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Epidemic & Sporadic Diphtheria
by

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Blantyre N. B.

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¹ Roberts. *Theory and Practice of Medicine* 14th Edition
Vol. I. page 178.

² Dr. G. de Gorreguer Griffith in *Obstetrical
Journal* for June and July 1879 pages
134, 222. (Quoted in Braithwaite's
Retrospect.)

Epidemic and Sporadic Diphtheria

The etiology of diphtheria is a subject surrounded by a great deal of obscurity. By some authorities it is regarded as a specific disease, produced by a specific cause, by others as only a peculiar manifestation of the presence in the system of a poison which would under other circumstances, or in different individuals produce scarlet, enteric, ^{or} purpurial fever, or erysipelas. This is a point which it will be difficult if not impossible to establish and will probably be settled only after careful experiment on the lower animals. It is a point which I do not purpose to discuss now, the object I have in view in this paper being to mention one or two reasons for questioning certain

3 Roberts: loc. cit.

4 Diphtheria: its Cause, cure, and how to arrest it.
By R. Bell. M.D. page 6.

statements usually made in text-books of medicine in regard to the disease. It is perhaps necessary for me to say at once that my experience of this disease is but limited, and that I had never seen a case of it till I was in practice on my own account. I am therefore not in the position of making assertions but only of indicating doubts on certain points.

Diphtheria³ is described as a contagious disease whose most characteristic feature is the false membrane which forms on certain mucous surfaces of the person affected more especially those of the tonsils pharynx and larynx. There are many proofs of the contagious character of the disease and though it has been said⁴ that its contagion is only moderately powerful

5 Trousseau's Clinical Medicine Sydenham Society
Vol. II pages 440. 441. 497.

Watson, Principles & Practice of Physic. Vol I page 892.

6. Trousseau. Op. cit. 535

7 Diphtheria at St. George's Hospital: by J.
Whipham M.B. Lancet. Vol II. 1880. pages
648. 686

cases are reported showing that in some epidemics at least it is ⁵ extremely virulent. Thus Troussseau says that "when the disease once enters a house it has an undoubted tendency to "propagate itself by contact from "individual to individual", and the cases he records amply bear out this statement. Mr Whippam, Physician to Saint George's Hospital London, records a series of cases which occurred there three years ago. Two children Esther S.C. aet 6. and Alice C. ^{aet 12.} were admitted to the hospital in the April of 1880, suffering from diphtheria; both died within two days of admission. The younger had been put into a ward in which lay a girl Annie B. aet. 20. under treatment for pneumonia, with the result that this girl contracted the

disease and died of it within three days. The nurse who attended to the two young children turned ill on the night after their death (23rd April) and died on the 26th; and another child occupying a different ward was also attacked with the disease presumably through the medium of a nurse coming from the room in which the nurse who died had been confined. This child exhibited symptoms of diphtheria, viz. swelling ^{at} ~~of~~ the angles of the jaws on the 25th, and died on the 27th. In addition to these the mother and nursemaid of this last child were also seized with the complaint but recovered. In this remarkable series of cases we have a good example of the way in which the disease may be propagated by direct contact with an infected person. But diphtheria may be carried

8 Lancet. Vol. II. ⁽¹⁸⁸⁰⁾ page 524.

9. Lancet. Vol I. 1881. page 589.

by other means.⁸ In the volume of the Lancet which contains Mr. Whittam's experience there is at page 874, a report of a case tried before the Kingston County Bench of Magistrates, from which it appears that seven cases in one doctor's practice in addition to those in other practices were found to have arisen through their respective families having been supplied with milk from a dairy in which a child was dying with malignant diphtheria. Such cases as those I have mentioned, afford ample and I conceive indisputable clinical evidence of the contagious nature of this malady.

Scientific research has shown why this disease should be so contagious. M. Yalamon, a Frenchman, has succeeded in isolating the contagious principle which he finds to be a cryptogamic

16 *Lancet: loc. cit.*

organism susceptible of cultivation and of inoculation into the lower animals. Before the results of his experiments were made public certain facts pointing in the same direction had been established. For example micrococci had been discovered in the false membrane while bacilli had also been found during life in the urine of diphtheritic patients and after death in their kidneys. The investigations of Salamon, however, have all but demonstrated as a fact that diphtheria is due purely and simply to a living organism, of a low order, capable of preserving its vitality for an indefinite period, and of growth and development when it reaches a suitable soil. Salamon was successful in cultivating this organism. He introduced it directly into the blood of the certain animals, such as guinea-pigs

pigeons, frogs and rabbits, by inoculation and also indirectly by mixing it with their ^{food}; the result was the same, the animals died of diphtheria and in the false membranes succeeding generations of the contagium were discovered, and in certain serous and mucous fluids as well. These experiments seem to show that diphtheria is first local then secondly constitutional; they show also that the vitality of its principle is not destroyed by the action of the digestive juices.

As I have already mentioned I had, when I entered the profession no practical experience whatever of this disease, but I was profoundly impressed by a sense of its formidable nature. The descriptions of it given in text books of medicine, in Prousscau's lectures and in such series of cases as those I have

quoted led me to conclude there were few diseases requiring prompter diagnosis and treatment. My experience since has in no degree lessened my respect for the disease so far as it affects the patient, but it has led me to doubt whether the diphtheria I have witnessed is not a different disease, at least in regard to contagiousness, from the diphtheria described in the cases I have mentioned.

Blantyre, the locality in which I practise, is a mining district with a large proportion of colliers and their followers. The occupation of these people, their habitual disregard of cleanliness either personal or domestic, their carelessness in regard to wholesome food suitably cooked and their addiction to intoxicating liquors make them a comparatively easy prey to all manner

of diseases. No epidemic that visits Glasgow fails to visit Blantyre also, and it is a very mild epidemic indeed that does not carry away a fair share of victims. The district is supplied by water gathered from moorlands in the upper part of the parish into a reservoir, whence it is conveyed by gravitation to wells set up along the roads and to a few of the better class houses. Though the water is not filtered it is pure and wholesome and not so hard as to make it ~~unavailable~~ ~~for~~ unavailable for washing as it makes a very fair lather with soap though inferior to rain water. It is said to be softer now than it was at first but this is probably due to the public becoming more accustomed to it. Besides the gravitation supply there are throughout the parish numerous spring wells

yielding waters of different qualities. The soil is for the most part heavy and clayey, difficult to work. The air is pretty pure except when a westerly breeze causes it to be polluted with the smoke of the Newton Steel works, which are of great extent and lie in the neighbouring parish. The local collieries contribute also a certain amount of smoke, but unless when the wind is unfavourable this causes little inconvenience. The prevailing winds are from the south-west as is indicated by the attitude of the trees which are all bent more or less towards the north-east. The climate is similar to that of the rest of the west of Scotland but is not so moist as along the banks of the lower part of Clyde owing, no doubt to its greater distance from the sea. The drainage is fairly good, where

it is attended to but the characteristic disregard of the simplest rules of hygiene exhibited by the lower classes make it of very little use. The jawboxes and sinks are very often choked and their contents allowed to decompose at leisure; slops, instead of being carefully emptied out are usually thrown straight from the door; tea-leaves, potato skins, vegetable refuse house sweepings are allowed to remain where they are thrown down until the next time the roadmen are repairing the way when they are removed. The children are not taught to use a closet but are encouraged to go outside wherever is most convenient to themselves which may be beneath a neighbour's window. The same lack of care is exhibited inside the houses. Even in those in

which a greater display of cleanliness is made, the concealed corners are seldom investigated until there is a change of tenancy when there may be a thorough scouring out, after which things are allowed to go on as before, till a similar crisis occurs. The houses themselves are often damp and badly ventilated; in many instances they consist of only one apartment, rarely of more than two, and they are usually by the Irish especially, utilized to their full capacity. When the family is not sufficiently numerous a number of lodgers are taken in, and the manner in which they are accommodated is at first sight marvellous.

In such circumstances one would imagine that a disease such as diphtheria if it once found its

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way into such a community would only with great difficulty be eradicated and not before it had secured many victims. If the disease was so fatal in an hospital in which, it is to be presumed, every means of subduing it that skill or experience could suggest would be available it would, one would think, be much more fatal when it got amongst the class, surrounded by the conditions I have tried to describe.

My experience however has not only not borne out my expectations, but it has been such that if I had not read anything about diphtheria, but simply trusted to my own observations, I should have concluded it to be a non-contagious disorder. In the case of only one family have I found more

Case I

than a single person affected, and in that instance four children exhibited simultaneously the symptoms of the disorder. I do not purpose to narrate my cases at length, but simply to epitomise them referring chiefly to those points that bear most closely on the question of contagion.

James D. 34, became ill on the 14th of April 1852. The case was a well marked one of diphtheria, the characteristic membrane appearing on the tonsils and pharynx. He recovered in the course of four weeks but was not quite strong for some time after. There was no paralysis nor albuminuria, and the heart was never affected. This man was a victualler he had been in depressed health for a few weeks before the outbreak of the disease but with no

definite symptoms. It is quite possible he may have received the contagion from some one with whom he came into contact, but no person in the district was known to have diphtheria at the time. He lived in a house of four small apartments, moderately well ventilated, but defective in point of drainage, the privy especially which communicated directly with an ashpit being very primitive in construction. The family consisted of patient, his wife, three sons aged respectively 14, 12, 7, an infant daughter 15 months old, a nephew aged 16, and a domestic, besides a sister who came to nurse the patient, but not one of these people showed the slightest symptom of the disease, nor have they done so up till this time.

base II

Maggie W.D. 15, pupil teacher, took ill in the month of May - I have lost the exact date. She exhibited diphtheritic patches on the tonsils which were inflamed and enlarged so that she could hardly swallow any food. This girl had a very severe attack but ultimately got better and has been well ever since, except from occasional touches of bronchitis. She lived in a two room and kitchen house, kept scrupulously clean, in a building containing on the same stairhead another house of similar size, and below were a room & kitchen house and a spirit shop. None of the inmates of this building have, either at the time or since, been at all ill and none of the children in her school have been attacked.

base III

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Jessie G. 3. I was called to see this child on 22nd Aug. last. She had been ill for a day or two previously but not so bad as to cause alarm; she became worse however during the night of the 21st and I was called in the next morning. The child's face was dusky, she was struggling hard for breath, she had a croupy cough. On examination of her mouth the fauces were found covered with a diphtheritic exudation, which, from the symptoms, I believed ran down into the larynx. Emetics were ordered with the view of displacing the membrane but without success and tracheotomy was suggested but disallowed. The child died in the afternoon from asphyxia. The house in which this girl lived was situated in a large building containing thirty-two families. The patient was the youngest

Bases IV. V. VI. VII

but one of a family consisting of a father and mother and three other children. Though they had all been having free intercourse with the patient not one of the family or of the neighbors showed a single symptom of diphtheria, and yet the property was in many respects in a very unsanitary condition, especially the drains.

I am not so able to give the particulars of the next four cases inasmuch as I was only called in to see the patients in the absence of their regular doctor. I was asked to look at James, aged two years, whom I found to be suffering from symptoms very similar to those of the patient last described but much milder in degree, the throat as far as could be seen was covered with a greyish yellow exudation as were also the tonsils. I took a very grave view of this case

from the first and said so. On inquiring whether the rest of the children were well, I was told they were not and accordingly asked to see them. Every one of them, (there were three in addition to the first) had more or less of an excudation on the throat & tonsils. In the case of the two younger (James & Margaret) the treatment was unsuccessful as both died, the first within twenty four hours of my having seen him, and the second in three weeks afterward. The other two made good recoveries and are now in good health. The father and mother were not affected. The property in which these people live contains twenty four families and among these there were no other cases of diphtheria. The building is largely occupied by miners, the houses are of one and two apartments, and

bases VIII. and IX.

Note: Marion J. lived in Stonefield; — Harkness
in High Blentyre.

in respect of want of hygienic precautions it is one of the best fitted for the development of an epidemic. I have omitted to say that James G. died of apnoea on the 7th September, his sister of asthma on the 28th.

Other two cases (Marion J. and — Harkness) are exactly similar in their details to the others. Though the two cases are here linked together the patients were ill at different times and in different places, the first was ill in the beginning of October 1882 the latter in the end of March 1883. The houses in which they lived were damp and dirty, but no one in either family took the disease. Both children were infants of between two and three years and both died of ~~of~~ apnoea.

base X

Isabella Mly. 12, complained of pain on swallowing, on the 25th April last. On examination of her mouth, both tonsils were found to be acutely inflamed as well as enlarged. there was pain at the angles of both jaws. I at first ^{i thought} this was simply a case of tonsillitis and treated it as such. I heard no more of it for two days when late at night on the 27th I was summoned to see the child again. On examination of the mouth I found it was impossible to see beyond the tonsils, both of which were covered with a thick pellicle of a creamy grey colour (as seen by lamp-light) extending to the uvula and thus forming almost a complete veil across the back of the mouth. Breathing was of course seriously embarrassed and deglutition was impossible. I removed

a portion of the membrane to find out the state of matters beneath and discovered that the left tonsil was enlarged beyond the middle line, pushing over the uvula till it almost touched the right tonsil, I excised the left tonsil with a guillotine and gave an emetic with the result that more of the false membrane was expelled. I then caused the parts to be painted with ~~an~~ antiseptic solution and gave internally stimulating tonics, with light and nourishing diet. The progress of this case was all that could be desired, the false membrane disappeared from the rest of the throat, the girl took her food well, and her bowels were regular. In the middle of the second week of treatment she suddenly became worse, her nose began to bleed, portions of food came back

through the nostrils and the pulse quite suddenly went down to forty beats per minute, becoming at the same time very irregular both in volume and time. The patient died on the 7th of May.

The house this girl lived in was very damp, at the door was a sink for slops etc. to be thrown out into, there was often a bad smell at the door. The father of this child was quite well, during the whole time I was in attendance; the step mother had been ill ever since she came to the district with bronchial asthma and relaxed sore throat, but up till the 28th of May when she removed to Glasgow, she had none of the symptoms of diphtheria although she was in constant dread of it and more than once fancied she had contracted it. There were no other children in the

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house, but the building contained about thirty families all of ~~whom~~^{which} or nearly all had young children in them, but not one had any complaint of sore throat up till the time this was written.

Elsie S. S. is a patient I heard at present. There was on Tuesday 5th July when I saw her first, a small patch of excudation on her right tonsil, she was feverish, and she complained of difficulty of swallowing. There was tenderness on pressure at the angle of the right jaw, where a large gland could be felt. My diagnosis of this case was diphtheria, it presenting to my mind symptoms exactly similar to those I had seen in cases which had turned out fatally. Doubt however was thrown upon this view by a rash exceedingly like that of scarlatina on the extensor

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aspect of the arms and legs, and a senior student of medicine thought the case was one of scarlatina. The rash however has never extended to the trunk, it has subsided without any desquamation, it did not appear till the child had been ill for nearly a week, it never appeared in the flexures of the joints at all. Moreover the temperature did not rise above 102° Fah. the tongue was never like that we find in scarlatina, and there has been no tendency towards suppuration in the affected gland. For these reasons as well as on account of the girl having had scarlet fever before with copious desquamation I adhere to my diagnosis. In Elsie's family there are two older and two younger children but none of them has as yet shown signs of diphtheria or scarlet fever.

I may state that in almost all the cases I have described other physicians were called

at one time or another, and none of them saw their way to diagnose the cases differently.

On contrasting this series of cases with that recorded by Mr Whippleham I was not a little tempted to fancy that my cases were not diphtheritic at all, but as I have said my diagnosis was in every instance in which a second opinion was obtained, confirmed.

I have said nothing as to sources of infection for I could find none either at farm houses or elsewhere though I made strict inquiry.

The point which strikes me most forcibly is the complete immunity the families of the patients have enjoyed from any throat affection at all or even any but the very slightest indisposition such as cold and it is this fact that has led me to doubt whether the cases I have seen and which I suppose ought to be styled "sporadic diphtheria" are

"This is derived from Meigs & Pepper's Diseases
of Children, 4th edition page 879.

essentially the same as those quoted in the preceding pages from Mr Whiplam's report: in other words are sporadic and epidemic diphtheria identical diseases? I am inclined to think they are not for the reason already indicated that the sporadic form has in no case showed the least inclination to travel from one person to another. In the case of the G. family there is nothing to show that the children were not simultaneously attacked.

"Encouragement is given to this view by the fact that Bretonneau and Bonchuet divided diphtheria into two forms viz. false or non-infecting and true or infecting, and it seems their opinion is strongly supported by recent researches of Drs. A. C. Wood & Henry F. Formad of the University of Pennsylvania. I regret I cannot refer to the original documents containing the views of those authorities French and American, but only to second-hand sources. Roberts also

12 loc. cit

seems to favour the non-identity theory. He says "¹²it has been affirmed that there is a "separate form of this disease (i.e. diphtheria) "which is not contagious, but which is "produced by unfavourable hygienic conditions "especially, by drainage emanations. Cases "have come under my notice which certainly "appeared to bear out this assumption" My own opinion is that idiosyncrasy has quite as much to do with the production of sporadic diphtheria as "drainage emanations", for the persons who were attacked by the disease were as little exposed to such emanations, and apparently as well adapted to resist their influence as those who escaped. This is a point I must reserve for future observation and examination, in the meantime my mind is open in regard to it.

I have to state that I was independently led to suspect that epidemic & sporadic diphtheria were distinct diseases as far back as the end of last year and that till the month of May last I had no idea that any authorities favoured this view.

David Bouper.