others remained perfectly limpid and already after twenty-four to forty-eight hours showed at the bottom of the fluid glassy fluffy masses which increased in amount on the following days, the supernatant broth remaining quite clear. When shaken the fluffy masses broke up easily into filamentous translucent flakes. In the agar tubes there also appeared growth; in some tubes a few translucent colonies looking like flat droplets of water, other colonies opaque and white. In the gelatine tubes there appeared only liquefying white colonies.

Subcultures were then made of the broth tubes which contained only the fluffy glassy growth at the bottom of the fluid. The subcultures were made on gelatine, on agar, and in broth. The gelatine tubes kept at 20° C. remained sterile; the agar tubes incubated at 37° C. developed colonies of exactly the same kind, which in all respects compare with those described by Kitasato: circular small translucent droplets, with no tendency to become confluent. In the broth tubes incubated at 37° C., the growth was characteristic, namely, while the broth remained perfectly limpid there developed at the bottom of the fluid the characteristic glassy fluffy masses; these were noticed already after twenty-four hours, but became more conspicuous after forty-eight to seventy-two hours. One fact which on further subcultures became very conspicuous was the rapid death of the cultures, both on agar and in broth, but more so in the former than in the latter. The agar cultures already after a week failed to yield new subcultures; the broth tubes after ten days to a fortnight lost their vitality.

Cover-glass specimens made of the fluffy masses from the broth cultures and of similar fluffy masses in the condensation water of the agar cultures showed the growth to be entirely made up of strings and filaments; each filament is composed of short thin rods, some stained uniformly, the great majority, however, showing a granule at each end; for this reason the filaments look exactly like streptococcus chains composed of dumbbell cocci, but the presence amongst them of uniform bacillary elements without polar staining proves the organism a leptothrix of minute bacilli. The specimens are very remarkably uniform and striking, being entirely made up of these filaments, interlacing and in bundles. Cover-glass specimens made of the colonies grown on agar show also filaments, but a good many groups of the minute bacilli; the groups more completely resemble in appearance the groups that were seen in the sputum. The organisms of all the cultures stained well in rubin (2 per cent. watery solution), in methyl blue anilin water, or in gentian violet anilin water. I have a large number of these specimens, and on examining them with only a moderately high power, the filaments could not be distinguished from streptococci made up of diplococci, but under an oil immersion their bacillary character is easily ascertained, each diplococcus being really a short bacillus with a stained granule at each end. In all specimens, those of broth culture, of agar condensation water, and of colonies on agar, there are present in the filaments numerous elements which, owing to their great thickness and irregular shape, compare with in solution forms; in broth cultures they are numerous present already after forty-eight hours.

From this it is seen that what is here stated of the bacillus, in the sputum in broth and agar cultures, completely coincides with and confirms what is described by Pfeiffer and Kitasato. One appearance which is not mentioned by Kitasato or Pfeiffer in their preliminary account, and which seems to be a very striking appearance, is that the growth in broth is entirely made up of filaments.

CASE II.—The second case in which the sputum was examined was J. M., a lad aged about 14; had bronchitis after the febrile stage had passed. When I saw him he had no fever, and was about the seventh or eighth day after the first onset of the disease. The cover-glass specimens of this sputum revealed also changes of the same minute bacilli; there was no difficulty in finding the bacilli in the substance of the pus corpuscles, but there never were more than a few bacilli in each one corpuscle. Most of the bacilli showed the polar-stained granules. Also from this sputum, after dilution, successful broth cultures were obtained the same glassy fluffy masses at the bottom of the broth, which was otherwise limpid.

CASE III.—The third case was that of a young man, A. A., aged about 20. Had bronchitis for several days after the febrile attack, but was getting better. Not much sputum could be got from him; cover-glass specimens showed some of the minute bacilli, either single or in small groups, but neither were they present in large masses, nor could they be found in the pus cells. Cultivations in broth and on agar failed to produce the characteristic growth.

The broth cultures obtained from cases E. F. and J. M. were used for inoculation of a number of mice and guinea-pigs, but no result, local or general, was produced.

BENZOL IN THE TREATMENT OF INFLUENZA AND ITS COMPLICATIONS—PNEUMONIA, ETC.

By WILLIAM ROBERTSON, M.D.,
Surgeon to the Newcastle-on-Tyne Throat and Ear Hospital.

In the later cases of influenza that have come under my attention I have been struck by the rapid amelioration of all the symptoms of the attack under treatment with benzol. The drug known to druggists as pure benzol is perhaps as reliable a pulmonary antiseptic as any we know of. In an hour or so after its administration it is clearly recognised in the patient's breath. The general results of its action in influenza are as follows:

In about two hours after the first dose the headache and pain in the back disappear, and in about six hours the

fever has subsided—not to return, so far as I have yet experienced, so long as the use of the drug is kept up. The catarrhal symptoms have also by this time become less prominent, as also the suffusion of the eyes and flushing of the face. So far I have seen no tendency to the development of pneumonia under cases treated by the drug throughout and early seen to.

If we are to suppose influenza to be of microbic origin and that the germs of the disease first make their assault on the pulmonary mucosa, then there seems to be an indication for the adoption of some such volatile antiseptic as benzol. This drug I have employed in whooping-cough—a disease displaying more than one relationship to influenza, as witness the several complications common to both, etc.—with unvarying success for years. Here it is now unquestioned that irritation of the respiratory tract from germ infection is the *fons et origo mali*.

The drug can be dispensed in capsules or in mixture (℥iij for children, ℥v for adults every two or three hours), for example: ℞ Benzol. pur. ℥80; spt. vini ℥ss; spt. chlorof. co. ℥iij; mucil. tragac. ad ℥viiij; ℥ss every three hours in lemonade. In its favour it may be stated that patients complain of no inconvenience from its use. It certainly does not reduce the patient in any way or interfere with digestion. I have generally kept up the action of the drug for three or four days after the disappearance of all symptoms.

ON THE TREATMENT OF INFLUENZA.

By FRANCIS TAYLOR SIMSON, L.R.C.P. LOND., ETC.
London.

WHEN influenza appeared in this country at the end of 1889, I treated the first few cases with quinine, but did not find any improvement that I could attribute to the action of the drug. I then contracted the disease myself, and, from the rapidity with which the symptoms developed, I concluded that my blood must be full of some very rapidly reproductive microbes. I therefore treated myself by the internal administration, three times a day, of 2 minims of pure carbolic acid, and I was much more quickly cured than any of the preceding cases, although I went on my round of visits with a temperature of 102°. It was so evident that my improvement was more rapid than the cases I had treated with quinine, that the medical man who was helping me in my practice at the time took the same remedy when the disease attacked him.

Many hundreds of cases have now been treated in my practice with this drug, sometimes as many as eighty patients with influenza being seen in one day, and every case has made a complete and quick recovery, the temperature frequently falling from 102° or more to normal in twenty-four hours, no after-complications being left behind.

Many of the cases have been of a very severe type. Young children and very aged people have been amongst them, some with lobar pneumonia, and many with that peculiar catarrhal affection characterised by crepitations without dulness, which I believe to be caused by slight exudation into the air vesicles, and which I think might be termed influenzic pneumonia. In severe cases I give the remedy every four hours, and for adults the formula is: ℞ Acidi carbolic pur. liquid. ℥iij; syru pi simplicis ℥xl; tinct. cardom. comp. ℥x; spiritus chloroformi ℥x; aquam menth. pip. ad ℥j; to be given until the temperature is normal, and followed by bitter tonics.

I have always insisted on the importance of sleep. Sleeplessness is so uniformly present at first, and so exhausting to the patient, that I usually give 10 grains of Dover's powder the first night, which has the double effect of giving rest and causing the patient to perspire.

To all but teetotallers I order stimulants, preferably good old brandy, with soda water, and dry champagne of good brand and age. I encourage the patient to eat in spite of his disinclination for food. Good beef-tea, fowls, pigeons, game, wild birds, and fish—especially oysters—I find valuable. I do all I can to keep the patient's strength to the maximum. It is of course necessary to keep the patient warm, and I advise bed in all but slight cases, with the temperature of the room kept between 60° and 65° F. When the cough is very

troublesome and morphine not contraindicated, I find the following linctus very useful and pleasant: *R. Liqueur morphinæ hydrochlor.*, 3j; *acidi hydrobromic. dilut.*, 5j; *chloroformi pur.* mijj; *tinct. limonis*, 3j; *syrupi simp.* ad 3iss. 3j tussi urgente.

Several persons have come to me who have previously suffered from influenza, and have troublesome cough, pain, and slight expectoration, with the peculiar crepitation, left behind. Carbolic acid has cleared these troubles up. The neuralgia which so frequently occurs, especially at the back of the eyeballs, I have found relieved by antipyrin in 7-grain doses, and lately by exalgine in 1-grain doses.

NOTES ON LEPROA MUTILANS IN SOUTH AMERICA.

By EDWARD H. HICKS, M.R.C.S.ENG.,
Folkestone.

THE prodromata in this form of leprosy are not so marked as in the other forms, rarely lasting more than three or four days, during which period heaviness of the head, irritability, and anorexia are the chief symptoms. During the pyrexial attacks its resemblance to acute articular rheumatism is remarkable. The tendency of the sinuses to heal spontaneously, especially those communicating with the phalangeal articulations, is also worthy of note.

CASE I.—J. H., aged 36, a cowboy, had always lived in warm and damp climates until six years ago, when he removed to a colder district. His family history was good. His food was usually beef, either fresh or dried in the sun, plantains, euchres, rarely potatoes; he said he might have had fresh fish five or six times a year, never dried fish. He denied syphilis, but admitted having been a free drinker. Eight months after arriving in the colder climate he had rigors, followed by fever, with pains in the joints of his fingers and toes, the pains being worse at night. This attack lasted ten days, when he returned to work, but he noticed that a certain amount of stiffness remained in his fingers. During the last six months he had had three similar attacks.

When first seen he was much emaciated; there was no change in the colour of the skin. The metacarpophalangeal and phalangeal articulations were swollen and painful on pressure. The left index finger presented an appearance like a stump on the end of the corresponding metacarpal bone; the first phalanx only of the right index remained, on the end of it was the nail black and transversely striated. The phalangeal joints of the remaining fingers were swollen. When seen twelve months later he was more emaciated, both elbows were flexed. At the metacarpophalangeal joints were stump-like processes flexed into the palm of the hand, with a tendency to be drawn to the inner side, with nails only on what remained of the right index, both little fingers, and the middle finger of the right hand. The lower ends of the radius and ulna were considerably enlarged, and a similar deformity was seen at both elbow joints. Along the course of both ulnar nerves small tumours were noticed. The toes of both feet were similarly disorganised, and no traces of nails could be found. On the feet were two gangrenous patches, one over the right external malleolus, about the size of a half-crown, and the other covering nearly the whole of the dorsum of left foot. There was considerable deformity of both ankle joints.

CASE II.—R. C., aged 25, a labourer whose family history was good, had always lived in temperate climate. He rarely had fish; his food same as Case I. He said that he had had fever (?), but gave no history of syphilis. Four years ago he had "rheumatism." The attack lasted about three weeks. Afterwards he noticed that the joints of his fingers remained swollen and stiff; two months later he had another attack lasting twelve days which caused still greater deformity of the joints of the fingers. He stated that in the course of the next six months openings formed by the sides of the joints discharging a large quantity of clear fluid, and that later pieces of bone came away, after which the openings closed. When seen the right arm was atrophied and the elbow-joint flexed. The hand looks like a club-shaped mass attached to the forearm by a constricted portion nearly half an inch wide, at the distal extremity of the club-shaped mass were stumps, the remains of fingers, and on those corresponding to the index and middle fingers were traces of nails. The lower ends of radius and ulna were much enlarged. The left elbow-joint was less flexed than the right; the muscles of the forearm were slightly atrophied; there was no enlargement of the ends of the radius and ulna; wrist-joint apparently normal. The joints only of the thumb were thickened; the index extended only half the length of middle finger. The middle finger had lost the last phalanx; the ring finger had lost two phalanges. On these fingers were no traces of nails. The little finger was swollen, and movement was impaired in the phalangeal joints. The toes were like processes attached to club-shaped masses representing what had been the feet. Both ankle-joints were considerably deformed. The muscles of the legs were markedly atrophied, the knee-joints much swollen and stiffened.

INFLUENZA.—Fifteen hundred members of the Metropolitan Police Force are said to be suffering at the present time from influenza. The average number away from duty at this season of the year is only about 300.

ON THE USE OF OXYGEN AND STRYCHNINE IN PNEUMONIA.

By T. LAUDER BRUNTON, M.D., F.R.S.,
AND
MARMADUKE PRICKETT, M.D.

THE great prevalence of pneumonia at the present time, and the number of deaths which it is occasioning, induce us to write the present paper without further delay, although we might have wished to bring forward a larger number of cases. It is self-evident that if we can increase the oxygenating power of the air inhaled by the patients in cases where the breathing surface of the lung is diminished, we may afford great benefit, and in some cases may save life. More especially is this likely to be useful where the interference with respiration is of a temporary character, as in cases of acute pneumonia. In some such cases, where one lung, or one part of a lung, is clearing up, while another part is becoming involved, the question of life or death will be decided by the amount of lung available for respiration. This, again, will depend upon the comparative rate with which the inflammation encroaches on the breathing space on the one hand, and the already consolidated lung clears up on the other.

It is possible that an increased oxygenating power of the respired air for even a few hours may sometimes turn the scale in such cases. We have, unfortunately, not had final success in a case which we are about to relate, but the immediate effect of inhalation of oxygen was so remarkable—we might also say miraculous—as to awaken the greatest hope of future success.

The Rev. E. V., aged about 40, a hard-working clergyman, was attacked with influenza and pneumonia of the right base. On Saturday, June 20th, 1891, this condition was beginning to clear up, but consolidation began to make its appearance at the left base. When we saw him together about 9 o'clock on the morning of Sunday, June 21st, we found him completely unconscious and apparently moribund, his face livid, the skin cold and covered with a clammy sweat, and loud mucous rattles accompanying every respiration.

There did not appear to be the slightest possibility of doing him any good, even temporarily, and we both thought it impossible that he could live more than two hours. Although we regarded the case as quite hopeless, we agreed that it was our duty to try every means of recovery. We accordingly performed venesection, and with some difficulty removed 15 fluid ounces of blood. We injected $\frac{1}{10}$ grain of strychnine subcutaneously, with $\frac{1}{10}$ grain more after an interval of about twenty minutes, in order to stimulate the respiratory centre and increase, if possible, the respiratory movements.

These measures had very little, if any, effect, but, after using them, it occurred to Dr. Brunton that the inhalation of oxygen might be useful. It had already been tried by one of us (Brunton) several years ago as a means of preserving life in poisoning by serpent venom, but great difficulty was then experienced in obtaining it in sufficient quantity and in a portable form. This difficulty has now disappeared, for it can be obtained commercially in iron bottles, in which it is condensed. The utility of oxygen in this form has recently been shown by Major Elsdale, who, in an article in the *Fortnightly Review* about a year ago, described his successful employment of it in a case of poisoning by coal gas.

We accordingly procured some oxygen with as little delay as possible from Brin's Oxygen Works, Horseferry Road, Westminster, the man in charge of the works kindly supplying it to us although, being Sunday, both the works and the office in 34, Victoria Street, S.W., were shut.

The Oxygen Company supplies a mouthpiece and inhaling bag somewhat resembling that usually employed for the inhalation of nitrous oxide and ether, but we used the simpler though more wasteful plan of allowing the oxygen to stream into the mouth through a plain piece of glass tubing attached by an india-rubber tube to the oxygen bottle.

In about fifteen or twenty minutes the patient's colour became less livid, though he was still completely unconscious.

¹ The telegraphic address of the Company is "Brins Oxygen, London."