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CONTENTS

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ON

TUBERCULOSIS WITH SPECIAL REFERENCE

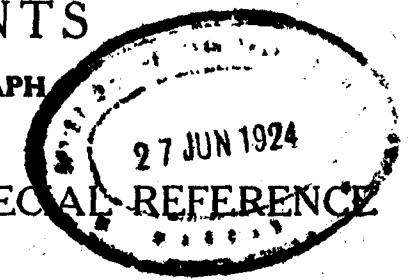
TO

The Most Modern Methods of Treatment

BY

DR. P. S. CHANDRA SEKHAR B.A., M.D.,

Superintendent, Government Tuberculosis Hospital, Madras.

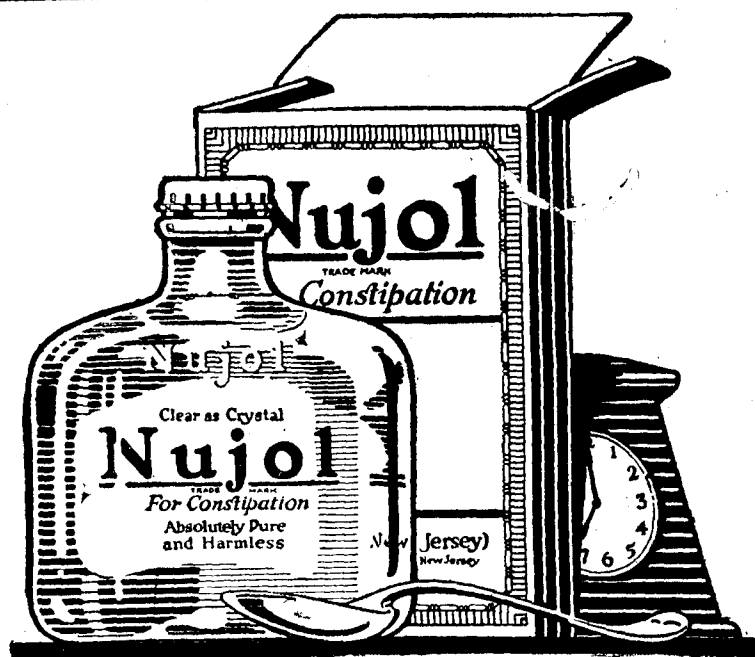


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THE MADRAS MEDICAL JOURNAL.

MAY 1924.

TUBERCULOSIS, WITH SPECIAL REFERENCE TO ITS MOST MODERN METHODS OF TREATMENT*.

(By DR. P. S. CHANDRA SEKHAR, B.A., M.D.,

Superintendent, Government Tuberculosis Hospital, Madras).

Infectivity.—For a long time tuberculosis was not considered an infectious disease. It was Villemin who first proved the infectivity of tuberculosis. Although it was known to be infectious in the time of Hippocrates and although in Italy the Public Health authorities were considering the disease infectious for a long time, it was Villemin's researches that brought home to the profession the infectivity of the disease. Since that time medical men have accepted the infectivity of the disease. For a long time there has been a dispute as to the channels of infection. The dispute still continues amongst the bacteriologists and physicians. Recent researches have shown that the disease is not infectious in the same sense as small-pox or plague. The most up-to-date researches point to the fact that the infection generally takes place in childhood. The accepted view at the present day amongst the majority of the tuberculosis doctors is that the great majority of adults who suffer from tuberculosis do not contract the disease in adult life as a rule. They must have been infected at some time in early childhood. Nine men out of 10 are infected before

* A paper read at a meeting of the Madras Medical Association held on 1st March 1924.

the 15th year. A child at birth is free from tuberculosis even if one or both parents be tuberculous at the time of its conception or at the time of its birth. In children under 3 years the proportion infected is small as they are usually less exposed than in later years. Infection under 3 years frequently results in fatal disease. In children over 3 years the proportion of those infected gradually increases until at 15 years it reaches about 90%. Children under 3 must be carefully protected from infection as infection leads to fatal disease. It may be possible to guard the infant from contact with strangers and other tuberculous relations. But, after 3 years when the child begins to move about, it is impossible to secure the same degree of isolation as in the years of infancy. It is impossible to avoid infection.

The great majority of adults are infected before reaching adult life. The consumptive is a great menace to infants, less dangerous to children, and not dangerous at all to adults if reasonable care be exercised. Adults need not be afraid of the tubercle bacillus. They need not fear any attack from the tubercle bacillus except from those that are inside their body already.

The problem of preventing the outbreak of frank disease in the legions of the infected is the crux of the whole problem of prevention. All the tuberculosis doctors of the present day believe that tuberculous disease in adults is invariably due to a recrudescence of a previous infection in childhood.

Temperature.—The importance of the use of the thermometer in the diagnosis and treatment of early tuberculosis is almost unknown to practitioners in this

The thermometer plays an important part in the diagnosis, prognosis and treatment of tuberculosis. The discovery of this fact is mainly due to the sanatorium physicians all over the world.

Dr. Hawes of Massachusetts has truly pointed out that if the stethoscope be used less and the thermometer and common sense be used more, there would be fewer mistakes in diagnosing tuberculosis.

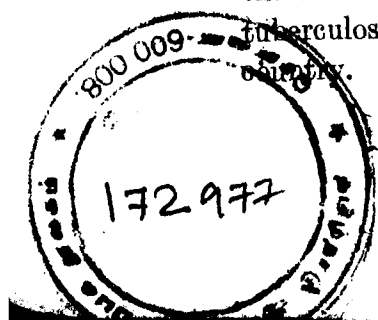
If the temperature be taken every four hours and the temperature be entered in a chart, the graphs give us very valuable information even in the very early stages of pulmonary tuberculosis. But care must be taken to record the temperature accurately.

A half-minute thermometer should be kept at least for full 5 minutes under the tongue or in the rectum. The rectal temperature is no doubt the most accurate but we may be satisfied with the oral temperature for all practical purposes.

In the very early stages of the disease, a slight rise of temperature will often be the only indication.

In what I call the first type of tuberculous temperature, the temperature in the morning is normal or at any rate below 99° and in the evenings it may rise to not more than $\frac{1}{2}$ a degree above 99°. The patient would be unaware of the fever. He may only complain of dyspepsia or lassitude especially in the evenings or of slight dry cough and a feeling of warmth.

This fever is often missed by practitioners, as such small rises do not prevent the patient from following his occupation and as practitioners are not in the habit of taking the temperature when the patient himself does not complain of fever.



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In this country it is usual for patients to complain of a heated condition very often. And the wary practitioner would do well to take the evening temperature in all suspicious cases and if the evening temperature be 99° and over, a thorough overhauling is necessary.

My experience is that tuberculosis of the lungs does not suddenly manifest itself with cough, high fever and hæmoptysis except when the disease immediately follows an attack of influenza or pneumonia. The first manifestation of the disease is always a slight rise of temperature. The normal temperature of both men and women in this part of the country is invariably under 99°. When the fever is persistently 99° and over, day after day, tuberculosis should be suspected.

“Realise that no excitement is capable of producing a temperature over 99° in a healthy person.”

The temperature in tuberculosis is so unstable that very little in the way of excitement soon affects the patient.

If, after resting for a few days, the temperature reappears on exercise, no time should be lost in seeking expert advice.

The fever of early tuberculosis is characterised by certain peculiarities :—

- (1) Chronicity.
- (2) Afternoon rise
- (3) Subnormality in the mornings.
- (4) A great difference between the minimum and the maximum.
- (5) Instability.
- (6) Imperceptibility of the fever by the patient and the absence of any discomfort felt by the patient.

In this country more importance should be attached to the diminution of the fever, than to an increase in weight, in noting the progress of the patient.

The type of cases seen in Europe, is not seen in this country. It is quite possible for a patient with a temperature below 99° to progressively get worse in Europe.

The results of the various forms of treatment and the weekly progress can best be judged by the temperature curve.

Early Diagnosis.—The whole problem of the prevention of tuberculosis and the problem of the treatment of tuberculosis hinge upon the early diagnosis of tuberculosis. The all-important points in the diagnosis of early tuberculosis are not bacilli in the sputum nor definite signs of an active process in the lungs but constitutional signs and symptoms which show only too clearly, were they but correctly interpreted, that the patient is *sick*. A diagnosis to be an early diagnosis must be made before there is a breaking down of the tissues (before bacilli are found in the sputum). In most cases a positive sputum means “moderately advanced tuberculosis.” The patient’s chances of cure are already gone in such cases. You should never be deceived by the robust appearance of the patient. I have found T. B. in the sputum of very robust people with few signs and a low fever. In the majority of cases, people are cured of tuberculosis without their knowing that they are suffering from the disease as slight symptoms are often ignored by them. A truly specific and definite curative treatment has not yet been discovered for tuberculosis. But early tuberculosis can certainly be “*arrested*.” Hence the necessity to make an early diagnosis is apparent. If any method of treatment

is to be satisfactory, the case must be diagnosed sufficiently early.

Another important idea of phthisio-therapists (almost a discovery) is the necessity for individual study in the treatment of tubercular patients. Different patients improve under different lines of treatment and different patients respond differently to different remedies and different doses of the same. Each patient is a law unto himself. The successful physician in the diagnosis and treatment of tuberculosis is one who can devote a considerable amount of time to the study of the individual cases. It is impossible to have a good knowledge of tuberculosis and to be able to treat cases successfully by the mere injection of tuberculins, vaccines and all sorts of nostrums. It is very unfortunate that people should ask for injection treatment in this country. Patients forget that there is no specific injection treatment for tuberculosis. A patient might require a suitable diet, or suitable rest and exercise, or suitable medicines, or the injection of vaccines, including tuberculin in suitable cases, or all of these measures.

There are various methods of treatment adopted by the tuberculosis experts of the present day : —

1. The sanatorium method by rest and graduated exercise in the open air combined with proper feeding.
2. The use of various vaccines and tuberculins.
3. The use of proprietary stuffs, such as Neo-Bios Pneumosan, Morrhuate, etc.
4. The so-called Sphalinger treatment.
5. The use of Dreyer's vaccine.

6. The induction of pneumothorax.

7. Heliotherapy, etc., in surgical tuberculosis.

Sanatorium Treatment. —The good results achieved in sanatoria are due not merely to the good climate but also mainly to freedom from care, daily worry and anxiety, rest, good food, regular life and peace of mind engendered in the new surroundings. People who should be allowed to rest and people who should be allowed to die quietly and in comfort should not be dragged in a vain search for health to distant sanatoria. The main factors in sanatorium treatment are : —fresh air, good food, rest and absence of worry. Rest is best taken in a verandah protected from rain and wind but open to every breath of heaven. In any scheme for treating the tuberculous provision should be made for “the temperature house or the fever rest-house” for the accommodation of the tubercular patients during acute exacerbations.

The cost of keeping a patient long enough under treatment at a sanatorium to permit of his immediate resumption on discharge, of the usual life of a healthy working man, is prohibitive.

By far the best idea that has been worked out in any tuberculosis scheme is that of the late Dr. Woodhead and Dr. Varrier Jones. The scheme includes a hospital at one end of the scale, the village settlement at the other and intermediate rest and temperature houses, open air shelters, hostels and workshops, each and all ready for his reception.

The results of sanatorium treatment vary according to the class of persons treated. Amongst the well-to-do the results of treatment are three times as good as those obtained among working men. If a patient selected for

sanatorium treatment, has well marked disease and if he be treated for 3 or 4 months in a sanatorium, he can never be discharged fit for work immediately after his discharge.

There is a danger in this country of people succumbing to the idea that "cure is more a matter of architecture than of the provision of fresh air, graduated work and an adequate food supply."

The poor man has to return to unsatisfactory work for unsatisfactorily long hours at once. He has to readjust his life, avoid the things that lessen resistance and to guard against excessive fatigue, worry and mental strain.

No prolongation of the period of sanatorium treatment will so arrest the disease that a permanent cure is effected if the patient is allowed to return to undesirable surroundings or to his old ways and habits in workshop and in office.

As a temporary expedient, sanatorium treatment gives excellent results. By itself as a means of permanently restoring the patient to health, it has proved to be a failure.

Something more is needed and that something is after-care designed to assist the patient in the continual struggle for fresh air, rest and good food.

"The struggle to make both ends meet, pay rent, and try to carry on business; and the absence of proper food and rest, worry and anxiety inevitably bring about a relapse."

Men and women are now going about their homes suffering from a disease which either unwittingly or otherwise is labelled bronchitis, influenza, etc. Even in England it has been found that soldiers who are granted

recurrent sick leave on account of bronchitis are found to be expectorating a number of T.B. later on and are eventually sent to a sanatorium for 3 months treatment. The bed-ridden advanced P.T. is not a source of danger. The real source of danger is the man just able to work, who feels well on some days and bad on other days, who struggles on with his work, often for long hours, who frequents crowded places, tram cars, coffee hotels, cinemas, etc., and comes in contact with children and young people, who is careless in habits and who is said to be suffering from bronchitis in the admission registers of the various hospitals. The sanatoria are not available for these and the homes for the dying will be unwilling to receive them as they are probably a long way from death.

In most of our dispensaries and hospitals the higher the figures shown in the registers, the more proud are we of the results of our labours. Indeed, the efficiency of the officer is judged by the attendance. Most of the infectious patients are what are called the chronic cases. "Chronic case," says the physician, and the case is dismissed from the hospital.

Tuberculins and Vaccines.—Ever since Koch recommended tuberculin for the treatment of tuberculosis, tuberculin in one form or another has been used by a very large number of phthisio-therapists. It has been used far more extensively in America and Germany than in other countries. Tuberculin, though a valuable remedy in selected cases, requires considerable amount of experience for successful administration. It is certainly not the universal specific for all consumptives in all stages. Men who have used tuberculin extensively and with care have been able to record good results. My own

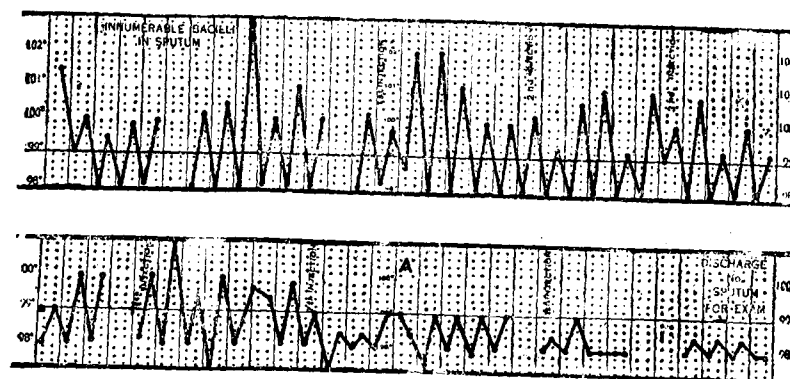
experience leads me to the conclusion that it is a very valuable remedy which cannot be neglected in the treatment of tuberculosis. (Though Digitalis is not a universal specific for all cases of heart disease, the heart specialist cannot dispense with Digitalis). I append herewith a few charts to show what older tuberculins can do under the most unpromising conditions. I do not ask you to believe that tuberculin is a specific. I only want to demonstrate what good results my humble self has been able to produce with tuberculins. Unfortunately in this country as in England many medical men are prejudiced against the remedy.

Here is the opinion of a distinguished London Physician :—"Tuberculin is no panacea ; it is not even a drug of universal applicability for tuberculosis. No more disastrous attitude is there than that all too common one. 'Here is a case of tuberculosis, let us give him tuberculin.' If I may speak from my small experience, it is a valuable method of treatment. I have not, personally, the smallest doubts about its value when given with proper knowledge and skill to suitable cases. I can, however, quite appreciate the doubts, or even the condemnation of those who use it indiscriminately and with no rational conception of its action. Unfortunately there are many persons to whom its very name is anathema and who, with little or no knowledge of its use on modern lines, condemn it loudly and publicly whenever the occasion arises. Unfortunately the value of tuberculin in a disease like phthisis is almost impossible of proof. If it were suitable for all cases, the matter would be easier ; but, this is far from the case for reasons which will appear later It is quite as likely to do harm to some as good to others among an unselected crowd." I quite agree with these views.

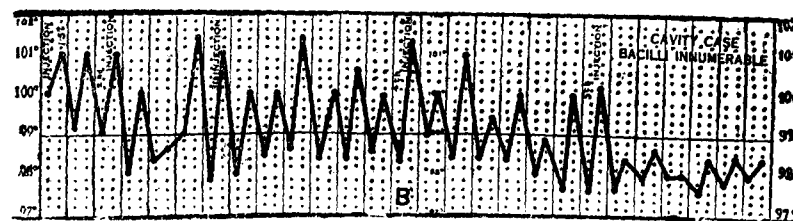
As regards the value of any remedy, all that any one of us can say is : "I have found such and such a remedy valuable and such and such a remedy unsatisfactory in my own practice." It is not fair to presume that any line of treatment must be unsatisfactory in other people's hands, when we ourselves have failed in achieving good results.

The man who loudly abuses tuberculin is evidently one who has come to grief in the few instances in which he failed. I will now show you a number of charts and leave you to draw your own inferences.

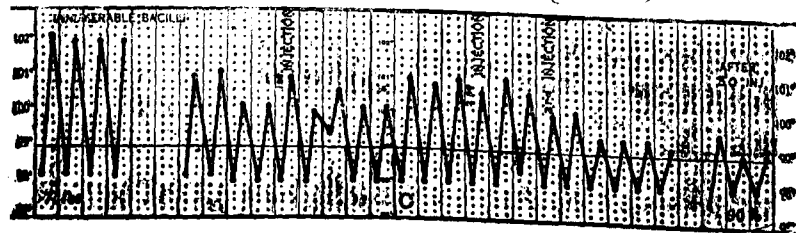
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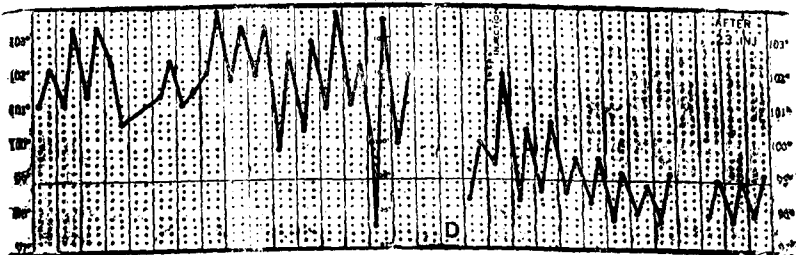
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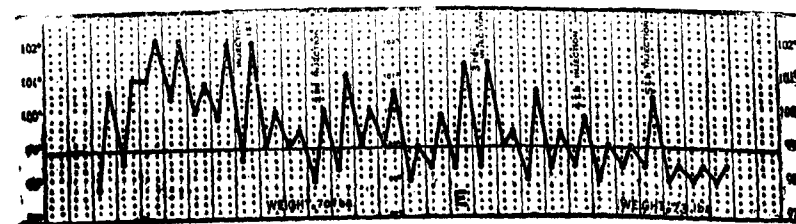
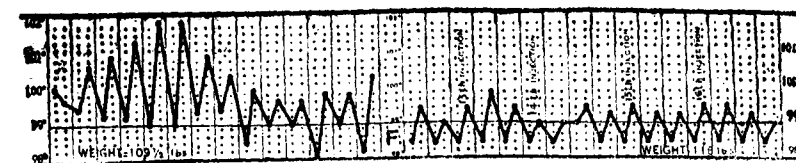
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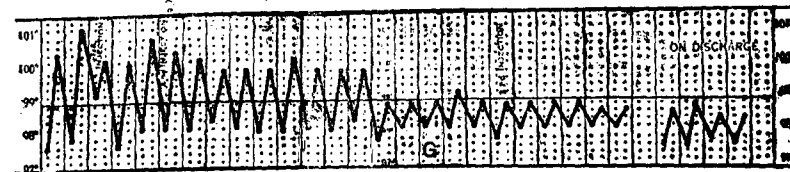
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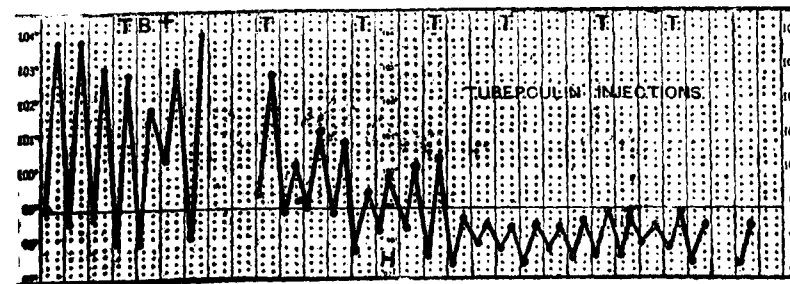
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The use of auto-vaccines in the case of secondary infections has proved useful in some cases but the applicability of these vaccines is very limited. Though successful results can be produced in some cases, the number of cases in which vaccines fail, will be found to be very much larger.

Dreyer's Vaccine.—As regards the Dreyer's vaccine it might be stated once for all that it is nothing but a modified tuberculin. There have been more than 20 kinds of tuberculins in the market and Dreyer has added one more to this formidable list of tuberculins.

I have seen a note of the preparation of this stuff and my own personal impression is that it is not going to work wonders in advanced cases of tuberculosis and in early tuberculosis many lines of treatment are available for the arrest of this disease. People at home are said to be

rather sceptic about this new form of tuberculin. I would not be surprised if clinical trial in the near future prove that Dreyer's vaccine is no more an infallible cure than many a remedy introduced from time to time.

Sphalinger Treatment.—Another line of treatment which has been lauded in the *Lancet* for sometime past is the injection of the partial or complete sera and vaccines of Mr. Sphalinger. As regards this treatment, I may say that Sphalinger's method consists in the use of antisera for the various components of tubercle bacilli and of different vaccines for the secondary infections. So far as can be gathered from the published records in the *Lancet*, the results cannot be said to be brilliant.

When I was in Europe last year, I had a long talk with Mr. Sphalinger in Switzerland. He seems to be working no doubt on right lines. His idea is to break up the tubercle bacilli by various methods and subsequently inject horses with different kinds of antigen and produce different kinds of anti-tuberculous sera. He combines the different kinds of anti-sera with the sera or vaccines of the organisms causing secondary infection, if necessary.

Instead of making an anti-tuberculous serum by the injection of complete bacilli of the toxins, he aims at immunising the horses with the different components of the bacilli and produce sera corresponding to those components. He has not yet published a complete account of his process.

He was kind enough to invite me to come and inspect his Laboratory at Geneva; but, unfortunately, to my great regret, I could not accept his kind invitation and inspect his Laboratory on account of some unforeseen difficulty in securing a return passage.

The amount of Sphalinger's serum that was available for distribution was utilised for making some observations in a few hospitals in London, sometime back.

We have seen a series of notes on the value of Mr. Sphalinger's serum in the "*Lancet*" from time to time. With the exception of the articles by Mr. Sphalinger himself in the "*Lancet*" of 7th January 1922 none of the correspondents have given any details from which one can judge of the efficacy of the sera, etc. The notes or a series of cases treated in the City of London Hospital for Diseases of Chest by Dr. Colebeck and Dr. Gloyne with the Sphalinger serum recently published in the "*Lancet*" of July 1923 are very welcome. I do not know whether the cases were selected with the special object of testing the value of the sera or whether the 17 cases reported were taken up at random without any selection. An analysis of the notes is given below.

We can judge of the efficacy of the remedy from these notes (Table I). One point that is clearly brought out by this analysis is that the cases selected were certainly not severe and advanced cases, judging from the short notes given. Most of them were what I would call "very moderately advanced cases." The only case which can be said to have been a fair one for trial for the new remedy is case 15. That is the type of the case on which we should try new remedies. Almost all the other cases had no pyrexia or very little fever and in many of them tubercle bacilli were not found. I find from a perusal of these notes that the cases selected were not severe, that most of them had little fever and that almost all of them gained little weight. The increase in weight is a very unsatisfactory sign of progress. It is quite possible for a patient to be rapidly progressing downwards and yet show a slight gain in weight.

TABLE I.
Colbeck and Gloyne : Cases treated by Sphalinger serum—Lancet, page 116, dated 21-7-1923.

No. and Age.	Symptoms.	Physical signs.	Fever.	T. B. in sputum on admission.	No. of injections.	Duration of treatment.	Gain in weight.	T. B. in sputum on discharge.	Condition on discharge.
1. 35 yrs.	Cough and Hæmoptysis	Infiltration Right apex and Left upper lobe	Mild	Plus	32	7 months	7 lbs.	Minus	No active sign. Temp. normal.
2. 39 yrs.	Cough, Hæmoptysis, loss of weight	Signs of reactivity of old lesions	Nil	Plus one in 19 exms.	23	4 months	$\frac{3}{4}$ lb.	Minus	No signs of active disease; at work after 9 years.
3. 34 yrs.	Loss of weight	Signs of infiltration, right upper lobe and left apex	Mild	Plus	More than 5?	2 months	4½ lbs.	Minus	No signs of active disease; Temp. normal; at work 9 years after discharge.
4. 37 yrs.	Loss of weight, dyspepsia, pain, palpitation, giddiness and indigestion	Bronchitis with infiltration of both lungs	Mild	Plus one in 29 exms.	25	5 months	7½ lbs.	Minus	No active disease except a few scattered Rhonchi; at work.

TABLE I—*contd.*
Colbeck and Gloyne.—Cases treated by Sphalinger serum—Lancet, page 116, dated 21-7-1923—*contd.*

No. and Age.	Symptoms.	Physical signs.	Fever.	T. B. in sputum on admission.	No. of injections.	Duration of treatment.	Gain in weight.	T. B. in sputum on discharge.	Condition on Discharge.
5. 34 yrs.	Cough, weakness, dyspepsia, loss of weight, night sweats, Hæmoptysis, Tachycardia pains in the back, indigestion	Signs of infiltration both apices and left base	Nil	Minus	14	3 months	$\frac{1}{2}$ lb.	Minus	Moist sounds cleared up at work.
6. 39 yrs.	(Cough, dyspepsia, night sweats, general weakness, loss of weight, Hæmoptysis), pain in the back, indigestion and Tachycardia	Signs of infiltration left base and both apices	Slight	Minus	11	2 months	6 lbs.	Minus	Temp. normal No active signs; at work.
7. 49 yrs.	Hæmoptysis, cough, loss of weight	Signs of infiltration, right lung excavation, disease of left upper lobe, Laryngitis	Nil	Plus	32	4½ months	2 lbs.	Plus	Well. temp. normal; at work.
8. 41 yrs.	Cough, loss of weight streak of blood	Signs of infiltration of upper lobe	Nil	Plus	23	4 months	Minus 5 lbs.	Minus	Temp. normal, no moist sounds.

TABLE I—*contd.*
Colbeck and Gloyne :—Cases treated by Sphalinger serum—Lancet, page 116, dated 21-7-1923 *contd.*

No. and Age.	Symptoms.	Physical signs.	Fever.	T. B. in sputum on admission.	No. of injections.	Duration of treatment.	Gain in weight.	T. B. in sputum on discharge.	Condition on discharge.
9. 37 yrs.	Chronic cough, loss of weight	Signs at both apices and left base	Nil	Plus	15	3 months	Plus 3 lbs.	Minus	No signs of activity. Temp. normal.
10. 37 yrs.	Cough, loss of weight, dyspnoea, weakness, indigestion, pain in the chest	Signs all over the left side and right upper lobe	Febrile	Minus	8	4½ months	10½ lbs.	Minus	Temp. normal, no moist sound heard.
11. 14 yrs.	Glands neck, showing signs of breaking down	No sign, lungs	Nil	Minus	14	5 months	9 lbs.	Minus	Glands subsided.
12. 18 yrs.	Cough, etc.	Signs of infiltration, right lung and left apex	Nil	Plus	20	7 months	9 lbs.	Plus	Temp. normal, moist sound still present.
13. 25 yrs.	Cough	Signs of infiltration, both apices	Febrile	Plus	4	10 months	7½ lbs.	Plus	Temp. normal, no moist sound.
14. 34 yrs.	Cough, etc., loss of weight, Hæmoptysis	Infiltration of right upper lobe and left apex	?	Plus	16	3½ months	2 lbs.	Plus	Lungs practically dry, reported well at work.

TABLE I—*concl.*
Colbeck and Gloyne :—Cases treated by Sphalinger serum—Lancet, page 116, dated 21-7-1923—*concl.*

No. and Age.	Symptoms.	Physical signs.	Fever.	T. B. in sputum on admission.	No. of injections.	Duration of treatment.	Gain in weight.	T. B. in sputum on discharge.	Condition on discharge.
15. 32 yrs.	Advanced case	Extensive signs in both lungs	Irregular pyrexia	Plus many	8 injec. of Lipoids (No Sphalinger available)	2 months	Minus	..	Patient got worse and died.
16. 22 yrs.	Pleurisy	Fibrosis of whole of left lung and recent infiltration of right apex	Febrile	Plus	9	6½ months	Minus ½ lb.	Minus	Lungs not markedly altered. Temp. febrile.
17. 34 yrs.	Cough, Hæmoptysis, etc.	Signs of infiltration of right upper lobe with excavations at apex and infiltration at left hilus	Slight Pyrexia	Plus	..	6 months	..	..	No moist sound heard. Temp. normal, well at work.

TABLE II.

No. and Age.	Symptoms.	Physical signs.	Fever evening temptr.	T. B. in sputum on admission.	Duration of treatment.	Gain in weight.	T. B. in sputum on discharge.	Temptr. on discharge.	Condition on discharge.
1. 26 yrs.	Fever, cough, expectoration, night sweats	Marked infiltration right upper lobe and left apex	High fever 103	Plus	5 months	24 lbs.	Minus	Evening temptr. 98.2	No active sign. Doing hard physical exercise without rise of temperature.
2. 26 yrs.	Cough, dyspepsia, fever, indigestion, loss of weight, weakness, dyspnoea at times, alternating constipation and diarrhoea and pain in the stomach, amenorrhoea (onset after 1st confinement)	Infiltration both upper lobe behind and apices in front	Evening temptr. 101.2	Many	5 months	10 lbs.	Minus	Evening temptr. 98.6	No sign of active disease except very fine rales over right apex.
3. 23 yrs.	Cough, fever, dyspepsia, dyspnoea, loss of weight, lassitude, weakness, amenorrhoea	Marked infiltration of right upper lobe and also the left upper lobe, tubular breathing right side, heart sounds very rapid.	Evening temptr. 101.8	Few	4 months	33½ lbs.	Minus	Evening temptr. 98.4	No signs of active disease, menses regular.
4. 16 yrs.	Cough, dyspepsia, fever, wasting, enlarged glands in arm-pits and groin (onset after 1st confinement)	Infiltration of both lungs behind and left apex in front and right upper lobe	Very high temptr. 104.0	Many	8 months	24 lbs.	Minus	Evening temptr. 98.8	No marked physical signs.

TABLE II—*contd.*

No. and Age.	Symptoms.	Physical signs.	Fever evening temptr.	T. B. in sputum on admission.	Duration of treatment.	Gain in weight.	T. B. in sputum on discharge.	Temptr. on discharge.	Condition on discharge.
5. 21 yrs.	Cough, loss of weight and fever	Infiltration of both upper lobes and enlarged glands, neck and groins	Evening temptr. 100	Many	8 months	12 lbs.	Minus	Evening temptr. 98.4	No definite physical signs.
6. 15 yrs.	Cough, fever, loss of appetite, emaciation and weakness	Both lungs badly affected, right more than the left	Evening temptr. 101.4	Many	4 months	16½ lbs.	Minus	Evening temptr. 98.4	No marked physical signs.
7.	Cough, fever, wasting, weakness, loss of appetite, looseness of bowels	Both upper lobes affected, murmur in the mitral area conducted to axilla	Evening temptr. 103	Unnumerable	12 months	58½ lbs.	Minus	Evening temptr. 99.4 after exercise	No definite physical signs.
8. 15 yrs.	History of Typhoid 2 years ago (onset after 1st confinement) fever, cough, poor appetite, constipation.	Miliary Tuberculosis	Evening temptr. 102	Minus	12 months	37 lbs.	Minus	Evening temptr. 99.0	No definite physical signs.
9. 30 yrs.	Cough, fever, night sweats, pain in chest, increased on swallowing and on deep breathing, hæmoptysis	Cavity left upper lobe and marked infiltration of right lung	Evening temptr. 102. Hætic temptr.	Many	8 months	19 lbs.	Minus	Evening temptr. 99.2	Few clicks and cavernous breathing over the cavity and dullness persistent.

TABLE II—*contd.*

No. and Age.	Symptoms.	Physical Signs.	Fever evening temptr.	T. B. in sputum on admission.	Duration of treatment.	Gain in weight.	T. B. in sputum on discharge.	Tempr. on discharge.	Condition on discharge.
10. 19 yrs.	Cough, vomiting, pain all over body, dyspepsia	Marked infiltration of right lung	Evening temptr. 103·6	Many	7 months	12 lbs.	T. B. in 5 fields	Evening temptr. 99·0	Few crepitations over right suprascapular region. No active disease. No marked physical signs.
11. 32 yrs.	Bad cough, chest-pain, fever, history of pleurisy and hæmoptysis poor appetite, lost 22 lbs. in weight	Infiltration of both upper lobes	Evening temptr. 100	T. B. one in each field	4 months	33 lbs.	Minus	Evening temptr. 99·2 after drive	
12. 27 yrs.	Cough, fever, night-sweats, hæmoptysis, dyspepsia, diarrhoea, poor appetite	Infiltration of whole of right lung especially upper lobe and left apex	Evening temptr. 100	T. B. Innumerable and in clumps	6 months	32 lbs.	Minus	Evening temptr. 98·4	Slight dulness over right suprascapular region.
13. 20 yrs.	Cough, poor appetite, diarrhoea, weakness, emaciation	Infiltration of right lung and apex left lung; breaking down of right lung	Evening temptr. 101	Many	8 months	31 lbs.	Minus	Evening temptr. 99·0	No sign of active disease.
14. 20 yrs.	Cough, hæmoptysis, fever, diarrhoea	Infiltration of both upper lobes.	Evening temptr. 100	Many	10 months	25½ lbs.	A few	Evening temptr. 98·8	Slight dulness above and below the left clavicle.

TABLE II—*contd.*

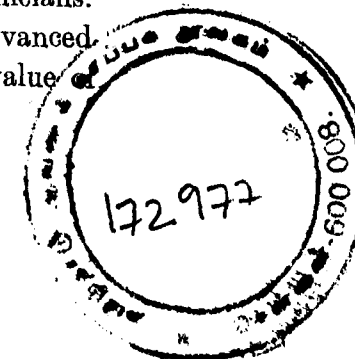
No. and Age.	Symptoms.	Physical Signs.	Fever evening temptr.	T. B. in sputum on admission.	Duration of treatment.	Pain in weight.	T. B. in sputum on discharge.	Tempr. on discharge.	Condition on discharge.
15. 24 yrs.	Cough and fever	Infiltration, left apex.	Evening temptr. 100	Minus	8 months	19 lbs.	Minus	Evening temptr. 99·0	No marked physical signs.
16. 25 yrs.	Bad hæmoptysis, onset after influenza.	Cavity on the left side, consolidation right side	Low fever	T. B. Plus Diazo plus	11 months	11 lbs.	Minus	Evening temptr. 98·4	Crepitations still persistent.
17. 33 yrs.	Fever, cough, frequent hæmoptysis, dyspnoea	Diminished expansion apex left side, Infiltration left upper lobe	Evening temptr. 100·0	Nil	6 months	11 lbs.	Nil	Evening temptr. 99·0	No definite physical signs.
18. 41 yrs.	Emaciation, cough, hoarse throat, hæmoptysis, glycosuria, fistula-in-ano, dysentery	Cavity right upper lobe, Infiltration left apex	Evening temptr. 101·8	Many	8 months	15 lbs.	No sputum	Evening temptr. 98·4	Physical signs not much altered. Can walk four miles without rise of temperature.
19. 32 yrs.	Cough, fever, emaciation, poor appetite	Both upper lobes affected, Infiltration of both upper lobes	Evening temptr. 102	One in many fields	4 months	30 lbs.	Nil	Evening temptr. 98·4	Nothing definite.

In the class of cases selected at the Victoria Park Hospital, quite as much benefit, if not more, can be secured by sanatorium methods or the use of tuberculin. Table II given above showing the results of treatment with tuberculin in my practice, would forcibly bring out the fact that the ordinary tuberculins can give quite as good (possibly, better) results in the class of cases treated with Sphalinger serum by Dr. Colebeck. The efficacy of his serum has *not* been proved yet. I was made to understand in a conversation with him that Mr. Sphalinger himself never desired a selection of cases, and he was of opinion that the serum is of great value in the most advanced cases.

The newer remedies boomed at present in the daily papers—Sphalinger serum, Dreyer's vaccine, etc., are only modifications of the older tuberculins. So long as there is a fair amount of vitality in the system, it is quite possible to secure very good results either by sanatorium methods or by the use of tuberculin or by pneumothorax treatment.

The innumerable short notes of other medical men which have been written on *L'Affaire Sphalinger* in the "*Lancet*" are not of much value in as much as they give no details. The Editor of the "*Lancet*" remarks in an editorial: "In withholding the panegyric with which new remedies are usually ushered into the world, they have acted with wisdom, as well as with restraint and have proved themselves conversant with the history of therapeutics. The usual record of a new remedy may be illustrated in a tracing by a sharp rise, culmination of brief duration and a slow decline ending either at a low level, or, sad to say, in the base line of oblivion. This last is the fate of many

remedies as we all know We may then do well to scrutinise the evidence supporting Mr. Sphalinger's case before we discard it as unproven. A perusal of the cases hereto published brings out this very important point. They were as a rule advanced cases and in many the disease was active as well as advanced. To undertake the cure of an early case of tuberculosis is often like rushing to the aid of the victor. During the recent tuberculin revival, cures were effected in persons whose only sign of tuberculosis was a positive tuberculin reaction. If (and we would emphasize this IF) Mr. Sphalinger's treatment is uniformly and permanently beneficial in febrile cases with signs of advanced pulmonary disease, then the stability of this treatment is assured. Considering how erratic the course of even advanced and febrile pulmonary cases may be, we must have many more records than we possess at present of the results of this treatment. The Editor of the "*Lancet*" evidently assumes that Sphalinger's vaccine and sera are apparently very effective in the limited number of cases in which they were tested. But Table II given above show that the results of Sphalinger's treatment are in no way better than the results achieved by the ordinary tuberculins obtained in the market. If the Sphalinger remedy is to be properly tested, the methods of preparation in all its details should be published so that the other workers may produce the sera and vaccines, and test them both in the Laboratory and in the Hospitals in order to confirm the value of the treatment. The final verdict upon the value of any line of treatment must always be given by clinicians. Animal experiments are of little value. The advanced tubercular patient is the *animal* for testing the value



these remedies. The statement of Dr. Edmund Lardy in the issue of the "*Lancet*," dated 7th April 1923, that "As long as a consumptive lives, how far gone his case may be, he can be cured with Mr. Sphalinger's treatment without being obliged to go to the mountains." is too big a pill to be swallowed even by an elephant. Much harm is done by claiming extravagant results and impossible cures.

Of the various methods of treatment for tuberculosis that have been introduced from time to time, two methods of treatment stand out pre-eminently in a separate class, viz., (1) Heliotherapy and (2) the Induction of Artificial Pneumothorax, the one for surgical tuberculosis and the other for pulmonary tuberculosis.

Heliotherapy.—Although many medical men have been aware of the beneficial effects of sunlight in the treatment of disease, the world owes a deep debt of gratitude to Dr. A. Rollier for having worked out the details of Heliotherapy and for bringing prominently to the notice of the medical men the wonderful efficacy of Heliotherapy in cases of surgical tuberculosis. At the present day, the term "surgical tuberculosis" is a misnomer, as Dr. Rollier and his followers have proved that operations are entirely unnecessary in these cases. The advantages of a non-operative method of this kind are many:—Mutilations are avoided and articular function is maintained to a large extent. The body recovers its harmonious outlines and the patients return to the outer world *complete individuals* capable of earning their living. I happened to see Dr. Rollier's work last year at Leysin. And my own experience is that the results achieved by Dr. Rollier are simply marvellous.

Dr. Rollier has been working since 1903 in this field and been perfecting his methods. He says that Heliotherapy is a local treatment which is at the same time analgesic, bactericidal and a powerful stimulus to cicatrization. An altitude of 5,000 feet is recommended, as the air is never oppressively hot even in the height of summer; and as, in winter the brilliance of the sun counteracts the intense cold. In this Presidency, Coonoor should prove a very suitable site. In spite of its apparent simplicity, the practice of Heliotherapy demands great attention to details and constant supervision, as pointed out by Dr. Rollier.

In England Heliotherapy is carried out at Alton by Sir Henry Gauvain, at Carshalton by Dr. Watts, and at Leasome by Dr. Martin. On account of the treacherous English climate, these distinguished English physicians are severely handicapped, but in spite of the handicap, they have also been producing good results.

Dr. Rollier is the High Priest of the Modern Sun Worshipers. Sun treatment is not mere exposure to the sun. The technique requires skill, care and gradual application. Dr. Rollier has recently brought out an English Edition of his work on "Heliotherapy." The book is one of the Oxford Medical Publications. I would refer you all to that book or the original French work *La Cure de Soleil*, if you want to know more of this method of treatment.

On the arrival of the patient at Leysin at one of Dr. Rollier's clinics, the patient is subjected to a thorough examination. The patient is kept absolutely quiet for a few days till he becomes used to the altitude, then the

fresh air treatment is started. Later on, the sun bath treatment is started.

Dr. Rollier attaches great importance to strict individualisation and careful progression—the two essential ideas common to all forms of treatment for tubercular patients. His technique of the sun bath has been evolved after considerable experience. The early morning hours between 6 and 9 a.m. are said to be the best hours. Heliotherapy has been proved to be beneficial not only in closed cases but also in open cases. The only surgical instrument used by Dr. Rollier is an aspirating syringe. Though he began work as an operating surgeon, he does not use his knife at present as a rule.

Leysin in Switzerland is the Mecca for all the tuberculosis surgeons all over the world. Every year he gives two post-graduate clinics which are attended by doctors from every country in the civilised world. I will now throw upon the screen some slides procured from Dr. Rollier who kindly selected this set of slides himself for me.

Artificial Pneumothorax.—One of the latest methods of treatment for tuberculosis of lungs is the induction of artificial pneumothorax. This method has been spoken off very highly by most of the phthisio-therapists who have taken to this method of treatment. This method is now used very largely in all parts of the civilised world. Dr. Clive Riviere writes:—"No more hopeful ray of sunshine has ever come to illumine the dark kingdom of disease than that introduced into the path of the consumptive through the discovery of artificial pneumothorax." Sir James Kingdon Fowler, one of the former physicians of the Brompton Hospital, London, is equally enthusiastic.

This method of treatment was first suggested in 1821 by Carson of Liverpool. Forlanini in Italy introduced this method of treatment as a routine measure in 1895. Between the years 1898 and 1905 a number of American physicians began to use this method of treatment frequently. But, it was Brauer of Hamburg who first introduced the use of a manometer during the induction of artificial pneumothorax and made the operation a safe measure. In 1906 Forlanini of Italy reported 25 cases of pulmonary tuberculosis in which artificial pneumothorax had been induced, and brought this method of treatment prominently before the profession. Since then the treatment has found favour in almost all countries. In those cases in which there was difficulty in the induction of artificial pneumothorax on account of pleural adhesions, Saugmann of Denmark, Jacobsen of Stockholm and Brauer of Hamburg, have all improved the method by resort to electric cauterisation of the adhesions with the help of the thoracoscope. Dr. Lillingston who introduced this treatment in England in 1911 was himself a sufferer from the disease and had been cured by artificial pneumothorax in Norway.

During my sojourn in Europe last year, I had many opportunities for witnessing this treatment carried out in many institutions in England, Germany and Switzerland and of discussing the value of the treatment with the various operators. Various types of apparatus are being used. Some use Forlanini's apparatus, some Pearson's apparatus and others other specially modified forms of apparatus. Many an operator has got his own modification. The gas used, the apparatus used, and the technique varies with the individuals but all physicians

who have used this method agree in assigning to it an eminent therapeutic value. "The role of artificial pneumothorax is to rescue those formerly beyond the bounds of human aid, to restore the lost to life, or at least to a measure of comfortable existence" is the enthusiastic view of Dr. Clive Riviere.

Amongst the mixed phthisis material, containing patients at all stages of the disease, the incidence of cases suitable for pneumothorax therapy appears to be about 5 per cent. Every case is not considered suitable for this method of therapy. The method is said to be unsuitable in patients with little or no powers of resistance, as the disease spreads rapidly and proves fatal. Neither is it indicated in patients with very good powers of resistance, as the disease can be completely arrested in these cases by sanatorium treatment or medical treatment. This method of treatment is mainly indicated in patients with medium powers of resistance and with unilateral disease (at any rate the better lung should not be involved to more than a third as determined by clinical and X-ray examinations). The physicians who have much experience in this method of treatment lay special emphasis on three facts in the selection of cases :—

1. The patients should have had 6 months medical or sanatorium treatment to start with. (If after such treatment for 6 months, signs and symptoms of active disease exist and tubercle bacilli be present, this method is recommended).

2. The disease should be unilateral. If the disease be bilateral, the sound lung must not be affected to more than a third.

3. Very early cases should be excluded, as they are considered to be unsuitable for treatment. For :—(a) It is unnecessary, as early cases are easily curable by other methods. (b) It is inexpedient since it brings with it risks and the chance of serious complications out of all proportion to the benefit it confers.

(Pleural shock and gas embolism cannot altogether be eliminated especially in early disease. Shock symptoms are said to be more common in cases of early disease where the pleura is healthy.*) (c) Pleural effusion and the deformities which may follow it are complications which cannot altogether be avoided. Pleural effusions occur in about 50 per cent of the cases. Lung expansion may fail or be incomplete and on re-expansion the pleural layers may become adherent and the patient may thereby be deprived of the benefit of this treatment at a later stage when indicated.

The Medical Research Council Report states that the following cases are suitable for artificial pneumothorax. (Sometimes when the clinical examination reveals unilateral disease, an X-ray examination may reveal that the better lung is not in reality free from the disease).

1. Patients with tubercular lesions of one lung who have signs of activity after 6 months medical treatment.
2. Patients with bilateral disease but with less than 1/3 of the better lung involved.
3. Recurrent or repeated hæmoptysis.

*Pleural shock is manifested by sudden pallor or loss of consciousness, irregular pulse and respiration, dilatation of the pupils with clonic and tonic spasms of the limbs.

The symptoms of gas embolism are similar ; but, the onset is less abrupt. Immediate cessation of respiration and circulation are to be feared.

4. Bronchiectasis with toxic symptoms and with copious or offensive sputum.
5. Abscess of the lung.
6. Pleural effusions (the fluid can be replaced by air or oxygen).
7. Very painful, acute dry pleurisy.

The special contra-indications are :—

1. Bilateral disease.
2. Advanced emphysema and asthma.
3. Serious disease of the heart and the kidneys.
4. Advanced laryngeal tuberculosis.
5. Intestinal tuberculosis.
6. Diabetes.
7. Highly neurotic temperament.
8. Ill-nourished condition with chronic dyspepsia, etc.

Active disease in the better lung should always be considered an absolute contra-indication.

It has been truly pointed out that each case should be considered individually and that there is no golden rule as to the selection of cases.

One of the German specialists informed me that the immediate results were very good though the remote results were not quite satisfactory. That seems to be the view of experienced observers in America also.

A few physicians have tried the treatment in bilateral disease; but, double artificial pneumothorax cannot yet be considered to have emerged from the experimental stage.

Pleural adhesions may be said to be the rock on which the immediate success of artificial pneumotherapy

is most commonly wrecked. Pleural adhesions often interfere with the successful induction of pneumothorax.

Amongst the cases selected for pneumothorax by the operator, the operation would be a failure in about 20 % of the cases on account of adhesions, even in the hands of the best operators.

One of my cases in the Tuberculosis Hospital was considered suitable for artificial pneumothorax, as the disease was strictly unilateral. On account of a shortage of X-ray plates, I could not get an X-ray photograph of the lungs. Four attempts were made to induce artificial pneumothorax; but, on every occasion I found I could not introduce more than 30 c.c. of air. I had to give up the attempt in despair; subsequently, when I had an X-ray photograph taken, the reason for the failure was made clear. The disease was found to be very extensive. The heart was tied down by a big band of adhesion and a large number of bands was found in every direction.

I have already stated that this method of treatment is highly spoken off by all the men who have resorted to it. But, is this method of treatment of universal applicability in this country? Would I advise every general practitioner to take up to this method of treatment? I would answer both questions in the negative. The classical case suitable for it, namely, the strictly unilateral case with a fair amount of fibrosis and a fair amount of resisting power is not often met with in this country in our hospitals. An indiscriminate resort is likely to lead to dangerous results and the lessening of the faith of the public in this method of treatment even in suitable cases, as in the case of tuberculin treatment in former times in all countries.

To carry on the treatment with success, various factors are necessary :

1. The careful selection of cases.
2. Experience on the part of the operator.
3. The willingness of the patients to come for refills once in 2 or 3 weeks for 2 or 3 years.

Dr. Charles Minor, of America, has noted beneficial results only in 13 % of the case operated upon. He states: " Its applicability will, of course, vary with the personal opinion of each one who uses it. To some, the field will widen, to others, it will contract. Immediate results are often surprisingly brilliant ; the percentage of really permanent arrests is disappointingly small. Its use in hæmorrhage is of the greatest value. It is often an immediate life-saver, frequently a life prolonger, not seldom a bringer of comfort and relative relief from distressing symptoms. It is the one method at our command that offers to the far-advanced unilateral or relatively unilateral cases a good chance of further longevity and reasonable chance of economic recovery." Dr. Boas of the Montefiore Sanatorium, U.S., after an experience of 6 years confesses frankly that positive cure is too rarely accomplished. Generally, marked improvements set in for a time, and then some complications supervene which cause the disease to resume its course. The percentage of permanent complete recoveries obtained is disappointingly small. The patient often gets a reprieve of a year or two and this means a good deal. Nevertheless, artificial pneumothorax succeeds in a sufficiently large number of cases to warrant its continual use together with constant searching for better technique.

I have seen this operation carried on with a variety of instruments in a variety of ways. Some people pump in the air, some people introduce the air under negative pressure and some use positive pressure. Some use a mercury manometer, while others use a water manometer. Some use a single manometer, while others use a double manometer. Some use oxygen gas, some nitrogen while others use ordinary air. Some use a trocar and canula for the 1st operation, while others use a hollow needle ; some incise the skin with a tenatome before introducing the needle. As for sepsis, some are scrupulous as in major operations, while others are not very particular ; some use a morphia injection on the first occasion, while many others do not. Some freeze the skin with ethyl chloride spray and then inject novocain before introducing the needle, while others do not make use of local anæsthesia. Some inject novocain but do not wait sufficiently long for the anæsthesia to be produced. Some use the same hypodermic needle which is used for the novocain injection for injecting the air also and thus avoid two punctures. Some introduce a small volume of gas, while others believe in a large quantity of gas. Two of the instruments used in England are the Pearson Apparatus and the Woodcock-Fernandez apparatus. (Dr. Fernandez is a Madras and one of our old students in the local Medical College, and a Science Graduate of this University. He is at present a Deputy Tuberculosis Officer in the County of Leeds and in conjunction with Dr. Woodcock, his colleague, has done a very large amount of work in pneumothorax. He has been in charge of a sanatorium and a tuberculosis dispensary in Leeds. When I was in England last year I was very much gratified to

see that a Madrasi Non-Brahmin could distinguish himself and carry on much original work and secure a permanent and responsible appointment in the tuberculosis service in England. It is a pity that there is no opening for men of his stamp in their own mother country.)

I may sum up by quoting the advice of an eminent physician who has distinguished himself in this method of treatment :—

“The treatment in my experience should be kept in the hands of those specially trained in it. I have seen disastrous results from inexperience. It should be only used for carefully selected cases. Accidents during the operation are nearly always the result of bad methods and the man who treats a large number of cases in a short time is, in my opinion, extending the operation to many cases which would be better left alone. It is not a justifiable treatment for early cases, or, for cases which can recover without it. On the other hand, it cannot be safely put off in cases which have got out of hand and do not progress otherwise ; but, the opposite lung must be a fairly good one.”

Rest.—After all that is said we must agree with the view of Dr. Krause, Associate Professor of Medicine in the John Hopkins University and the many-sided Editor of the “American Review of Tuberculosis,” that Rest remains the sovereign remedy for tuberculosis. “More direct and spectacular methods of treatment, inhalations, injections, drugs by mouth, come and go. The years since 1900 have spawned hundreds of them ; few have survived the momentary sensation of their announcement ; none has earned even a vogue ; all this despite the fact that none

has been employed unless rest were also a part of the treatment. Rest alone has returned thousands of consumptives to productive life. Of those who were *living an active life* and relied on drugs or vapours or serums or vaccines to fight their battle, few have made their journey back.”

I do not expect that the treatment of tuberculosis will ever become similar to the treatment of malaria by quinine or syphilis by salvarsan. Even in syphilis and in malaria, with use of salvarsan and quinine in the treatment, the problem of cure has not been completely solved. Successful treatment of tuberculosis will always require individual study. Each patient is a law unto himself and the successful phthisio-therapist will be the one who makes an individual study of each patient.

The infecting bacillus of tuberculosis is always with us. The number of the tuberculous and the number of the civilised beings are almost equal ; but, the seed can be kept from flowering and bearing fruit, not so much by the isolation of the consumptive as by the advocacy of a healthy way of life for all mankind.

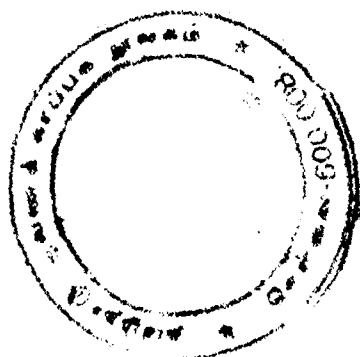
The crux of the problem of prevention is “the problem of preventing the outbreak of frank disease in the legions of the infected.”

“More or less poverty in a community will mean more or less tuberculosis ; so, will more or less crowding and improper housing, more or less unhygienic occupations and industry, more or less occurrence of other diseases, particularly respiratory infections. Under the circumstances, our duty, our programme is plain and permits of no equivocation. It is to contribute to the attainment of civic decency and cleanliness, of light, space and food enough for all ; of a rational proportion

of working and leisure hours for those who cannot dispose off their own time ; and of the reduction of preventable infections to a minimum."

Something is needed to fill the gap between the sanatorium and the return to the working day, a gap which the writer puts at between 3 and 5 years. Permanent segregation will never solve our problem.

"Petty quarrels, Achillean aloofness, selfish scrambles for recognition, perfunctory and rule-of-thumb performance of work in laboratories, sanatoria and dispensaries are just so many barnacles on our boat. They invite no passengers to embark ; they impel many to cancel passage ; they give the craft a dangerous list. Above all, and take this to heart, they help us to save no lives and do seriously hinder the extension of vital aid to many. IN NONE OF ITS PHASES HAS THE ERECTION OF THE TUBERCULOSIS MACHINERY CONTEMPLATED THE CREATION OF PLACES FOR THOSE WHO SIMPLY WANT JOBS OR A PLACE OF REFUGE."



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