cannot recollect anything of his previous states. Frowns as if puzzling over his thoughts, which, judging from his expression, are not displeasing; he endeavours to give them verbal expression, but fails. After such attempts he repeats words in a whispered tone.

March 20th, 1892.—Increased dulness and confusion; very silly look; frequent grimaces; marked hysteroid tendency; emotional.

April 4th, 1892.—The condition above noted merged into a dream stage. He sits or stands in an easy attitude with half-closed eyes, his features expressive of pleasing imagery; there is a moderate degree of *flexibilitas cerea*, volition is almost at a standstill; he is evidently out of touch with his surroundings, and is happy in cloudland. He utters words and part-sentences in a gentle tone: "Can—not—not—not. Love—to me; to me."

During the ten months which the patient has been under observation the phases have been very numerous, recurring daily, weekly, and monthly. At present he is relapsing into a state of melancholic stupor, with paroxysmal fulminations.

Cases of Hereditary Chorea (Huntington's Disease). By W. F. Menzies, M.D., B.Sc.Edin., M.R.C.P., Senior Assistant Medical Officer, Lancashire County Asylum, Rainhill. With plate.

A list of works on hereditary, or Huntington's chorea, which will be appended to this paper, shows that this disease is by no means so rare as has been supposed. At the same time it appears either endemic to, or at least prevalent in, certain parts of many countries, where its entity is well recognized by the laity, its cardinal signs discussed, and its universally unfavourable termination so proverbial, that members of families in which it is known to exist find great difficulty in securing partners in marriage—whereby the disease tends to a spontaneous cure. It is beyond doubt that this particular form of chorea has for a long time been differentiated from others by medical practitioners in its particular habitats, although even yet, in spite of the many able expositions of its peculiarities, considerable confusion seems to prevail in general medical literature. An old woman, nearly 80 years

https://doi.org/10.1192/bjp.38.163.560 Published online by Cambridge University Press

of age, told me, when I was collecting information, that when she was a girl her "old family doctor said no one ever got over it." This statement carries us back a hundred years at least.

Dr. E. S. Reynolds, of Manchester, in the "Medical Chronicle," April, 1892, mentions a case, John Wood, from St. Helens, who was under his care at the Manchester Workhouse Infirmary. This man told him that there were "plenty like him in St. Helens," and he, after inquiry, heard that two separate families were affected, but was unable to find them.

It so happens that for the last five years I have had these two families, or certain members of them, under observation, and the present time appears, therefore, suitable for recording their history. Before going further, I must thankfully acknowledge the great assistance I have received from the officials of the Prescot Union, especially the Clerk, Mr. A. F. Mann, who is also Superintendent Registrar, and Mr. J. Pennington, Relieving Officer for the St. Helens District of the Union, without whose help I should never have been able to get what information I have. I may mention that if the man John Wood, Dr. Reynolds' patient, belongs to either family under consideration, he has sprung from the female stock not later than four generations back. None of the old residents of the same name know about him, and all his friends seem to be dead, so that I have not been able to go further with his case than confirm his statement that his mother died of chorea in Prescot Union Workhouse.

One family is named Tickle, the other Dixon. The admission of a member of each into Rainhill Asylum in 1887 called my attention to the disease.

I shall first briefly mention the individuals in each stock, explaining the genealogical tree, and naming them as there denoted—the generations by Roman capitals, the members of each by Arabic numerals, not attempting to give the exact order of age, which from want of evidence would only mislead; second, describe somewhat fully a case which shows an average balance of the chief signs, and is well-marked, without being too far advanced; third, briefly summarize the salient points in other cases I have seen; and last, devote some space to a consideration of the disorder as a whole.

The Tickle Family.—The first individual (A 1) who, as far back as I can trace, was affected with hereditary chorea, lived in the township of Parr, St. Helens, and had been dead many years at

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the time when his elder son (B 1) told my informant, now an old man of 72, about him. B 1 and his brother B 2 have been dead over 60 years, and one was over 70 when he died. A 1, assuming that he was 20 to 30 at the time of marriage, must have been born nearly 150 years ago. These three early cases appear to have been old men at death, as if showing that the type of disease was only developing, for, as we shall afterwards see, there is a general tendency to precess in each generation. My informant was best acquainted with the third generation, who were more of his own age, but he knew only the elder branch, consisting of eight individuals.

C 1, male, was unaffected, but died before reaching adult life.

C 2, male, commenced to be affected at 40. His ailment progressed rapidly. He was admitted into Rainhill Asylum on 7th April, 1853, and died 13 days later. He was very feeble and emaciated, and was mistaken for a case of general paralysis, an error easily made in the last stage and without any guiding history.

C 3, male, was unaffected, and lived to 76. Of his children ten (D 1 to D 10) died in childhood; a son (D 11) died at 54, unaffected. He left five children, who all either died early or left the district, so that I have been unable to find them. A daughter (D 12), single, is alive, aged 53.

C 4, male, commenced at 30. He died, with most of his children, in Liverpool during the great cholera outbreak. The other members of his family are untraced.

C 5, male, commenced at 24, and died at 38. He had five children, viz.:—D 13, male, who was affected at 17, and died young; D 14, female, unaffected, married, who has two small children; D 15, male, single, aged 22, who began at 18, and was for some time an inmate of the Prescot Union Workhouse, but took his discharge under the idea that he was still strong enough to do some useful work; D 16, female, single, admitted into Rainhill Asylum 12th August, 1887, and died 14 days later of phthisis, aged 40 (she was in an advanced stage when seen, having commenced at 34); and lastly, D 17, female, single, admitted into Rainhill Asylum 15th May, 1889, and still resident, who commenced at 28, and whose case I have taken as a type of the disorder.

C 6, female, was affected for some years, and died at the age of 43. She was twice married, and her children were:—(i) D 18, female, died aged 4; D 19, female, single, affected, who died aged 51, and had two illegitimate children by different men, viz., E 9, male, a drunken, ill-doing man, half insane, aged 33, who is married and has two little girls (F 1 and F 2), whom he has deserted, and who are unaffected, whereas he himself has had tremors for two years; and E 8, female, who commenced to be affected at 26, and died at 40, leaving five children (F 3 to F 7), whose ages range from 18 to 8, and of whom one (F 5) is possibly affected;

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(ii) by the second marriage C 6 had four children. Three (D 20-D 22) died in infancy, D 23, female, commenced at 29, and died at 35, leaving three children, viz., E 10, female, 26, single, who commenced to have tremors in her fingers at 25; E 11, male, 23, single, mentally affected, of violent temper, who commenced at 20 (he has an illegitimate infant, F 8); and E 12, single, female, who is unaffected.

C 7, female, single, had tremors for some years, and died of them at 36.

C 8, female, single, servant, died of phthisis, aged 22, and was not affected.

Turning to the younger branch of the family descendants of B 2, we find a more limited connection, but one to which I have not yet been able to do complete justice. Curiously enough the members of the two branches are quite unknown to one another, and would not allow the possibility of any connection between them, until I obtained the link from an old woman who has known her branch for 65 years, and had heard tell of the elder brother, B 1.

The children of B 2 were:—

C 9, male, single, who commenced to have tremors at 16; age at death unascertained.

C 10, female, who died aged 50, unaffected. Of her children, four (D 24-D 27) died in infancy, two are alive, unaffected, single (D 29, D 30), and three who are married and unaffected (D 31-33) have all their children free. One daughter (D 28), unaffected, has a son (E 13) aged 20, who is said to have had irregular movements continuously from 14 to 17 years old. He is at present quite healthy, and, if his mother's statement be reliable, is the only example in the series of the disorder terminating in any other event than the fatal, and also the only one where it has reappeared after missing a generation.

C 11, male, who died in Prescot Union Workhouse 16th Feb., 1887, aged 53. He had been affected for some years, and was married, but his eight children all died in infancy.

C 12, male, who commenced at 30, and died at 50. Of his children, six (D 42 to D 47) died in childhood. A son (D 48), single, aged 43, is at present an inmate of the Prescot Union Infirmary, badly affected. A daughter (D 49), aged 34, is unaffected, as are her six children, of age varying from 15 to 3 (E 14-E 19). Another daughter (D 50), aged 32, is unaffected, so are her four children (E 20-E 23), whose ages are from 10 to 4. Lastly, a son (D 51), 26, single, of intemperate habits, has for eighteen months had typical tremors if anything excites him when "in drink." When sober he is free.

C 13, female, unaffected, who died in her first pregnancy, leaving twin girls (D 52, D 53). These are alive, single, and free from chorea.

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Appended is a summary of the Tickle family :—

Generation.	Individuals traced.	Lived to over 12 years.	Number affected.
First (A)	1	1	1
Second (B)	2	2	2
Third (C)	13	13	8
Fourth (D)	53	20	8
Fifth (E)	23	13	5
Sixth (F)	8	8	1
Total	100	52	25

The Dixon Family.—The individual from whom this stock is sprung is said to have come from Cheshire, but beyond the fact that he lived some years in St. Helens before becoming affected, and that he died an old man, nothing can be discovered. His third son died in 1854, aged 60, so that he himself was probably born about 1760-70. Five of his children grew up, and two had large families.

B 1, male, was affected, but at what age he became so is unknown. He, too, had five children, two of whom left families. They are :—

C 1, female, married, commenced with tremors at 30, and died about 50. She had no children.

C 2, male, single, intemperate, had shakes from 40 years of age.

C 3, female, was free, as are also her children, now grown up.

C 4, male, single, accidentally killed in youth.

C 5, female, unaffected, as also are her children.

B 2, second son of A 1, commenced with the disease at 46. His temper became violent, and in 1862 he was sentenced at the Liverpool Assizes to penal servitude for life for a murderous assault upon his wife. He afterwards died in some prison near London. He left nineteen children.

C 6, female, affected from 45, died at 53. Her children, now in adult life, are free so far.

C 7, female, admitted into Rainhill Asylum 10th Sept., 1887, and died 3rd March, 1889, of phthisis. She suffered for ten years, and left six children :—

D 1, female, unaffected, who has six children (E 1-E 6).

D 2, female, unaffected, one child (E 7).

D 3, female, married, no children.

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D 4, female, died aged 14.
D 5, male, now aged 33, married, has no children.
D 6, male, single, aged 23.
None of these children are yet grown up.

C 8, male, single, unaffected. He was an ill-doing young fellow, and was sentenced to ten years' penal servitude for highway robbery. Since his release he has disappeared from view.

C 9, female, single, commenced with tremors at 40, and died in Prescot Union Infirmary 17th Sept., 1890, aged 48. She had four children to one man, one to another (D 7-D 11), none of whom are yet affected.

C 10, male, 45, not affected. He has three boys and three girls (D 12-D 17) still in childhood.

C 11, male, 43, free. He has five young children (D 18-D 22).

C 12, female, unaffected. She died aged 38, of cancer of mamma, and left five boys and one girl (D 23-D 28), all free.

C 13, female, 36, unaffected, has two children (D 29, D 30).

C 14, male, 34, commenced with tremors at 26, but is still able to get about. Has three children (D 31-D 33).

C 15, male, 32. He is just commencing to show the disease. He has two boys and four girls, all young.

C 16, female, died in her third confinement, leaving a boy and girl. She was unaffected.

C 17, male, C 18, female, C 19, female, died in childhood.

B 3, third son of A 1, never married. He was affected, but at what age is unknown. He died in the Prescot Union Infirmary 17th March, 1854, aged 60.

B 4, male, single, unaffected, died in youth.

B 5, male, died in the Prescot Union Infirmary 8th April, 1867, of the disease. His children have left the district, but the eldest (C 20), then a man of from 20 to 30, had already commenced when last seen about here. Summary:—

Generation.	Individuals traced.	Lived to grow up.	Number affected.
First	1	1	1
Second	5	5	4
Third	20	18	8
Fourth	41	20	—
Fifth	7	—	—
Total	74	44	13

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Such, then, are the two family trees. I had preferred that they were more complete, but the sources of information are few. Both names are common about here, and all such persons have been examined and those unconnected eliminated; but could we go a little further back, probably some members of these would prove to have originally suffered, although the disease died out before the memory of present informants. Much better histories can be got about affected lines where the interest is sustained by the presence of the disease than about those who have remained free.

I now pass to the consideration of the case to which more particular attention has been devoted. The mental condition is good enough to allow of a fairly satisfactory examination.

Jane Tickle ("Tickle D 17"), aged 32, admitted to the asylum 15th May, 1889, from Factory Row, Sutton, St. Helens. Her elder sister (D 14) says that she worked in the glassworks till four years ago, when gravescent weakness and inability to execute the manual operations required caused her to give up. She had always been of hasty temper, but grew worse about a year ago, when her memory began to fail. Since then has suffered greatly from indigestion, with vomiting. Of late has been upset by mere trifles, and will scream and cry, and on several occasions has been violent, threatening her sister with a knife, and throwing glass and crockery about the room. Had inflammation of the eyes as a child, and was treated in Liverpool; has had no other illness at all, no specific fevers, rheumatism, or early chorea. Has been a bright, steady, active-minded, hardworking, healthy girl. Can read and write. Has menstruated regularly all her life.

State on admission.—Patient is a well-nourished, not unhealthy-looking woman, with great want of facial expression.

Sensation.—Sensibility to touch, pain, and temperature is normal, although the slowness of response makes it at first appear that there is general tactile hypæsthesia. There is no recollection of pains anywhere. Muscular sensibility is decidedly acute, minute differences of weight being appreciated without hesitation. Sense of posture exact, no hyperæsthesia of muscle nerves.

Motion.—The muscles are everywhere well developed, but there is no hypertrophy. No recognizable loss of power, nor any local or general wasting. The most apparent abnormality is a continuous irregular choreic muscular jerking, not increased by voluntary movement, but rather, to some extent, under control. It affects all groups of muscles, but no individuals. Thus, the head is jerked upwards and backwards, and brought back quickly; the shoulders are raised, the thigh flexed or inverted, the forearm flexed, extended, pronated, or supinated, the hands or ankles flexed. Even the smaller movements in the hand are associated, as

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when the thumb and forefinger are opposed. Three points deserve notice: (1) Muscles accustomed to specialized movements perform these more frequently, but less extensively; (2) organized movements enervated from both hemispheres are common; (3) the proximal parts of the limbs are affected less than the distal, the legs less than the arms, the face scarcely at all, while the scalp is free. The pace is slow and measured, with a tendency to rotation of the trunk to the left. Correct gait and balance are interfered with only by the uncontrollable jerkings; there is no tendency to stagger or fall in any particular direction while the patient is standing still.

Reflexes.—The superficial are normal, but are overbalanced if the limb is preoccupied, so to speak, by a jerk. Thus, while the thigh is being rotated no plantar occurs, even although correctly timed. Conjunctival reflex and reaction to light, accommodation and cutaneous stimulation perfect. Pupils 4·5 m.m., equal and of regular outline. The knee-jerk is decidedly but not greatly increased; there is no ankle clonus, no wrist or elbow jerk.

Special Senses.—Smell is very imperfect, but there is nasal catarrh, probably of long standing. Taste and hearing normal, tongue protruded steadily in middle line. V=$\frac{20}{60}$, some corneal nebulæ present, optic disc and retina normal. Fields of vision, both to light and colours, normal. Speech is affected only in so far as enunciation is impeded by laryngeal jerkings, to obviate which the muscles of phonation are rendered tense, the tone becomes monotonous, the pace slow and dragging, then suddenly a word is shot out with explosive violence on the first or second overtone. Heart, lungs, and abdominal organs normal; no enlargement of spleen; urine normal; no glycosuria or albuminuria. No trace of rickets or syphilis.

Cerebral Phenomena.—The most obvious abnormality is an undue apathy, a want of interest in her present surroundings and future fate. She discusses her ailment with equanimity, laying stress on its fatality. Says she "supposes" she "will die of it too," but the thought leaves no unpleasant impression. About her past she is much more interested, and is willing, and even eager, to give all the information she can. She says she is "quite happy," and doesn't "trouble about things." Perception is normal, its spatial relations are not disturbed. Objects, form, colour, familiar faces are all recognized at once, and calculation of distance is fairly correct. But apperception is diminished. She avoids explanation or interpretation of perceptions, and when asked to describe an object says, for example, "I don't know," or "I can't see." But when roused by a sharp demand, she performs the cerebral act at once, and correctly. Differentiates by signs equally well. In the absence of a recording instrument assumption is, perhaps, unsafe, but I suspect that the reaction time is markedly increased. There is diminished attention, and the sense

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of effort is objectively apparent, *i.e.*, she employs visual and other muscular fixation as extraneous aids. It is difficult to analyze this loss of attention accurately, for want of terms. She is "very noticing," and darts to snatch a crust out of the mouth of a feeble fellow patient. Yet to look at her one would imagine she notices nothing. The motor memory is difficult to rouse, also that for past events, but when stimulated to the proper pitch continues to reproduce the action or fact for as long as a minute, and she repeats an answer over and over again in different words. But independent of this there is real loss of memory, and she shows considerable skill in endeavouring to compensate for it by enlarging upon unimportant particulars. Also the memory for acquired actions is defective, a point which is apt to interfere with the examination of muscular sensibility. Her judgment is faulty, and in describing new sensations, tastes, objects, etc., she shows great want of decision in "making up her mind," pronouncing alternately in favour of each possibility. If annoyed she flies into a great rage, and swears and screams, and endeavours to strike out, the muscular jerkings becoming meanwhile more prominent. Her affective nature is distorted, and she takes violent, and apparently unreasonable likes or dislikes, and expresses aversion in no measured terms. She is purely selfish, and shows total disregard for the comforts and feelings of others, although full of complaint if she herself be not satisfied. Lays no plans for the future, and does not seem to cast her thoughts ahead in anything. Hope and despair are alike absent.

Progress.—During her period of residence there has been an absence of fluctuations, and the disease is slowly advancing to an unfavourable termination. Briefly we notice:—(1). Gradually increasing want of control over the jerking movements, so that now they persist, though with lessened intensity, during sleep, whereas at first they ceased entirely. (2). Progressive weakness of the musculature, with slow atrophy. (3). Gradual increase of the superficial trunk reflexes, so that now the abdominal and scapular are well marked. (4). Increase of deep reflexes, especially the knee jerk, with advent of ankle clonus, and triceps and wrist jerks. (5). Progressive loss of memory, with increased instability of temper. (6). Of late, loss of flesh and digestive power, with tubercular growths in the peritoneum. The electrical reactions have been tested from time to time with negative result. The passage of constant currents of moderate strength through the muscles appears to be without influence on the jerking movements.

(To be continued.)

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