appeared normal in 80, or a little less than half; among 81 cases of repair or amputation of a lacerated cervix the endometrium was normal in 15; in 78 hysteromyomectomies the endometrium was normal in 11; out of 60 cases of pelvic inflammatory disease the endometrium was normal in 12, and in 53 cases of retroposition of the uterus the endometrium was normal in 24. As curettement was not performed and the endometrium was not examined in any cases which did not present the indications of endometrial disease, or of malignant growth, it can be seen that the number of times alterations were found in the 483 specimens above represents the number of times a diseased endometrium was encountered in the service at the University Hospital from October, 1899, to October, 1907. There were 2,286 gynecologic patients during this time. Among them there were 337 instances of diseased mucosa, but only 94 occurred as clinical entities, and 243 were associated with more serious lesions requiring operation.

It can at once be seen that the endometrium is diseased in no more than half of the cases in which curettement is done for a suspected endometritis. The endometrium is most apt to be affected in connection with some other lesion which requires treatment, as is evidenced by the comparative frequency with which endometritis is found associated with a diseased cervix or fibroid tumors or pelvic inflammatory disease. Even in cases of retroposition in which the patients complain of a discharge the endometrium is normal in a large proportion.

The practical conclusion to be drawn from this analysis is that one must be very guarded in promising a patient that a given uterine discharge will be cured by a curettement. Furthermore, the non-operative treatment of leucorrhea by the direct application of antiseptic or caustic solutions to the uterine cavity is almost never justified. Such a plan would, as we have indicated, be useless in half of the cases, even though none of the dangers incident to a proceeding of this sort made themselves manifest. The treatment of endometritis by intrauterine applications of formalin, so fully described by Menge⁷ several years ago, can surely never find a place in the therapy of a general practitioner, and never in the hands of a gynecologist, unless the patient is under ether and the cervix has been dilated.

A chronic discharge from the uterus which is dependent on pelvic disease usually requires more than a curettement or intrauterine applications. In the case of a uterine discharge for which no pelvic origin is apparent, general tonic and hygienic treatment should be given a fair trial before resorting to curettement or to any intrauterine manipulations.

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7. Die Therapie der chronischen Endometritis in der allgemeinen Praxis. Arch. f. Gynäk., lxxiii, 1 and 2.

Metabolism During Courses of Mineral Waters.—G. Rempicci published in the *Policlinico*, July and August, 1907, a series of researches on the metabolism during ingestion of various mineral waters. The data presented seem to show that the mineral waters have an unquestionable action on the cells, stimulating them and favoring expulsion of waste, especially the elimination of nitrogen and uric acid. This stimulating action occurs on ingestion of even a moderate quantity of the water, and it is not necessary to drink excessive amounts. The stimulating effect soon wears off, consequently the course of mineral waters should be brief, and resumed after an interval, if desired.

DELIRIUM DURING AND AFTER TETANUS.

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Serious mental symptoms of any kind rarely occur during or after an attack of tetanus. In the great majority of cases consciousness remains unclouded, judgment fairly clear, memory good and the moral sense normal, until the end or very near the end. Emotional control, when we consider that almost always the patient, if an adult, knows he is suffering from a very serious disease, is usually better than would be expected. When, then, mental symptoms do occur, three questions arise: (1) Is the abnormal mental state a mere accidental complication, merely happening at the time of the tetanus and in no way caused by it? (2) Is it due to the medication employed? (3) Is it the direct result of the exhaustion produced by the disease or a result of a secondary intoxication set up by the primary intoxication of the tetanus bacillus?

In certain of the acute infectious fevers, for example, typhoid, pneumonia and smallpox, in addition to the febrile delirium which is very common, a confusional state, followed by death, recovery, or permanent dementia, occurs frequently enough to make mere accidental coincidence impossible. The confusion is most likely due to the exhaustion from the disease, though it is possible that it may be due to secondary perversions of the chemistry of the body, caused, primarily, by the toxin of the infection. The symptoms are the same whatever acute infectious fever the patient may have had. A similar confusional state sometimes occurs during pregnancy and after parturition.

These mental sequelæ are so well known that they do not need discussion. They, and delirium during the attack, are, however, very rare during or after tetanus. I have seen delirium in only three patients in a quite large number of cases. In one case I am not sure that the mental symptoms were not caused by the bromid and chloral used; in another, I believe the previous abuse of alcohol was a large causative factor, while in the third I can find no cause save exhaustion and the influence of fever in a susceptible person.

CASE 1.—The patient, a negro, 30 years old, was admitted to the Philadelphia General Hospital, June 6, 1898, complaining of stiffness of the trunk and legs, and attacks of colicky pain at the pit of the stomach, coming on about every half hour, and lasting a few minutes. His previous history had been uneventful, except that he had had gonorrhea one year before admission, and that a urethral discharge had reappeared ten days before admission. There was no history of any accident, but his feet, which were far from clean, were covered with many superficial scratches and cuts in all stages of healing. He stated that three days before coming to the hospital he noticed, on getting out of bed, that his legs were stiff, and that he could walk only with difficulty. He tried to overcome the stiffness by walking, but that made it worse. He returned to bed, and as the day passed, the rigidity became more marked. About 3 o'clock in the afternoon, the first attack of epigastric pain occurred, accompanied by great dyspnea. The next day, the rigidity of the legs was so great he could scarcely walk. By this time his back also had begun to be stiff. He did not notice any stiffness of the jaw until his admission to the hospital.

Examination on Admission.—He was a well nourished, muscular negro. His facial expression was anxious, but he showed no mental symptoms of any kind. The thighs and legs were rigidly extended. There was slight opisthotonos. The abdominal muscles were rigid. The jaw was, at this examination, free, except that whenever there was a sudden increase in the

tonic spasm of the legs and trunk it also became involved. The arms were entirely free until two days later. The increase in the tonic spasm was always accompanied by sudden and severe pain, referred by him not to the recti abdominalis muscles, but to the stomach itself. He was supersensitive to touch, except on the arms; or rather a touch anywhere on the affected parts would instantly cause a severe, painful tonic spasm. He was, of course, entirely unable to walk. The pulse varied greatly. In the intervals between the paroxysms, it was full and strong, during the paroxysms weak and rapid. Physical examination of the chest revealed nothing. A yellow, creamy discharge, containing gonococci, exuded from the urethra. As a mere touch on the skin produced a paroxysm, no attempt was made to determine the condition of the reflexes.

He slept very little throughout the night, and had three very painful paroxysms, each lasting about five minutes. During the paroxysms there was marked dyspnea, the pulse was rapid, and the skin became bathed in a profuse cold sweat. The temperature ranged from 99 to 100 F. By the next morning spasmodic retention of urine came on. On the ninth day of his illness he began to be delirious. At first the delirium was very slight, and he could be recalled momentarily to himself without difficulty, but after some hours he became wildly delirious. He yelled and shouted, seemed to see fleeting objects, and paid no attention to anything said to him nor to what was going on around him. The pain from the paroxysms seemed to have increased greatly. Delirium and the tetanic spasms continued until death, on June 16. During his entire stay in the hospital, there was an irregular but gradually rising fever. For the first four days it hovered around 100 F., falling twice to normal for a couple of hours. It then hovered around 102 F., several times rising to 103.8. At death it was 102.2.

Postmortem examination was negative. Gross examination of the brain and cord showed nothing abnormal. There was no active congestion. No lesion of any kind was found in the abdominal and thoracic viscera. Nothing was found to account for the fever which must have been caused by disturbance of the nervous heat regulating apparatus.

The delirium in this case was probably caused by the fever and intense pain of the muscular contractions, as well as by the exhaustion due to the disease in a person susceptible to mental breakdown. The relation of fever to delirium is very interesting. Of course, in children it is very common for even slight fever, lasting only a short time, to produce delirium. In adults, slight fever, as a rule, causes no mental symptoms, unless it lasts many days, when delirium may occur with or without stupor. In some people, however, a very moderate fever, say of 99 or 100, may be a distinct cerebral stimulant and a higher temperature may cause wild delirium. Thus, I know a clergyman whose best sermons are those written when in the early stages of a mild influenzal attack—a disease to which he is subject. His sermons are, however, emotional and artistic rather than intellectual. I have never seen power of pure reasoning increased by fever. I know another man, a very successful worker in one of the industrial arts, who becomes mildly and, as he says, pleasantly delirious so soon as he has any fever at all. Others of my acquaintance become dull, stupid and somnolent, without any delirious stage whenever fever comes on. I am speaking of the slight transitory fever which accompanies mild ailments and not of the serious long continued fever of typhoid or pneumonia.

What it is that determines the mental effect of fever is unknown. It is not a question of mere nervousness. I have known many nervous and apparently mentally unstable women who were not affected by slight febrile attacks at all.

CASE 2.—The patient, an Italian laborer, 33 years old, was admitted to the insane department of the Philadelphia General Hospital, Dec. 9, 1907, with the following history: In

October, 1907, he sustained a compound fracture of the great toe of the left foot. Nineteen days after the injury he began to complain of inability to open the mouth and of great muscular rigidity. Five days later he was taken to one of the city hospitals. On admission, there were marked symptoms of tetanus, general muscular rigidity, tetanic convulsions, opisthotonos and the sardonic smile. Within two days he was given 64,000 units of tetanus antitoxin, and over 300 grains of sodium bromid. He became much better, apparently, and then relapsed and was given carbolic acid hypodermatically, and large doses of bromid and chloral.

Ten days after admission all symptoms of tetanus disappeared, and he seemed to be convalescent, but on the thirteenth day (three days after all medication had been stopped) he became violent and delirious, and had to be physically restrained. He muttered and yelled, struggled, refused food and medicine, was angry and destructive, thought the attendants and doctors were trying to poison him, and believed the roof of the room was about to fall on him. After the delirium had continued thirteen days, he was sent (Dec. 9, 1907) to the insane department of the Philadelphia General Hospital. During his stay in the other hospital bromid and chloral were used continuously and hyosein occasionally for many days.

On admission to our wards he was stupid and confused. He improved rapidly, all medicine having been stopped, and by December 27 he showed no evidence of mental illness. He remembered the accident, and a great deal of what passed through his mind during the period of delirium. He remembered that he thought he saw people being burned and getting killed, that he heard voices saying to him, "When will you die?" "I am going to kill you," "To-morrow you shall die." He remembered being taken to the two hospitals, but could not remember when he had been taken to either of them, nor how long he had stayed in them. He realized that he had been mentally ill and that the voices and visions were the result of disease.

I feel sure that in this case the mental symptoms were in no way due to tetanus, but were the result of the heroic doses of bromid and chloral in a susceptible person.

CASE 3.—The patient, a laboring man, 26 years old, was admitted to the Philadelphia General Hospital Jan. 15, 1907. He had been a hard drinker for several years, and smoked two or three packages of cigarettes daily. One year previously he had had an attack of delirium tremens. On admission he was clear mentally. He stated he had been employed in a stable and drove a mill team. He knew nothing of any wounds, but his feet had many recent scratches. On Jan. 4, 1907, he noticed some soreness of the jaws, and gradually increasing stiffness in them. After a few days he could scarcely separate the jaws. He could swallow liquids easily, but could not chew at all. Barring a slight indistinctness from inability to open his mouth, speech was normal. He could move the eyes well, but there was some tonic spasm of the orbicularis palpebrarum. He had a drawn, anxious look, but there was no retraction of the corners of the mouth. He complained of pain in the back only. His neck and arms were stiff, and though he said his legs felt stiff, rigidity was not demonstrable in them. The tendon reflexes were quicker than normal, and there was a tendency to ankle clonus on both sides. The Babinski reflex was absent. He could not void urine at will, but did so spasmodically. After a day or two the muscular rigidity extended and increased. He also became obstinately constipated and complained of epigastric pain.

Five days after admission he became surly and quarrelsome, and four days afterward began to be delirious and have visual and auditory hallucinations. He had no idea of time or place, was much confused, talked ramblingly, and complained of seeing faces and lights. He had to be restrained. He was transferred to the insane department on Feb. 1, 1907. After a week or ten days, his mental symptoms passed off and, barring physical weakness, he was well. The physical signs of tetanus had ceased a little before the time he was sent to the insane department. On Feb. 28, 1907, he was discharged well. He had no fever throughout the course of his illness. The tetanus itself was very mild.

The man was of an unstable mental type; not at all alert, emotionally very weak, had little power of self-control and was a victim of alcohol. I think any stress at all would have been sufficient to upset for the time being his mental equilibrium and in that sense the tetanus was, I have no doubt, the cause of his delirium, but I do not think it was the one specific cause needed. Any other sudden stress would have been as efficient.

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A TYPHOID FEVER EPIDEMIC FROM INFECTED MILK.

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During August and September, 1907, there occurred in Bridgeport, Conn., thirteen or more cases of typhoid fever originating from a common source. The features in connection with this epidemic which seem worthy of general consideration are: (1) The importance of investigation, on the part of health authorities, of every case of typhoid fever reported to them; (2) the desirability of examination by attending physicians of blood and excreta in doubtful cases of this disease; and (3) some facts concerning the Widal test and dissemination which are sometimes overlooked.

On September 14 I attended a patient presenting the classic symptoms of typhoid fever. Inquiry developed the fact that there were four or five cases in the immediate neighborhood, all partaking of milk from the same dairy. It has never been the custom of our local health officers to investigate the source of typhoid fever, so that, while the cases mentioned had been reported to the health board by the attending physicians, the common source of the trouble remained unrecognized.

A list was procured of cases reported to the local health authorities, twenty-seven in all, and with the cooperation of the milk inspector and the various attending physicians, each case was carefully investigated. Thirteen positive cases and two doubtful ones, out of the twenty-seven had consumed milk sold by one dairyman. Four patients had eaten clams from a common source. Two of the four died; the other two cases ran mild courses.

Of the thirteen positive cases typical clinical manifestations were present in all; Widal reaction present in eleven; not tested in two. There was one death, eight patients were severely ill, and the remaining cases ran mild courses.

The dairyman, an ordinary vender of milk, was not a producer but a middleman, procuring his supply from no less than nine different sources within a radius of fifteen miles. Each source was carefully investigated. Histories of any illnesses in the various families and former tenants were carefully considered. Premises and methods of handling milk were inspected. Several specimens of blood and well-water were procured and examined. Results were negative in all but one instance.

George C., occupying since April 1, 1907, a rented farm ten miles distant from this city, was supplying eighty quarts of milk a day to the middleman. The cow stables were in poor condition. The outhouse and sink drain were within a short distance of the well. Well-water, without previous boiling, was used to wash the milk cans. No means were at hand to sterilize milk receptacles. Those milking the cows and handling the milk used no special precautions regarding personal cleanliness.

Mr. C.'s family consisted of himself, his mother, a younger sister and two children—a boy of 4 years and a girl of 3. Another sister had been visiting there for a month. Mr. C.'s brother, together with the latter's wife and her mother, from Massachusetts, had visited there early in the season. Three farm hands had been employed there. Two boys from Bridgeport had boarded there during July and August. The 4-year-old boy, George Jr., was recovering from a recent illness. A near-by physician had seen him once. He had not examined the boy, no diagnosis was made and, his services being unsatisfactory, a physician was called from a neighboring town. The father stated that the last-named physician pronounced the case one of typhoid fever.

The various members of the family and former employees were questioned carefully regarding previous illnesses. No history of typhoid fever or any condition resembling it could be determined. Specimens of blood were taken from each member of the family and the former employees referred to, with one exception, and were examined by a local bacteriologist of recognized ability.

The Widal test was positive in the case of Mr. C.'s mother, the 4-year-old boy and the 3-year-old girl, the latter ailing at the time but not confined to bed. A specimen of well-water showed the presence of colon bacilli.

The two boys living in Bridgeport, who had boarded at the C. farm during July and August, were next sought. The younger of the two, Charles S., one of a family of six, gave a negative Widal test, as did also the other five members of his family. The other boy, James B., aged 14, gave a most positive Widal reaction. Repeated examinations of his blood were made with uniform results. Through the cooperation of the health officer of Enfield, Mass., specimens of blood were obtained from Mr. C.'s brother, the latter's wife and her mother, and in the case of Mr. C.'s brother the Widal was positive.

Here, then, were no less than five persons who had been members of the C. family and had visited or lived varying lengths of time on the farm, whose blood responded in a positive manner to the Widal test, and some of whom were possibly excreting typhoid bacilli in both the feces and urine.

Those coming in direct contact with the milk were Mr. C., his mother and the two boys from Bridgeport. They milked the cows, stirred the milk with a stick, and drank the milk from a cup, repeatedly dipped into the cans without intermediate cleansing. Much earlier in the season the three farm hands referred to had done the milking. Mr. C.'s brother from Massachusetts and the two children at the farm had not handled the milk in any way.

Had Mrs. C., the mother, a woman of 68 years, at some remote period, suffered from typhoid fever and become a common carrier, awaiting an opportunity such as is afforded by the handling of milk to disseminate the germs of the disease? An investigation of her previous environment was made. She had lived and acted as cook and housekeeper in the following named places: a dentist's family in a neighboring town in this state; the home of a relative in Smiths, Mass.; a private family in North Adams, Mass.; a normal school in North Adams, Mass.; a small hotel in Whitingham, Vt. Replies to letters of inquiry stated that previous to, during and subsequent to her stay at these places no cases of ty-