1861
Frederick Aheut

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On Diphtheria

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Dysfunction of parotid organ
Doubt as to use of ligo. Leuconeo. members
Parotid
In a memoir read before the Academy of Medicine in 1821, M. Brettonneau established under the name of Sphæritis (Sph. Ompa, a German) a disease which may develop itself on the mucous or cutaneous surfaces, but which shows a predilection for the buccal-pharyngeal chamber, & the mucous membrane adorning it. Although then especially characterized for the first time, this was the Real Malady. Several physicians on the continent and also in our own country had referred to its leading features; and, as remarked by Dr. Bent, the account of the disease, given by Dr. Hare, as it existed at Liverpool, a century ago, leaves scarcely a symptom wanting to identify the
two affections. Still Brotoneau was the first by his careful & connected researches to determine the specific nature of the disease; I do first gave a complete account of it. Before the outbreak at Tours in 1818, French practitioners of the present century seem to have been little acquainted with Diptheria, and previously to the epidemic of 1857 it was practically unknown to the faculty of this country. It would appear however, to have prevailed in all ages, and to have been familiar to physicians under different aspects & various names. Retzius made pointed reference to some of its characteristic symptoms: Retzius and Retzius seem also to allude to it; and at different periods during the last five centuries, it has appeared as a fatal epidemic in various European countries and also on the continent of America. Holland suffered in the earlier part of the fourteenth century: Paris in 1576; and Spain at a time that later period. In 1618 it broke out at Naples, and assumed a very fatal form. In 1747 it showed itself at
Eloquently, it invaded Sweden in 1761, America in 1771 and again in 1818. The epidemic of 1818, which prevailed from 1818 to 1825, afforded ample scope for correct observation, and enabled Dr. Darwin to explicitly determine the character of the affection. Prior to this time it had not been formally described, the older writers having mistaken it for or confounded it with somewhat allied affections. Various epidemics have since visited France, and furnished the physicians of that country with great opportunities for the study of the peculiar nature of the disease. It was particularly fatal at Boulogne in 1855-56, and thence seems to have extended to the south of England, where it fairly manifested itself early in 1857. Since that time it has prevailed, with greater or less violence, over the whole country. In Scotland, it has hitherto been less common, but a slight epidemic visited Edinburgh in , and it seems to have occurred in a sporadic though fatal form in Aberdeen during the past winter.
The etiology of diphtheria, as of most other diseases, remains very obscure. Its sporadic occurrence at one time, its epidemic prevalence at another, and the various modifications of its onset and progress, together with many other curious facts connected with its history, all tend to render the question of its determining causes a very difficult one. Many able Physicians have turned their attention to this point, although it must be owned with but little success, for as yet they have been unable to particularize the circumstances attending its outbreak or the influence to which its irritations are due. Its development cannot be attributed to the unhealthy position of the localities invaded, for it seems to have been ubiquitous. Illerisone writes:—"When I saw Diphtherite prevailing as an epidemic at Tours, I thought that the position of this city, which is situated in the midst of a valley watered by two rivers, had some influence in the development
of the disease, and I attributed, like almost nobody else, the cause of this formidable affection to cold, and especially to humidity.

But soon I saw it raging with excessive violence, in the hamlets of Loir et Cher, which are remarkable for their salubrity, and for their excellent geographical position, while some of the villages of the Loire, situated in the midst of marshes, remained exempt from the scourge; and on the other hand, some hamlets and towns situated on the banks of rivers were depopulated by the epidemic, while others enjoyed a perfect immunity, which was I thought to be attributable to the ordinary salubrity of the place. We have had a little experience in our own country. It reached the sea-side, and has visitated in several of our most fashionable watering places. The narrow streets and crowded courts of our cities - the marshy fens of Lincoln, the open moors of York, and our most upland districts have all alike suffered from its ravages. In this country as in
France, it appears to have been equally independent of all meteorological conditions. Indifferent to change of weather, it has raged with as much intensity during the heat of summer as the cold of winter, and has a more equal temperature abolish its influence. Airmass and moisture have been as ineffectual in its limitation, for Miasma found, in the dry year of 1825, the maximum vitality of the epidemic, in the districts lying to the north of Orleans, and placed under exactly similar physical conditions, did not occur at the same time; while 1828, which was hot and rainy, the scourge was as severe to the south of Orleans as it formerly had been to the north. Moreover, in consulting the tables of mortality of the different villages, which had been attacked, he found that the first deaths coincided in each case with the commencement of the winter, in another, with the rainy days of spring, and in a third with the middle of summer.
v. determines
The difficulty is experienced in endeavouring to trace the causes of the disease to the habits, regimen, or hygienic condition, of the suffering population. Daviott considers it must derive its origin from some atmospheric agent, resultant in its nature, but which always produces inflammation. How it must be admitted, that diphtheria shows a preference for the wretched hovels of the poor, where the confined air is charged, with all manner of poisonous emanations, rather than the cleaner and airier dwellings of those in better circumstances. Its predisposition to break out in barracks, and the tendency to concentrated action by which the various epidemics have all along been characterized, seem also to vindicate that obnoxious influences of a domestic origin must be reckoned among the pestilential causes. But poverty, wretchedness and filth are by no means essential to its development, although its ordinary concomitants, for it frequently
Selects its victims from the upper classes of society, and although it generally shows a predilection for weakened and depraved constitutions, it is no less true that it may attack persons in vigorous health.

A Laycock has suggested that the disease is probably one of parasitic origin, and further investigations may prove this. The determining cause: The etiopores and thalli of a fungus, the etiopilum albicans, have been detected in the caudation in several instances, but most physicians regard this as a merely accidental circumstance, since it is not invariable, and since it has been discovered in the patches of aphthae, and other diseases affecting the buccal chamber.

Once developed, it cannot be doubted that septicemia propagates itself by contagion. Much diversity of opinion prevails on this point, but most observers pronounce in the affirmative.

A Bard considered the disease to be of a contagious character, and thought the infection due to the
influence of effluvia, transmitted by the breath, of infected persons, and thus endeavours to explain why the disease may attack a whole family without affecting the houses adjoining. Metchnikoff devotes the first part of his first memoir to the consideration of this question. He believes that the disease is not communicated by volatile invisible emanations, susceptible of being dissolved in the air; that persons attending patients cannot contract it unless the diphtheritic secretion come in contact with a mucous surface, or with denuded cuticle—in fact, that 'true inoculation is necessary.' He relates the following case where inoculation took place. A child suffering from diphtheria, who had already transmitted the disease to its parents, was placed under the care of Dr. Hervieu, Surgeon to the Hospital of Tours, at one of his visits; by access of cough, a part of the diphtheritic membrane was ejected from the throat, while the process of hanging was being performed, and it lodged on the aperture of the nostril of Dr. Hervieu.
Occupied with his task, he neglected for a moment to remove it. A severe diphtheritic inflammation of the part ensued, which spread over the whole throat and pharynx. Extreme constitutional disturbance ensued, and the prostration was so great, that convalescence occupied more than six months. Several other cases are detailed, all tending to establish the validity of his conclusions. But in this opinion he stands alone, for most other physicians believe, that not only can diphtheria be transmitted by inoculation, but that the infection may act at a distance from its origin. Moreover, it is worthy of note, that Monsecour failed to induce diphtheritic inflammation by puncturing his tonsil with a lancet, covered with secretion obtained from a diphtheritic wound. It is likely too has made some experiments on animals with the same object in view, but unsuccessfully. But experiments of this kind would need to be conducted on a more extensive scale for, although their result was negative, it cannot be regarded
V. A. Spear.
As conclusive, since, although the vaccine and
syphilitic poisons can be successfully inoculated
they sometimes prove abortive. Many cases might
be adduced, and where the origin of the disease
was distinctly traceable to infection, and where there
was a fulness of testimony as regards inoculation,
it would, therefore, unquestionable, that the
atmosphere is capable of transmitting the
contagion of the affection. This question
had most important practical bearings,
for it not only explains the action of
the disease in confined centres, but
suggests that patients should be removed
as much as possible from society. Rousseau
truly observes, that among poor families, the
frame bed, the ravel clothes, and the same
utensils, often serve almost everybody, and
it must happen that, the virulence accumulated
in greater force in proportion to the want
of cleanliness, quickly attacks all the
members of the same family.
There is a great variation in the symptomatology of this disease, but whether it manifests itself in a mild or malignant form, its essential anatomical characteristics is in every case the same. This consists in the exudation of a peculiar false membrane, which may appear in the mouth, in the pharynx, the tonsils, the pharynx, the nasal fossae, the larynx, trachea, bronchi, the oral cavity, the anus and the cutaneous surface. In the majority of cases a preference is shown for the pharynx, but it may develop itself wherever there is a raw surface, and wherever it appears it presents the same characters and passes through the same phases. Some writers (Copius) seem to think that the presence of air is a condition essential to its production, and that, as a consequence, it is never found in the oesophagus or digestive canal which are withdrawn from atmospheric influence. At least however, states that in two instances, though the mouth was free from false membrane, the oesophagus was lined with it.
For two thirds of its length, although the
perdation was not directly connected to the
 subjacent serous surface. Below the appearance
of the gelatine on its more usual site,
the parts present a red, swollen and congested
appearance. This is attended by the exudation
of a viscid serous mucous liquid, which speedily
becomes more tenacious, and closely invades the
relating surface. In this little points or
spots would make their appearance, and
these by their coalescence, form a uniform
 gelatine of a yellowish colour, which
gradually becomes thicker and more coherent,
and attaches itself firmly to the subjacent
parts. In the earliest stage, this gelatine
is easily removed from the surface of
the affected tissues, but, when fully developed
it assumes a membranous character, and if
detached from its connections, a number of
minute bloody points will frequently appear,
attesting the firmness with which it adhered
to the subjacent parts. These in the majority
of cases are not found to display any marked
alteration, they are generally free from
breach of continuity, and only present a greater
or less intensity of vascularity. But the affected
tissue does not always preserve its integrity,
for it has been noted, regarding the epidemics
both of France and this country, that loss
of substance often takes place. Indeed
Pillet and Blatthy regard this to be
the rule in true diphtheria, and West
believes, that in a large proportion of the
instances in which the exudation extends
into the air passages, the mucous
tenting of the larynx is distinctly eroded,
and small specks of ulceration are
discernible about the edges of the glottis.
The microscopic characters of the
exudation would appear to differ in different
cases. It has often been described as
fibrous or plastic, but most observers
in this country have failed to detect
traces of fibrillation, and consider it
an adventitious exudation of a granulo-
cellular character. In examination the
The purification declined.
Membrane appears to consist of a number of distinct laminae, and consequently varies considerably in thickness. The laminae appear to be formed by the agglutination of epithelial, fibrin, and blood cells, together with granular matter. Fungi may or may not be present, and must therefore in the mean time be considered accidental. Harley examined twelve cases, and the traumatic albinism was absent in all except one, and even in that it was not developed until fifty-six hours after the death of the patient. The membrane is of an aplastic character, and speedily changes its color and structure under the influence of autolysis, soon splitting up into threads and patches, which, depending from the pharynx, simulate the character of a gangrenous affection. The parts where the scarlaternal deposit is usually observed to show itself first are the pharynx, the tonsils, or soft palate. Though why this should be we cannot explain. But it seldom
limits itself to this region, its tendency being to extend downwards into the larynx, and upwards into the posterior fauces. The false membrane has been rarely seen to affect the fauces in this country, for when states, that he has never met with a single instance but different epidemics seem to vary in this respect. In France it would seem not to have been unrequent, for we find Retoreau stating, that the disease is often insidiously developed in the nostrils, and silently extends itself there, without any warning or any apparent symptom. He therefore advises that whilst an epidemic prevails, a careful inspection of the nostrils in all suspected cases should be instituted. The disposition to the formation of exudation on wounds and abraded surfaces, is characteristic of the disease in France. This has been uncommon in this country, but cases of deposit occurring on the mucous lining of the fauces have occasionally been noted. The amount of deposit on the fauces is
As criterion of the extent to which the air passages may be involved. The whole pharynx and soft palate may be coated with false membrane, which, yet as extension to the windpipe occurs, and on the other hand, there may be only some trifling roughness in the tonsils, while a copious exudation has taken place on the pharynx and trachea.

To the peculiar condition of the fauces, which may be considered a pathognomonic sign, there is generally superadded swelling of the submaxillary glands, and sometimes of the parotids, together with an edematous condition of the cellular tissue adjoining, and as a result of this there is an amount of dysphagia, and a feeling of stiffness in the muscles of the neck proportionate to the intensity of the tumefaction.

Having described the anatomical characteristics and local appearances peculiar to diphtheria, we shall now proceed to describe its more general symptoms. Diphtheria occurs either as a primary or a secondary affection. When primary it may present itself either in a sporadic or epidemic
form; if in the former it is generally it with in character, if in the latter, it then conforms to the laws of epidemic disease, and is of a more active and malignant type. As a secondary affection, it occurs as a complication of Measles, Scarletina, Syphilis, Carcoma, &c. &c.

In the milder forms of the disease, the usual premonitory symptoms are slight fever, headache, vertigo, and uneasiness in the throat, and slight difficulty of deglutition; the most remarkable feature in that case being generally that the depression of the patient is much more severe than would have been inferred from the local ailment. If the jaws are examined at an early stage of the attack, the tonsils will be found red and slightly swollen. In a short time, a few white specks make their appearance, and are usually at first confined to one tonsil, but soon the other becomes similarly affected, and the deposit sometimes extends itself to such an extent, as to involve part of the pharynx and soft palate. In such cases the elevation
is easily removed by astrigent applications, and is not reproduced; if the symptoms is favorable, and although convalescence is generally more tardy than might have been expected from the trivial local symptoms, two or three days suffice to see the patient well again.

A case recently came under our notice which illustrates very well an attack of simple phthisis. The patient—admirably fit and apparently of a robust constitution—& lately officer on board one of Her Majesty's gun boats, had been exposed early one morning to a sharp cold east wind, while he was standing on the washing deck of the vessel. He experienced some slight shivering at the time, and as the day advanced he was sensible of an uneasy feeling in his throat. In the evening he sought the advice of the Medical officer attending the ship, but failed to find him till the following day. When he complained of pain in the jaws, and great difficulty in swallowing. On looking into the patient's mouth, the Medical officer was struck with the unusual appearance of the fauces, and deemed it prudent to
send him to the Royal Infirmary. Here a careful examination of the throat was instituted, and disclosed that both the tonsils, the soft palate, and back of the pharynx were covered with a distinct fibrillar exudation. The case was recognized as one of diphtheria assuming a mild form. Although there was scarcely any constitutional disturbance, the patient was kept in the hospital for some days and treated by the local application of potassium of silver, mixture of bichromate of potash in combination with chlorate of potash, and a gentle antiseptic.

Another phase presented by this affection, and in which it is very fatal amongst children, is when it appears to have a tendency to attack the larynx from the very outset, and in that account termed laryngeal diphtheria. When the disease assumes this particular type, it is usually preceded by pretty smart fever, intense headache, appaliable dysphagia. Swelling about the angles of the jaws, and these symptoms are attended by more or less prostration, showing that I some moribund.
agency is at work. Complaint is now manifested by the throat, which, on inspection, is found to be covered with a leathery exudation which, if unchecked, speedily extends to the larynx, and sometimes even into the larger ramifications of the bronchi. Soon the character of the voice becomes changed, and the barking cough marked; the difficulty of respiration increases until there are frequent paroxysms of dyspnoea, and symptoms of asphyxia gradually show themselves. When the attacks of suffocation are little, the sufferer tosses himself about, and in his distressing restlessness throws his arms violently into the air, struggling for breath. But the struggles also tell too often in vain; for the condition of parts is now such as to be almost inevitably fatal. At intervals relief is obtained by the expulsion of small globules of mucus, which have been blocking up the air tubes. But recovery in such cases is quite exceptional. It has been previously remarked; that the amount
Of deposit in the sputum is no criterion of the tendency of the false membrane to extend to the air passages, and it is worthy of note that coughed symptoms may supervene although the onset of the disease has been mild and its local symptoms never well pronounced. The cough in these circumstances, may present but little of the loud, prolonged, dry, or ordinary cough, and the respiration may have little of the characteristic stridor; but grave apprehensions may be all at once excited (and this especially in infants and young children) by the breathing suddenly becoming laboured and interrupted by paroxysms of urgent dyspnoea, the evidence of the already complete formation of false membrane, and the herald of death, which may not delay four and twenty hours from the first sign of serious change. It should be remembered too, that cases occur and then occur, where the local symptoms appear very amenable to treatment, but in which the seeming recovery is very fallacious.
In the graver forms of the disease, there is often great constitutional disturbance, as is
evinced by the severe headache, rigors, strong
fever, vomiting, and occasional hemorrhages,
which are the usual precursors of the
attack. At an early period a thick
false Membrane of a dull yellow
colour invades both tonsils and the
whole of the Pharynx, and though it
would appear to have little tendency to
inveade the larynx, it often extends into
the Nares, as is shown by the foetid
smell, which is discharged from the nostrils.
Accompanying of this condition of the Guaees,
there is great engorgement of the Salivary
Glands and Infiltration of the adjoining
Cellular tissue; and in some cases the
intense, tumefaction of the tonsils and uvula
renders deglutition almost impossible.
After the false Membrane begins to thicken
its break up into shreds under the influence
of Putrefaction, a peculiarly disagreeable odour
is communicated to the Breath, and the
Appearance of sloughing ulceration is given to the fauces, whence arose the old names of Angina Maligna & Angina gangrenosa. These local symptoms are invariably attended by those of extreme depression of vital powers. The pulse is weak and irregular, in extreme cases frequent, the countenance cadaverous, the extremities cold, but there is generally no disorder of the intellectual function. A low typhoid type of fever may continue for two or three days; the pulse gradually growing feeble; the signs of failing power becoming more manifest, and this in spite of a liberal administration of stimulants, until at length either the signs of the last stage of typhus suddenly appear, showing that the local mischief has been extending silently and unperceived, or else an attack of delirium follows, and soon sudden and violent action of the bowels, or causesless convulsions come on, and in the subsequent coma the patient dies. It has been recently observed that in severe cases the white
is often found to contain albumen, but its significance in this disease cannot be precisely determined.

The duration of the disease varies much in different cases. Whole death results purely from the local symptoms, it may prove fatal within thirty hours, but it may continue for several weeks and terminate fatally, either from long continued illness, or from its remote sequelae. Amongst these have been observed, causeless convulsions, jointing, fits, a general failure of muscular power, and particularly paralyses of the oculi palpatae.

Regarding the true Pathology of Diphtheria, opinion is very much divided. Many consider it merely an anomalous form of scarlatina, in which the throat affection is unaccompanied by the skin rash. Such a view is undoubtedly favored by the circumstance, that diphtheria and scarlatina sometimes occur together, not only in the same locality but even in the same household; and it is further strengthened by the fact that a rash
similar to that of Scarlatina, sometimes though rarely appears in Diphtheria. Moreover, the occurrence of albumenuria in the latter draws a still closer analogy between the two affections. Still many considerations favour the opinion that they are two essentially different diseases. At the outset, it may be advanced that a breach of surface but rarely accompanies the edema of Diphtheritic sore throat, whereas in that of Scarlatina it is almost always present. Again, though instances seem to have occurred of the same contagion producing indifferently Scarlatina in one subject and Diphtheria in another, it must be admitted that a number of facts are wanting sufficient to decide the question. Thirdly, in epidemics of Scarlatina the absence of such is the exception. Fourthly, the prominence of the papillae so characteristic of the tongue in Scarlatina is never seen in Diphtheria. Fifthly, Scarlatina does not protect from Diphtheria, but on the other
hand, does diphtheria differ from scarlatina. From true croup, with which it is often confounded, it may be distinguished both by sight and symptoms. And, if, as Dr. Bevan remarks, we extend our enquiry beyond the three changes wrought in the respiratory organs, the affinities of diphtheria are seen to be to the class of blood diseases rather than that of purely local inflammmations. The opinion generally entertained with regard to the essential nature of the disease is that it is of a toxic character, and many considerations, this theory highly probable. Amongst the most important of these may be mentioned the identity in character of the diphtheritic secretion and the its simultaneous or successive affection of different and distant parts; the disposition of the precursory and general symptoms to the trivial character of the local ailment; its epidemic prevalence; and the pecuilar nature of its agueae
A true correct understanding of the pathology of diphtheria has brought about quite a revolution in its treatment. Originally it was believed to be a disease of a toxic or character, and accordingly was combated by active antiphlogistine remedies. Constriction, leaching, blistering, mercury formed the treatment first advised, but these by common consent have long been discontinued as being very distinctly contraindicated. Blistering and leeching increase the danger by the liability of their lesions to assume a diphtheritic character, and from the authentic type of the disease depletion by mercury is to be avoided. The two great indications of treatment are to arrest the local symptoms, and to support the system generally. For since the immediate source of danger often arises from obstruction to the important function of respiration, and since there is an undoubted connection between the arrest of the deposit and the speedy recovery of the patient, local remedies hold a most important place. One of the best of
these is the application of a strong solution
of nitrate of silver (3: 10 5: 1); and if this fails
To arrest the progress of the exudation, string
Hydrochloric acid, diluted with from four to ten
Parts of honey, acetic acid, or chloroform, also is strongly
Recommended by some physicians to be applied
by a brush, or given in a gorgle (5: 10 to 5: 100 grates)
Boric acid, and chloride of soda, are very serviceable
remedies, and are used by its West for
keeping the throat free of the excrescences which are
apt to accumulate in it. Insufflation
of powdered alum is often had recourse to
and seems to control the irritating discharge.
The only external local applications which
should be applied are fomentations or poultices,
and by means of these, the difficulty of
dejection is often alleviated.
The constitutional treatment consists in the
administration of stimulants and the employment
of tonic and antiseptic remedies. Of the
latter the most generally approved are the
Inhale of the Weakly of Iron in combination
with Chlorate of Potash, or Quinine with Tincture.
of bark and Hydrochloric acid. But the medicinal treatment is quite subordinate to the administration of food and stimulants, which require to be given early and with an unflinching hand. Accordingly, even where the attack is attended with marked febrile symptoms, and where it may be deemed prudent to administer a hematin of Jecacuah, we should not be misled into an antiphlogistic line of treatment.
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