carpine, which caused no irritation when applied to the conjunctiva, equally as effective as eserine. His experience was confirmed by Dr. Galippe.

In my own experiments, made with the chlor-hydrate of pilocarpine, the results obtained have differed a little from those produced by eserine sulphate, in the facts that less conjunctival irritation, less supra-orbital pain, and less spasm of the accommodative power seemed to be induced, while the contraction of the pupil and the temporary myopia corresponded in degree with those following the use of eserine. In these respects pilocarpine offers great advantages over eserine. It is, moreover, at present, less costly than eserine, and it does not, as does the latter, deliquesce on keeping.

We have, therefore, unquestionably, two myotic agents capable of rendering immense service in ocular affections, and probably of use in other diseases, especially of the nervous system.

It is needless to say that these, as all other remedies, have their limitations of usefulness; in iritis, for instance, eserine and pilocarpine would doubtless be highly injurious, as tending to congest the already distended vessels, and as favoring the formation of adhesions between the iris and the capsule of the crystalline lens.

THE RELATIONS OF DIPHTHERIA AND "CROUP."

BY T. B. CURTIS, M. D.

In an interesting article upon Diphtheria published in the Journal of January 10th, the question of the relations of diphtheria and "croup" is touched upon, and in this connection a statement is made to the effect that "we have the high authority of Virchow that it [diphtheria] is pathologically distinct from croup." Having already some months ago[1] discussed this question at some length, I hope I may be pardoned if I make an attempt to meet this new argument in favor of the view which I then endeavored to oppose.

The name of Virchow carries with it so much weight that many readers will be disposed to accept his statement as final, since it appears to corroborate, by unimpeachable pathological evidence, the nosological distinction which so many observers are seeking to establish. I am convinced, however, that the distinction drawn by Virchow and the German pathologists is not relevant to the question at issue, which is whether a membranous croup distinct from diphtheria can be shown to exist.

Great confusion has been introduced into this question in consequence of the different meanings which have unfortunately been attached to

[1] See the Journal, July 5, 1877, page 4.

the words diphtheria and croup, diphtheritic and croupous or croupal. To avoid ambiguity, it is therefore necessary that these words should be strictly defined before entering upon any discussion of the significance which should attach to the dictum of Virchow mentioned above.

Diphtheria, then, or cynanche contagiosa, is a disease, specific and infectious, of which the main characteristic consists in the formation of false membranes upon or in certain mucous membranes, and occasionally also upon abraded surfaces, and which is accompanied by a more or less pronounced condition of asthenia, apparently dependent upon blood poisoning.

Croup, better called membranous laryngitis, is an affection whose nosological position is under discussion. According to some authorities, it exists only as a laryngeal localization, primary or secondary, of the specific disease called diphtheria. Others, however, believe it to occur as a simple inflammatory, unspecific, local disease, characterized by the presence of a laryngeal false membrane, and by the symptoms therefrom arising.

With these acceptations the words just defined have a purely nosological signification, and the derived adjectives (diphtheritic and croupous or croupal) are analogous in meaning, denoting that which belongs to or is derived from the respective diseases.

Another wholly different acceptation has been introduced by the German pathologists, according to which these same designations were applied no longer to diseases, but to pathological processes. As so used by Virchow, the words in question have the following meanings: —

Diphtheritic inflammation, or diphtheritis, is a process, inflammatory, exudative, and destructive, consisting in the formation of a morbid product which infiltrates the diseased tissue and causes its necrosis.

Croupous inflammation is a process characterized by the formation of an exudation which is situated not within but upon the diseased part. The exudation when spread out upon a free surface constitutes a croupous membrane; when confined in small spaces or cavities, it takes the form of croupous deposits.

The contrast between the two typical processes just defined is sufficiently manifest, and the authority of Virchow is not needed to enforce it. But does this purely pathological distinction imply a corresponding nosological difference between the diseases diphtheria and croup? Evidently not, unless it can be shown that the diphtheritic and croupous processes belong respectively to the diseases whose names they have been made to bear. So far, however, is this from being the case that in typical cases of diphtheria the exudation is frequently, if not generally, croupous rather than diphtheritic. So often is the exudation of this character that Oertel, describing four forms of diph-

theria, calls one of them the "croupous form," the other three being the catarrhal, the septic, and the gangrenous forms. Niemeyer describes pharyngeal diphtheria under the name of "croup of the pharynx," adding, however, the statement that there is, in this disease, as it were, a transition between the croupous and the diphtheritic inflammations. Other examples of the croupous process, as conceived by German pathologists, are to be found in lobar pneumonia (called in Germany "croupous pneumonia") and in parenchymatous nephritis ("croupous nephritis").

While the morbid process in diphtheria is perhaps more often croupous than diphtheritic, it is in the intestinal lesions of dysentery that "the prototype of diphtheritic inflammation," according to Niemeyer, is to be found. The diphtheritic process also occurs in a typical form in ulcero-membranous stomatitis. This disease is in nowise connected with diphtheria, although consisting in a diphtheritic inflammation of the mucous membrane of the mouth.

Thus we see that although the diphtheritic and croupous processes are pathologically distinct, it does not follow that the diseases bearing similar names are so also.

It has been alleged that the clinical histories of diphtheria and of croup are very different. So, too, is the clinical history of malignant pustule very different from that of carbuncular fever. No one, however, would infer that they were nosologically distinct. It is, on the contrary, universally recognized that these two affections are but separate manifestations of one and the same disease, which may be associated, succeed each other, or exist alone. In diphtheria, also, either the local or the general symptoms may predominate, so as alone to be apparent. The local lesions, generally originating in the pharynx, and often extending secondarily to the larynx, may from the first be restricted to the latter. In a case of primary laryngeal diphtheria (*croup d'emblée*) occurring in a very young child, and progressing rapidly to a fatal termination by asphyxia, the local symptoms due to the false membrane will alone attract attention. Such a case will be liable to receive the name of membranous croup, having, indeed, all the pathological and clinical features attributed to that form of disease.

In the varying degrees of intensity of the local and general manifestations we find a satisfactory explanation of the variations observed in different epidemics of diphtheria. In such epidemic exacerbations as that now in progress, the malignancy of the disease is often extremely marked, and cases which no one can fail to identify as diphtheria predominate. During the intervals separating such outbreaks the general manifestations are apt to be less conspicuous, the local symptoms caused by the laryngeal membrane predominate, and cases having the characters attributed to "croup" become more common. Similar variations, quite as

pronounced, are observed in all the infectious diseases which occur epidemically, malignant forms of small-pox or of scarlet fever, for instance, differing very considerably from ordinary mild forms of those diseases.

The object of my argument is not, by any means, to assert that the unity of the pseudo-membranous disease is conclusively demonstrated, but to maintain that all attempts to prove its duality have thus far been unsuccessful, whether on pathological or on clinical grounds. It is not impossible that at some future day diphtheria may be divided by nosological distinctions based upon a more accurate knowledge than we as yet possess of the *materies morbi* or of the ætiological conditions under which the disease arises. I am, however, convinced that no criterion, pathological or clinical, has thus far been shown to exist by which we can trace any such line of demarcation as is held to separate croup from diphtheria.

Finally, even if the view which I am opposing should prevail, if it should be maintained that a non-diphtheritic, *non-transmissible* croup exists, every one must, I think, admit that the difficulty of making a correct diagnosis between such a form of disease and certain cases of primary laryngeal diphtheria must be well-nigh insuperable. It would therefore be highly rash to rely upon such a diagnosis to the extent of allowing the precautions considered necessary in cases of diphtheria to be neglected.

For this reason, it seems to me, that in the order of the city Board of Health enjoining upon householders and physicians to report cases of infectious disease, "membranous croup" ought unquestionably to be placed upon the same footing as diphtheria. It is comparatively unimportant, after all, under what names cases are recorded, provided that we are careful to keep on the safe side in matters relating to their practical management.

RECENT PROGRESS IN ANATOMY.[1]

BY THOMAS DWIGHT, M. D.

Lymphatics. — Among the contributions to our knowledge of the lymphatics we must notice the papers by George Hoggan, M. B., and Frances Elizabeth Hoggan, M. D., presented to the Royal Society of London, of which we have as yet only the abstract.[2] They claim to have discovered the lymphatics of striped muscular fibre. These consist of radicles, reservoirs without valves, and efferent vessels with them. The reservoirs are found on one side of a muscle and the efferent vessels on the other; this is the state in the diaphragm, for instance. We regret that we do not find any account of the radicles. The efferent

[1] Concluded from page 309.

[2] Proceedings of the Royal Society of London. Vol. xxvi., Nos. 178 and 182.