Personally I have not seen a suppuration, much less a panophthalmitis, after cataract extraction since 1891, when I had the case which made me adopt the practice of testing the conjunctiva before operating.

The second group consists chiefly of cases of extraction followed by iritis or irido-cyclitis. These, no doubt, may be due to something introduced at the time of the operation, but I am strongly of opinion that for the most part they are due to such sources of infection as obtained in the case above described, and in addition to examining the conjunctiva I have come to the conclusion that no case of cataract extraction should be undertaken till the operator is satisfied that there is no acute septic condition of the mouth, of the antra, of the nasal cavities, of the ethmoidal cells, and of the frontal and sphenoidal sinuses.

I have not much hope from drugs, except in the presence of syphilis, in the treatment of such cases. Atropine should certainly be used, but probably the best line of general treatment is biological, as by suitable serums and vaccines, together with the removal of the source of infection. I use atropine regularly, but not indiscriminately, for it is liable to do damage by interfering with drainage, and thus may cause the retention of toxins.

"TETANISM" IN MENINGITIS.

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The following case contains much that is of interest, especially from the point of view of diagnosis.

E. P., a married man, aged 37, was a mattress manufacturer, a business which brought him into contact with feathers. Although feeling far from well for a week or so at the end of October before coming to London from his place of business in the country, severe illness only commenced in London on November 1st, 1922, with sharp pain in the left side of the chest, and a shivering attack. Dr. Charles Dixon of Acton attended him and found him looking very ill and suffering from left-sided pneumonia; the fever persisted for six days, a pseudo-crisis occurring on the fourth day, the true crisis on the sixth. On November 4th, as the pulse was so weak, the patient had been given three separate hypodermic injections of 1/60 grain of strychnine sulphate; on November 5th two such injections, and on November 6th one.

For the nine days following the crisis the patient's temperature remained slightly subnormal (about 98°), his pulse was 70 to 80, and respirations 20 to 24. On November 15th he was seized with acute pain in the right side of the abdomen, evidently due to colitis, for he passed slime and membranous material shortly afterwards for twenty-four hours. On the following three days his temperature rose to a maximum of 101°. On the morning of Sunday, November 19th, he complained of stiffness of the jaw and neck, which he attributed to sitting in a draught. The next day, however, the spasm of the neck and jaw muscles was much more marked, and, as tetanus was suspected, he was admitted to University College Hospital (November 20th).

When seen at 2.15 p.m. on that day his condition was grave. The temperature was 97°, pulse 104, and respirations 26. He lay on his back in bed with his neck held rigid; the angles of the mouth were drawn outwards, and his face presented the typical risus sardonicus; the masseters were in a condition of tonic spasm, producing absolute lockjaw; the accessible muscles of the neck were rigid, and the recti abdominis were in such a state of tonic contraction that a remarkable "statuesque" appearance was given to the anterior abdominal wall. The musculatures of the upper and lower extremities were not affected. He was quite conscious, and the reflexes were normal; although unable to speak, he conversed quite rationally by means of "hand" signs. At 5 p.m. lumbar puncture was performed, and 10 c.cm. of perfectly clear fluid was withdrawn, following which 6.5 c.cm. of a sterile 25 per cent. solution of magnesium sulphate were injected intrathecally. Examination of the fluid revealed no abnormalities microscopically, nor was any growth obtained on culture.

As it was impossible to feed the patient by the mouth a nasal catheter was passed at 5.30 p.m., but in spite of the fact that 1/4 grain of morphine and 1/120 grain of atropine had been given an hour previously, a violent spasm was produced directly some milk was given by this method, and was repeated at a second attempt.

Between 12 noon and 12 midnight the patient received 9,500 units of antitetanic serum subcutaneously. When seen at midnight (November 20th-21st) his jaw was partially relaxed, he was sweating profusely, the axillary temperature had risen to 104.4°, and the pulse to 130. He was kept under morphine during the night, but in spite of this the spasms of the neck and facial

muscles became more severe, and he died in a sharp spasm at 8.45 a.m. on November 21st.

The autopsy was delayed until thirty-three hours after death, because, despite the fact that there was no trace of any wound or abrasion, it was considered advisable to report the case to the coroner as one of tetanus. The left lower lobe was intensely congested and showed signs of delayed resolution of the former pneumonia; there was a small patch of fibrinous pleurisy at the right base posteriorly; elsewhere there were signs of broncho-pneumonia. The arachnoid and pia mater looked more opaque than normal, and were adherent to the dura mater; along the lines of the cortical vessels was a greenish-yellow exudate; microscopical examination showed the presence of an intense infiltration of the meninges with polymorphonuclear leucocytes. A streptococcus was grown from the meninges, and also from the heart blood. There were no other *post mortem* findings of note; the stools yielded no signs of the tetanus bacillus, nor was this organism discoverable in the meninges, lungs, or colon.

This case can be viewed from many different clinical points of view.

1. The case might have been one of meningitis, against which were the facts that the spinal fluid was normal; the patient was perfectly rational and conscious, and did not complain of headache or photophobia; there was no vomiting, nor were there any ocular palsies.

2. The tonic contractures might have been due to the effect of strychnine injected during the pneumonia.

3. The case might have been thought to be one of tetanus, and that the infection had taken place at the time of hypodermic medication; or one of so-called visceral tetanus, which is said to occur in patients who present no sign of external wound or abrasion.

With regard to the first possibility, at no moment did it occur to us that the patient could be suffering from any form of meningitis, or even of meningism, nor are we aware of any systematic account of tetanus, except one, in which meningitis is put forward as a condition to be diagnosed from tetanus. The late Sir G. Sims Woodhead, in vol. i of Allbutt and Rolleston's *System of Medicine*, stated that basal meningitis may sometimes be mistaken for tetanus. But had we thought that spinal meningitis might be present the negative findings of the spinal fluid excluded this, and the complete absence of cerebral symptoms excluded the cerebral form of meningitis. So far as we can find in the literature there is no description which says that the tetanus bacillus may produce meningitis, nor do we know of any observation which could give information as to the effects produced upon the meninges when intrathecal medication with magnesium sulphate is practised.

Mr. C. J. Fuller, clinical clerk, fortunately called to mind the details of a case which was similar to the present one. It was reported by Dr. L. S. Fry in the *BRITISH MEDICAL JOURNAL* of January 14th, 1922 (p. 56), as one of meningitis simulating tetanus. The case was under the care of Dr. W. Collier in the Radcliffe Infirmary, Oxford. In correction of the report by Dr. Fry, Dr. W. T. Collier informs us that a few organisms were found in the meningeal pus—including a very small Gram-negative bacillus and Gram-positive diplococci, and on cultivation a Gram-positive diplococcus grew; smears from the vesiculæ revealed no pus cells or gonococci, nor were gonococci found in the meningeal exudate.

It is thus clear that meningitis may provoke tonic spasm of the facial muscles, producing risus sardonicus, of the muscles of the neck and of the abdominal wall; that the spasm may be constant, lasting for hours and even days; and that the spasm may become increased by irritation such as is produced by nasal feeding, etc., the patient remaining conscious throughout the illness. Such features have been held in the past to constitute a clinical picture of undoubted tetanus; this view must be abandoned. It appears to us that no reliance can be placed upon an exclusive clinical picture of tetanus, because the disease may be accurately imitated by meningitis. It is very convenient to speak of the clinical condition of "meningism" to describe those cases which, though closely simulating meningitis, are shown to be quite free from any inflammation of the meninges. As a result of the experience gained by a study of Dr. W. Collier's case and our own it would seem advisable to coin an expression—"tetanism"—to fix the identity of those clinical conditions which simulate the very special form of toxæmia produced by the growth of *Bacillus tetani* at some spot remote from the central system, and which may be dependent upon meningitis developed as a result of infection of the central nervous system by organisms quite different from *B. tetani*.