Discussion

This subject was reviewed in the Milroy Lectures of 1909 by Hewlett,⁴¹ and a comparison of the position at that time with that of the present day reveals that it has altered singularly little in a quarter of a century. There were then two recognized tests, the Rideal-Walker and the Chick-Martin, each having a limited sphere of usefulness; they exist to-day in forms which respectively are slightly modified and entirely unaltered. There was then no appropriate and recognized method of testing a surgical disinfectant; there is none now. Disinfectants having multiplied during this period, the position is, if anything, more confusing than before, in spite of more extended study. It is, briefly, that significant comparative data on the practical action of certain classes of disinfectant are almost unobtainable, simply because there are no generally accepted terms in which to express them. A test yielding such information must take into account six variable factors, and unless investigators can be induced to standardize the conditions of their tests the isolated scraps of knowledge which they furnish cannot be co-ordinated.

In other spheres regulation of this sort has been an outstanding success. The control and standardization of therapeutic substances has made rapid progress, especially in this country, and if accepted methods of assay can be devised for vitamins, hormones, and drugs, they presumably can be for disinfectants. It is certainly desirable that they should be in the mere interests of truth, but if, as many believe, chemical sterilization is feasible in a variety of circumstances in which faulty methods at present fail to achieve it, then a valuable preventive weapon is capable of being brought into more effective use.

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THE PROVISION FOR MAJOR SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS

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Institutional treatment has played a very prominent part in the management of cases of pulmonary tuberculosis for the last forty years. Sanatoria have been regarded as places for the treatment of phthisical patients whose prospect of recovery is good, but until recent years little or no provision has been made for the advanced case or for the one requiring prolonged rest in bed and careful nursing. Stress has been laid upon the point that advanced cases must not be mixed with early ones owing to the depressing influence of the former upon the latter, and a number of local authorities have established homes for the hopeless cases. These are generally unpopular with both the patients and the staff. It is often difficult to get the former to consent to admission and more difficult to persuade them to remain, while the staff dislike working in a place devoid of hope, with the patients slowly fading away and meanwhile producing a daily crop of grumbles because they have nothing else to do but think of their ills and brood over their misfortunes.

It naturally follows that quite a large proportion of cases with extensive disease find their way into sanatoria, partly owing to the complete absence of symptoms in the early stages of particular cases, partly owing to the desire to escape the home for the dying, and partly owing to the inadequate provision for cases which are not hopeless, but require prolonged rest before any hope of recovery can be entertained. Where this has occurred it is found that the boggy of depression caused by mixing advanced and early cases does not exist. The general cheerful atmosphere of the sanatorium is not affected by the increased number of bed patients, although the problem of providing the necessary suitable accommodation becomes very serious, and a constant trial to those in authority.

The division of tuberculosis institutions into two classes—one for the reception of early cases and one for the advanced cases—is impracticable, and does not produce the best results for the money expended. A better method is to segregate the patients according to the treatment they require rather than according to the extent of their lesions; the sanatorium mainly providing routine treatment, special courses of chemotherapy, and the minor surgery of collapse therapy, while the tuberculosis hospital and a special department of the municipal hospital accommodate cases requiring major surgical treatment, observation, and prolonged rest in bed prior to a period of sanatorium treatment.

While the patient requires lengthy treatment in bed it is both unnecessary and uneconomical to send him far from home into the depth of the country, for bed cases require a large, well-trained staff, which are often not easy to obtain and keep in areas remote from towns. Also patients are much happier and more contented during the period they are confined to bed if they can be visited easily and regularly without great expense to their relatives. Observation cases, too, should be in hospitals where it is easy to obtain a full and complete examination of the patient with the assistance of the expert opinion of a radiologist, pathologist, and other specialists as occasions arise, along with the close co-operation of the tuberculosis officer or the physician primarily interested in the case.

The Surgical Case

The important problem that has arisen by the extended application of major surgical treatment has to be faced by all those whose duty it is to provide treatment. This work demands the services of a surgeon with special experience, assisted by a trained staff fully conversant with the post-operative treatment and nursing of these particular cases. In order to give patients the full advantage of all the various forms of collapse therapy a specially equipped theatre and accessory rooms are essential, and necessitate great expenditure. Yet the actual percentage of cases in which major surgical treatment is possible is still very small. Extremely careful selection is most important for good results, and this selection can only be determined with the help of a modern x-ray plant and a pathological laboratory, where the staff can make the various examinations and tests which are becoming increasingly important.

After proper investigations have been made and all the pros and cons have been considered, it is doubtful if more than 2 per cent. of patients are suitable for major surgical treatment.

At the Brompton Hospital,¹ where cases are sent specially for major surgical treatment and where every facility exists for selecting cases, 1,280 cases of pulmonary tuberculosis during 1932 provided only forty-seven Stage I, forty-four Stage II, and five Stage III thoracoplasty operations, and six apicolyses. At Colindale Hospital, where all cases are carefully scrutinized for the possibility of surgical treatment, out of 752 admissions during 1933, only six thoracoplasties and three apicolyses were performed. These figures mean that approximately 98 per cent. of cases of pulmonary tuberculosis cannot be treated by thoracoplasty.

Every scheme for treatment of tuberculosis must aim at giving the best possible results in the most economical manner, and so the question immediately arises: Are all local authorities going to be involved in great expenditure so that 2 per cent. of their consumptive patients may receive the treatment necessary for their recovery, and, if so, where is this special treatment to be performed? It is only natural that a medical superintendent wishes to develop his institution so that he can follow his cases through to a successful end, and every local authority should be keen on being able to give to those under its care the advantages of modern treatment; but on the other hand it must be remembered that money can easily be wasted by isolated attempts at progress in small areas with insufficient material to justify the expenditure or to keep a special staff employed frequently enough to ensure good technique.

It is also reasonable that local authorities like to feel that they provide the necessary treatment for all types of cases within their area, and are not dependent upon the institutions of other organizations; but the tuberculosis problem is a national one, and all patients in all parts of the country should be able to obtain treatment from which they will derive the most benefit, and have the advantages of modern methods administered under good conditions.

Defects of the Present System

With the above aim in view it can easily be seen that the problem of providing major surgical treatment such as thoracoplasty, apicolysis, and adhesion section is not an easy one for councils responsible for the care of the phthisical population. The treatment is essential for recovery in a very small percentage of cases. As already pointed out, it must be carried out by a surgeon skilled in the practice of thoracic surgery, it requires special equipment and a good operating theatre adequately

staffed, and also a competent staff with modern apparatus and necessary facilities for selecting the patients and deciding that they are suitable for such special treatment. Furthermore, thoracic operations usually have to be done in stages, between which complications may arise, so that the services of the surgeon cannot be dispensed with immediately the one operation is performed, but are required for a number of weeks for each case.

It is therefore better for all concerned that the patient is near to the surgeon throughout the operation period. This usually means in a hospital near or in the large town in which the surgeon resides, which, incidentally, is generally more accessible for the visiting of most patients by their relatives, a factor which may be of great comfort to both. For these reasons it appears that unless the medical superintendent or one of his resident staff is qualified to carry out major operations and is experienced in thoracic surgery, the sanatorium situated in the country is *not* the best place for this treatment to be carried out. Even if there is a capable resident surgeon—unless he has a reputation which causes patients to be sent to the particular institution for the special treatment—it is doubtful if he will obtain sufficient practice to improve his technique.

Furthermore, the small number of cases for major operative treatment means a very considerable increase in the upkeep of the sanatorium, for a unit for thoracic surgery means an increase in the nursing staff beyond the ordinary needs of the place. When one considers that this increase of highly trained staff has to be carried continuously for the benefit of so few patients the scheme is obviously uneconomical, and not the best that can be devised for the patient. All those who have experienced the difficulties of persuading patients to submit to thoracoplasties will appreciate that the hopeful environment of a sanatorium, with its stimulating routine, encouraging the patients to look forward to a future of useful activity, does not fit in with drastic treatment by extensive operative measures. It is difficult for the selected patient to realize the necessity for such intervention when he appears to himself to be progressing favourably. In a hospital it is very different. Here the whole atmosphere leads him to think that his disease is serious. Not that the place is depressing, but the greater number of bed cases, the more frequent use of the operating theatre, and the greater frequency of all types of special treatments in the wards naturally cause a state of mind more amenable to consenting to major surgical treatment.

Essentials of a Surgical Unit

Enough has been said to show that a centre for thoracic surgery should be kept busy; therefore it must serve a large area. It must be accessible and possess a surgeon specialized in the work. To comply with such conditions in provincial districts three or four counties must arrange to send their cases to a hospital, properly staffed and equipped, in or near to a large town conveniently situated for the area. Large municipal boroughs will have sufficient cases to justify setting aside part of their general hospital for the work. After operative treatment has been completed the sanatorium in the country is the ideal place for the patient to recuperate.

The memorandum submitted to the Ministry of Health Departmental Committee by the Society of Medical Officers of Health in July, 1934,² stated that, as regards institutions for the residential treatment of tuberculosis,

"in modern construction, equipment, and treatment, there is no definable difference in principle between a small and a large institution. . . . Modern tuberculosis institutions, whether called sanatoria or hospitals, approximate closely to

the standard set by general hospitals because of recent developments in diagnosis and treatment; hence the need for providing complete facilities as regards equipment, staffing, and accommodation for carrying out these developments."

Does this mean that every tuberculosis institution, regardless of the type of case admitted, and regardless of the number of beds, be it fifty or 300, must have a fully equipped and adequately staffed operating theatre, x-ray room, and pathological laboratory costing many thousands of pounds? It is hardly possible that such lavish expenditure can be desired, yet if there is no distinction between the function of the tuberculosis hospital and the sanatorium then that must be the case. The whole idea of turning the country sanatorium into a hospital is difficult and costly, otherwise we should long ago have built all large hospitals in the country and discarded with the use of convalescent homes. Every town-dweller benefits from treatment in the country, whatever may be his disability, but it is quite unnecessary to transport him into the wilds to perform operative treatment, even if he is suffering from pulmonary tuberculosis.

On this recommendation every sanatorium would be saddled with the upkeep of a surgical unit for one or two major operations each year, which would be not only bad for the patient, owing to the lack of experience of the staff, but also a serious burden on the local authority responsible for the upkeep of the institution.

Extensive Field of Thoracic Surgery

Moreover, nobody at present can foretell the future of plastic surgery in the treatment of tuberculosis. It is still in the experimental stage. Even now the surgeons differ widely in their technique when doing a thoracoplasty, and there is considerable doubt as to the efficacy of apicolysis. Phrenic evulsion has been condemned very definitely by some distinguished thoracic surgeons, and adhesion section can produce very alarming and distressing complications.

Although some form of collapse therapy is desirable in many cases, we must proceed very cautiously when an artificial pneumothorax fails to give the desired result. Collapsing the diseased lung is a valuable mechanical process that assists the patient towards recovery, but however perfect the treatment may be, we still have to rely upon the reaction of the body tissues towards the toxic processes of the infection, and we shall not be able to claim a cure for the disease until we are able, by biological or biochemical methods, to build up with certainty the patient's resistance, and desensitize him against further activity of the bacillus.

Up to the present, tuberculosis hospitals and sanatoria have been kept specifically for the treatment of one particular (pulmonary) disease. The fear of infection has prevented any cases except those with definite tuberculous lung lesions being admitted. Surely we can take a broader view of respiratory diseases now that we are able to control the wanderings of the bacillus so effectively. Already many general hospitals have tuberculosis wards, and the tuberculosis physician and the thoracic surgeons do not confine their energies entirely to the treatment of tuberculous patients, for a thorough knowledge of the pathology, diagnosis, and treatment of pulmonary tuberculosis ensures a familiarity with the details of other chest conditions. No thoracic surgeon would be content to operate merely on tuberculous cases, and a hospital equipped for all forms of operative treatment and examination of tuberculous cases is equally capable of providing facilities for lobectomy or bronchoscopy and implantation of radium without much additional expenditure.

The Proposed "Chest Hospital"

The vision of the future, therefore, brings before us the establishment of hospitals and sanatoria for diseases of the chest—the hospitals situated near large towns and capable of dealing with all chronic diseases of the lungs, the sanatoria in the country doing minor surgery and receiving the cases from the hospitals to convalesce after major operative treatment. Just as a municipal or county sanatorium to-day serves a specified area, so the hospital would receive cases from a certain area large enough to make it an economical unit. The tuberculosis officer would become a chest specialist working in close co-operation with the medical superintendent of the chest hospital, and also controlling treatment centres for artificial pneumothorax cases requiring refills—a need which demands urgent attention—the provision for artificial pneumothorax treatment, particularly the continuation of it after leaving the sanatorium, being grossly inadequate in many parts of the country.

By this scheme the present limited future of the tuberculosis worker would be eliminated. The practice would be more attractive, because of the wider scope and better prospects afforded by the greater variation of the cases. The patient would also obtain a certain degree of satisfaction by being sent to a chest hospital instead of having to bear the ordeal, with all its unpleasant associations, of being sent to a tuberculosis institution.

Let us apply the same title as that given to the Brompton Hospital to our tuberculosis hospitals and sanatoria, and add to them the function of treating diseases of the chest. The respiratory system is a distinct and important part of the body, and those who are able to treat one of its pathological conditions are equally able to treat any other, to the benefit of all concerned.

The tuberculosis dispensary would be converted into a chest clinic completely equipped for diagnosing diseases of the respiratory system and for providing out-patient treatment for patients discharged from the hospitals and sanatoria. The need throughout the country for chest clinics constructed on the lines laid down by Ellman* is far more desirable than a large number of centres for thoracic surgery in remote sanatoria in the country. The progress of anti-tuberculosis work is being hindered by the poor facilities for the diagnosis of tuberculosis at many dispensaries, and the results of artificial pneumothorax treatment are not favoured by the difficulties patients experience in being compelled to travel long distances to attend for their refills, which are not infrequently done in the out-patient departments of hospitals by junior house-physicians who have not had the necessary experience to appreciate important details so essential for a successful result. The elimination of these undesirable conditions should be the first call upon public expenditure devoted to the fight against tuberculosis.

The development of chest hospitals and clinics for the diagnosis and treatment of chronic diseases of the respiratory system would have a further advantage in providing centres for student and post-graduate education in a comprehensive, economical, and convenient manner. The average medical student still finds it difficult to obtain a well-balanced knowledge of chronic pulmonary conditions. He finds a few cases here, and a few cases there, treated by different physicians in different hospitals, and unless he attends a tuberculosis clinic he is apt to miss phthisical cases completely. So his ideas become scrappy and disconnected, with a restricted vision of the fundamentals of thoracic diseases. The chest hospitals and clinics and the special wards in the general hospital would, by their accessibility and proximity to the medical school, become centres of training in all methods of diagnosis and treatment.

Conclusion

The results of thoracic surgery are most encouraging and the work must be supported, but there is no need to be carried away in our enthusiasm to provide surplus possibilities for the treatment of one case while there are not adequate facilities for treatment of the ninety-nine others.

In conclusion, I wish to state that the above views are my own personal opinions, and have no bearing on, or connexion with, the scheme or work of any public authority, and that I have brought them forward merely with a view to promote discussion on what I consider an interesting and important problem.

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A REVIEW OF ONE HUNDRED CONSECUTIVE GALL-BLADDER OPERATIONS

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The cases under review have all been operated on by the writer, and sufficient time has elapsed since operation to enable one to judge from a clinical standpoint the success or otherwise of the operative procedure.

In Table I the cases have been divided into four groups. Included in the first group are cases of empyema of the gall-bladder and tension gangrene of the gall-bladder, so that the term "acute" denotes the urgency of the condition rather than its duration, since many of the acute cases were associated with, or superimposed on, a chronic condition. The other three groups are self-explanatory.

TABLE I

Type	No. of Cases	Sex		No. of Deaths
		Male	Female	
1. Acute	14	5	9	3
2. Chronic cholecystitis with stones	50	4	46	6
3. Chronic cholecystitis without stones	34	6	28	0
4. Carcinoma of gall-bladder ...	2	1	1	1
Totals	100	16	84	10

Sex Incidence, Age, and Habitus of Patient

In this series 84 per cent. of the patients were females, and of these fifty-three had borne children. This corresponds with what is generally known. The average age of the eighty-four female patients was 49 years, while that of the sixteen males was 52 years. Of the whole series forty-six of the patients were of the asthenic type of bodily habitus, and fifty-four of the sthenic type.

Symptoms and Associated Lesions

In eighty-five of the cases there was a history of flatulent indigestion; thirty-three cases had suffered from attacks of biliary colic; and in thirty-one of the cases jaundice had been present either at the time of treatment or on some previous occasion. Fifteen of the patients had definite symptoms or signs of "cholecystitic heart"—namely, dyspnoea on exertion, cyanosis, oedema of the ankles, or bronchitis. Four cases suffered from attacks

of bronchial asthma. Pyelitis was an accompaniment in sixteen of the cases, and was due to *B. coli* in every instance. Duodenal ulcer was present in addition to the gall-bladder lesion in four cases. Chronic appendicitis was present in ten instances, and in one case hour-glass stomach accompanied the gall-bladder infection.

Type of Operation and Percentage Mortality

Cholecystostomy was performed in the fourteen acute cases; in the two cases of carcinoma of the gall-bladder cholecystectomy was the operation carried out; and in the eighty-four chronic cases the choice of operation performed is shown in Table II.

TABLE II

Type of Operation	No. of Cases	No. of Deaths
1. Cholecystectomy	56	4
2. Cholecystectomy with drainage of the common bile duct	3	1
3. Cholecystostomy	25	1
Totals	84	6

In the acute cases there were three deaths out of fourteen, a mortality of 21 per cent. The cause of death in two cases was peritonitis, and in the third myocarditis. All three patients were over 68 years old. In the eighty-four chronic cases the mortality rate was 7 per cent. In two cases the cause of death was a technical error—namely, ligation of a crushed cystic duct with necrosis at the site of the ligature and extravasation of bile into the peritoneal cavity on the eighth and tenth days after operation respectively. Pulmonary embolus accounted for another fatality, and subphrenic abscess for a fourth. The remaining two deaths occurred in patients over 70 years of age, and were due to myocarditis and bronchitis respectively.

Pathology and Late Results in the Chronic Cases

In fifty of the eighty-four chronic cases stones were present, and in these the gall-bladder, if removed, was not examined microscopically, stone formation being sufficient evidence of a diseased organ. In the remaining thirty-four cases in which the gall-bladder was removed histological examination was carried out, and the results are tabulated below.

TABLE III

Gall-stones {	single	...	...	...	13 Cases
	multiple	...	...	...	37 "
					50
Chronic cholecystitis					22 Cases
Cholesterosis and fibrosis					12 "

Associated liver changes were noted at the time of operation in forty-six cases. The liver showed "whitening" in the region of the gall-bladder, and this discoloration was of value in determining cholecystectomy when the gall-bladder did not appear to be grossly diseased to naked-eye inspection. (E. S. Judd, writing in the *Mayo Clinic Collection* of 1930, states: "Hepatitis may occur as a primary condition, and the symptoms which result from it are similar to those of cholecystitis. Furthermore, removal of the gall-bladder in these cases of primary hepatitis will relieve the symptoms.")

There is still a difference of opinion regarding the effects on the health of the patient of removal of the gall-bladder. This review was undertaken with the aim of finding out the late clinical after-results of cholecystectomy as compared with those after cholecystostomy. The recurrence of previous symptoms, the onset of new