THOUGHTS ON THE PATHOLOGICAL RELATIONS AND THE ETIOLOGY OF DIPHTHERIA.

Read in the Section of Public Medicine.

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L. 1. RECENT microzoic pathology has established beyond doubt in some cases, and presumably in others, that infections and infective diseases, with a few apparent exceptions—if, indeed, they be exceptions—are caused by, dependent on, or constantly associated with, the presence of certain more or less differentiated forms of bacteria.

2. We are justified in considering these as specific—though, as in the case of the ova of man, ox, and dog, the specificity of which is clear enough, our visual organs may not be able to distinguish them—by the specific character of their effects in the body, the contagium of each disease producing the same, and not another.

3. Yet there is reason to believe that these specific forms may be evolved—except in the case of some of the most highly differentiated, as small-pox, the conditions necessary to whose evolution do not now exist—from non-specific and inert forms; and that thus some diseases, afterwards and usually propagated by contagion, may at times be evolved from extracorporeal or other bacilli, in other words, may arise *de novo*, though not *de nihilo*.

4. These lower forms of bacilli, non-specific, but capable of developing into higher and specific forms, as well as the necessary conditions for their development, are most likely to be found in and among the processes of putrefaction of organic matter—processes themselves invariably set up by like organisms; and such diseases are thus, as Murchison maintained against Jenner regarding enteric fever, *pythogenic*.

5. While history and medical observation warrant us in denying such evolution, under existing social and sanitary conditions, in regard to small-pox and measles, and leave the case of typhus and scarlatina open to differences of opinion, there is an overwhelming mass of evidence in favour of its frequent occurrence in enteric fever, and still more of diphtheria.

6. Bacilli of a more or less infective character are present in most forms of pharyngitis and tonsillitis, whether induced by exposure to and absorption of septic poisons, or by the usual causes of catarrh.

11. *Diphtheria* may be defined as an infectious and specific, though perhaps not highly differentiated disease, marked by some or all of the following phenomena. Locally, there is an inflammation of all or any part of the fauces, tonsils, pharynx, nasal passages, and larynx, characterised by the exudation of lymph rich in fibrine and proliferated epithelioid cells and leucocytes, leading to submucous thickening and the deposition on the surface of a so-called false membrane of any degree of thickness and consistence. Generally, there are blood-changes or derangements of innervation and nutrition, manifested not only by pyrexia and albuminuria as in scarlatina, but by certain characteristic phenomena, viz., paralysis of the heart, of deglutition, and perhaps of voluntary muscles, of the nerves of special sense, and derangements of common sensation; these phenomena differentiating it from non-specific pharyngitis.

The local dangers are: (1) the liability of this exudation to putrefaction and the absorption of the putrid matter; (2) the obstruction of the glottis by the exudation; and (3) the paralysis of the glottis, due to the inflamed state of its muscles, causing its margins to collapse during inspiration, while expiration is unaffected.

That this, and not spasm, is the cause of the suffocation is evident, because (1) muscles actually inflamed are not subject to spasm, but rather to loss of contractile power, (2) so long as the glottis is not obstructed by membrane expiration is not impeded, (3) identically similar respiration follows division of the laryngeal nerves, *i.e.*, artificially produced paralysis, and (4) is also heard when artificial respiration is performed on the dead body in which the glottis is passive.

III. *Diphtheria and Croup*.—Croup is an equivocal expression, being popularly applied to any cough marked by a peculiar brassy sound, indicating its origin in any abnormal condition of the larynx. It may thus mean (1) simple or catarrhal laryngitis; (2) laryngismus or true spasm of the laryngeal muscles, arresting, during its continuance, both inspiration and expiration; or (3) laryngeal diphtheria. The last name is by some physicians restricted to cases of diphtheria, originating in the larynx itself; but identical symptoms and consequences follow the extension of the diphtheritic process from the pharynx to the larynx, and such a distinction is unscientific and without any practical value.

"Croup," therefore, if not simply catarrh, or a reflex spasm of the glottis, is, and should be called, diphtheria.

IV. *Diphtheria and Tonsillitis*.—In catarrhal tonsillitis, the

increased and altered secretion of the tonsils thickened by cell-proliferation distends and protrudes from the crypts in the form of whitish points, which may ultimately coalesce, undergo putrefaction, lead by absorption to inflammation, and even suppuration of the cervical and submaxillary glands, or assuming a fibrinous character simulate diphtheria, but in such cases albuminuria, and the nervous derangements characteristic of diphtheria, are absent.

More often the inflammatory process is localised, and pseudo-abscesses, in the tonsils, and enlargement of the neighbouring glands, are the only consequences.

V. Though the great majority of cases of tonsillitis and pharyngitis are purely catarrhal, set up by exposure to cold and wet, to irritants, etc.; experience places it beyond doubt that they may be produced by the absorption of septic agents, as sewer-gas, etc. Between these cases and well-marked diphtheria it is impossible to draw any satisfactory line of demarcation, and we are justified by analogy as well as by clinical observation in believing all such cases of septic tonsillitis and pharyngitis to be essentially the same as diphtheria.

By analogy, even in those fevers whose lesions are usually visible and unmistakable, we meet with obscure and unrecognised cases, whose true nature is only revealed by their remoter consequences, as albuminuria in scarlatina, or even by their merely giving rise by infection to other cases which admit of no such doubt. We have small-pox with one pustule, and why not with none? scarlatina without visible eruption, enteric fever marked only by slight intestinal derangement and malaise or weakness, and so on.

Clinically, I have seen three sisters with what seemed to be a common foul smelling sore-throat, but in one of whom fatal laryngeal symptoms rapidly developed, she being a feeble child of five, and they healthy girls of fourteen and sixteen years. In none was there any visible exudation on fauces or pharynx.

I, therefore, firmly believe that diphtheria is of far more frequent occurrence than is commonly supposed, and that all, or nearly all, cases of sore-throat evidently connected with unsanitary surroundings, and affecting, simultaneously or consecutively, several members of a family, are to be reckoned as diphtheria.

VI. *Etiology*.—The connection between sewer-gas and faecal or other putrid accumulation in or around dwellings and diphtheria has long been recognised by medical men, especially those resident in towns. But, of late, several rural practitioners and medical officers of health have advanced a theory of meteorological causation. Dr. C. Kelly, medical officer of health for West Sussex, insists on the fact that, while diphtheria is scarcely known in Worthing, it is very prevalent in the rural districts; and he attributes it to exposure to cold and wet in going to and from distant village-schools. In the reports of the German Imperial Board of Health, I observe that it is at times fearfully prevalent in the rural districts of Saxony; and, in those of the Board of Health of Michigan, I find that among the sparsely peopled settlements in the backwoods, amid foul and stagnant pools, etc., its ravages surpass all example.

I do not deny the facts adduced by Drs. Kelly, Slade King, etc., but I do their inferences; for where does one meet with foul dunghills, pigstyes, etc., in close proximity to houses, saturating the soil with putrescent matter, or with cesspools side by side with wells, more frequently than in such villages and rural homesteads?

Again, it is remarkable that, in Munich, as Dr. Soyka has shown, enteric fever prevails most in those quarters provided with old and pervious sewers, next in those with good sewers, but where the houses are not properly disconnected therefrom, and least in those without any sewers at all; whereas diphtheria is constantly present in the latter, drained only by the open *Stadtbücher*, and with cesspools dug in the porous rock. Thus, diphtheria and enteric fever exist in Munich side by side, but in inverse proportions in the several quarters of the city. In fact, it would appear that surface-accumulations of filth are more likely to generate diphtheria, and pent-up putrid gases to produce enteric fever.

PROFESSOR OLLIER ON NEPHRECTOMY.—The first case of this operation in Professor Ollier's practice (*Rev. de Thérap.*, 1883, p. 232) was a sarcoma of the kidney in a child four years and a half old, who died a short time after the operation. The second case was a renal cyst, and the patient died on the third day. In the third case, a woman twenty-two years old, a renal abscess had formed in the lumbar region. An opening having been made, a fistula discharging pus and urine resulted. M. Ollier extirpated the much enlarged kidney through an incision in the lumbar region. The patient recovered. M. Ollier thinks that nephrectomy is justified in cases of small renal sarcomata and of pyelonephritis with intractable fistule; but ought never to be practised in cases of cyst or floating kidney.