spirit lamp till evaporation is complete, and after a few minutes the dried residue is covered with a few drops of an alcoholic solution of gentian violet. Five minutes afterwards, the excess of colour is washed off with distilled water, and the slide again heated over the flame of the spirit lamp. I found this second heating absolutely necessary to kill the organisms, many remaining still alive after the first heating and the removal of the excess of colour, showing thus a most remarkable tenacity of life. The preparation may now be studied with a $\frac{1}{2}$ immersion lens, oil or water. A specimen mounted in Canada balsam can be very well studied with a $\frac{3}{8}$ object glass and No. 2 eyepiece. Latterly, I found that methyl blue gives a better result than gentian violet; for, though not so bright a colour as the latter, it somehow defines the micro-organisms more distinctly. It is to be noted, however, that the process of staining is much slower with methyl blue than with gentian violet. Quite recently I got excellent results from using a mixture of equal parts of the two colours. It would appear, then, that curved bacilli are not specifically connected with cholera; at all events, not in the light in which the head of the German Cholera Commission would have these organisms regarded. They are, nevertheless, an indubitable pathological feature of that disease; but this, I think, will soon be shown to be something more in the shape of a consequence than a cause of the malady. An experienced and trustworthy observer like Surgeon-Major Lewis testifies to the presence of comma bacilli in healthy saliva. They can be seen by anyone in healthy urine and in the mucus of the small intestines of those who have died from ordinary diseases, and are thus presumably discoverable throughout the mucous tract under most circumstances. This leads me to the expression of an opinion that has been gaining ground in my mind for some time, which is that the organism in question should be regarded more as a physiological than a pathogenic entity. Dr. Koch's own careful observations lend a measure of support to this supposition. He noticed that a colony of comma bacilli in cultivation to a certain extent dissolved the sterilised proteids on which they were nourished; presumably, the proteids were thus converted into peptones. He noticed also that for some days these organisms multiplied, to the exclusion of all others, in the flaky mucus of cholera kept on linen in a moist atmosphere, and then gave place to those characteristic of putrefaction.

Now, this is exactly what I find in the case of urine; until it becomes markedly alkaline, or, perhaps I should say, till decomposition commences, it shows myriads of curved bacilli, to the exclusion of all other organisms; whilst beyond this point large straight putrefactive bacteria predominate. Indeed, the former are seldom to be found in decomposing urine. This would appear to indicate the small comma bacilli to be *fermentative*, and the large straight bacilli putrefactive, organisms. And the fact that curved bacilli are found under varied circumstances in different regions of the mucous tract, surely points to the probability of their performing a certain set normal piece of work in the animal economy. In urine we have seen that their life history is closely associated with the pre-putrefactive or fermentative state of the change which this excretion undergoes. Now, we either know or suspect that fermentation plays a part in the digestion which takes place in the lower portion of the small intestine; but hitherto we have failed clearly to identify the agency by which it is accomplished. And here, I think, some light has been shed by Dr. Koch's observation that growing colonies of comma bacilli liquefied in their immediate neighbourhood the proteids on which they grew. We have it on good authority that the bacillus butyricus is commonly found in the stomach and intestine of herbivora, and the fact that this organism has the property of decomposing cellulose at once explains its importance in the digestive process of such animals. Why, then, should a similar zymogenic function not be attributed to an organism like the comma-shaped bacillus, which seems to have its normal habitat in the presence of mucous membrane in the human body? Indeed, I should not be surprised to find it conclusively proved that the comma-shaped bacillus is specially concerned in nitrogenous fermentation. Dr. Koch has drawn much more momentous inferences from arguments of a not less speculative character, and that, too, in the face of experiments, the negative result of which went to disprove his own hypothesis; and if I say that a superabundance of comma-shaped bacilli is found in the small intestines of cholera victims, because it would appear that whatever gives rise to that ailment brings about exalted fermentation in that

part of the alimentary canal, I shall, at least, have as much logic in my assertion as he had in declaring that these organisms must bear a causal relation to the disease.

I am, Sir, yours, &c.,

GEORGE WATERS,

Surgeon-Major, I.M.D., Professor of Pathology,
Bombay, Oct. 17th, 1884. Grant Medical College.

COCAINE FUNGUS.

To the Editor of THE LANCET.

SIR,—I feel it is my duty to point out to those who are using cocaine largely, either in ophthalmic or vesico-urethral practice, a danger which I have reason to suspect lurks in stale solutions of the alkaloid. A peculiar mould growth soon appears in the weaker solutions (4 per cent.), and apparently possesses the power of setting up inflammation of the mucous membrane to which it has been applied. It is well known that the epithelium is denuded by the action of the drug. The facility thus afforded to rapid absorption, or to direct action upon the tissues of any deleterious matter, is unquestionably great. Much greater, then, is the risk of absorption in operative procedure when cocaine is employed—e.g., iridectomy, lithotripsy, internal urethrotomy, &c., for here division or laceration of the tissues coexists with epithelium denudation. The most scrupulous asepsis of our solutions, as well as of instruments, is therefore imperatively demanded. My attention was first drawn to the subject by a stricture patient, whom I had treated with cocaine, complaining of profuse urethritis. As I had previously used the same solution with marked success in over fifty cases of stricture in urethral neuroses, lithotripsy, &c., I could not account for the discharge, and was inclined to blame the patient sooner than damage the infant but brilliant reputation of the alkaloid. Two more stricture patients, however, appeared, both having been treated with cocaine, each of whom returned with acute urethritis (one with chordee). I examined my 4 per cent. solution, and found the mould growth I mention. Since my solution has been changed no fresh complication has occurred. I believe the stronger solutions do not permit the growth of the fungus, for with a 20 per cent. solution made on the same day as the one at fault I partially removed a large laryngeal papilloma without any resulting inconvenience, and on examination yesterday no fungus could be seen in it. Although the microscopical report of the growth is not yet to hand, nor am I able to adduce additional or more certain proof that the fungus *per se* has the power of setting up inflammation, I do not hesitate to publish the above facts, and trust their recognition may prevent other similar and more serious mishaps.

I am, Sir, yours truly,

HURRY FENWICK.

George-street, Hanover-square, W., Jan. 26th, 1885.

MEDICAL OFFICERS OF HEALTH AND PRIVATE PRACTICE.

To the Editor of THE LANCET.

SIR,—The subject of your leader of last week is one in which I have long taken interest, and I therefore ask permission to say a few words thereon.

While agreeing generally with the views you express, I would point out that after twelve years' experience of the working of the Public Health Act, the number of towns or districts in which the state of public opinion is such, at the present time, as to enable the authority to guarantee a salary sufficient for the payment of the entire services of a competent officer of health is very few indeed. Such a salary ought not to be less than £600 per annum (seeing that there is no pension attached to the office); while in the case of a tried and valued officer, who has devoted his whole time and energies during some of the best years of his life to the public medical service, and who is precluded from otherwise adding to his income, the sum of £800 might fairly be considered as reasonable remuneration. But, excepting Glasgow, Liverpool, and Birmingham, there is no town where public opinion is sufficiently advanced for this, and in those mentioned the salaries given are much below that which should be accorded to the principal medical adviser of the corporate authorities of those great cities. In another twelve years things may