charged with the required amount of chloroform passes next through a copper chamber containing six 16-candle power electric bulbs; this chamber is baffled so that the air must circulate round each lamp before it leaves. Each of the lamps has a separate switch; usually two lamps only are sufficient to produce the required temperature of about 85° F., but the additional number allows for the possibility of a fuse blowing or a broken filament. When the air leaves the heating chamber it is conducted past a thermometer, and then by a rubber tube to the intubation tube, which will be described presently.

In the expiratory circuit the air passes from the intubation tube into a metal box connected with a manometer and fitted with an expiratory valve which can be weighted to the required pressure. On the tube leading into this box there is a tap which can be opened if it is required suddenly to reduce the pressure.

The two manometers are arranged so that the ascending limbs are side by side; these and the thermometer are in a row, and the light from the electric lamps of the heating chamber fixed beneath the shelf shining through a talc disc illuminates them.

A movable arm fitted to one of the guides supports the rubber tubing between the apparatus and the patient.

The whole apparatus can be easily taken to pieces for cleaning.

The intubation tube consists of an intratracheal part fitted with a collar which rests on the glottis; a curved intrabuccal and an extrabuccal part. The intratracheal portion is surrounded by an airtight rubber sleeve which communicates with a very small pipe, through which it can be blown up. The intratracheal and buccal sections consist of a single tube ending externally in an open expansion, which is closed with a screw cap. The inlet and exit tubes which are joined up with the inspiratory and expiratory circuits enter the main tube just below the expansion.

Before the patient is intubated, the screw cap is disconnected and the patient breathes, and is given the anaesthetic through the opening of the expansion until the time when the pleura is about to be opened. The air is then turned on from the chamber, and as soon as it is flowing freely the screw cap is fixed, and the hyperatmospheric circuit thereby closed.

A movable gag is attached to the buccal portion of the intubation tube, so that the teeth can be made to hold the tube in position by putting a bandage round the jaw and head.

I have used this hyperatmospheric apparatus both on animals and men with complete success. The lungs are kept properly distended, the movements of inspiration and expiration continue unaltered, the pulse remains good as regards quality and frequency, the blood pressure is maintained, and there has been no trace of dyspnoea, even though the chest has been widely opened for one and a quarter hours in man and two hours in animals. During the operations oxygen has only occasionally been given. The details of the operations I hope to publish later.

My justification for publishing a detailed account of this apparatus is that it offers a certain combination of advantages not possessed by other hyperatmospheric machines. The pressure of the air remains constant, yet can be altered at will; the manometer in the inspiratory circuit shows only the slightest inspiratory and expiratory oscillations when the chest is opened, while the expiratory manometer shows a rise and fall of $\frac{1}{2}$ in. to 1 in. with each expiration and inspiration, according to the depth of the patient's respirations, and thus offers a very satisfactory guide to the condition of the patient and the depth of the anaesthesia. The pressure of air is regulated in both the inspiratory and expiratory circuits. The machine is extremely simple in its working, and the anaesthetist can reach and control every part of the apparatus with his right hand, the left being sufficient to steady the patient's head and the intubation tube. There are no motive forces such as motors, which may fail at any moment. The cost is about two-thirds that of the Brauer *ueberdruck*. It is capable of transport, and can be used in any theatre or operating room. Finally, its efficiency has been demonstrated by use.

I should like to take this opportunity of expressing my thanks to Mr. Rood for the trouble and care he has taken in the administration of anaesthetics for me with this apparatus.

Throughout I have profited greatly by the interest shown and the many valuable suggestions given me by Mr. Wilfred Trotter.

REFERENCES.

- ¹ *De Humani Corporis Fabrica*, Basilee, 1559, p. 824. ² Garré and Quincke, *Grundriss der Lungenchirurgie*, Jena, 1903. ³ Sauerbruch, *Zur Pathologie des offenen Pneumothorax und die Grundlagen meines Verfahrens zu seiner Ausschaltung*, *Mittheilungen aus den Grenzgebieten der Medizin und Chirurgie*, 1904, T. 13, S. 399. ⁴ Brauer, *Die Ausschaltung der Pneumothoraxfolgen mit Hilfe des Ueberdruckverfahrens*, *Mittheilungen aus den Grenzgebieten der Medizin und Chirurgie*, 1904, T. 13, S. 483. ⁵ Karewski, *Ueber den Wert des Druckdifferenzverfahrens für die Lungenpleurachirurgie und über eine neue Ueberdruckkammer*, *Berl. klin. Woch.*, 1909, No. 8. ⁶ Meyer, *Pneumectomy with the Aid of Differential Air Pressure*, *Journ. of the Amer.*

Med. Assoc., December 11th, 1909. ⁷ Tiegel, *Ein einfacher Apparat zur Ueberdrucknarkose*, *Centralblatt für Chirurgie*, 1908, No. 22; *Ueberdrucknarkose*, *Beitr. zur klin. Chirurgie*, 1909, Bd. 64, Heft 2, S. 356. ⁸ Lötsch, *Ein Apparat zur Ueberdrucknarkose*, *Archiv für klin. Chirurgie*, Bd. 93, Heft 1, S. 285. ⁹ Sauerbruch and Robinson, *Investigations Concerning the Technic of Lung Resection, with the Application of Both Forms of Differential Pressure*, *Annals of Surgery*, 1910, vol. ii, p. 320. ¹⁰ Lothar Dreyer, *Vergleichende experimentelle Untersuchungen über das Ueber- und Unterdruck-verfahren*, *Verhandlungen der deutschen Gesellschaft für Chirurgie*, 1908, S. 146. ¹¹ Meltzer, *Continuous Respiration without Respiratory Movements*, *Journ. of Experimental Medicine*, 1909, ii, p. 622.

A NOTE CONCERNING THE TREATMENT OF TUBERCULOSIS BY "RADIO-ACTIVE IODINE AND MENTHOL."

BY

LEONARD ROBINSON, M.D. EDIN. AND PARIS,

PHYSICIAN TO THE HERTFORD BRITISH HOSPITAL, PARIS.

At the last Hungarian National Medical Congress Professor Szendeffy laid before his colleagues the results he had obtained during the two preceding years with a new chemical body with a basis of iodine and radium. He cited a large number of facts tending to prove that it was possible with this chemical product to arrest *in vitro* the development of the most virulent cultures of the bacillus of Koch, and also to stop the progress of tubercle in animals which had been experimentally inoculated with the bacillus.

Professor Szendeffy and Dr. Kertez-Aba, Physician to the Austro-Hungarian Court, together communicated a large number of clinical observations which proved that the hypodermic injection of radio-active iodine and menthol was well tolerated by patients, and also that this compound had a very powerful phagocytic action in patients with tubercle who improved under treatment and made progress towards recovery. Wishing to have his statements controlled by an independent expert, Professor Szendeffy asked the help of Dr. S. Bernheim, of Paris, President of the *Oeuvre de la Tuberculose Humaine*, who had a vast field for testing the new treatment among the numbers of patients who attended the various dispensaries and sanatoriums supported by this charity. During the last twelve months Dr. Bernheim, with the help of Drs. Dieupart, Hervé, Diamantberger, Michalovici, Baud, and others, has applied the treatment to a large number of patients, and clinical reports of the cases were recently communicated to the *Société Internationale de la Tuberculose*, the French Clinical Society, and other scientific bodies.

In the opinion of Dr. Bernheim, the action of this chemical product invented by Professor Szendeffy is due more especially, and almost exclusively, to the volatility of radium, which is eliminated slowly by the lungs. Dr. Bernheim believes that there is a true selective action, a fixing of helium at the site of the tubercles in the lung, and considers it not astonishing that this radio-activity should neutralize the harmful action of the bacilli of Koch and of the associated microbes. According to Dr. Bernheim, this radio-activity also paralyses the harmful influence of the toxins. Considering the rapidity with which Koch's bacilli are destroyed by the sun's rays, and also how easily the development of bacilli is arrested when in contact with radium, a comparison between these two physical phenomena is justifiable.

Dr. Bernheim described to me the three following recent cases, which have a great clinical importance and interest.

CASE I.

A lady in society, aged 24 years, tuberculous herself and having tuberculous parents, during her five years of married life had had three miscarriages. Pregnant for the fourth time, and being in the fifth month of pregnancy, she was given injections of radio-active iodine and menthol, and received two series of injections (eighty in all). Her condition improved, and she was able to carry to term, and was confined of a living child, weighing 3 kilos.

CASE II.

A similar case in a woman of the working classes, aged 44 years, tuberculous, a patient at the Dispensaire Antituberculeux at St. Denis, who had had seven miscarriages, and who had contracted tubercle from her husband. She was treated by injections of radio-active iodine and menthol from the beginning of the third month of pregnancy. It proceeded to term, and she was confined of a living child.

CASE III.

Dr. Dieupart recently treated a patient sent to him by a *dispensaire antituberculeux*, who had phthisis with bacilli in the sputum, and also tuberculous disease of the left wrist, which had prevented any use of the joint for several months. After twelve injections the swelling of the radio-carpal joint completely disappeared, and the patient recovered all the normal movements at the wrist-joint.

The authors, in their original communication, came to the following therapeutic conclusions:

1. That "radio-active iodine and menthol" destroys the bacillus of Koch. In all the cases in which the sputum has been systematically examined microscopically before and after the injections, it was found, first, that the bacillus took the stains less well, that it was in a degenerating condition, and that it became rarefied, and finally disappeared.

2. That radio-active iodine and menthol has a powerful action on streptococci. In tubercle, the existence of a mixed infection implies generally a bad prognosis: streptococci and staphylococci seem to increase the toxic secretion of the bacillus of Koch. Radio-active iodine with menthol destroyed streptococci very rapidly. In two grave cases of sore throat with streptococci Dr. Kaminski found on the third day that the throats were cured, and that no streptococci were present. Dr. Bernheim has noticed that after the injections the streptococci, which were numerous in the sputum in some cases of phthisis, diminished in numbers, and eventually disappeared.

3. That radio-active iodine and menthol improved the general condition of the patients. In these conditions the destruction or attenuation of the bacilli, *ipso facto*, brought about the disappearance from the organism of the toxins secreted by them. Every patient—even hopeless cases—felt a great improvement in his general condition. He found that patients who were exhausted and could no longer walk, were, after treatment, able to walk without fatigue; hopeless cases, which could not be cured, could take walks; those with intense dyspnoea were again able to breathe freely. Many patients had returned to work, feeling stronger and more cheerful.

4. That this product seems to possess a dynamogenic action. The radio-active emanation appeared to be manifested in the patients by facts that could be, so to speak, mathematically proved. They were imbued with a feeling of strength and renewed life. This increased strength was remarked in practically all the cases. Neither menthol nor iodine could cause this, and it could only be explained by the emanations of radio-active barium chloride, which thus confirmed the opinion of Szendeffy, Wickham, and Degrais.

5. That this product caused an increase in weight; this increase, which was observed in every case, was fairly rapid. Some increased a pound a week; others who came in bad condition, their sputum teeming with bacilli, put on weight in a remarkable way; even patients with cavities, and in whom the prognosis was fatal, also increased in weight.

6. That the beneficial effect of the product persisted in spite of intercurrent affections. Some of the patients had influenza, or dry pleurisy, and had to stay in bed and stop the injections for several days; these acute attacks were mild and of short duration; there was simply an interruption in the radio-active treatment, without any aggravation of the local or general symptoms.

7. That radio-active iodine and menthol cured tuberculous glands. Several cases were quoted in support of this.

8. That the treatment had an action on tuberculous laryngitis. The authors quoted two cases in which the improvement was manifest; at the beginning of the treatment the voice was weak, raucous, and broken; gradually after the injections the normal timbre of the voice returned.

9. That the product acted locally on tuberculous lesions, diminished the quantity of sputum, suppressed the cough, and caused the fever and night sweats to disappear.

10. That the treatment made the gastric functions more regular. In many of the cases bad appetite had been the rule for a long period; there were some cases with occasional vomiting, and absolute intolerance on the part of the stomach, so that such cases could not be treated by hyper-alimentation. After the radio-active treatment the appetite always returned.

The experiments with radio-active iodine and menthol are not of recent date, as some writers have stated, but have been carried on for more than three years. This compound, after laboratory experiments, has been applied, followed and controlled by a large number of independent medical men, working in open and public sanatoriums, dispensaries, and hospitals, and its action has been proved, so that it is impossible to doubt of its efficacy.

The composition of the compound is given as follows:

Peptonized iodine...	...	0.75 gr.
Menthol ...	...	0.06 gr.
Radium barium chloride		
One-tenth of a drop of ether solution.		

The compound is put up in sterilized tubes of 1 c.cm. each, and is given by Dr. Bernheim by intramuscular injection in the gluteal region. The injections are given in series of forty—one every two or three days for five or six injections, to test the susceptibility of the patient, and then one every day till thirty have been given; then one injection every other day. After ten days' interval a new series of forty injections is given.

It is now being tried in numbers of the hospitals in Paris and elsewhere, and this is doubtless but the beginning of fresh researches in radio-activity, analogous to those already carried out by Dr. Danlos, in the Paris hospitals, and by Drs. Wickham and Degrais at the Radium Institute. It is almost certain that this method will be improved, the doses of radium injected being gradually and with prudence increased, but the profession will read with interest the results already obtained from scientific research and clinical observation.

ON CAESAREAN SECTION: WITH NOTES OF
TEN CASES.

BY

C. E. PURSLOW, M.D.LOND., M.R.C.P.LOND.,

HONORARY OBSTETRIC OFFICER, QUEEN'S HOSPITAL, BIRMINGHAM.

I PRESENT very brief notes of the cases. These notes are arranged in the form of a table. This arrangement is the one adopted by Dr. Amand Routh in his report to the recent International Congress of Obstetrics and Gynaecology held in St. Petersburg, and he has kindly given me permission to make use of it.

Every case in which I have performed Caesarean section is included in the table appended to this paper. All the operations were performed in the Queen's Hospital. All the mothers recovered. The children were all born alive, with one exception. In this case the patient had been in labour many hours, and forceps had been tried unsuccessfully. The child was known to be dead, as the cord was prolapsed and pulseless, and the reason that Caesarean section was done rather than craniotomy was that the head was high above the pelvic brim and the uterus in a state of violent tetanic contraction, which appeared to presage rupture; indeed, on examining the uterus after removal of the child an extensive effusion of blood under the peritoneum on its right lateral aspect seemed to show that rupture was already taking place, and hysterectomy was performed.

Of the children born alive, two died in hospital, one on the day of its birth, and the other, which was probably premature, on the twenty-third day from diarrhoea and vomiting. This case will be referred to later.

Of the women operated on, five were in labour at the time of operation, and of these, in two cases the membranes were ruptured; the other five were not in labour. In four of the five cases in labour the operation was performed between 1 a.m. and 3 a.m.

I do not in this paper propose to discuss the indications for Caesarean section or the alternative procedures which may be adopted, but rather to consider the method of its performance.

The first question is as to the time of operating; it was formerly taught that it was better to wait until labour had begun to ensure that the cervix would be open for drainage, but experience of operations performed before the onset of labour shows that this advantage is rather theoretical than practical, and the cervix can readily be dilated, if this is thought necessary, by passing the finger or a Hegar's