None of them face north, and nearly all of them have got balconies, some of which are so large that the bed can be wheeled out upon it, and thus patients who are very ill can get fresh air and sunshine without being moved from their beds. The other balconies, which are smaller, are adapted for couches. While outside the patients can be protected from glare or from wind by a sort of sun blind which can be put up or removed at pleasure. All the rooms have electric light, and are warmed by steam pipes. They are protected from draughts by having double doors, above which are glass ventilators. Opposite to these and above the windows are other ventilators, so that a free circulation of air can be easily maintained.

One of the two most remarkable things about the sanatorium, and in which it differs from others, is the extreme care to prevent infection, which is shown not only in the general arrangement of the building itself, but in every detail of structure and furniture. The other is the extraordinary manner in which this principle has been carried out without detriment to beauty or comfort. There is not an angle or corner in the whole building; all are carefully rounded off so that there can be no lurking place for microbes. The seats of the chairs can all be taken out and disinfected, and every cushion, mattress, and coverlet can also be disinfected. Every room is as free from the risk of harbouring microbes as the most thoroughly antiseptic operating theatre, and even the cups, knives, and forks have been specially made so that they can be most effectively cleaned, and no microbe can find a lurking place in them. The floors, which are made of plaster, are covered with linoleum which can be washed with antiseptics, and the walls are covered for a great part of their height with a specially-made washable material called "Salubra." The remaining part of the wall and the ceiling is painted in oil. Linoleum usually has a hard, cold appearance, but here it is of a rich red colour, and has the appearance of a warm carpet. The "Salubra" is in various tints, and in one room especially it is pale blue, and looks as if the wall were covered with blue satin, while the ceiling has garlands of flowers painted in Italian fashion on a cream-coloured ground. The combination of this with the dark red of the linoleum produces a most pleasing effect. Pictures are banished from the walls on account of the dust they might gather, but yet one does not miss them. The whole of each room can be readily disinfected in a very short time by washing with an antiseptic solution.

The plan of the sanatorium was drawn by Dr. Turban of Davos, it was built by Mr. Gros of Zürich and fitted up by Mr. O. Hüglin, Freiburg-i-B.

In visiting this establishment one does not get at all the feeling of being in a hospital, or even in a sanatorium, but rather of being in some palatial hotel, where everything is arranged to please the eye, and to minister to the comfort of the visitor. One would imagine that it would be impossible to provide such accommodation at anything but a prohibitive price, yet at present the charges are 8s. 6d. a day for feeding, medical attendance, heating, and lighting. The rooms are from 2s. to 6s. extra, and there is an entrance fee of £1. It seemed to me that this price was likely to be raised as soon as the establishment was filled, but I was informed that this was not the intention, but rather that, on the contrary, the profits from the establishment were to be devoted—in part at least—to reducing prices to those who were not well off. On going from this establishment to Nordrach I was greatly struck with the comparative simplicity of the arrangements there, and the results which Dr. Walther has had show very clearly that success in the treatment of consumption depends more on the doctor who regulates the treatment than on the place where it is carried out. Yet at the same time, as an ideal sanatorium for consumption, I cannot but corroborate my friend's (Professor Bäumler) dictum that Wehrwald is the most perfect sanatorium at present in existence.

DONATIONS FOR THE TREATMENT AND INVESTIGATION OF CANCER.—Mr. Timothy Bean has sent to the Treasurers of the Middlesex Hospital the sum of £1,050 for the endowment of a bed in its cancer wing, and Lieutenant-Colonel Windsor-Clive has sent an additional donation of £50 towards the fund for the investigation of cancer.

THE TECHNIQUE OF THE INTRATRACHEAL "DIRECT" METHOD OF TREATMENT OF PHTHISIS.

By COLIN CAMPBELL, L.R.C.P.I., M.R.C.S.ENG.
Southport.

SINCE the publication in the BRITISH MEDICAL JOURNAL of February 22nd of a favourable article on the Treatment of Phthisis by the Intratracheal Injection of Izal, which I had the honour of bringing under the notice of the British Congress on Tuberculosis last summer, I have received a large number of letters requesting usually "full" or "further" particulars. As some letters have been received from gentlemen who are engaged in the open-air cure, it may be inferred that the 20 per cent. of "cures" with which Professor Koch credits that method is beginning in England to be regarded as hardly satisfactory.

The matters on which further information is desired may be classed under the following heads.

Materia Medica.

The most frequent request has been for "a formula." Ten years ago I had one which I thought all-sufficient; now I employ a score. Supposing the case to be of pulmonary tuberculosis, I give two formulæ which I often use concurrently, or give No. 1 for the first week.

(1) R Thymol 3j;
Salol 3ij;
Menthol 3j;
Glycerini (Price's Redest.) 3v.

Mix in a 6-oz. bottle, and dissolve in a water bath. Inject from 3ij to 3xiij twice daily at a temperature of 140° F.

(2) R Medicinal Izal 3ijj;
Menthol 3ij;
Glycerini (Price's Redest.) 3v.

Mix, and inject as previous.

I would not, however, administer izal in this strength at first, but would rather establish a toleration of the method with a weaker emulsion.

According to Professor Delépine's experiments, izal diluted 125 times exterminates the tubercle bacillus in an equal quantity of sputum, if thoroughly mixed, and I have shown elsewhere¹ how the admixture is obtained—(1) by the dehydrating power of the solvent glycerine, and (2) by the action of respiration.

Instruments.

The instruments required are an intratracheal syringe and a laryngoscope. The syringe I now use is a great improvement on the glass-barrelled instrument which I exhibited at the Congress last year—the great fault of which was an occasional smash at the moment of injection. This lands the contents backwards over the face and into the eyes of the operator. The one I now use is all metal, and is made, like the old one, by Messrs. W. Wood and Son, Cross Street, Manchester; its capacity is 60 minims.

The laryngeal mirrors in ordinary use are most dangerous. With the exception of a recent wound, there is no part of the human body more open to septic germs than the throat, yet the ordinary mirror cannot be sterilized. Boiling cracks the mercury, it cannot even be "wiped" clean—as the glass mirror cannot be removed from its metal frame. The reflectors I use are of plated metal. They are made by Messrs. Weiss and Son, Oxford Street. Mr. Weiss tells me that the idea is not new, but that metal, as a reflector, has gone out of use for many years. There is one metal handle and three different sized reflectors fitting in a ball-and-socket joint like a dentist's mirror.

Modus Operandi.

I would here restate a question asked in many forms: Is there not produced by sending fluid down the windpipe, intense (1) irritation, (2) coughing, (3) choking, and how can this be avoided?

That none of these unpleasant consequences need occur I have many times publicly demonstrated. The last occasion was before the Tuberculosis Congress, and I hope to be allowed to again do so during the coming annual meeting of the British Medical Association at Manchester. If a beginner be accustomed to the use of the laryngoscope he should not have much difficulty; if not, he must be prepared for some

mishaps, until by patience and constant practice on willing patients he acquires dexterity and rapidity.

The laryngoscope should be used at first to make certain that the dose intended for the lungs does not find its way into the stomach, and there produce very unpleasant consequences. It is almost incredible, yet absolutely true, that the lungs will easily tolerate single doses, say, of iyal, creosol compounds, or menthol, which the stomach would either at once reject, or accept to the exclusion of food.

The patient sits upright in front of the operator, with his mouth on a slightly higher plane; for this purpose chairs which can be elevated or lowered are desirable. Next the patient draws his own tongue forwards and downwards with his right forefinger and thumb, covered with a clean handkerchief or paper "tongue cloth." Then the operator, with the aid of his laryngeal mirror, guides the nozzle of his syringe along the curve of the palate, without touching it, over the tip of the epiglottis, then it is brought down rapidly, and the injection delivered. If properly done the horizontal part of the nozzle of the syringe will rest on the tongue, whilst its curve will hold the epiglottis and thus prevent spasm.

The injection is best delivered at the beginning of inspiration.

Duration of Treatment.

Obviously this must depend on a variety of circumstances—the primary factor being the extent of the disease. If the infection be recent and the digestion and general health still fairly good, one may expect a rapid "cure." The following case may be mentioned as a recent example.

In August last year I was called to see Mrs. H. M., aged 27, who had been confined about six weeks before. I found her in the last stage of phthisis with extensive tuberculous ulceration of the larynx—too far gone to attempt anything more than palliative treatment. Shedied about a month later, and her infant soon followed her with symptoms of general tuberculous infection. I only mention her as the probable source of infection in her husband's case, whom I saw at the same time.

H. M., aged 28. He had slept with his wife up to her confinement. He had always been very strong until about four months ago; since when he had lost 8 lbs. in weight, and now found that his work as a grocer's assistant tired him very much and put him out of breath. He had had a slight attack of haemoptysis in June. He had cough, not much expectoration, temperature 99.8° to 100°, pulse 90°, the only other appreciable physical sign being a prolonged and intensified expiratory murmur. I told him I thought he had become infected with tuberculosis, and advised intratracheal "disinfection" of his lungs with iyal, etc. To this he did not at once assent, but within three or four days he had a second attack of haemoptysis, which quickly decided him to submit to this method of treatment. Previous to beginning, the sputum was examined and found to contain tubercle bacilli. He commenced treatment in the second week of August, 1891, and finished January 11th, 1902. For the first four months he had one sitting a day; for the last month three a week. He readily took 2 oz. of solution (equal to quite 1 drachm of pure iyal oil) at each sitting. During the entire period of treatment (except whilst resting after haemoptysis) he worked on an average twelve hours a day, and walked three miles to and from his work, yet gained 11 lb. His gain has been maintained, and he reports himself as still "perfectly well and free from cough" on May 2nd.

I hope the details I have here given will help many practitioners to commence a method of treatment which is simple and effective and which goes to the root of the evil by destroying the tubercle bacillus in its nest. I hope soon to publish some more statistics.

REFERENCE.

Transactions, British Congress on Tuberculosis.

ARSENICAL BEER POISONING AT THE HALIFAX UNION POOR-LAW HOSPITAL.

By J. F. WOODYATT, M.R.C.S., L.R.C.P.,
Principal Medical Officer.

SINCE the new Halifax Union Poor-law Hospital was opened in September, 1901, I have had under my care two advanced cases of arsenical beer poisoning and my colleague, Mr. Shaw, has had two other cases of the same nature. The hospital is large and takes patients from a district having a population about 200,000; so that there cannot be any severe epidemic here as was found in other places some fifteen months ago. The two advanced cases were well marked, and must have had a considerable amount of the poison whatever may have been its origin. The brewers have been most careful as to their

brewing materials sending them to various chemists and the reports, I am told, were always good. Recently some samples of beer were taken, and Mr. Allen, of Sheffield, found considerable amounts of arsenic present. Yet on inquiry of the other medical men in Halifax I find that, with one or two exceptions, they have no cases in spite of being on a careful look-out.

At an inquest held here recently on an old man who was supposed to have died of arsenical poisoning, Mr. Allen, the analytical chemist, said that $\frac{1}{100}$ gr. of arsenic per gallon of beer was something we should not make a fuss about. Other chemists, he said, would pass $\frac{3}{10}$ gr. per gallon. If this amount of arsenic is allowed, it would be detected in the tissues after death, from whatever cause, in a habitual beer-drinker; and in the case in question a very minute trace of arsenic was found in the tissues after death. The analyst, speaking of the tissues sent him (parts of the stomach, liver, and kidney), said: "Taking first the whole, I found a doubtful indication of arsenic representing not more than $\frac{1}{100}$ gr. of arsenic." He did not say how little it might have been, but on being asked by the coroner if it was arsenic, he said it was arsenic, but in his opinion it had no definite significance.

If brewers are to be allowed a certain amount of arsenic in their beer, the fact that we find it in the tissues after death does not help us to come to a conclusion as to the cause of death in doubtful cases. And during life there are cases amongst the patients of medical men who have had some considerable experience of these cases which will tax his power of diagnosis to the utmost.

The cases in the hospital are fairly typical. Dr. Reynolds, of Manchester, very kindly came over to see them, and his opinion was that they were arsenical beer poisoning cases without doubt.

CASE I.—A man admitted November 14th, 1901, gave a history of beer drinking, and stated that he had been ill six weeks. He was unable to walk, was very anaemic, and had considerable general oedema. His voice was very husky, and he showed general pigmentation, especially down the centre of the back. There was complete loss of power in the legs. The knees were bent and the toes pointed, and the reflexes were absent. He has made considerable improvement. He can straighten his knees and move his feet a little. There is only slight oedema, but some keratosis of the feet remains.

CASE II.—A male, admitted January 15th, 1902, had been ill a few weeks, but not laid up. He gave a history of beer drinking. The pigmentation was so marked that he looked like a mulatto. The voice was husky and there was much bronchitis, but no other signs of arsenic poisoning. The reflexes were present, his walk was natural, and there was no tenderness of the calf muscles. The patient died of acute croupous pneumonia, and necropsy showed old-standing aortic disease and cardiac hypertrophy with granular kidneys.

CASE III.—A female, admitted October 7th, 1901, had been ill three weeks with loss of power in the legs. There was a history of beer drinking, and she presented marked pigmentation of the back and shoulders. She was unable to walk; there was foot drop and the calves were tender on pressure. The reflexes were absent. She has much improved, but still has foot drop and the reflexes are absent, though she is able to walk.

CASE IV.—A female, admitted October 23th, 1901, gave a history of beer drinking and recent diarrhoea. The only symptom was marked and typical pigmentation with keratosis. She has improved much. The keratosis has gone, but the pigmentation still present, though to a less marked degree.

I am told by those who are trying to trace the origin of the arsenic, that they are of opinion that it gets into the beer from the anthracite coal used in malting.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

FOREIGN BODIES IN THE WINDPIPE.

IN the BRITISH MEDICAL JOURNAL of April 26th there is an interesting case of a young woman who coughed up a ragged crown of a tooth which had been in her windpipe or bronchus for fifteen months, causing uncontrollable coughing and much haemoptysis. The tooth had slipped into the windpipe when the patient was under chloroform for the extraction of nearly all her teeth. A similar accident happened to my son when walking through a swampy bit of ground in the Bahamas. He climbed a sapodilla tree to get some of the fruit. He felt that he had swallowed a seed of the fruit he was eating. On reaching home he was seized with violent coughing, which he ascribed to a bad wetting in the swamps. This continued for