as others in the literature, shows how successful operative interference is if undertaken early, before general peritonitis has occurred, especially in those instances where adhesions (or local abscesses) have formed, or where symptoms arise indicating that a perforation is about to take place. That such a condition sometimes exists cannot be doubted.

Harvey W. Cushing,⁶ whose valuable paper first directed my attention to this matter, and whose conclusions are liberally made use of in these remarks, has emphasized the frequent presence of what he terms a "pre-perforative stage of ulceration." This condition he describes as "a localized inflammation of the serosa leading to a slight adhesive peritonitis, due to the near approach of an ulcer to the general peritoneal surface." The symptoms of this stage, as I have observed them, are gradual, rather than sudden, onset of pain, continuous in character, *which is complained of by the patient himself*, associated with more or less general or localized abdominal tenderness on palpation, with often, but not always, slight muscular rigidity. In addition, Cushing states that there may be a moderate leucocytosis. Vomiting is usually absent, as well as any marked change in temperature, and, if a change occurs, a rise is as often observed as a fall.

In my case there was almost continuous complaint of abdominal pain, with tenderness on deep pressure, and variable but slight muscular rigidity for three days preceding the first perforation, which occurred, probably, with the marked fall of temperature on the morning of the twenty-sixth day. At the second perforation, similar symptoms foreran by one and one-half days the decided fall in temperature, collapse and other symptoms of general septic peritonitis.

In another case under my care this winter, a boy of fourteen, an extremely nervous lad, there was constant complaint of abdominal pain, moderate tympany, tenderness on pressure and, at times, muscular rigidity, but no vomiting or change in temperature, for three days before signs of extravasation into the general peritoneal cavity occurred. In a third patient, also a boy, of about fifteen years, rigidity, tenderness and complaint of pain in the epigastric region, without vomiting, and with higher temperature, continued for a week before general peritonitis developed. This case was taken home before death, but, from the description given, general peritonitis probably determined the fatal issue.

If there is a definite recognizable stage, characterized by symptoms, sometimes present before actual perforation occurs, it is evident that operative measures undertaken during such a stage would be attended by a much greater measure of success than is usually seen after surgical interference in typhoid perforations. And even where operation is not performed, the recognition of this condition would, at least, put us upon the alert: by enjoining greater quiet, the cessation of baths, and constant watchfulness for the occurrence of more pronounced symptoms. My own experience leads me to believe that, had I appreciated the significance of these symptoms in some of my cases, perforation might not have occurred. Of course, "the earlier operations are performed the more will mistakes in diagnosis be seen."⁶ Dr. Davis and myself were guilty of this error in one of our cases: A man, age forty, in the fifth week of typhoid fever, was seized

with sudden, sharp pain in the umbilical region after getting out of the bath. When seen by us seven hours later there was very great tenderness on pressure, particularly over the transverse colon and in the epigastrium, complaint of pain by the patient, sufficient to require a small dose of morphine, rigidity, and slight movable dulness in the right flank, moderate distention, a fall of temperature of 2°, with a pulse of 140, but no vomiting. An exploratory incision was decided upon. At the operation *no perforation was discovered*. The appendix was normal, and the portion of the ileum exposed, about three feet, revealed only intense congestion of the serosa and many thickened Peyer's patches; there was no peritonitis or adhesions. A small amount of serous fluid was present. The gall-bladder was not examined. The peritoneum was flushed with saline solution and the wound closed. The patient made an excellent recovery, and seemed rather benefited than otherwise by the operation. Cushing⁷ reports a somewhat similar case in a girl of fifteen, and C. J. Symonds⁸ operated on a case where the history and mode of onset indicated a perforating gastric ulcer, but found nothing abnormal. Both patients made uneventful recoveries. Cushing and Symonds regarded their cases as hysterical. In mine we were inclined to believe that either a pin-hole perforation had been overlooked, or that the symptoms were due to a temporary obstruction of some sort, a twist of the gut, for instance, that relieved itself before or at the time of operation. The operation, evidently, if skillfully performed, is almost devoid of danger. In advising operation, however, the surgical means at hand should always be considered by the medical attendant, for, as Symonds⁹ well says: "Success can only be obtained in the hands of an operator whose training makes an error in technique almost impossible."

The diagnosis of intestinal perforation in typhoid fever is at times one of the most difficult problems that is presented to the physician for solution. At the same time, early operation, before collapse symptoms have developed, affords, in the majority of instances, the only chance the patient has of recovery. And if painstaking and thorough study of our cases will show that the actual perforation is sometimes preceded by well-defined symptoms — and the cases reported in this paper would seem to corroborate the observations of Cushing in this respect — their early recognition will undoubtedly be the means of saving some lives that are now lost by waiting for the signs of perforation as usually given in the text-books.

Clinical Department.

COMPOUND FRACTURE OF THE SKULL, WITH ESCAPE OF BRAIN MATTER.¹

REPORTED BY HENRY DU R. PHELAN, M.D.,
Acting Assistant Surgeon, U. S. A., Battery G, Sixth United States Artillery.

PRIVATE H. S., age 22, Light Battery G, Sixth Artillery, while on guard on board a water boat alongside the United States transport *Newport*, in the Bay of Iloilo, Philippine Islands, during the evening of

¹ Published by authority of the Surgeon-General.

⁷ Cushing: Johns Hopkins Hospital Bulletin, 1898, vol. ix, No. 82, p. 257.

⁸ Symonds: British Medical Journal, March 4, 1899, p. 519.

⁹ Symonds: loc. cit.

⁶ Johns Hopkins Hospital Bulletin, 1898, vol. ix, No. 82, p. 257.

C. J. Symonds, M.S.: British Medical Journal, March 4, 1899, p. 519.

January 4, 1899, was struck upon the head by a Filipino armed with some sharp instrument.

Upon examination I found an incised wound of the skull on the top of the vault, about three-fourths of an inch posterior to the bregma, and two and one-half inches in length, transverse to the long axis of the head. The front portion of the bone was depressed, and both parietal bones fractured down to the squamoparietal suture, and possibly the temporal bones were fractured as well, as both halves of the skull could be moved independently. A small fragment of the outer table of the right parietal bone was found to be detached at about the level of the superior curved line and was removed. Through the aperture at the vertex the lacerated dura mater and the exposed brain matter were protruding.

Although conscious from the time the injury was received, the patient was suffering from shock, from paralysis of the right leg and foot, and from a slight loss of power in the right arm, the latter, however, being but temporary.

Three hours after the occurrence of the accident the man recovered sufficiently to allow an operation to be performed. Major E. R. Morris, brigade surgeon, operated, with the assistance of Dr. Henry du R. Phelan, surgeon of Light Battery G, Sixth Artillery, and Dr. Charles A. Dukes, surgeon of the steamship *Newport*, who administered the anesthetic. The left parietal bone was trephined at a point two inches from the middle line of the skull, and the opening enlarged by means of a rongeur. The depressed bone was elevated, the lacerated meninges trimmed off and the protruding brain matter replaced. No clot was found. Curiously enough the superior longitudinal sinus escaped injury, although the wound crossed the middle line of the skull. The pericranium and scalp were brought together by means of catgut sutures and drainage provided for. The patient revived readily after the operation, and the recovery was uneventful, the wound healing by first intention. On the following day the rectal temperature rose to 101.5° , and during the rest of the week it varied from 99° to 99.5° . From the ninth to the fifteenth day the temperature was taken by the mouth, and ranged from 98.5° in the morning to 99° in the evening. Since then no record was taken till the 9th of February, when the buccal temperature was found to be normal. On the day following the operation the pulse varied from 120 to 100; on the two succeeding days it remained at 80, and for the following two weeks it varied from 70 to 52, the mean morning pulse being 59. At the present time it is normal. The respiration has been unaffected. On the night of the operation the man complained of pain in his right leg only, but this was probably a result of his fall. Subsequently he made no complaint of pain, either in his head or elsewhere. His appetite and spirits have always been excellent. On the ninth day he was allowed to sit up in bed, and on the tenth he was taken out of doors on a chair and remained up for an hour, when he complained of dizziness. This disappeared upon his return to bed. On the thirteenth day he was again allowed up, and was then able to walk with the assistance of his nurse. On the fifteenth day the dressings were removed permanently, and the wound was found to have healed by first intention.

At the present time the paralytic symptoms of the right leg and foot show no change from what they

were one week after the accident. The motions of flexion, extension and outward and inward rotation of the foot are weak and limited. There is a loss of sensation over the entire leg and foot, with the exception of small areas of paresthesia located one on the mid-dorsal region of the foot, two on the middle of the plantar region, and one at the tip and ball of the great toe on the inner half. On the thigh the area of anesthesia is confined to the front and internal surfaces. The flexors of the thigh are weak, as well as the internal rotators, allowing the limb to rotate out when flexed.

If when standing erect, with the ankles together, the man closes his eyes, he falls over to the right side. Should he bear his weight upon the right limb the knee flexes either forward or backward, causing a loss of support on that side. Without the aid of vision he is unable to appreciate the sensation of contact of his foot with the floor in standing, excepting a slight pressure at the hip.

The senses of pressure, touch and temperature are wanting in the entire limb, except at the points already mentioned. There is exaggerated patellar reflex on both sides, and ankle-clonus on the right side. There is some vasomotor disturbance, causing a lowering of the cutaneous temperature of the right leg and foot. There is no atrophy as yet. The mind is clear, but there are occasional attacks of vertigo and headache. The man was in a splendid physical condition at the time of the accident.

A CASE OF TYPHOIDAL CHOLECYSTITIS ASSOCIATED WITH GALL-STONES; OPERATION; RECOVERY.¹

BY S. J. MIXTER, M.D., BOSTON.

It has long been known that infection of the gall-bladder was apt to occur in a considerable proportion of cases of typhoid fever, but it is only since the discovery of the typhoid bacillus that the subject has been thoroughly investigated.

Flexner found that in 50 per cent. of the fatal cases the gall-bladder was infected.

Cushing² has so thoroughly discussed the relation between such infection and the presence of gall-stones that it is only necessary to refer to some of his most important conclusions and to add another carefully observed case. At the time his paper was written he was able to collect but six cases.

A very interesting and important point in the matter is the possibility that the typhoid infection may perhaps lead to the formation of gall-stones in a gall-bladder previously free from them, the clusters of micro-organisms acting as nuclei. It is also probable that in certain cases the stones present might give no trouble were it not for the irritation produced by the infection.

In the same number of the *Bulletin* Miller reports a case where the bacillus was found in an active state seven years after the attack of typhoid.

The case which I have to report is as follows:

Mrs. H. H., age sixty years, was admitted to the medical wards of the Massachusetts General Hospital March 30, 1898. Thinks she has had "heart trouble" for twenty years. For the past seven years has had

¹ Read before the Boston Society for Medical Improvement, February 20, 1899.

² *Bulletin* of the Johns Hopkins Hospital, vol. ix, No. 86.