announcement had not come squarely to his ears.

With the first part of the reply I entirely agreed, but with the second part I confess I was not satisfied. However, I acted upon it as a whole and did nothing. The sequence was that having been called by the undertaker on the 19th, two days after the death, to sign a certificate for cremation, I learned the "cause and manner" of the death, and called an inquest in accordance with the practice in Boston and my own preconceived ideas of propriety.

In looking back over the *Transactions* of this society, I find that our subject has been but seldom touched upon. Certainly nothing on record from the lips of a medical examiner defines any rule to govern in the premises, if perchance any rule can govern. I have quoted to you the opinion of Dr. Draper, and I now quote to you the opinion of an officer of the law.

District Attorney Asa French, in a paper entitled "The Duties of a Medical Examiner Considered in their Practical Relations," read before this society June 10, 1879, says (Vol. I, No. 2): "What constitutes a notice to the first inquiry? I answer, any reliable information of the fact. The notice need not be a formal one; whenever and however the medical examiner becomes aware that a dead body has been found under circumstances of suspicion, his duty is to attend and take charge of it without delay."

This is a pretty clear definition of the sort of information which should set a medical examiner to work investigating, but unfortunately the words "under circumstances of suspicion" are somewhat ambiguous. These words materially limit the definition's scope, unless we conclude them to be synonymous with "supposed to have come to his death by violence." I am forced to believe that Mr. French's words were meant to be synonymous with the last clause quoted, because it seems to me to be their safest interpretation for guidance in the future. For instance, there was no suspicion of foul play in my case, but there was a very strong, in fact positive, opinion among the friends of the deceased that the death was in no way due to any fault of F. K.'s.

Now, unquestionably, it is just as much our duty to establish innocence as guilt, but if doubt, which cannot be swept away by view and autopsy exists, as to some one's negligent or criminal act, neither innocence nor guilt can be determined without an inquest. Mr. French's words, "under circumstances of suspicion," would give me just as much reason to act as the words "supposed, etc.," for there was certainly a "suspicion" that the motor-man on the outward car was at least negligent, in fact this was the finding of the judge after the inquest.

Other quotations more or less to the point may be cited. In a discussion of a paper by Dr. Mead (June 12, 1894, Vol. II, No. 5), Dr. Munsell quotes a letter from District Attorney George Marston, who says, "You had better make ninety-nine uncalled for views than let the one-hundredth

go by." We may draw something from this by inference.

Attorney General Knowlton, in a paper read before this society February 3, 1897 (Vol. II, No. 7), is clear enough in his definition as to who has a right to "suppose" that a death is by "violence." He says: "Who is to make the supposition? I answer, anybody, anybody." Would that he were as clear a little further on when he says: "I am told that there is some hesitation on the part of some of your body as to how far they should proceed upon rumors; . . . no one can lay down rules; the medical examiner must not be influenced by considerations of the county treasury, or by objections of county officers against the expense, but by considerations which are founded upon his own good sense and experience"!

All agree that the medical examiner may be in doubt at times and in cases. I believe that our guild will agree that rules by which to make up one's mind as to the exact procedure in all cases cannot be laid down. Fortunately, all medico-legal authorities are in accord that we should act for the best interests of the Commonwealth, and they define the best interests of the Commonwealth to be, to quote the words of Dr. Amory, "to err in cases of doubt upon the side of too much rather than too little investigation." (Oct. 5, 1881, Vol. I, No. 4.)

LEUCOCYTOSIS AND TYPHOIDAL PERFORATION.

FROM THE MEDICAL CLINICS OF THE MONTREAL GENERAL AND ROYAL VICTORIA HOSPITALS.

BY COLIN K. RUSSELL, B. A., MONTREAL, CAN.,

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MUCH has been written of late on the subject of leucocytosis in typhoid fever, and special value is attached to its diagnostic importance in impending or actual perforation. Upon what degree of leucocytosis we ought to depend has not been elucidated, though one realizes that the more marked this sign is, the greater may be our assurance in deciding on the presence of a serious complication.

As to the nature of the leucocytosis, differential counts have shown that the most marked relative increase occurs usually in the mononuclear cells, a condition to be expected in view of the preponderance of lymphatic gland involvement in enteric fever. Experience in the hospital wards with cases of typhoid fever has shown that the leucocyte count may not always be accepted off-hand as positive proof of the nature of the complications, even where a perforation has been suspected, for other conditions resembling perforation in their symptoms may yield marked leucocytoses, while, on the other hand, in cases of actual perforation there may be sometimes even a diminution of the number of white cells found in the blood.

In 37 examinations of uncomplicated cases of typhoid fever, the leucocytes showed a variation

between 2,000 to 12,000, an average of about 6,500. All counts were made as remotely as possible from the digestive period in order that I might obtain more uniform results.

Of the number of complicated cases examined the blood counts have shown most instructive and interesting results, results which, while showing the importance and diagnostic value of blood counts in enteric fever, nevertheless teach the important lesson that grave exceptions may occur, and that one may readily be led into error by attaching too great a significance to leucocytosis as a sign of perforative peritonitis. A few examples will readily explain the results obtained.

CASE I. *Typical case showing value of blood examination; very doubtful signs of perforation; leucocytosis 28,000; operation: perforation found; recovery.*—A boy, age 7, was admitted from Dr. C. W. Vipond's practice to the Royal Victoria Hospital on the eleventh day of the disease. The malady had been attended by the usual symptoms incident upon incipient typhoid fever, and on the tenth day he complained of gradually increasing pain in the abdomen, especially in the right lower quadrant. There was no alteration in the pulse or temperature to indicate radical change, nor did the abdomen present, apart from slight general tenderness, any rigidity, distension or obliterated liver dulness. He vomited once a small amount of food. Dr. Garrow saw him in consultation and ordered his immediate admission to the hospital where he was carefully watched for the next few hours, and the blood counts by Dr. Tooke showed in four different examinations an average of 28,000 white cells. A few hours later he was thought to have slightly increased rigidity and Drs. Bell and Martin recommended operation which Dr. Garrow performed. The perforation, which was promptly discovered near the mesenteric attachment of the ileum, was sutured, and the boy made a good recovery.

After the operation the leucocytes diminished, two days later being 19,000 and two weeks subsequent to the operation, 9,000.

This, then, was a typical case to illustrate the value of leucocytosis, which was the main feature on which to base a conclusion as to the necessity for operative interference.

CASE II. *Signs of perforation, definite; leucocytosis twelve hours after perforation occurred only 12,000; operation: recovery.*—Mrs. T. This patient was admitted to the Montreal General Hospital under Dr. Shepherd as an emergency case. She had developed signs of perforation on the fourteenth day of the disease and was operated upon soon after admission.

In this case I was enabled to examine the blood immediately before operation, and the patient, apart from the local condition in the abdomen, was in a good state for operation. The white cells numbered only 12,000, but the perforation signs were characteristic. Operation was performed and the bowel duly sutured. The patient enjoyed an uninterrupted recovery.

CASE III. *Peforation; leucocytosis 4,800; operation: death.*—Mrs. V. Admitted to the Montreal General Hospital under Dr. Molson on the sixteenth day of the disease, with a blood count of 6,100 and no evidence of complication. Four days later the classical signs of perforation suddenly developed; a careful blood count was made by Dr. Henry three hours later, showing only 4,800 white cells. Operation was performed, the ruptured bowel discovered and promptly sewed, as were also six other ulcers which had already nearly eroded the thickness of the intestine. The patient unfortunately succumbed to the disease.

CASE IV. *Signs of perforation; leucocyte count averaged 14,500; operation: no perforation found; recovery.*—Mr. St. L. This case was one of two which presented features of unusual interest and instruction. The patient came to the Royal Victoria Hospital under Dr. W. F. Hamilton's care on the tenth day of the disease, presenting the typical signs of typhoid fever with reaction to the Widal test. For four days the disease ran the usual uncomplicated course, when suddenly, on the evening of the fourteenth day of his malady, the man developed pain in the abdomen, chiefly in the left lower quadrant. The pain gradually increased until within thirty-two hours marked rigidity was present. Dr. Ballantyne made two blood counts in succession at this time, the white cells numbering respectively 16,000 and 13,000, an average, therefore, of 14,500, before operation was commenced.

The operation by Dr. Garrow, however, showed neither signs of perforation nor peritonitis; the condition of the bowel being nearly such as is to be expected at that stage of the disease. The abdominal wall was again closed, and the patient has since run the usual favorable course of the disease without complication. The blood count made on the day following the operation revealed, in the average of three counts, less than 10,000 white cells.

CASE V. *Signs of perforation; leucocytosis 17,000; operation: no perforation found; mesenteric glands unusually large and swollen; recovery.*—Miss O. In this patient, age thirty-nine, at the Montreal General Hospital under Dr. Lafleur, the course of the disease had been favorable up to the seventeenth day, when, one hour after a bath, pain suddenly developed in the right iliac region, progressively increasing and with gradually developing rigidity. The tenderness and distention became so marked as to arouse the grave suspicion of perforation, and a blood count was made showing 17,000 white cells. Two hours later there were 14,000 leucocytes, and after a period of two hours more the cells were reduced to 10,500; showing, in other words, for typhoid fever, a moderate degree of leucocytosis.

Upon consultation with Dr. Armstrong, operation was decided upon and performed a few hours later, the local symptoms not having shown any signs of abatement. The laparotomy, however, failed to reveal any perforation, though two of the ileocecal glands were unusually tense and swollen.

In the absence of anything further the abdominal wound was closed, and the patient made an uninterrupted recovery, no further signs of perforation developing.

CASE VI. *Very indefinite signs of perforation; blood count 14,000 to 12,000; delay in operation to watch progress; sudden general peritonitis; leucocytosis 32,000; operation: death.*—Mr. A. This patient, an adult male, was admitted to the Royal Victoria Hospital under Dr. Martin on the twelfth day of the disease, with the characteristic symptoms, signs and reactions of enteric fever. Two days later he developed rather suddenly some pain in the region of the spleen, with tenderness on pressure over the ribs in that area; there was no rigidity nor abdominal tenderness elsewhere; the pulse remained unaltered and the leucocytes numbered 12,000. The condition remained thus for the

with signs which in the early stage of the malady were far more characteristic of perforation, and yet the operation had revealed nothing.

With all the signs of collapse in this case and a pulse which could scarcely be felt when Dr. Bell saw the case before operation, the recovery after operation was not to be looked for, and the patient succumbed a few hours later.

REMARKS.

That one may obtain marked variation in the leucocyte count in typhoid fever is well known, and in Dr. Cabot's comprehensive observations he has shown that even where no complications are evident, one may obtain an average of over 15,000 white cells to the cubic millimetre. Further, that where certain abdominal complications other than perforation exist, the leucocytes may rise to a very marked degree. Moreover, in the case cited by

Name.	Date.	Day of Disease.	Temp. at Time of Exam.	Relation in Time to Last Meal.	Nature of Diet.	White Cells.	Complications.
1. Drysdale.	Dec. 31, 1900.	13th.	103.2°		None.	22,000	Perforation.
2. Talbot.	Oct. 2, 1900.	14th.	104.3°	2 hours.	Liquids.	12,000	Perforation. Emergency case; count made twelve hours after perforation; operated on and perforation sutured; recovery.
3. Vosburg.	Nov. 27, 1900.	20th.	104.3°	2 hours.	Liquids.	4,800	Perforation. Abdominal pain between 7.30 to 8 A.M.; tenderness, tympanites and evidence of perforation, pulse rapid and irregular; operated on, and one perforation and six ulcers sutured; death.
4. St. Louis.	Dec. 20, 1900.	14th.	101°			14,000	Mesenteric glands enlarged. Operation; no perforation found.
5. Ogilvie.	Nov., 1900.	17th.	102°			17,000	Symptoms of perforation. Operation; no perforation present.
6. Anderson.	Jan. 7, 1901.	11th.	97.2°	2 hours.	Liquids.	30,000	Several previous counts at different intervals gave an average of 22,000.
7. Miller.	Dec. 31, 1900.	18th.			Liquids.	13,000	Cholecystitis.
8. Laundry.	June 29, 1900.	18th.	98.4°	2 1-2 hours.	Custard.	13,000	Otitis media, which later disappeared.
9. Kelly.	June 30, 1900.	46th.	99.4°	3 hours.	Milk, toast, eggs, custard.	20,000	Simple bronchitis.
10. Powers.	July 3, 1900.	22nd.	99°	2 hours.	Liquids.	12,000	No complication.
11. Demers.	June 30, 1900.	18th.	98.4°	3 hours.	Liquids.	13,000	Septicemia; died; no perforation.

following eighteen hours except that his general condition seemed slightly more serious and some tenderness developed in the right iliac fossa as well. The pulse, however, which had been about 96, was not raised during this time over 104, and there was still no increase in the rigidity.

The blood examinations were made every three hours by Dr. Tooke, and showed never more than from 12,000 to 14,000 white cells. For this reason, and more especially after the experience as recorded in Cases IV and V, operation was not immediately performed. The patient a few hours later became suddenly collapsed, with signs of general peritonitis, vomiting, rigidity, great tenderness and a rapid pulse. It was then, for the first time, that the blood count rose appreciably, 32,000 white cells being present in the cubic millimetre. The 2 previous cases recorded had had a higher leucocyte count without perforation, and

him of phlebitis the white cells numbered 16,200 to the cubic millimetre.

In a number of complicated cases of typhoid fever which I have examined, the same results could be determined; in one patient in whom the only discernible complication was a simple bronchitis, there were 20,000 leucocytes to the cubic millimetre. In a case of cholecystitis 13,000; in one of mild middle ear disease 13,000, and in a case complicated by general sepsis, the white cells, as was to be expected, showed a similar increase, namely, 13,000 to the cubic millimetre. The cases above cited lead in the main to the following conclusions:

(1) That in perforation it is the general rule to have a leucocytosis, but that the degree may vary within wide limits.

(2) That the leucocytes, while appearing as a rule early, may not be at all marked until the general peritonitis and collapse have supervened.

(3) That there may be an utter absence of leucocytosis with marked perforation and peritonitis; in fact, that the cells may be lower than normal.

(4) That with typical signs of perforation and a definite leucocytosis there may be no such complication present, and an operation may be performed unnecessarily.

(5) That a marked degree of leucocytosis may occur in complications other than perforation, for example, bronchitis, cholecystitis, etc.

(6) That with pain and tenderness in the abdomen, coming on suddenly during an attack of typhoid fever (and in the absence of evidences of cholecystitis or other definite complication), and a distinct leucocytosis, even without other signs of perforation, an exploratory operation is justified, even advisable, thereby obviating the dangers of a fatal issue from too great a delay. The exploratory operation in Cases IV and V, done unnecessarily, resulted in no bad consequences, and the patients made a satisfactory recovery.

In conclusion I would like to record my indebtedness to Dr. C. F. Martin for assistance in carrying out my little investigation, and to the other clinicians of the hospitals for kind permission to use their material.

Clinical Department.

CONTUSION OF THE ABDOMEN; NO EXTERNAL WOUND; RUPTURE OF THE DESCENDING COLON; FECAL ABSCESS; DRAINAGE; SUTURE OF RUPTURED GUT; RECOVERY.

BY CHARLES L. SCUDDER, M.D., BOSTON.

J. H. M., thirty-six years old, was caught between a station platform and a moving railroad car. He was crushed. A few hours later he entered the accident room of the Massachusetts General Hospital, service of Dr. A. T. Cabot, in a condition of moderate shock. The temperature was 100°. Over the left iliac crest was an hematoma slightly tender and fluctuating. The urine was smoky in color. The white blood count was 10,200.

The first night he vomited three times, the vomitus consisting of the stomach contents. The next morning the abdomen was slightly distended. The third day all food by mouth was stopped on account of nausea. On the fifth day he had two fecal dejections. There was no more vomiting. On the sixth day the temperature was 101°. The abdomen was less distended. On the left side in the loin the hematoma was tender and fluctuating and the skin over the area was red. Under ether the swelling was opened and a large fecal abscess was evacuated. The cavity toward the abdominal side was bounded by the small intestine, descending colon and omentum. The muscles of the abdominal wall had been torn from their attachments to the iliac crest. At the extreme depth of the abscess was discovered an opening into the descending colon which admitted the tip of the

forefinger. The abscess, so well separated from the peritoneal cavity, was thoroughly evacuated and its wall cleansed with sterile water. Gauze drainage was used. After the sloughing portions of the wound had granulated, some eight weeks after the accident, an unsuccessful attempt was made to close the fistula. Ten days later a second attempt at closure succeeded. The edges of the fistulous opening were refreshed, all tension in the part concerned was removed and the gut was closed with silk sutures.

The particular interest in this case lies in the fact that the rupture of the bowel was not attended by such symptoms as would ordinarily lead one to suppose that a serious injury had been received.

A suppurating hematoma was evident. The rupture in the gut was concealed.

The very important sign that was misinterpreted was that of vomiting. This symptom, instead of being explained by the patient's statement that he had eaten something indigestible before he was injured, should have suggested a lesion of the bowel, or at least serious involvement of the peritoneum.

Vomiting once of stomach contents after an abdominal contusion is of no especial importance. Continuous, unexpected vomiting without any apparent reason is significant of an intestinal lesion. This is true in spite of the absence of other signs of involvement of the peritoneum.

During convalescence this patient had a pneumonia and a phlebitis of the left thigh and leg.

Medical Progress.

RECENT PROGRESS IN NEUROLOGY.

BY PHILIP COOMBS KNAPP, A.M., M.D., BOSTON.

THE INFECTIOUS AND TOXIC ORIGIN OF NERVOUS DISEASES.

At the tenth congress of the Società Freniatria Italiana in Naples last October, one of the subjects for formal discussion¹ was the intoxications and infections in the pathogenesis of mental diseases and neuropathies. This discussion was opened by D'Abundo, who maintained that infections and intoxications are the most frequent sensible and active factor in the pathogenesis of nervous diseases in general, in every period of life both intra-uterine and extra-uterine. The toxic infectious heredity (as syphilis or alcoholism) facilitates in the descendants the evolution of toxic-infectious neuropathies with a classical anatomico-pathological basis. Infections and intoxications in the progenitors, or in the mother during gestation, very often produce in the fetus very marked retardation of the processes of myelinization of the different systems of nervous connections. Some degenerative forms of neuropathy are often to be regarded as due to defective cerebral or spinal organization, the result of toxic pathological processes in the embryo which have been healed.

¹ Rivista Sperimentale di Freniatria, xxvi, 919, December, 1900.