CARE OF THE TUBERCULOUS IN THE HOME*

BY

F. R. G. HEAF, M.D., F.R.C.P.

Professor of Tuberculosis, University of Wales

At the end of 1948 there were approximately 210,000 cases of tuberculosis on the dispensary registers; 180,000 of these were respiratory tuberculosis, and about 100,000 of them were expectorating tubercle bacilli. Every one of these cases was a potential source of spread of the disease. At the same time approximately 30,000 beds were occupied by patients suffering from respiratory tuberculosis; about one-third of these patients would not be infectious, so that 20,000 of the positive cases were in-patients, leaving 80,000 patients, most of whom were expectorating tubercle bacilli, among the general population. This is a minimum figure, as mass radiography surveys show that there are at least three unknown cases with active disease among every 1,000 adults between the ages of 15 and 45. If these are taken into account another 57,000 persons must be added, making a grand total of 137,000 cases of respiratory tuberculosis with active disease under domiciliary conditions. It is the care of this great army of infectious and potentially infectious persons that is the problem we have before us.

It will not be denied that every case with a positive sputum constitutes a public health problem, and in most instances a medical one, too, so that the subject is of major importance in any tuberculosis scheme. Curiously enough, the attention given to it bears little relation to its magnitude and significance. The problem has come into prominence in recent years because of the shortage of institutional beds. We have been forced to treat patients in their homes, and we are finding out that much can be done to benefit them: in some instances actual recovery can be effected without resorting to institutional care. The number of patients treated in their homes who return to normal life and work without danger of spreading tuberculosis to their fellows is increasing every year. This is a most significant change in tuberculosis administration, and will have a profound effect upon the future development of public health programmes.

Approach to the Problem.—The problem may be approached from two points; first, from consideration of the requirement of the individual to recover or maintain a good state of health; and, secondly, from the need of the community as a whole to be protected from the risk of contracting the disease. In other words, we have the curative aspect and the preventive aspect, neither of which must be allowed to eclipse the other

The Curative Aspect

Although the results of domiciliary treatment are becoming known, most persons suffering from tuberculosis are still recommended for a period of sanatorium treatment. It is possible that this slavish adherence to the prescribing of this form of treatment has become a habit, and a more enlightened approach to the management of all cases might be established by asking ourselves in every case if sanatorium treatment is really necessary. In present circumstances, whatever the answer may be, most patients will be treated at home for a long period. It is only recently that the problem of pre-sanatorium domiciliary care has become a matter of importance, and we must realize that it has come to stay for a number of years. It is therefore worthy of close attention and detailed study.

*Read in opening a discussion at a combined meeting of the Sections of Diseases of the Chest and Tuberculosis and of Preventive Medicine at the Annual Meeting of the British Medical Association, Liverpool, 1950

Pre-sanatorium Period

When tuberculosis has been diagnosed the management of the case will depend greatly on the social circumstances; but, whatever these may be, it is essential that the family appreciates the implications of the diagnosis and that certain obligations fall on all its members to play their part in assisting the patient towards recovery. In this matter it is highly probable that the general practitioner can be of considerable help, as he usually has a better acquaintance with the individual peculiarities of each member of the family, and knows best how to deal with them. It is important, however, that the chest physician and the general practitioner agree on the line of treatment to be pursued. A most unfortunate situation would arise if the former advocated rest in bed and quiet, whilst the other recommended basking in the sun on the hill-tops. It is hoped that neither of these physicians will cause unrest and discontent by arguing with the patient and members of the family about the National Health Service Act, and enlarge upon the fact that there are not enough sanatorium beds to allow for the immediate admission of patients to institutional treatment. However much we may fume within ourselves, such agitation does nothing but harm if passed on to the patient.

It will be agreed that during this pre-sanatorium period, which may be as long as nine months, the one important lesson the patient has to learn is the need for rest of both mind and body. Every instruction and piece of advice to the family must be designed to promote an atmosphere of calm patience in the home, thus providing the foundation on which treatment depends—treatment that quite often reduces the duration of the subsequent period at a sanatorium and sometimes eliminates the necessity for it altogether. I would say that three essentials in successful home treatment are (1) the full co-operation of the patient and the family; (2) freedom from financial anxiety; and (3) the possibility for the patient to obtain the necessary rest in bed. There are other essentials; but these are of primary importance, and without them success cannot be obtained. Adequate physical rest is complementary to peace of mind, and the spectre of want can easily destroy both.

In some homes it is impossible to create an atmosphere that is conducive to recovery. The experienced chest physician will soon become aware of this and not attempt the impossible. Patients in these households must be sent to sanatorium or hospital to escape the nerve-racking of such conditions, the most frequent cause of which is overcrowding. Where this exists, domiciliary care is extremely difficult, and priority of admission to an institution should be given to all such cases. If this is not done, money and labour will be wasted, for domiciliary treatment costs money and involves a great deal of work for the staff of the chest clinic.

It is a big mistake to think that treatment of patients at home can be organized without considerable expenditure, and both regional hospital boards and local health authorities must be prepared to vote money so that the necessary facilities may be provided. It is cheaper than sanatorium treatment, but that does not mean that it costs nothing. Money must be found to provide an adequate

ambulance service, sufficient home helps, good equipment for the chest clinic, and enough health visitors and handicraft instructors to give every patient the full attention he needs. Home helps are the key to the problem of relieving the patient of domestic worries. We all know how difficult housekeeping has become these days. If the patient happens to be the mother of the family, she can obtain no rest without a generous provision of labour in the form of home helps. To start a scheme of domiciliary treatment without home helps is like running an engine without oil.

Domiciliary care becomes increasingly difficult with the lowering of the standard of living and the morals of the home. In fact, in certain areas the factors that we know to be the predisposing causes of tuberculosis are present to such a degree that it is useless to try to establish domiciliary care until they are removed. In this problem, as in others connected with tuberculosis, we must be realists and deal with fundamentals, otherwise we shall waste much money in attempting to achieve the impossible.

Special Treatments

There are, however, homes in which domiciliary treatment can be carried out with success; and where this is so the enthusiastic physician will often be of the opinion that, although adequate rest has been secured for the patient, more can be done by the application of special treatments in the form of collapse therapy, postural rest, and antibiotics and chemotherapeutics. It must be realized that the inability to exercise close supervision over the patient introduces an element of risk into the administration of special treatment in the home. If there is sufficient staff at the chest clinic to provide frequent visits to the patient, and a good ambulance service to ensure the attendance of the patient at the clinic for adequate radiographic control, then much can be done to reduce these risks to a minimum..

Active domiciliary treatment throws a great strain on the chest clinic and a considerable amount of extra work on the staff. We all know that with collapse therapy certain complications often arise. Adhesions need cutting, fluid has to be aspirated, phrenic operations may be necessary, and, occasionally, emergency admission to hospital must be provided owing to the development of an empyema or a bronchial fistula. These complications can be avoided by inducing a pneumoperitoneum instead of a pneumothorax, but even here it is usually necessary to have the services of a surgeon.

Existing Schemes

Three different schemes have been developed to provide special treatment in the home during the pre-sanatorium period. In Glasgow in 1943, under the direction of A. Maclean and J. S. Gemmill, four beds were reserved in Baird Street Auxiliary Hospital, to which selected patients awaiting admission to sanatorium, and suitable for collapse therapy, were admitted. Artificial pneumothorax was induced on the day of admission, and the first and second refills were given on the following days. Some hours after the second refill the patient was sent home by ambulance, and rest in bed continued at home; refills were given at the hospital on the fifth or sixth day after induction and subsequently at weekly intervals. A report on 150 consecutive cases treated in this way shows that 20 to 33 months after induction the result was satisfactory in 82 cases, and in 65 (43%) recovery was obtained without any institutional treatment (Maclean and Gemmill, 1948). Sputum conversion occurred in at least 36%.

A modification of the Glasgow scheme has been adopted by Wynn-Williams, Shaw, and Mashiter (1950) in Bedfordshire, where selected patients suitable for collapse therapy, and others in need of emergency treatment, are given priority of admission to sanatorium, but when they are ambulant for two hours they receive their discharge to enable treatment to be carried on at home, with medical supervision at the chest clinic or sanatorium. In this scheme chronic cases with good home conditions are not admitted to institutional beds, but are given necessary treatment at home. In selected cases phrenic crush, pneumoperitoneum inductions, and bronchoscopies are performed on out-patients.

Heller (1949), at Hounslow, induces artificial pneumothorax or pneumoperitoneum, and is not averse to giving streptomycin while the patient is under domiciliary treatment. Phrenic crush is performed on selected cases in the out-patient department. Of the 50 cases in which artificial pneumothorax treatment was attempted, a successful induction was obtained in 33, and the disease was arrested in 11 and made quiescent in 19. Five of the artificial pneumothorax cases developed fluid. Pneumoperitoneum was induced in 150 cases and had to be abandoned in only 11. Eight of the artificial pneumothorax cases were treated entirely at home, and 25 were admitted to sanatorium for short periods for adhesion section.

James Cuthbert (1950) by careful selection of cases has had good results when admitting patients to hospital for successive periods of from three to five nights for the induction of a pneumoperitoneum with a phrenic crush, later for artificial pneumothorax induction, and, finally, if necessary, for adhesion section. In this way collapse therapy is established without undue risk while the patient is at home, and the danger of the development of progressive disease during the waiting period before sanatorium treatment is considerably diminished.

Toussaint has carried out domiciliary collapse therapy for a number of years, and at Tottenham he has been giving artificial pneumothorax and pneumoperitoneum treatment whilst the patient remained at home. He has had very encouraging results, achieving quiescence in 60% of cases. The organization of the scheme is worthy of close study, as it is a model of its kind. While in no way detracting from the value of the work, it must be noted that the Willesden Chest Clinic is very well staffed, the Central Middlesex Hospital is most co-operative in every way, the services of a thoracic surgeon are readily available, the area served by the clinic is mainly of the artisan and lower-middle-class type, and, most important of all, a large number of home helps are available. These conditions and facilities are not always easy to obtain, but that does not mean that we should be deterred from extending the trail that has been blazed by the enthusiastic work of an energetic chest physician. To-day domiciliary treatment is a necessity, and Toussaint has shown us what is needed to produce good results.

Administration of Special Treatments

It will be agreed that, although the administration of special treatments under domiciliary conditions may not be a method of choice and has been adopted only because the bed situation causes such a long waiting period for admission to sanatorium, it can nevertheless be carried out successfully and be of benefit to the patient. Those who have practised it are unanimous on four points: (1) it throws a very heavy strain on the staff of the chest clinic; (2) the chest clinic must be well equipped; (3) it is necessary

to have a good and efficient ambulance service at the disposal of the chest physician; and (4) the latter must have complete control of the patient during domiciliary treatment and during periods of admission to sanatorium or hospital for special procedures. There must therefore be close co-operation between the chest physician and the medical superintendent of the hospital.

To these points I would add that the services of a thoracic surgeon must be available when required, and the local health authority should show a sympathetic interest in the work and provide the means to enable the patient to procure adequate rest at home. I would emphasize that in all domiciliary treatment there must be complete agreement and mutual co-operation between the local health authority and the regional hospital board, as each of these bodies has a special responsibility in the matter, and if quibbling about payments and providing services is allowed to arise, administration of the scheme will be difficult and probably impossible.

Very little has been written on the administration of streptomycin and P.A.S. under domiciliary conditions, but there is no doubt that these drugs are being tried on an extending scale now that both are cheaper and are available to all. There is no objection to the use of P.A.S. in domiciliary treatment, except that the drug's efficiency when used alone is still debatable; but streptomycin is in a quite different category, and if indiscriminately prescribed can do more harm than good. The use of streptomycin should be controlled by drug-sensitivity tests, and a careful watch should be made for the development of complications. These precautions are difficult to maintain under domiciliary conditions, but the neglect of them may mean on the one hand the infection of other individuals with drug-resistant bacilli, and, on the other, distressing sequelae to treatment. It is therefore permissible to use streptomycin in home treatment only in the circumstances in which these conditions can be met.

Lesions of the respiratory tract are an exception to this rule. Cases of tuberculous laryngitis, particularly those with dysphagia, and cases of tuberculous tracheobronchitis or bronchitis, respond so remarkably to streptomycin that its use under domiciliary conditions is justified. I think, however, that it would be a wise policy for all general practitioners wishing to use the drug in respiratory tuberculosis to consult the chest physician before starting treatment.

Prevention

As we are still considering the management of the patient prior to admission to an institution, it is necessary to refer to prevention of the spread of the disease. The diagnosis of active tuberculosis in one member of the family places the others in the category of contacts, requiring full medical examination, including tuberculin-testing. This should be carried out on adults as well as children, and the negative reactors should receive B.C.G. vaccination. This is not the time to discuss the need or practicability of segregation, but one is inclined to the view that, although segregation is desirable, vaccination without segregation is better than no vaccination at all.

In addition to the well-known precautionary measures that should be taken to prevent the spread of infection, I should like to put in a plea for a more systematic development of facilities for educating the family, and in particular the housewife, in domestic economy and the special points in household management that are associated with the presence of a tuberculous person. There must be much that the average housewife could learn which would improve the nutrition of the family and add to the comfort and well-being of the patient and others in the house.

I would also ask for biological and biochemical research into the reason why some members of a household develop the disease while others escape active infection and in some instances even fail to exhibit tuberculin sensitivity though they have been living in contact with an open case for a long period. The detailed study of family units would reveal facts which would be helpful in solving some of the problems of the pathogenesis of the disease.

Post-sanatorium Treatment

The problems of the post-sanatorium period of domiciliary treatment differ considerably from those associated with the person awaiting admission, for the patient will either have recovered sufficiently to need rehabilitation or be a chronic invalid, ambulant for only short periods or completely bedridden. The patient may be infectious or non-infectious, but it is well to remember that the ambulant infectious case spreads the disease to a much wider circle than the bedridden one; therefore our preventive measures must not neglect control of the habits of the ambulant person. It is probable that the bedridden patient can do little harm if he has a room to himself and is not allowed contact with children and Mantoux-negative persons.

The problem of the prevention of the spread of infection should be simpler in the case of the patient who has received sanatorium treatment, as we should be able to assume that he has had a thorough instruction during the course of treatment. In view of the frequency with which the child of an ex-sanatorium patient develops tuberculous meningitis even in a reasonably good home environment, some doubt may be expressed on the efficiency of this tuition. The fault may be in ourselves in that we do not instruct the patient carefully and thoroughly enough for him to retain the essentials of the precautionary measures we wish him to put into practice in his home.

Evidence that control of infection in tuberculous households is possible is found in the fact that no case of meningitis or miliary tuberculosis has developed among the children of the tuberculous households in our village settlements; showing that there need be no danger from living with open cases of tuberculosis if there is willing co-operation and understanding of the problem by the patient and members of the family. We must therefore ensure that they are all properly instructed.

In addition to prevention of spread of infection, the ambulant or semi-ambulant case presents many problems. The presence of an idle person with a well-developed invalid complex is a great trial to the other members in any household, particularly if there is any degree of overcrowding. Sheltered employment for such patients relieves the situation to a considerable degree. It is unfortunate that the development of organized schemes to provide rehabilitation that leads to employment has been so slow. This is mainly due to the reluctance of local health authorities to shoulder the responsibilities which the Act permits them to assume with regard to aftercare, which, of course, includes rehabilitation.

The value of diversional therapy to bed patients is well known, yet there is little enthusiasm for the development of home handicrafts. I admit that this is an expensive venture and must not be expected to bring in any financial return. It is difficult to organize, and to be successful it should be controlled from the chest clinic, if possible in connexion with a municipal workshop. All this involves

considerable expenditure; but does not the comfort and welfare of these patients, whom we are forced to treat at home through lack of beds, mean nothing to those responsible for their domiciliary care? Cannot some of the money which would have been expended on them had they been admitted to a sanatorium at anything from £6 to £10 a week be expended on developing efficient domiciliary treatment?

In answering these questions we come up against the difficulty that the money not being expended on institutional treatment is the concern of the regional hospital boards, and the cost of domiciliary care is largely borne by local health authorities, so that the adjustment is complicated. It is another instance in which the dual control operates against the benefit of the patient.

During the post-sanatorium period rehabilitation is of the highest importance. The National Health Service Act places this responsibility on the local health authority. The National Assistance Act provides for financial relief in cases of need and has made the National Assistance Boards responsible for the provision of the benefits that were scheduled in Memorandum 266T of the Ministry of Health. Under the Disabled Persons Employment Act, 1944, the development of sheltered industries can take place on a commercial basis, and the Ministry of Labour and National Service can give adequate financial assistance, both to the disabled individual under training and to the rehabilitation centre, for the provision of facilities to overcome the loss of working power which the disability has caused. The stage is therefore set for the development for the tuberculous in this country of the finest rehabilitation service in the world if we will only take full advantage of the powers that are provided in the Acts mentioned.

Drawbacks of Dual Control

It is not always realized how great is the change in environment for a patient who is discharged from a sanatorium and returns to an urban home. The frequency of relapse during the first year after discharge from the sanatorium shows how serious the strain can be, and how unfitted some patients are to withstand the stresses and anxieties of normal life. It is one of the disadvantages of sanatorium treatment that recovery takes place in conditions that are totally different from those under which the patient normally lives. For such a patient the first few months of domiciliary care should always be regarded as a transitional stage during which the closest clinical observation is maintained and wherever necessary sheltered employment provided until stabilization under home conditions is assured. In this way many relapses could be prevented, but it can be done only through the recognition by regional hospital boards and the local health authorities that rehabilitation is an essential part of treatment. Rehabilitation does not begin when sanatorium treatment ends, but both run concurrently from diagnosis until the disease is arrested.

It has been stated on many occasions that the most urgent need in tuberculosis at the present time is an adequate supply of nurses. This, indeed, is a necessity in order to provide more beds for institutional treatment, and also more efficient domiciliary care; but on the administrative side there is just as urgent a problem—the reuniting of the tuberculosis services so as to restore the relationship between prevention, diagnosis, treatment, and rehabilitation that existed before the National Health Service Act.

To try to organize treatment of tuberculosis apart from prevention and rehabilitation is to admit a complete lack of appreciation of the fundamental characteristics of the disease. Tuberculosis is most deceptive and insidious in its manifestations; it has a serious influence on the industrial life of the population, and causes repercussions throughout social relationships, and yet at the same time it is one of the most individualistic of disabilities. For these reasons the treatment of a case of tuberculosis should not be, as it is at present, the responsibility of one authority, leaving another authority to deal with the important aspect of prevention and aftercare.

Reorganization of the Services

The need for a reorganization of the existing administration of our tuberculosis services is urgent, and the care of the tuberculous in the home emphasizes very clearly the necessity for an amalgamation between the local health authorities and the regional hospital boards with respect to this disease. Let it be clearly understood that domiciliary treatment has come to stay. Experience has shown that in certain circumstances domiciliary treatment can shorten, and sometimes eliminate, institutional treatment, and it is reasonable to suppose that the clinical improvement obtained in the normal environment of the home will be more permanent in character than that derived under the abnormal surroundings and routine of the sanatorium. By domiciliary treatment the great difference between sanatorium life and home life is avoided, and the patient escapes the hazard of having to acclimatize himself to home conditions.

We therefore must plan for the development of domiciliary treatment, and create the machinery whereby the regional hospital board and the local health authority can jointly deal with the tuberculosis problem in their areas. The employment of the chest physician by either body should be on the same terms, and there should be an easy exchange of information and a mutual interest in each other's activities. This can best be established by the formation of a joint tuberculosis panel, consisting of members of the board of governors of teaching hospitals, regional hospital boards, and the local health authorities. It may be that there is no authority under the Act to give such a body preceptive powers, but it could be an authority to which all debatable tuberculosis problems in the region could be referred for advice. This would go some way towards adjusting the present disjointed administration.

A more satisfactory solution is to admit that the National Health Service Act as at present administered is inadequate for dealing with tuberculosis, because it does not take into consideration the peculiarities of the disease, and to press for an Amending Act to create a tuberculosis administration that would enable a service to be developed that could reduce the mortality and morbidity of the disease to an insignificant figure. Until this is done we shall proceed in a wasteful, discontented, and disorderly manner without hope of any real progress. The necessity for this action is of increasing importance in view of the international situation. In the event of war it is essential that our defences against tuberculosis shall be strong enough to withstand the strain that such conditions place upon them.

Conclusion

I would stress that domiciliary treatment can be beneficial, but to carry it out successfully requires money, good equipment, staff, and all those facilities that enable the patient to take the necessary rest at home. The higher the standard of living and the better the morals of the family, the more successful will be the result. Pre-sanatorium

treatment differs from post-sanatorium care, but both should be of interest to the regional hospital board and the local health authority. Without the mutual co-operation of these two bodies there is little hope of the development of efficient domiciliary care and treatment. In fact, there is urgent need for a complete revision of our tuberculosis administration and the creation of a special service which the peculiar characteristics of the disease demands.

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THE CONTENT OF HAEMOPOIETIC FACTORS IN LIVER EXTRACTS

RELATIONSHIP TO CLINICAL RESPONSE

BY

RONALD H. GIRDWOOD, M.B., Ch.B., F.R.C.P.Ed.
Lecturer in Medicine, University of Edinburgh

AND

KATHLEEN M. CARMICHAEL, M.B., Ch.B.
Assistant, Department of Medicine, University of Edinburgh

With Statistics by B. WOOLF, M.A., Ph.D., F.R.S.E.
Lecturer in Medical Statistics, Department of Public Health and Social Medicine, University of Edinburgh

In recent years there has been considerable discussion about the potency or otherwise of liver extracts available in this country for the treatment of the megaloblastic anaemias. This has been referred to by Mollin (1950), who has given clinical evidence of a decline in the potency of commercial liver extracts during the period from 1943 to 1948.

Since vitamin B_{12} was isolated from liver almost simultaneously in Great Britain (Lester Smith, 1948; Lester Smith and Parker, 1948) and in the United States (Rickes *et al.*, 1948), it has become clear that this substance is the main therapeutically active material present in refined liver extracts used for the treatment of pernicious anaemia, and vitamin B_{12} is therefore generally considered to be what was formerly known as the "specific anti-anaemic factor." Ungley (1949) has reported on the therapeutic activity of vitamin B_{12} in a series of 53 patients with pernicious anaemia, and Cuthbertson *et al.* (1949) and Shaw (1949a) have assayed certain liver extracts for vitamin B_{12} content and discussed the relationship of this to their clinical activity. A detailed review of the clinical and experimental uses of vitamin B_{12} and related factors has been made by Girdwood (1950).

The object of the present investigation was to estimate the vitamin B_{12} and pteroylglutamic acid (folic acid) content of various liver extracts that had been prepared commercially between the years 1945 and 1950, and to compare the vitamin B_{12} activity as assayed by microbiological methods with the clinical response on the basis of the results of Ungley (1949), who used vitamin B_{12} itself as the therapeutic agent in cases of pernicious anaemia and put forward a formula to indicate the rise in red cells that might be expected to occur with various doses. In addition, by the kind co-operation of certain manufacturers of liver extracts it was found possible to compare a few of our vitamin B_{12} estimations with the results obtained by these commercial houses. Estimation of vitamin B_{12} was carried out in all instances by measuring the turbidity produced by the growth of organisms in a vitamin-B_{12}-deficient medium to which had been added various dilutions of the liver extracts to be tested. These were compared with a standard obtained by measuring the growth sustained by adding known amounts of vitamin B_{12} to the same culture medium.

Methods

The patients were typical cases of Addisonian pernicious anaemia with histamine-fast achlorhydria and a megaloblastic bone marrow. There was no evidence of steatorrhoea or of any abnormality of dietetic habits. A control period without treatment preceded the injections of liver extract, and during this period there was no evidence of spontaneous remission. All the haematological investigations were carried out by one of two experienced research technicians whose results were in close agreement.

The liver extracts were kept in a refrigerator from the time of issue for clinical testing except where otherwise noted.

The microbiological assays for vitamin B_{12} were carried out by an unpublished modification of the method of Hoffmann *et al.* (1949), using *Lactobacillus leichmannii* as the test organism. Hoffmann and his co-workers in one of their methods added thioglycollic acid to the culture medium to prevent loss of vitamin B_{12} activity as a result of autoclaving, but we preferred to omit the thioglycollic acid and to add the samples aseptically after the medium had been autoclaved It has been shown (Cuthbertson and Lester Smith, 1949; Shaw, 1949b; Winsten and Eigen, 1949) that liver extracts contain substances other than vitamin B_{12} capable of sustaining the growth of *L. leichmannii*. These can be separated by methods which include partition chromatography and by destroying the vitamin B_{12} by alkaline hydrolysis and then re-estimating the ability of the extract to support growth of the test organism. We tested our liver extracts by the latter method, and showed that substances other than vitamin B_{12} were responsible for only a negligible fraction of the growth-supporting activity of the samples tested, except in the case of the extract produced by Manufacturer C, 1948 (Table III), where 25% of this activity was due to substances other than vitamin B_{12}.

In each instance our vitamin B_{12} assay figure is the mean of three readings, and, as will be seen from Table I, the readings were in close agreement. The discrepancies within a group of triplicates are approximately proportional to the absolute value of the mean. The logarithms of the readings were therefore taken for statistical treatment.

TABLE I.—*Results of Vitamin B_{12} Assays on 16 Liver Extracts, Using a Tube Method with L. leichmanii as Test Organism*

Extract No.	Results of Three Assays (μg./ml.)			Mean
1	7·5	7·7	7·6	7·6
2	5·4	5·5	5·4	5·4
3	4·1	5·5	4·7	4·8
4	4·4	3·4	4·9	4·2
5	4·3	4·0	3·7	4·0
6	3·95	3·3	3·75	3·7
7	2·85	2·3	2·9	2·7
8	1·9	2·0	2·3	2·1
9	2·05	2·2	2·0	2·1
10	2·0	2·2	1 8	2·0
11	1·3	1·6	1·3	1·4
12	1·3	1·2	1·25	1·25
13	0·92	0·99	0·82	0·91
14	0·47	0·45	0·45	0·46
15	0·36	0·34	0·35	0·35
16	0·24	0·27	0·24	0·25