On diphtheria.

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Four years ago I publiſhed a fragmentary memoir upon diphtheria, intending to finiſh it at an early date. But much remains yet to be done before a complete account of this diſeaſe ſhall be poſſible. The fact that a great majority of caſes occurs in private practice, where facilities for minute obſervation during life are ſcanty, and *poſt mortem* examinations are conſtantly refuſed, is one principal cauſe of our deficient knowledge. Another is, that public attention has not yet been ſufficiently attracted to certain points, the determination of which is eſſential to any ſatisfactory hiſtory of the diſeaſe. In the hope of procuring for theſe points that inveſtigation which is due to them, and which moſt aſſuredly they will eventually obtain, I venture to ſubmit the following propoſitions to the profeſſion. The ſtyle adopted is certainly open to the imputation of curtneſs; but it ſeems to me that by diveſting the ſubject as far as poſſible of extraneous matter and verbiage, thoſe who deſire to do ſo will the more readily arrive at my meaning. I have abſtained from particulariſing the data upon which theſe concluſions are baſed. Some of them are received medical dogmas. With regard to the others, the continued prevalence and fatality of diphtheria will enable every one to judge for himſelf whether or no it preſents the features and phenomena here indicated, and whether the practical concluſions here drawn are wholly, partially, or at all juſtifiable. I have the ſatisfaction of knowing that the principles and practice here recommended are moſt highly approved by thoſe practitioners who have moſt fully teſted them at the bedſide. I have only to add that, in the hope of con-

centrating attention upon certain points in the natural hiſtory of the diſorder, many others of great intereſt have been entirely omitted.

1. At the commencement of the preſent epidemic, being diſſatisfied with previous *poſt mortem* examinations, which had been limited to an inveſtigation of those parts whoſe tiſſues are continuous with thoſe of the throat, and having noted phenomena which were not thereby explained, I determined, when opportunity ſhould offer, to examine the ſtate of other organs whoſe tiſſues were not ſo continuous.

2. The firſt *poſt mortem* furniſhed me with kidneys (of which I retain a drawing) as much altered in appearance as any that we find after death from ſcarlatinal dropſy.

3. Obvious pathological analogies led me then to ſuſpect that ſuch a condition would be attended with albuminuria during life. The examination next day of the urine of a patient under the care of Mr. *Robins* ſhowed that it contained albumen. The frequent occurrence of albuminuria in diphtheria has ſince been univerſally recogniſed.

4. Curiouſly enough ſubſequent diſſections have but rarely furniſhed me with kidneys ſo conſpicuouſly altered as theſe firſt ones. The changes are more commonly microſcopical; conſiſting of crowding and opacity of the epithelium, which is moſt readily detached and rapidly diſintegrates.

5. Caſts of various kinds are to be found in ſome ſpecimens of the albuminous urine of diphtheria.

6. This albuminuria and theſe anatomical alterations of the kidney are important as ſhowing---

(*a*) That the diſeaſe does not ſpread ſolely by continuity of tiſſue, as had been previouſly believed;

(*b*) That in ſome caſes the diſorder has a tendency to migrate; and in ſuch there is more reaſon to apprehend croup and other complications than in caſes where this migratory tendency is not apparent.

7. Albuminuria as a ſymptom of diſeaſe is important from the fact of its being frequently, though not neceſſarily, connected

with and dependent upon conditions which impair the excretory action of the kidneys.

8. In many cases there are indications of diphtherical albuminuria being so associated.

9. These indications are: diminution of urine in quantity; suppression of lithates; nervous symptoms---as indifference to surrounding objects, somnolence, coma---coincidently with the commencement of albuminuria, and not referable to any other known cause but the kidney complication.

10. The commencement of the albuminuria may be attended by an increase of the pyrexia, unexplained by any increase of the local disorder or other efficient cause.

11. These symptoms are relieved by increased urinary excretion.

12. Albuminuria is not necessarily attended by any obvious symptoms of an unfavourable character.

13. An imperfect elimination of urinary elements may be unattended by albuminuria. In one case, sudden diminution of the urinary secretion without albuminuria was attended by swelling and pain of the carpal joints (rheumatic?). The symptoms described in No. 9 are developed coincidently with this imperfect elimination.

14. I have not observed the early presence of albumen in the urine, which, from the concurrent testimony of trustworthy observers, no doubt frequently occurs. Two explanations of this fact offer themselves. In the first place, most of my cases have been seen in consultation, which is demanded in the majority of cases only when fatal symptoms have already supervened. Secondly, my treatment has long been directed to the prevention of kidney complication.

15. Apart from its early occurrence, there seems to be a special tendency to albuminuria about the seventh or eighth day, at which time the disorder has a natural tendency to terminate. Under such circumstances it is to be looked upon as a critical phenomenon. It may occur at any period.

16. Kidney affection commonly precedes other complications, such as croup and purpura.

17. More exact observation upon the amount of urinary

excreta, before, during, and after intercurrent albuminuria, are much wanted. Alſo in caſes where albuminuria does not occur.

18. If there be retention of urinary elements in the ſyſtem, it is probable that it tends to induce other complications. (See Dr. *Parkes'* Lectures on Pyrexia.)

19. I have found ſpecimens (of which I retain drawings) of anatomical alterations of the ſpleen, which has in ſome inſtances been found ſolidified, and of a pinkiſh-buff colour.

20. The microſcope ſhowed that in ſuch ſpleens there was an unorganiſed, hyaline, ſemi-ſolid material filling the interſpaces of the trabeculæ.

21. I have alſo found alterations of the ſpleen ſuch as Dr. *Haberſhon* has deſcribed as occurring in caſes of purpura.

22. In no caſe has maniſeſt alteration of the ſpleen been found after death where purpura had not been obſerved during life.

23. Some caſes of purpura have been ſeen in which I could not undertake to ſay that the ſpleen was abnormal.

24. There is no conſtant proportion between the ſeverity of the purpuric ſymptoms and the amount of ſplenic change.

25. The vaſt majority of fatal caſes have preſented croupy ſymptoms in the laſt ſtage, but many would probably have been fatal without the croup.

26. In no caſe that I have diſſected was the laryngeal exudation continuous with the faucial.

27. In no caſe of croup that I have diſſected has the exudation failed to extend beyond the bifurcation of the trachea. In moſt inſtances it has extended into the minute ramifications of the bronchi.

28. The tracheal and bronchial exudation has varied in conſiſtency from a very firm membrane to a paſty granular layer.

29. In two caſes, beſides (other?) purpuric ſymptoms, I found after death nodules of pulmonary apoplexy.

30. In one caſe I thought that there was ſome hyaline exudation in the ſupra-renal capſules. In that caſe, and in another, theſe organs were intenſely vaſcular.

31. We are juſtified by the preceding obſervations, as well as by other well-known ſymptoms of the diſeaſe, in looking upon

diphtheria as a zymotic diſeaſe; not as *Bretonneau* conceived it to be, a local diſeaſe ſpreading by continuity of tiſſue, and only affecting the ſyſtem in a ſecondary manner.

32. I have never ſtated, and I am not prepared to ſtate, my opinion upon the relation, if any, between diphtheria and ſcarlatina.

33. To thoſe who find less difficulty in coming to a poſitive concluſion on the point, I beg to recommend the following conſiderations:

(a) Scarlatina and diphtheria may be aſſociated.

(b) Scarlatina is not neceſſarily accompanied by efflorescence, or by noticeable fever.

(c) Diphtheria may probable affect the ſyſtem without producing any throat exudation.

(d) Scarlatina may recur.

(e) Certain forms of ſcarlatina may be *accompanied* by albuminuria.

(f) Scarlatinal albuminuria does not neceſſarily produce dropſy; dropſy, in fact, is the exception in albuminuria *accompanying* ſcarlatina.

(g) Any occaſional form of a ſpecific fever may become the type of an epidemic.

(h) Granting that ſcarlatina and diphtheria are both zymotic diſorders, we do not know what is the nature of their reſpective poiſons.

34. Local treatment exerts no known influence upon the general courſe of ſpecific fevers.

35. The true rule of practice in ſuch diſeaſes is to obviate the tendency to death.

36. The tendency to death in diphtheria is ſometimes by aſthenia, directly induced by the blood-poiſon; ſometimes by complications, of which the earlieſt is generally a kidney affection, interfering with urinary elimination. We muſt therefore eliminate the poiſon, and if poſſible *prevent* the complications.

37. In pyrexial diſorders, one of the moſt conſtant and myſterious phenomena is the quantity of water diſpoſed of by the ſyſtem. (See *Parkes* on Pyrexia.)

38. In diphtheria the quantity of ingeſta will be commonly ſmall if the patient be allowed to conſult his own convenience.

39. Water is eſſentially neceſſary to the performance of the urinary functions.

40. Concentration of the urine is equivalent to kidney irritation.

41. Diphtherical albuminuria is often preceded by urine of high ſpecific gravity. The ſupervention of albuminuria may fail to reduce this.

42. It is often preceded by the depoſits of lithates, ſhowing a comparative paucity of the urinary water.

43. All plans of treatment which have been adopted on the large ſcale for the treatment of diphtheria have embraced the ingeſtion, in large quantities, of fluid nutriment as an important if not eſſential element.

44. By the copious adminiſtration of pure water or diluents in diphtheria, the urine may be often enormouſly increaſed in quantity, without correſponding diminution of its ſpecific gravity, which is indeed ſometimes actually higher at the ſame time that the quantity is increaſed.

45. This ſeems to indicate that the detritus of interſtitial metamorphoſis had been previouſly inſufficiently eliminated.

46. I recommend the ingeſtion of bland fluids in as great quantity as the patient will take: half a pint every hour or two, if poſſible, in the caſe of adults.

47. To avoid chills, I recommend that in all caſes the patients ſhould be clothed from head to foot in a flannel gown, and kept in bed. I believe that the adoption of this plan would have ſaved almoſt innumerable lives, more eſpecially in ſlight caſes.

48. Aſſuming the preſence of a ſubſtantive poiſon in the ſyſtem, we know no drug which will act as a direct eliminant but iodide of potaſſium. It poſitively eliminates lead, and we may preſume that it poſitively eliminates ſyphilis.

49. I employ iodide of potaſſium in two, three, or four grain doſes, every two or three hours. I have been in the habit of conjoining with it chlorate of potaſs in five to ten grain doſes.

50. I have known no inſtance of a fatal termination where this plan of treatment had been carried out. I have known no

inſtance of ſerious ſymptoms or of ſecondary paralyſis ſupervening where this plan had been rigorouſly carried out. The difficulty, eſpecially with children, is in inſuring a copious ſupply of fluid.

51. This plan exerciſes a ſpeedy and ſalutary influence upon the general ſymptoms of the diſeaſe. The exudation often diminiſhes with extraordinary rapidity. Eſſential fevers run a definite courſe, and can be rarely if ever cut ſhort. Till the diſeaſe has gone we cannot be free from the danger of complication. Hence the immenſe importance of continuing the treatment after immediate relief has been obtained.

52. Aqueous injections may be employed to ſupplementaliſe ingeſtion by the mouth; but this is a plan of very inferior efficacy. If deficiency of urine be preſent, bitartrate of potaſh, ſinapiſms to the loins, warm bath, and ſolution of acetate of ammonia help to reſtore it.

53. This general plan of treatment does not preclude other remedies in ſpecial caſes, or to meet ſpecial indications.

54. Where it has been carried out I have not found a neceſſity for ſtimulants, nor have I found that theſe, when adminiſtered, have produced that immediate and ſenſible (even if incomplete) amelioration that we expect to ſee in caſes where they have a beneficial influence.

55. The ſame may be ſaid of tonics and iron. I have never met with ſuch marked anatomical alterations as in caſes which had been freely treated with a mixture containing muriated tincture of iron and hydrochloric acid. It does not neceſſarily follow from this that ſuch remedies may never be required; but they ſhould not be uſed indiſcriminately and reckleſſly.

56. It is contrary to the ordinary rules of our art to interfere with the local development of blood-poiſons, except for ſpecial reaſons.

57. The faucial exudation of diphtheria is to be conſidered as the local manifeſtation of a general diſeaſe.

58. Interference with it will not prevent its reproduction, nor will it prevent laryngeal complication, nor will it prevent the ſupervention of grave conſtitutional diſorder. It is, beſides, exceedingly irkſome to young patients.

59. We are juſtified in interfering with the throat exudation

when there is exceſſive fetor, or when it is ſo copious as to interfere with reſpiration or deglutition---not otherwiſe.

60. If the croup always extend below the bifurcation of the trachea, tracheotomy is but a forlorn hope; as ſuch it may be right to reſort to it in ſome caſes.*

61. I am not ſatisfied with that explanation of the ſecondary paralytic affections which attributes them to reflex irritation. Poſſibly minute diſſection might diſcover ſome organic change in (*a*) the nervous centres, (*b*) the nervous periphery, or (*c*) the muſcular tiſſues.

62. Albuminuria may or may not be preſent in caſes of diphtherical paralyſis.

63. Caſes of paralyſis progreſs ſo ſlowly when treated ſimply by quinine and other tonics as to lead to the ſuppoſition that theſe drugs exert no direct influence upon this ſequela, which probably in ſuch caſes wears itſelf out.

64. I believe that I have obtained more ſpeedy reſults with eliminants---as iodide of potaſſium, iodide of iron, and bichloride of mercury with bark.

65. Bliſters to the top of the ſternum, if applied early, ſeem to exerciſe a moſt beneficial influence upon the paralyſis of the palate.

66. Paralyſis may follow, as kidney complication may attend, ſlight as well as ſevere caſes of diphtheria. In one caſe I have heard that the paralyſis has laſted two years, and may be conſidered permanent.

67. I am acquainted with one caſe in which the patient has recovered, but in which albuminuria is ſtill occaſionally preſent, four years after the primary attack.

* According to M. *Roger*, twenty per cent. of the children operated upon at the Hôpital des Enfans Malades in Paris recover.---*Archives Générales de Médecine*, April, 1862.