

thermometer. The liquid should be stirred occasionally, as also the ice and salt mixture, by means of a wire or spiral passing through the stopper.

The column of mercury will at first fall to a point where it remains for a short time stationary, after which it will slowly rise to a permanent level — the freezing point. Meanwhile can be seen small crystals of ice forming in the tube, which are destroyed by the stirring process. On account of the great delicacy of the thermometer, particular care should be taken that the column of mercury be not broken by sudden jars or otherwise. The whole test should not take over fifteen to twenty minutes.

To summarize very briefly: The results of cryoscopy in renal disease, as reported in the different foreign medical journals, would appear to be of the greatest value, and if by further work in this line its value receives additional corroboration, the surgeon of the future will have a means of diagnosis which will be invaluable in all prospective operations upon the kidneys.

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A NOTE ON PLEURISY IN TYPHOID FEVER.¹

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A REPORT of the following case, whose true character was not suspected until the patient had been under observation for a number of days, may be of interest in calling attention to the probable fact that pleurisy resulting from infection with Eberth's bacillus may be less rare than published cases give reason to suppose, but is overlooked because it simulates so-called idiopathic pleurisy and does not receive sufficient study to be recognized.

An Italian laborer, twenty years old, was admitted to the first medical service of the Boston City Hospital on Feb. 26, 1902. He had been seized fourteen days before with a sharp pain in his right chest, which was followed by cough with frothy expectoration and progressive dyspnoea. There was fever and headache. Examination showed the right chest to be well filled with fluid, and 2,000 cc. of clear serum with a specific gravity of 1.025 and containing $\frac{1}{2}\%$ albumen were immediately withdrawn. While only a small portion of the fluid re-collected, the temperature kept up between 102° and 104°, and the chart strongly suggested the typhoid curve. His mental state was also suggestive of the same disease, but his condition at no time gave cause for special anxiety. The bowels were slightly loose, but the stools were not characteristic. Except for a possible enlargement of the spleen, examination of the abdomen showed nothing abnormal. No rose spots were noticed. The Widal test was negative on the thirty-fifth day of the disease, but positive on the thirty-eighth and later. A marked reaction was also obtained with the serum which was aspirated on the fifty-ninth day. Positive proof of the presence of Eberth's bacillus was lacking as the effusion was sterile, but strong presumptive evidence was present in the appearance of the Widal reaction after its previous absence, in our inability to discover tubercle bacilli in many examinations and in the failure of the patient to respond to tuberculin injections. The temperature chart as convalescence set in was typical of typhoid.

Although pleurisy as a complication of typhoid has long been recognized, the direct dependence of one condition on the other has been definitely shown only since the discovery of the bacillus typhosus. It appears, however, to be one of the rarer complications. Betke² found 58 instances among

¹ Contributed to the thirteenth series of Medical and Surgical Reports of the Boston City Hospital.

² Quoted by Gerhardt, Mitchell, a. d. Grenzgeb. d. Med. u. Chir. Bd. v., 1900.

1,420 patients. Osler³ met with it 5 times among 389 cases; Gillies⁴, 6 times in 249; Ivanoff², 11 times in 143; Stritzl², 7 times in 122; while A. A. Smith⁵ makes no mention of it in an analysis of 87 cases. Remlinger⁶ found it occurring 7 times among 1,055 cases. Among 1,065 cases admitted to the Boston City Hospital since Jan. 1, 1899, it was positively diagnosed but 18 times. It is doubtful in the latter instance, at least, if the proportion is not considerably understated, partly owing to the difficulty of diagnosis between it and pneumonia, which is greatly increased when dealing with patients too ill to render any assistance to the examiner, and partly because in the cases which develop late, and, as usually happens, insidiously, it may easily be overlooked from the disinclination to examine too carefully patients whose condition is critical. A fairer estimate may perhaps be obtained from autopsy records, although the percentage of mortality is low among the published cases. It was present in 6.7% of 1,073 autopsies recorded by Holscher, and in 9.5% of the fatal cases among Betke's patients. It occurred 3 times among 53 autopsies at the Montreal General Hospital.

Although reference is made in these statistics to a considerable number of cases, Remlinger in 1900 was able to collect from the literature only 31, including 7 of his own. These, with a few overlooked by him, a few which have been published since, and 18 taken from the City Hospital records give a total of 57, which may be used for analysis; but positive demonstration of the presence of the typhoid bacillus was lacking in a number of these cases. References were found in a somewhat hurried search to a number of others which, in the meagre details furnished, closely corresponded to the more fully reported cases. Forty-eight of these patients were males, nine were females, a disproportion for which no explanation is apparent.

Except as an initial event, when it may be the most prominent feature and mask the real condition, pleurisy as a complication of typhoid is rare during the first week. It is most common after that date while the temperature is still high, but it may be delayed until convalescence seems fully established or even occur as a complication of a relapse. It may show itself by the usual symptoms of pleurisy, but more frequently its onset is insidious and its presence is only discovered on physical examination.

Neither side seems especially liable, since out of 56 cases in which it was definitely localized in the reports the right and left pleura were each affected 24 times, while in 8 it was double. Twelve of the cases were not aspirated, and the character of the effusion remains in doubt, but as all but one recovered it was probably serous. Among the others it was serous in 16, purulent in 17 and hemorrhagic in 7, while in one case pus was present, in one pleura and serum in the other. The process was represented in 4 solely by a friction rub. References were found to other cases in which the effusion was loculated, the pockets containing different forms of exudate. Pneumo-

thorax was an occasional occurrence, which was secondary in some cases to pulmonary infarction; in others it was attributed to straining at stool.

Etiologically Eberth's bacillus has been demonstrated as the cause in a considerable proportion of cases, and in a few of those in which the onset of the disease was marked by pleural symptoms, the mild course and the absence of abdominal symptoms, save for a slight digestive disturbance, give reason for questioning if the bacilli may not have been confined in their activities to the pleura. Only two cases, however, were found by the writer in which it was definitely proved that the typhoid bacilli were localized there, in both of which the infection was secondary to tuberculosis. One was reported by Charrin and Roger⁷, the other by Kelsch⁸.

In the former the typhoid bacillus appeared in pure culture; in the latter tubercle bacilli were also present. Autopsy showed a complete absence of typhoid lesions. In the later cases emboli have been demonstrated in a few as the carriers of infection, and the proportion in which pleurisy was preceded by phlebitis of the femoral veins or intestinal hemorrhage, which showed the depth of the ulcerative process, among the City Hospital cases, was suggestive of this method of distribution, phlebitis occurring in three cases, and hemorrhage in two, while both were present in one. In a smaller proportion pleurisy was the result of a secondary infection with other bacteria, staphylococci or streptococci. In two cases, not included in the above, an empyema was secondary to abscess of the lung, but while the typhoid bacillus in one was fairly distributed in the various organs, staphylococci alone were found in lungs or pleura. An interesting point in the bacteriology of these cases was the tendency of Eberth's bacilli to disappear from the effusion which later became sterile.

The Widal reaction with serum drawn from the pleural cavity has been tried in a number of cases with varying results. In some it was negative, while in others a more intense reaction was obtained than when the blood was used. Achard succeeded by a special method in cultivating the bacilli in serum, which gave a very distinct reaction.

The white cells have been counted in only a few cases, but these seem to show that their number either remains normal or is but slightly increased, unless the effusion is purulent, when a marked leucocytosis is to be expected.

The character of the effusion, which shows a close relation to the period of the disease in which it develops, has an important bearing on prognosis. None of the initial cases ended fatally, the course being often noticeably mild, while a considerable proportion of the later ones died. None, however, which came on before the twelfth day were either hemorrhagic or purulent. A serous effusion seemed to add but little to the gravity of the original disease, while 2 of the 7, in which it was hemorrhagic, and 6 of the 18, in which it was purulent, died. Free incision and drainage of an empyema was usually required, yet a few recovered after repeated aspiration, with or without the injection of antiseptics.

³ Johns Hopkins Hospital Reports, vol. v, 1895.

⁴ Montreal Medical Journal, vols. xxix, xxx.

⁵ Medical News, New York, Dec. 9, 1899.

⁶ Rev. de Méd., vol. xx, 1900.

⁷ Soc. Méd. des Hôp., 1891.

⁸ Semaine Méd., 1892.