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The Sanatorium Today

One of the popular pastimes among health professionals in recent years has been to ask their colleagues connected with tuberculosis sanatoria what they can do for an encore, or if in fact there should be an encore. The question is not a simple one to answer. We have witnessed the phasing out of these institutions all over North America because of the tremendous progress in the treatment of tuberculosis in the last twenty years. Phasing out has been considered to be progress and in most respects it has marked, in substantial and measurable terms, the advance that modern medicine has made against what Osler called the "Captain of the Men of Death". But, is tuberculosis a disease of the past and are special treatment facilities an anachronism? What are the needs of today and where do institutions like the Nova Scotia Sanatorium fit in?

In the quest for an answer it is worthwhile to look at history, particularly the history of the Nova Scotia Sanatorium since it has been so closely allied with the history of tuberculosis in this century. The institution was founded in 1904 as a small cottage type of hospital, patterned after similar institutions founded in upper New York State a few years earlier. The "cure" consisted of bed rest, diet and fresh air, and there was the probability of confinement for a period of years with little hope of returning home to live a completely normal life. The First World War years saw a great expansion of facilities, and many of the familiar brown wooden buildings in use today were built during this period. The census rose to about 400 patients then, and did not vary substantially from that level until well into the 1950's. The first definitive treatment, surgery, was introduced at the Sanatorium in the 1930's and it was then that the most recent patient treatment facility was constructed. During this same period, it was decided to decentralize to some extent, and tuberculosis

units were opened at various places throughout the province. However, the Sanatorium remained the main treatment facility and all surgery was referred there. The great breakthrough came in the late 1940's with the discovery of streptomycin, followed by other tuberculostatic drugs. In the decade of the 1950's and early 1960's the numbers of patients in sanatoria all over North America decreased substantially. The impact was felt in Nova Scotia by the closing of the regional treatment facilities and a reduction in the patient load of the Sanatorium of nearly 75%. At the same time, the length of stay was reduced from years to months with the prospect that the patient would return to a productive life. In order to make use of idle capacity, it was decided that Sanatorium facilities could be made available for non-tuberculous patients, on a referral basis, for investigation of respiratory diseases. At the present time, the Sanatorium is admitting approximately 400 patients per year, 200 with non-tuberculous conditions. However, these non-tuberculous patients account for only 15% of the 50,000 annual patient-days.

The current debate about returning tuberculosis to the mainstream of medicine has far-reaching implications and the most important consideration has to be the patient. The approach to the treatment of choice has to consider the method that will return him to a normal and productive life in the shortest period of time, at the lowest possible cost, and with the greatest potential for receiving continuing care as necessary. The experience in some jurisdictions where sanatoria have been phased out completely has been chaos since inadequate preparation had been made to ensure that the interest, fund of knowledge, and experience in tuberculosis were continued. Change is imminent and necessary, but great care must be taken to ensure that the baby is not thrown out with the bath water. While the

question as to who can or should say what the encore should be must yet be settled, it is certain that the following points must be given serious consideration:

i. Although the incidence of tuberculosis has declined markedly in recent years, it is still the greatest communicable disease problem in Nova Scotia, requiring the availability of 100 to 150 hospital beds on a continuing basis;

ii. The supply of medical and paramedical personnel, experienced and versed in the current treatment of tuberculosis, is dwindling and these people can be held together only if centralized treatment facilities are available;

iii. Apart from the mental and federal hospitals in Nova Scotia, the Sanatorium is the only institution

with experience and a tradition of quality in medium- to long-term hospital care;

iv. At an optimum scale of operation, a medium- to long-term hospital can offer economic advantages that are not attainable or apparent in short-term general hospitals;

v. The optimum size can be reached by an expanded role as a provincial or regional referral centre for non-tuberculous respiratory disease and other chronic hospital care;

vi. A sanatorium program, properly planned and utilized, will complement rather than duplicate other treatment facilities and will be an integral part of a co-ordinated health care delivery system. □

P.S.M.

NOTICE OF MOTION

Be advised that it is the intention of the By-Laws Committee to present amendments to the By-Laws of the Medical Society of Nova Scotia on the occasion of the 7th Meeting of Council, November 25, 26, 27, 1971 for approval. Amendments are as follows:

1. That provision be made for a category of Student Membership in the Medical Society of Nova Scotia for 1st, 2nd, 3rd, 4th, and 5th year medical students (including interns), studying in Nova Scotia; such Student Members not to have voting privileges except as follows:

(a) 1 such Student Member, appointed by the Dalhousie Medical Students' Society, to represent each of the 5 student years as a voting member of Council.

(b) 1 voting Student Member, recommended by the Dalhousie Medical Students' Society, appointed to the Executive for from 50 to 100 student members, with one additional voting appointee for from 101 to 200 Student Members, and a second additional voting appointee for from 201 to 300 Student Members, for a maximum representation of three. Should the Student Membership number less than 50, a non-voting observer only may be recommended by Dalhousie Medical Students' Society for appointment to the Executive.

(c) That the eight Medical Student Members having votes at Council be voting members at the Annual Meeting also.

2. That the annual student-membership dues for the Medical Society of Nova Scotia be as determined by the Executive Committee from time to time.

3. That Student Membership on Medical Society Committees shall be as determined by the Executive Committee from time to time.

4. That all living Past Presidents be members of Council.

5. That Chairmen of C.M.A. Councils, when they are ordinary members of the Medical Society of Nova Scotia be members of Council.

6. That the Chairman of the Provincial Health Council, if a regular member of the Medical Society of Nova Scotia be a member of Council.

7. That the Dalhousie University Vice-President for Health Sciences if a regular member of the Medical Society of Nova Scotia be a member of Council. □

D.D. Peacocke
Executive Secretary.



A New Health Team Member: The Physician's Assistant

W. A. Cochrane, M.D., F.R.C.P.(C),*

Calgary, Alberta.

The need for a new category of health worker, referred to as the physician's assistant, has been much discussed in North America recently. A national Conference was held in Ottawa in April, 1971 to "determine the need for assistance to the physician in meeting the increasing demands for health services and to determine the complementary roles and responsibilities of the medical and nursing professions in meeting this need."

There is little question that new approaches to the delivery of health care must be considered. The radius over which the physician can exert his influence has been steadily shortened as a result of many factors, including expansion of medical knowledge by biomedical research and increased demand for medical services as a result of expanded pre-paid medical insurance. Factors affecting the personal life of the physician, including family responsibilities and the need to keep up with developments in medical science, have resulted in his awareness that he may not be able to respond to the growing demands for his services.

Development of the Physician's Assistant

Few would argue with the need to develop better clinical support "systems" to help physicians deliver more units of personal health service per hour of their working day.

One such system is the expansion of non-medical health personnel to serve as immediate extensions of the physician by performing functions normally performed by physicians only.

The Soviet Union has effectively utilized "feldshers", or physician's assistants, since the 17th century when Peter the Great introduced the concept from observations of European military medical personnel or barber-surgeons. Today in the USSR, approximately 30,000 "feldshers" graduate yearly, along with 28,000 physicians. Feldshers receive approximately 2½ to 3 years training after completing their secondary school education.

In 1965, Duke University in the United States initiated a Physician's Assistant training program of two years duration, requiring applicants to have a high school diploma and

at least one year as a military medical corpsman. Preference is given to applicants with two years of college experience. In the United States there are now over 68 programs training "physician assistants" and 15 more being planned. These programs include assistants of various types including general physician's assistants, paediatric nurse practitioners, urology assistants, orthopedic and emergency assistants, surgical assistants and pathology assistants.

In Canada programs are being considered and planned at all 16 medical schools, the Dalhousie Outpost Nursing Program probably being the most advanced and comprehensive.

Types of Assistants

Physician's Assistants might be considered under three types or categories.

Type 1 would be an individual capable of approaching a patient and obtaining historical information and carrying out a general physical examination. Information would be summarized and presented in such a way as to allow the physician to visualize the medical problem and to determine appropriate diagnostic and therapeutic steps. The assistant would have skills that would allow him to assist the physician in performing certain procedures and in some cases to carry out tasks without the immediate surveillance of the physician. Such an individual would therefore be able to collect, integrate, and interpret findings on a basis of general medical knowledge and to exercise a degree of independent judgment. They might counsel patients regarding diet, alcohol, drugs, and contraceptive methods; they might also advise and assist patients with certain psychosomatic complaints. Simple laboratory procedures including blood counts, urinalysis, EKG recordings, venipuncture, and Pap smears could be done by the assistant. They would be responsible to a physician, whether located in the physician's office or in a geographic location several miles from a physician.

The *Type 2* assistant would not be equipped with the general knowledge and skills to cover the whole range of medical care but would possess exceptional skills in one clinical specialty or in certain procedures within a speciality. This assistant would be less qualified for

*Dean of Medicine, Faculty of Medicine, The University of Calgary.

independent action but might have a greater degree of skill in a particular area than the Type 1. Such an individual might include a urology assistant to oversee a renal dialysis unit, a midwife, or a cardiology or pulmonary assistant supervising special units in a hospital and in a home.

Those of *Type 3* would carry out a number of tasks assigned by the physician but would not have the general knowledge or skills to act independently or to integrate information. Such individuals would be comparable to the present-day Nursing Aid. Many physicians have trained and utilized similar personnel in their offices for many years and have recognized their great value and assistance.

In Canada discussions regarding the Type 1 assistant have only recently been considered, with a growing conviction that the graduate nurse is the logical person, after further specialized training, to assume this new role. While this proposal is appropriate, consideration should also be given to the training of individuals whose background may not have included nursing training. The long hours, the physical endurance required, the need for continued and sustained practice, and a greater experience in a non-hospital setting might suggest that young men completing high school or certain college programs should be recruited into this new position of medical auxiliary.

Problems to be solved

Advocates and adversaries of the "physician's assistant" concept have both commented on various problems that may occur.

Whether the public will accept such individuals has been questioned. From experience in other countries, and studies done in the United States, it would appear that this is not likely to be a major problem.

The meaning of any legislation covering the utilization of such persons providing medical services in different provinces must be quite clear; any looseness or lack of clarity might otherwise engender excessive flexibility and strained interpretation that would jeopardize the quality of health care now being provided. The medical profession must maintain responsibility for these individuals who will be providing medical services.

Before Canada embarks on a mass training program a clear outline of the objectives and the methods to evaluate the results and the objectives should be available to avoid a "health risk" to the public. The use of assistants to obtain historical information and examine patients, and to provide information to the physician, will likely provide more time for the physician, but may also provide some risks. Is it possible, for instance, that certain basic skills may be lost to the physician if he is not directly and continually practicing the basic procedures of medicine, namely history taking and general physical examination?

Remuneration for this new kind of health worker has not been delineated. Is it expected that the physician will provide a salary out of the present fee-for-service schedule? Will the physician's assistant be able to charge for his services through the responsible physician or independently? Will physician's assistants be employed on a salary provided to the physician by provincial medical insurance programs? How significantly will the cost of health services be affected by the expansion in numbers of this new type of health worker?

There are many questions yet unanswered, but a new and open-minded look must be taken at this one aspect of a complex system to ensure high quality and efficient health services that will respond to the needs and expectations of the Canadian people.

Please

At this time, there are approximately 40 members of the Medical Society who have not paid their dues for the fiscal year ending September 30, just past. This deprives the Society of loss of operating revenue of about \$5,000, not to mention loss of revenue that would accrue as a result of investing dues that the By-Laws "require" paid in the first six months of the fiscal year. Those of you who have been so busy with your practice and have neglected this item are encouraged to give it your immediate attention.

The costs of operating the Society continue to rise despite all efforts to contain them. The reasons for this were discussed in depth at your recent Branch meeting. The investment earnings of the Society are, surprisingly, fairly substantial and contribute to holding dues increases to the reasonable levels. These earnings could be nearly doubled if all members would give this matter prompt attention on receipt of the first billing. The cost of 2nd, 3rd, 4th, and 5th billings plus reminder correspondence is an ever-increasing cost that could easily be eliminated with your co-operation. What a pity that so much of your Society funds should fall into the hands of that all consuming monolith — the Post Office of Canada.

D.D.P.

THE 7th MEETING OF COUNCIL
AND
THE 118th ANNUAL MEETING
OF
THE MEDICAL SOCIETY OF NOVA SCOTIA

November 25-27, 1971

Thursday — November 25th

2:00 p.m.- 5:00 p.m.	Council	Lord Nelson Hotel
8:00 p.m.-11:00 p.m.	Reunion Reception	Lord Nelson Hotel

Friday, November 26th

9:00 a.m.-12:00 p.m.	Council	Lord Nelson Hotel
12:00 p.m.-12:30 p.m.	Annual Meeting	Lord Nelson Hotel
12:30 p.m.- 2:00 p.m.	Mixed Luncheon	Lord Nelson Hotel
2:00 p.m.- 4:30 p.m.	Council	Lord Nelson Hotel
4:30 p.m.- 5:00 p.m.	Annual Meeting	Lord Nelson Hotel
7:00 p.m.- 8:00 p.m.	President's Reception	Lord Nelson Hotel
8:00 p.m.- 1:00 a.m.	Banquet and Ball	Lord Nelson Hotel

Saturday, November 27th

9:00 a.m.-11:00 a.m.	Council	Lord Nelson Hotel
11:00 a.m.-11:30 a.m.	Minister of Public Health	Lord Nelson Hotel
11:00 a.m.-12:30 a.m.	Annual Meeting (Final Session)	Lord Nelson Hotel
2:00 p.m.-	Executive Committee Meeting	Sir Charles Tupper Medical Building

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The Treatment of Tuberculosis—1971

E. W. Crosson, M.D.,* and H. M. Holden, M.D., C.R.C.P.(C)†,
Kentville, N.S.

Summary: *The treatment of tuberculosis in 1971 is outlined. Reference is made to the situation 25 years ago, when approximately 30% of patients died of the disease. A new era dawned with the discovery of streptomycin. The use and the effects of this drug and that of PAS and INH, the other "first line" drugs, is discussed, and then the place of the "second line" drugs is outlined. The indications for surgery in tuberculosis and the reasons why treatment of the tuberculous patient should be started in a tuberculous hospital are also presented.*

A new era began when streptomycin was introduced as the first drug of clinical value in the treatment of tuberculosis. In February, 1947, a patient at the Nova Scotia Sanatorium became the first patient in the province to be treated with streptomycin, and he made a dramatic recovery, although almost moribund due to airway obstruction resulting from endobronchial disease.

Until this time, the treatment of pulmonary tuberculosis was based largely on bed rest combined with various measures designed to collapse and rest the affected lung. These methods included artificial pneumothorax, pneumoperitoneum, phrenic crush or evulsion, in order to paralyze the diaphragm on the affected side, and thoracoplasty. While these earlier forms of therapy met with considerable success, and were often lifesaving, treatment was prolonged, the hospital stay averaging two and one-half years. It was tedious and relapses were not infrequent. Most important, 25-30% of patients admitted to sanatoria died of the disease. The prognosis was equally discouraging in extrapulmonary disease: tuberculous meningitis was a fatal illness; tuberculosis of the bones and joints was a permanent disabling illness in many patients; and tuberculosis of the urinary tract was often relentlessly progressive, nephrectomy being then a common operation.

All this changed with the advent of drug treatment, and during the succeeding 25 years amazing progress has been made in the treatment of tuberculosis. Streptomycin (SM) was followed by paraminosalicylic acid (PAS) in 1949, and isoniazid (INH) in 1952. The last name proved to be the most effective of the three, and is still the best drug in common use today. PAS is a relatively weak drug but does prevent the emergence of resistant bacilli when given in combination with streptomycin and/or INH. As a result of therapy with drugs, the 33% mortality rate of 25 years ago has been reduced to practically zero, and the relapse rate in patients who have faithfully continued a course of treatment has dropped to less than 2%. Most tuberculous patients can now look forward to complete recovery with

the expectation of returning to their former occupations and ways of life.

Other effective antimicrobial agents include pyrazinamide (PZA), cycloserine (CS), capreomycin (CAP), ethionamide, viomycin, kanamycin, ethambutol (EMB), and finally, rifampin. The last named is still an investigational drug in Canada, but has been released recently in the U.S.A. It has been studied extensively and has been on the market for some time in certain European countries. Rifampin has proved to be a very powerful drug, certainly the most effective since the introduction of isoniazid, and indeed, may prove to be the best of all.

Antituberculous drugs, however, are not without hazard so far as adverse reactions and side effects are concerned. Sometimes it is difficult to establish a suitable program of therapy in a given individual owing to intolerance to multiple drugs.

Standard Drug Therapy

In the newly diagnosed case, it is our usual policy to initiate treatment with triple chemotherapy in the form of streptomycin, PAS and INH. *Streptomycin* is given in a dosage of 1 gm daily by intramuscular injection to patients who are under the age of 40 years, later decreasing to 1 gm thrice weekly, while older individuals, unless they are seriously ill with tuberculosis, receive 1 gm three times weekly, the duration depending on progress. In the younger person, streptomycin is continued daily through a period averaging six months, and it is much more effective if it can be continued on this basis. Streptomycin sometimes damages the vestibular branch of the 8th cranial nerve causing disturbances of balance; this is more apt to occur in older patients, and occasionally the drug must be discontinued after only three or four injections. Allergic reactions can also occur, and desensitisation may then prove successful.

PAS not infrequently causes gastrointestinal toxicity, and it is contraindicated in patients who suffer from gastric or duodenal ulcer, and even in those who give a history of peptic ulceration. It is usually administered as the sodium

*Physician, Nova Scotia Sanatorium.

†Medical Director, Nova Scotia Sanatorium.

salt, each tablet containing 0.69 gm; 20-24 tablets must be given daily in order to achieve a dosage equivalent to 16 gm of the acid. This medication is usually given in divided doses at breakfast and supper time but can be given in a single dose in the morning. Occasionally a patient may tolerate Calcium B PAS when unable to tolerate the sodium salt. Those patients who require a low sodium diet must also take the calcium salt. This is manufactured in 1 gm tablets, 12 of these constituting the usual daily dose. The potassium salt is another alternate.

INH is administered in the form of a tablet containing 300 mg, given once daily in the morning. If used in large doses, INH may cause peripheral neuritis, and it is wise to administer pyridoxine to patients who are prone to neurological disorders, including diabetics and chronic alcoholics. INH can also cause severe liver damage. However, it should be emphasized that this drug is the most important of these three medications, and that by giving these three agents in combination the problem of drug resistance is usually forestalled. If only two are given, and the organism proves resistant to one of the pair, by the time sensitivity results are available, resistance to the other drug will have developed. Fortunately, drug resistance is comparatively rare in Canada in cases being treated for the first time, and this triple drug regimen is highly successful. In a straightforward, uncomplicated case, the patient receives these three drugs throughout hospitalization. At the time of discharge, it is customary to discontinue streptomycin, carrying on with INH/PAS therapy at home for a variable period. Most often, treatment continues for a total period of two years, frequently with INH alone during the final few months.

Value of "Second Line" Drugs

In patients in whom treatment has failed, and in cases with drug toxicity, certain "second line" drugs assume particular importance. Thus, *ethambutol (EMB)* is a satisfactory substitute for PAS in those who have gastrointestinal complications or other side effects. It is provided in 400 mg tablets, and is administered in a dosage of 25 mg/kg for the first two months, and 15 mg/kg for the remainder of the treatment period. Unfortunately, optic neuritis may occur with EMB; careful ophthalmoscopic monitoring is required, preferably at monthly intervals, with regard to visual acuity, peripheral vision, and colour perception. A slight change in ability to read the letters on the Snellen chart may be the first indication of difficulty, but there may be subjective complaints such as blurring and distortion of vision. It has been stated that the neurological damage is readily reversible,¹ while others, however, are more wary;² in our experience we have noted that one 60-year old man took several months to recover from visual toxicity of sudden onset.

Rifampin is being used in primary treatment of an investigational basis, being given in combination with INH and also with INH and SM, as part of a country-wide trial. However, until the present, it has been used chiefly in re-treatment cases where the organisms have become

resistant to isoniazid. For this purpose, it has been given in combination with EMB and dramatic results have been achieved in some patients in whom all other possible drugs had been given. Rifampin is manufactured in tablets each containing 150 and 300 mg. It is given in a dosage of 450-600 mg daily one hour before breakfast. It has been proved to be relatively free of side effects, though it has been known to cause liver damage as well as haematological disorders, and it has not been cleared so far as teratogenic effects are concerned. Its use in this country is limited to male adults, and those females who have passed the child-bearing age, unless it is required as a life-saving measure.

Brief mention will be made of the other alternative drugs, all of which are weaker. *Pyrazinamide* is given in a dosage of 500 mg twice daily. It may cause hepatitis and hyperuricemia with actual symptoms of gout. *Cycloserine* is given in a dosage of 250 mg twice daily; it is quite toxic so far as the nervous system is concerned, sometimes causing rather bizarre types of psychosis, or aggravation of pre-existent epilepsy, and at times peripheral neuritis may develop. *Capreomycin* is administered by the intramuscular route, in a dosage of 1 gm five times weekly; its toxic manifestations resemble those of streptomycin, with the additional effects of possible potassium depletion. *Kanamycin* is also given by the intramuscular route, and its chief undesirable side effect involves the auditory part of the 8th nerve; it is not a common antituberculous agent. *Viomycin* is rarely used today; again, it is given by the intramuscular route, in a dosage of 2 gm twice weekly; it may affect the sense of hearing in addition to causing kidney damage. *Ethionamide (ETA)*, an effective antituberculous drug, is difficult to tolerate from a gastrointestinal standpoint, while neurological disorders and depression may also occur; it is best given in divided dosage at supper and bedtime, sometimes with an antinauseant, starting with a total dose of 500 mg but increasing to 750-1000 mg if possible. Early warning of possible drug toxicity from all these "second line" drugs may be obtained by determining both renal and hepatic function periodically as well as the hematological values.

Indications for Surgery

During the acute phase of the illness, bed rest is still of importance. Once symptoms have subsided the patient can be quite active, bed rest being less important.

The surgical treatment of tuberculosis underwent a radical transformation following the introduction of the antimicrobial agents. Pneumothorax, phrenic crush, and pneumoperitoneum were abandoned, while thoracoplasty is now rarely performed. With drug coverage, it became possible to carry out pulmonary resection safely, and this is the operative procedure that is employed today. Resectional surgery is indicated in those patients who have localized residual disease following a preliminary period of drug treatment and in whom there is persistent cavitory disease, or a large area of fibrocaceous disease and/or bronchiectasis. Social factors are sometimes of importance

in electing surgery. The operation can consist of a wedge resection, segmental resection involving one or more segments, a lobectomy, and, in very rare instances, a pneumonectomy. Drug treatment does not end at this point, but must continue post-operatively.

In our view, treatment should begin in a tuberculosis hospital for the following reasons:

- i. to establish a definite diagnosis;
- ii. to initiate a suitable program of drug treatment;
- iii. to protect family and friends during the infectious stage of the illness;
- iv. to educate the patient regarding tuberculosis, and in particular, to stress the importance of taking his and her medications, not only in hospital, but particularly in the months following discharge. Many relapses are due to failure of the patient to take his pills regularly;
- v. proper management of co-existent conditions, such as diabetes mellitus, cardiac disease with congestive failure, hypertension, pregnancy.

Extrapulmonary Tuberculosis

With regard to the other forms of tuberculosis, drug therapy has revolutionized the outlook just as much as in pulmonary disease, and treatment is administered in a similar way. Surgery is rarely required in bone and joint tuberculosis, with the exception of the occasional spinal fusion for tuberculous spondylitis. Tuberculosis of the urinary tract responds very adequately to drug treatment, but total or partial nephrectomy is still necessary on occasions to fully control the disease.

If treated promptly, the prognosis in tuberculous meningitis is favourable. A delay may cause irreversible brain damage, if the patient survives. If meningitis is present, and there is any doubt as to the etiological agent, there should be no hesitation in initiating antituberculous treatment. Certainly, it can do no harm in such instances. Additionally, it should be pointed out that isoniazid is available in an injectable form and can be administered both intramuscularly and intravenously in emergency situations.

When the patient returns home to the care of the family doctor, the need for continuing treatment cannot be over-emphasized. Clinical assessment and x-ray examination should be done at regular intervals, usually every three months until treatment is complete. At the time of a respiratory infection, it may be advisable to carry out an extra examination. Follow-up sputum tests are also important, as reactivation may manifest itself by positive sputum prior to any radiological evidence of extension of disease.

A final comment: steroid therapy is of value in certain acute forms of tuberculosis, particularly tuberculous meningitis and miliary tuberculosis; in addition, steroids have

been used as an adjunct to triple therapy in the hilar lymphadopathies of primary infection.³

It is beyond the scope of this paper to discuss the re-treatment, drug-resistant case; an excellent summary of the present position has recently been presented.⁴ □

References

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Steroids and Tuberculosis – A Two Edged Sword

H. M. Holden, M.D., C.R.C.P.(C)*,

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Summary: *Corticoids are valuable in the treatment of certain acute, life-threatening forms of tuberculosis. Very different is their effect in the unsuspected and therefore untreated cases of tuberculosis. Latent tuberculosis may be activated in such cases by long-term steroid therapy given for nontuberculous disorders, corticosteroids sapping the host resistance in all forms of tuberculosis if anti-tuberculous therapy is not given simultaneously. The experience of this aspect of steroid therapy gained at the Nova Scotia Sanatorium over the past 20 years has been reviewed in order to assess the situation. 14 cases form the basis of the review; four groups of cases are recognized. These are: reactivation of disease in the previously diagnosed case, activation in tuberculin reactors with normal x-rays, sarcoidosis, and the case of the mediastinal mass. Recommendations are made for the prevention of the special hazards of steroid therapy in these groups of patients.*

It is well recognized that corticosteroids are of benefit when combined with chemotherapy in the treatment of certain forms of tuberculosis. This applies especially to tuberculous meningitis, acute miliary tuberculosis, tuberculous pleurisy with effusion, and fulminating tuberculous pneumonia, while they are also of value in the treatment of tracheobronchial lymph node tuberculosis.

However, the adverse effects of non-specific steroid therapy on undiagnosed, untreated tuberculosis cannot be over-emphasized. This applies also to the former patient who has been classified as inactive, and in whom activity may flare up if steroid therapy is commenced for the treatment of some unrelated condition, without antituberculous drug coverage. Similarly, the individual in the grouping of "presumed pulmonary tuberculosis inactive" (no history of treatment or positive sputum but suspicious x-ray findings), and the tuberculin reactor with a negative chest film, are subjected to the same hazard. Antituberculous therapy is therefore recommended in all these instances if steroid therapy is to be employed.

In Addison's disease, replacement therapy is mandatory. This condition is frequently of tuberculous origin but once any possible active tuberculous infection has been adequately treated, there is no need to continue antituberculous therapy, as the small dose of the steroid drug does not exceed the amount produced by normal adrenal glands and hence does not present the danger of the larger nonspecific therapeutic dosage.

Activation of pulmonary tuberculosis by steroid therapy

During the last twenty years, 14 patients have been admitted to the Nova Scotia Sanatorium with active

pulmonary tuberculosis, which was considered to have been precipitated by the administration of steroids for the treatment of other conditions (Table). They fall into four groups.

Group A: Reactivation of disease in the previously diagnosed case.

Four of these patients had received previous treatment for tuberculosis, and a fifth was known to have had a primary complex for a period of some years. A sixth patient was treated with steroids for a period of five years prior to a survey film which disclosed bilateral disease, and sputum was positive for *Mycobacterium tuberculosis*; review of an earlier film revealed disease in the right apical region prior to the start of steroid treatment. This patient required pulmonary resection and made an uneventful recovery. It was necessary to continue steroids owing to the severity of his arthritic state. The other five patients in this group also showed a satisfactory response to antituberculous therapy, but Case 4 required bilateral resection.

These six patients exemplify the previously diagnosed case in which reactivation of tuberculosis by steroid therapy is a well known but sometimes forgotten hazard.

Group B: Activation of disease in tuberculin reactors with normal x-rays.

Cases 7-11 inclusive consist of patients who were known to have had chest films in the past, presumably with normal findings, for respectively 12, 48, 15, 11 months, and for an unknown length of time, prior to initiation of cortisone therapy. In none was there any record, however, that a tuberculin test had been done. Presumably, they were tuberculin reactors who developed active disease as a result of steroid therapy. It must be stressed that a tuberculin test should be done before commencing long term

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TABLE
Patients with tuberculosis precipitated by steroid therapy

Case	Nontbc. Diagnosis	History of Tb. treatment	Previous x-ray findings	History of steroids	Tbc. Diagnosis	End Result
1. F.W. (F,41)	Angioneurotic oedema	Yes	Inactive 18 mos.	6 mos.	Min. reactivation 0*	Inactive
2. G.V. (M,61)	Osteoarthritis	Yes	Thoraco. unchanged 15 yrs.	12 mos.	Mod adv. thoraco. reactivation +*	Inactive
3. S.K. (M,67)	Chronic nephritis c̄ nephrotic syndrome	Yes	Mod. adv. Inactive 16 yrs.	2 mos.	Far adv. bilateral +	Inactive
4. D.L. (F,41)	Acne	Yes	Minimal Inactive 10 yrs.	3 mos.	Minimal bilateral +	Inactive (bilateral resection)
5. E.G. (F,53)	Osteoarthritis	No	Primary calcif. many yrs.	6 mos.	Far adv. bilateral Tb of knee joint Urinary tb. +	Inactive
6. R.R. (M,52)	Rheumatoid arthritis	No	Minimal 5 yrs. not treated	60 mos.	Mod. adv. bilateral +	Inactive (lobectomy)
7. B.H. (M,41)	Bronchial asthma	No	Neg. 1 yr. prev.	6 mos.	Far adv. bilateral +	Died
8. E.M. (F,62)	Rheumatoid arthritis	No	Neg. 4 yr. prev.	24 mos.	Far adv. bilateral +	Inactive
9. A.L. (M,62)	Rheumatoid arthritis	No	Neg. 15 mos. prev.	24 mos.	Mod. adv. left +	Inactive
10. M.L. (F,42)	Cirrhosis Portacaval shunt & splenectomy	No	Neg. 11 mos. prev.	21 mos.	Mod. adv. right +	Inactive
11. P.M. (M,30)	Haemolytic anaemia Imbecility Diabetes	No	Unknown	4 mos.	Acute miliary c̄ multiple cerebral lesions +	Died
12. M.H. (F,41)	Sarcoidosis	No	Diffuse nodulation 1 yr.	11 mos.	Miliary & laryngitis +	Inactive
13. M.G. (F,27)	Sarcoidosis	No	Exudative disease 1 yr.	6 mos.	Far adv. bilateral +	Inactive (plombage)
14. M.M. (M,29)	Lymphoblastoma	No	Mediastinal mass	5 mos.	Far adv. bilateral Tbc. spondylitis c̄ paravertebral abscess Broncho-oesophageal fistula +	Inactive (spinal fusion)

* + = m. tuberculosis present
0 = m. tuberculosis absent

steroid therapy even in the presence of a negative chest film, and that INH should be administered to reactors so long as they are receiving steroids.

Two patients in this group died of tuberculosis. Case 7, a severe asthmatic, died 38 months after admission. Case 11, who died 16 hours after admission, was an imbecile who had received immunosuppressive therapy together with cortisone for the treatment of haemolytic anaemia. Autopsy disclosed acute miliary tuberculosis with brain involvement.

Group C: Activation of disease in patients with sarcoidosis.

Cases 12 and 13 presented complicated situations in which biopsies supported a diagnosis of sarcoidosis. Case 12 was a tuberculin reactor who was given steroids for a period of eleven months, ultimately being diagnosed as a case of miliary tuberculosis and tuberculous laryngitis. Case 13 was a negative tuberculin reactor (250 units PPD) who received steroids for approximately six months before a diagnosis of tuberculosis was established. No doubt she had been rendered anergic to tuberculin by the co-existent sarcoidosis. Steroid therapy activated the tuberculous process already present and this became the predominant factor. Ultimately, the outcome was favourable in both instances.

Group D: Activation of disease in the patient with a mediastinal mass.

Tuberculosis must be considered in the differential diagnosis of a mediastinal mass, as illustrated by Case 14, in which steroids were administered for the treatment of a "suspected lymphoma"; the outcome was almost a disaster. The actual diagnosis proved to be tuberculous spondylitis with paravertebral abscess formation, and the patient developed a fulminating form of pulmonary disease complicated by a broncho-esophageal fistula and was critically ill at the time of admission to the Sanatorium. The fistula closed following a long period of Levine tube feedings. Later, a spinal fusion was performed, and he made a satisfactory recovery.

Discussion

14 cases have been presented in order to illustrate the way in which corticosteroid drugs can reduce the host susceptibility to tuberculosis. This can occur in the individual who gives a history of previous treatment, or in whom there is radiological evidence of primary calcified or presumed inactive disease (Cases 1-6). It can also occur in tuberculin reactors who have no other evidence that viable tubercle bacilli are harboured within their bodies (Cases 7-11). When definite pulmonary changes are seen in the roentgenogram, and these are considered to be non-tuberculous in origin, both the possibility of mistaken diagnosis and the fact that tuberculosis is frequently a co-existent disease should be kept in mind (Cases 12 and 13). In such cases, if steroids are to be administered, it can do no harm, and it may prevent an unfortunate occurrence, if isoniazid also is given. This is true even in the

tuberculin-negative person who may have been rendered anergic to tuberculin especially if sarcoidosis is present.

The approach to treatment with steroids on a long-term basis may be summarized. Tuberculin testing and a chest film should form part of the pre-treatment study of the patient in whom long-term steroid therapy is under consideration. If then steroid therapy is elected in a patient who formerly had tuberculosis but who has been classified as inactive, or whose x-ray findings are suspicious, or who is a tuberculin reactor with a negative chest film, chemoprophylaxis should be administered as follows:

- i. To the tuberculin reactor: INH 300 mg, once daily;
- ii. To the patient previously treated, or with evidence of inactive tuberculosis: INH 300 mg once daily, with a second antituberculous drug, at least until sputum tests have been reported and active disease has been excluded;
- iii. In the case of the patient with active tuberculosis, the adverse effects of steroids will be prevented by the simultaneous administration of effective chemotherapy, as determined by drug sensitivity studies.

Finally, steroid-treated patients should have chest films regularly, even if these patients are tuberculin-negative, for steroids themselves may render the tuberculin test nonreactive. □

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Corticosteroids in the Treatment of Tracheobronchial Lymph Node Tuberculosis: A Report of Eleven Cases

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Summary: *The particular destructive effects of primary infection tuberculosis of the tracheobronchial lymph nodes on the bronchi and lungs are first described. The resistance to standard chemotherapy is emphasised, and the development of steroid therapy for this form of the disease is discussed. The use of prednisone for tracheobronchial lymph node tuberculosis at Nova Scotia Sanatorium is reviewed, two case reports illustrating the value of this form of therapy in hastening resolution of adenopathy. The place of bronchoscopy prior to therapy, and the significance of tracheobronchitis, which also responds to prednisone, are emphasised.*

The treatment of primary infection tuberculosis usually presents relatively few problems. An important exception is the lymph node component of the primary complex.¹ Enlarged caseous nodes can wreak havoc on the adjacent bronchi, and during the development of the primary complex, the enlarging lymph node may cause compression of the bronchus, leading first, to an obstructive emphysema and then, with complete occlusion of the bronchus, to atelectasis of the corresponding lobe or segment. Even though the tuberculous component then becomes inactive and the node undergoes calcification, permanent damage may have been done to the lung. In our experience at the Nova Scotia Sanatorium, the indication for pulmonary resection in 20 children was irreversible damage to a lobe or segment caused by previously enlarged tuberculous lymph nodes.²

Sometimes, the tuberculous gland will not undergo regression but, rather, will rupture into the bronchus, discharging its caseous material directly into the segment or lobe supplied by this bronchus.¹ This may result in tuberculous pneumonia or atelectasis of the affected portion of lung. Often, the healing of the perforation will lead to bronchostenosis.

The caseous tracheobronchial lymph node is particularly resistant to chemotherapy. Streptomycin, para-aminosalicylic acid, and isoniazid have virtually no effect in the resolution of the lymph node component of the primary complex.^{3,4,5}

Because of their proximity and, in many cases, adherence to the large mediastinal and hilar vessels, excision of these caseous glands is fraught with considerable difficulty and danger. Thomas, and Seal, both advocated

adenotomy rather than adenectomy^{6,7} and, in 1964, Robinson reported excellent results following thoracotomy with incision and evacuation of the caseous material from these glandular masses.⁸

Villar in 1963 suggested that steroid therapy might give benefit in these children.⁵ In the same year Nemir and her associates reported the use of massive doses of prednisone as an adjunct in the chemotherapy of lymph node bronchial tuberculosis in childhood.⁹ There was a double blind study in 42 patients, and the immediate results were not too encouraging, indicating little difference in those children treated by prednisone when compared with the group who received a placebo. However, in 1967 the same workers reported a follow-up.¹⁰ Seventy-five additional cases making a total of 117 with primary infection tuberculosis of not more than six months' duration were treated, 58 receiving prednisone and 59 a placebo. On this occasion, a very significant difference was noted with markedly better results in the prednisone group, particularly in the more advanced cases where perforation of the bronchus had occurred. There were very few side effects and it was suggested that, as prednisone seemed to be much more effective when given early, the corticosteroid should be included as part of the initial therapy.

Prednisone in lymph node involvement

Stimulated by these results, we began the use of prednisone as an adjunct in the treatment of tracheobronchial lymph node tuberculosis in 1967.

The dosage suggested by Nemir and her group⁹ was used in all cases. It will be appreciated that these children are receiving a rather massive dose; for example, a 50 lb. (22.7 kg) child receives approximately 67 mg prednisone daily for the first three days. It should be noted, however, that the

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TABLE 1
Prednisone Therapy

DOSAGE (mg. per kg body weight)	DURATION (days)
3	3
2	3
1	24
0.5	4
0.25	3
TOTAL	37

TABLE 2
Sex and Age Grouping

Age	Male	Female	Both Sexes
0 - 4	2	2	4
5 - 9	1	1	2
10 - 14	1		1
15 - 19	2	1	3
20 or over		1	1
Total	6	5	11

course is relatively brief and is completed in all instances in 37 days (Table 1).

Eleven patients underwent the full course of treatment and, with the exception of a 31-year old recent immigrant from India, the oldest patient was 16 and the youngest 3 months (Table 2). With reference to the adult status of the Indian woman, it has been recognized for some time that the course of primary infection in the adult North American or European differs from the typical course of childhood. However, in countries where the incidence of tuberculosis is high and the resistance of the population low, first infection in adults is characterized by the same bipolar lesion as in children. Six of the patients were male, and five female.

The *investigative procedures* prior to the institution of treatment are outlined in Table 3. All patients reacted to tuberculin and seven out of the 11 had either sputum or gastric washings positive for *Mycobacterium tuberculosis*. The roentgenogram in two patients revealed unilateral hilar adenopathy and in one patient unilateral mediastinal adenopathy. In eight patients bilateral hilar and mediastinal adenopathy was noted and nine patients, in addition, had a visible focus in the parenchyma. Bronchoscopy was carried out in eight of the eleven individuals, and in seven of the eight, type A tracheobronchitis was present. According to the classification of Judd,¹¹ this designation indicates rupture of a caseous focus into the bronchus.

The *course of treatment* is summarized in Table 4. All had previously had standard chemotherapy: nine received

TABLE 3
Results of Investigative Procedures

Mantoux Test	
Positive 1 T.U.	8
Positive 5 T.U.	3
Sputum or Gastric Lavage	
Culture for <i>M. tuberculosis</i>	
Positive	7
Negative	4
X-ray Appearance	
Hilar Adenopathy, Unilateral	2
Mediastinal Adenopathy, Unilateral	1
Hilar and Mediastinal Adenopathy, Bilateral	8
Parenchymal Lesion	9
Bronchoscopy	
Tracheobronchitis, Type A	7
Normal findings	1
Not Done	3

streptomycin, isoniazid, and PAS; one, streptomycin and isoniazid; and one, streptomycin, PAS, isoniazid, cycloserine, and kanamycin. The duration of chemotherapy prior to the addition of prednisone was less than three months in only one patient, from three to six months in eight, and more than nine months in two. In one instance, prednisone was discontinued before the completion of the prescribed course due to the development of dizziness, headache, and epistaxis. Side effects were quite common: the classical moon face and buffalo obesity was seen in ten of the eleven, hirsutism in seven, with headache, dizziness, and epistaxis, as already noted, in one patient. These effects were all reversible following the discontinuation of the corticosteroid.

TABLE 4
Treatment

Previous Antimicrobial Therapy (AMT)	
Streptomycin + PAS + INH	9
Streptomycin + INH	1
Streptomycin + PAS + INH + Cycloserine + Kanamycin	1
Period of Previous AMT	
Less than 3 months	1*
3 - 6 months	8
More than 9 months	2
Prednisone Course	
Completed	10
Prednisone Side Effects	
Moon Face	10
Buffalo Obesity	10
Hirsutism	7
Headache, Dizziness and Epistaxis	1

*Course of prednisone not completed but resolution of nodes did occur.

TABLE 5
Results

X-ray appearance	
Complete resolution	11
Bronchoscopy	
Previous Type A Tracheobronchitis, resolved	5
Previous Type A Tracheobronchitis, improved	1
Normal before and after	1
Not done	4
Rebound Phenomenon	2*

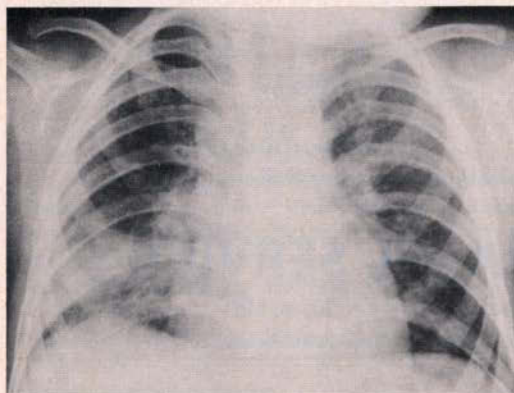
*Both resolved without further steroid therapy.

The *results* of treatment were extremely gratifying (Table 5). The roentgenogram indicated complete resolution in all 11 individuals. Repeat bronchoscopy revealed that the bronchial perforation had healed with no stenosis in five patients. In one, the healing was virtually complete, one patient was normal before and after, and in three the procedure was not carried out. A rebound phenomenon implying reactivation of the parenchymal or glandular component following initial resolution occurred in two patients but resolved uneventfully with further chemotherapy.

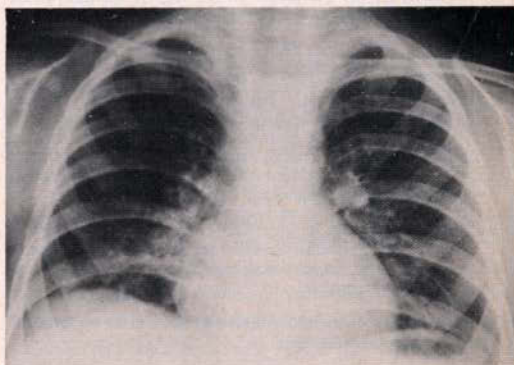
The following *two case reports* will serve to typify the beneficial effect of corticosteroid-supplemented chemotherapy in these patients.

Case No. 1: I.A.M., aged 16. This boy was admitted to the Sanatorium January 26, 1970, with radiological evidence of marked paratracheal adenopathy on the right side. He was placed on triple chemotherapy but re-examination in three months revealed no change. Bronchoscopic examination, April 22, 1970, revealed tracheobronchitis, type A, involving the lower end of the trachea. The usual 37-day course of prednisone was given in addition to the chemotherapy, with an excellent response. The roentgenogram June 3, 1970, revealed complete resolution of the adenopathy. Bronchoscopy, July 24, 1970, revealed healing of the tracheobronchitis.

Case No. 2: B.D.H. This eight-month old boy was admitted March 23, 1969. The roentgenogram showed a dense confluent infiltration involving the major portion of the lung, particularly from hilus to base (Fig. 1).



Gastric washings failed to demonstrate tubercle bacilli. He was placed on triple chemotherapy and fairly satisfactory improvement occurred until February, 1970, when a film of the chest showed again the presence of an extensive infiltration in the right hilar area and involving the lung from the third rib to the base. This film was practically identical to that taken on admission, indicating undoubted recurrence of the obstructive pneumonitis due to pressure of the enlarged mediastinal nodes. There was some improvement just prior to the prednisone therapy. He was given adjunctive corticosteroid therapy in the usual course, with an excellent response (Fig.2).



Discussion

While the experience just related is limited and the series uncontrolled, we are most impressed with the benefits of addition of prednisone to standard chemotherapy in the treatment of tracheobronchial lymph node tuberculosis. Our indications for the use of prednisone were slightly different from those proposed by Nemir and her associates in that, for the most part, our patients were given a good trial of adequate chemotherapy and either showed no response or progression of the disease.

While most cases of primary tuberculosis will resolve with or without conventional treatment, the presence of large mediastinal and/or hilar caseous lymph nodes is always of considerable concern to the physician treating tuberculosis. Which ones are going to resolve, and which ones are going to cause complications?

Our experience with this small series of cases has convinced us that in every patient with obvious tracheobronchial lymphadenopathy, bronchoscopy should be done immediately. Should there be evidence of compression of the trachea or bronchi, or worse, type A tracheobronchitis, we consider that prednisone should be added to the drug regimen at once. If bronchoscopy is normal but the nodes appear unduly large, this also would appear to be an indication for the addition of hormone therapy. Also, in the presence of a normal bronchoscopy but with no apparent response of the glandular component of the primary complex after three months of standard chemotherapy, again prednisone is indicated. □

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Spontaneous Pneumothorax[†]

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Summary: *The main features of spontaneous pneumothorax are described. Aspects of the management are discussed, including the indications for conservative and active treatment. The need for intubation of the pleural space, and thoracotomy, is appraised. Against this background, the 11-year experience gained at the Nova Scotia Sanatorium is reviewed to illustrate the nature and management of spontaneous pneumothorax.*

The occurrence of spontaneous pneumothorax in a previously healthy individual is relatively common. Usually benign, it may sometimes present as a dire emergency. The diagnosis of spontaneous collapse of the lung is not difficult, and the relief of even the most severe respiratory embarrassment is accomplished so easily that every physician in the general practice of medicine should be familiar with at least the immediate management of these patients. The purpose of this paper is to review briefly the main features of spontaneous pneumothorax, and then to highlight these by a presentation of our experience of spontaneous pneumothorax at the Nova Scotia Sanatorium.

Etiology

Spontaneous pneumothorax was fully described by Laennec in 1819¹; he suspected then that it was due to the rupture of surface blebs. However, for many years thereafter, it was considered to be exclusively a complication of pulmonary tuberculosis, and as recently as 40 years ago it was reported that 78% of cases were due to tuberculosis.² In a comprehensive thesis, Kjaergaard in 1932 showed that most cases of spontaneous pneumothorax had a nontuberculous cause and were due to the rupture of a subpleural bleb or bulla.³ With the decrease in the incidence of tuberculosis over the past twenty-five years, it may be assumed that spontaneous pneumothorax due to this disease is most uncommon.

Spontaneous pneumothorax today is usually due to the rupture of a subpleural collection of air, or bleb. The origin of blebs is unknown. They are common and are frequently seen at thoracotomy for unrelated conditions; they may not be detected by x-ray and undoubtedly many individuals harbour them throughout their lives and never have a spontaneous pneumothorax. Pneumothorax from this cause occurs mainly in the third and fourth decades of life and is more common among men. In other cases there is obvious evidence of emphysema, usually the localized bullous form, but sometimes the more common widespread chronic obstructive emphysema; in such cases, the blebs or bullae

can usually be seen on x-rays of the chest. These individuals are typically older, and the complication of spontaneous pneumothorax is much more serious since it compromises an already diminished respiratory reserve. Rarely pneumothorax may be caused by rupture of a tuberculous cavity or of a lung abscess. One interesting etiological factor was described more recently: spontaneous collapse of the lung, always on the right side, occurred concomitant with menstruation.^{4,5} In these patients, the lungs were normal; it is postulated that pelvic endometriosis yields deposits on the under-surface of the diaphragm, and small perforations of the diaphragm result. Air enters the peritoneal cavity during menstruation through the partly opened external os and finds its way through the diaphragmatic perforations and into the pleural cavity.

Clinical Picture

The onset of the condition may often be insidious and the pneumothorax discovered only on a routine chest roentgenogram. Usually, however, the onset is acute, and it is almost invariably accompanied by pain in the chest. The pain may be slight or excruciating and it may be localized anywhere from the abdomen to the shoulder; as a rule, it subsides in a few hours. Dyspnea is common particularly in older individuals with emphysema, but younger patients, without obvious lung disease, can have considerable degrees of collapse of the involved lung without complaining of shortness of breath. The onset of the pneumothorax bears little relationship to physical activity and many cases begin when the patient is at rest. The physical signs will depend on the degree of pneumothorax. In a typical case, percussion of the chest will reveal a hyper-resonant note, while auscultation will disclose diminution or absence of breath sounds. A roentgenogram of the chest will confirm the diagnosis, even the smallest pneumothoraces being visible in good postero-anterior films.

Certain spontaneous pneumothoraces are fraught with particular danger. These include:

- i. Tension pneumothorax. In these cases, the tear in the visceral pleura is held open during inspiration, frequently by a visceroparietal adhesion, and closes during expiration. The pressure inside the pleural cavity rapidly builds up causing compression of the

[†]Presented to a meeting of the Valley Branch, Nova Scotia Institute of Science, Kentville, Nova Scotia, March 1, 1971.

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involved lung and shift of the mediastinum to the opposite side;

ii. Spontaneous hemopneumothorax. Rarely, rupture of the bleb is accompanied by tearing of a blood vessel. Bleeding into the pleural space may even produce hypovolemic shock;

iii. Bilateral spontaneous pneumothorax. Fortunately, simultaneous collapse of both lungs is rare; usually, there is an interval between re-expansion of one lung and pneumothorax on the other side.

Treatment

While there is no argument that the treatment of complicated pneumothoraces is surgical, controversy still abounds as to whether the more common forms of spontaneous pneumothorax should be treated conservatively or aggressively. The consensus is that spontaneous pneumothorax should be managed in the following manner:

i. All patients should be admitted to hospital. If the degree of collapse is less than 25%, it is safe to keep the patient under observation, at bed rest, with frequent radiological examinations of the chest. Unless the degree of collapse is increasing, no active measures are necessary, and the lung re-expands uneventfully.

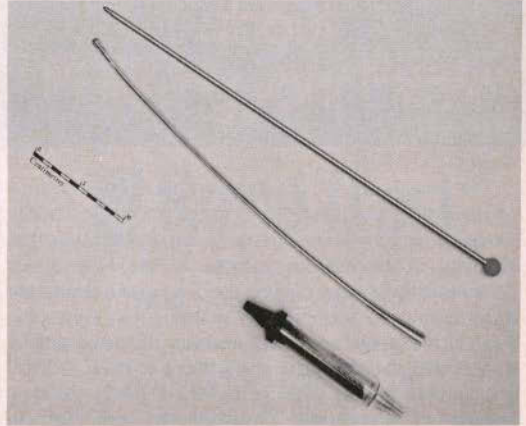
ii. If the degree of collapse is between 30 and 50% it is helpful to determine the intrapleural pressure. If the pressure is negative both on inspiration and expiration, about 300-500 ml air are withdrawn. There should then be an increase in negative pressure. If the pressure remains the same, air is still leaking into the pleural cavity and intubation is necessary.

iii. If the collapse amounts to 50% or more, the pleural cavity should be intubated immediately. The tube is then connected to a water seal, and usually the lung promptly re-expands.

iv. If the lung is completely atelectatic, it signifies that the main bronchus is occluded. This may be due to kinking or it may be caused by obstruction with retained secretions. Frequently, intubation suffices to undo the kink and the lung re-aerates. Sometimes, however, intermittent positive-pressure breathing with percussion of the chest wall by a physiotherapist is required and, in some instances, bronchoscopy may be necessary to relieve the obstruction.

TECHNIQUE OF INTUBATION A suitable interspace, most commonly the third anterolaterally, is chosen. The skin and deeper tissues are infiltrated with a local anaesthetic solution. A three-inch 18-gauge needle, attached to a syringe containing saline, is inserted into the pleural cavity, entry being evidenced by the appearance of air in the syringe. The lung is then sounded by carefully advancing the needle to the full length or until air ceases to appear in the syringe. This will ensure that the lung is neither adherent to the chest wall at this point, nor so close that it will be damaged by the trocar.

A short incision is then made through the skin and intercostal muscle almost as far as the parietal pleura. It is our custom to employ the disposable Trocar-catheter (see Figure). This is plunged into the pleural space, the trocar removed, and the catheter attached to a water-seal. Fixation to the skin is obtained by leaving the skin sutures long, tying them around the tube and then taping them around the tube.



Apparatus for intubation of pleural space.

ABOVE: Argyle 20 Fr. Trocar-catheter unit.

BELOW: Heimlich valve.

If the patient must be transported, it is convenient to utilize a Heimlich valve. This is attached to the chest tube and ensures egress of air while preventing air entry.

When intubation has been carried out, closed drainage should be maintained until the lung is shown to be fully re-expanded by radiological examination. The tube is then clamped for 24 hours. If the lung remains re-expanded, it is safe to remove the tube.

THORACOTOMY We consider that thoracotomy is indicated in recurrent pneumothoraces. The recurrence rate is variously reported as between 30-60%,² in our own series, the recurrence rate was approximately 35% (Table 7). We also believe that individuals who have episodes of bilateral collapse should be managed by thoracotomy; it is not inconceivable that pneumothorax may occur simultaneously on both sides, at a time when the patient is far away from medical attention with obvious dire results. Hemopneumothorax is usually an indication for emergency thoracotomy, and in some cases of tension pneumothorax the chest must be opened for closure of the large rent which is present.

The aims of thoracotomy are to seal the lung leak and ensure permanent obliteration of the pleural cavity. If blebs are present, they are resected. In all cases, as little lung tissue as possible is removed. Sometimes, no blebs are seen and there may or may not be an obvious small lung leak. The important part of the operation is parietal pleurectomy or removal of the pleura over a large area of the inner chest

wall. One tube is left in the pleural cavity and brought out through a stab wound at the base and connected to a source of constant suction, the purpose being to expand the lung against the raw chest wall surface. Post-operative adhesions quickly form and even though blebs may re-form on the lung, a spontaneous collapse can never again occur.

In some centres, artificial non-operative pleurodesis utilizing substances like talc is preferred to operative treatment. Talc is blown into the pleural cavity through a cannula; it produces a violent pleural reaction with the formation of fluid and eventually dense adhesions between the lung and chest wall. We consider that this is unsatisfactory procedure, as the adhesions are frequently unreliable or, on the other hand, they may be so dense as to compromise lung function. However, when the patient cannot tolerate major surgery, for example, the individual with advanced bilateral emphysema who has a non-expanding lung or a recurrent pneumothorax, some form of artificial non-surgical pleurodesis may be indicated. We have had quite satisfactory results with the instillation of 50% glucose into the pleural space. This substance produces a mild pleuritis but apparently sufficient reaction takes place to bring about obliteration of the pneumothorax space.

Spontaneous Pneumothorax at Nova Scotia Sanatorium

A review of our own experience in the management of spontaneous pneumothorax will serve to emphasize the main features of this condition. The case records of all patients admitted to the Nova Scotia Sanatorium with a spontaneous pneumothorax between January 1, 1960 and December 31, 1970, inclusive, were reviewed for this purpose.

During this period 37 persons were admitted. Five had bilateral pneumothoraces, so that 42 episodes of spontaneous pneumothorax were available for analysis. Table 1 gives data relating to sex and age; there were twice as many males as females, and 50% of episodes occurred in patients aged between 10 and 39. Confirming common experience, the right lung was more commonly involved than the left,

TABLE 1
Sex and Age Grouping

Age	Male	Female	Totals
10 - 19*	3	1	4
20 - 29	7	1	8
30 - 39	3	6	9
40 - 49	1	2	2
50 - 59	8	1	9
60 - 69	2		2
70 - 79†	2		2
All Ages	26	11	37§

*Youngest 18 yrs. 11 mos.

†Oldest 77 yrs.

§37 individuals in series, yielding 42 episodes.

and one patient presented with simultaneous bilateral pneumothorax (Table 2).

Features of the *clinical picture* of spontaneous pneumothorax are tabulated in Tables 3 and 4. All patients had some symptoms suggestive of pneumothorax. Shortness of breath, without pain, was noticed by 21 patients, while only 18 patients admitted to both pain and dyspnea. Also at variance with general experience is the fact only seven were at rest when their symptoms began. Unusual exertion as a factor appeared to be significant in only four cases. Signs of spontaneous pneumothorax were present in 31 of the 42 episodes; hyperresonance of percussion together with diminished or absent breath sounds were noted in 27, while in four, there were diminished or absent breath sounds only. It should be noted that normal findings were evident in 11 cases.

TABLE 2
Laterality

Right	23
Left	18
Both (Simultaneously)	1
Total	42

TABLE 3
Symptomatology

(a) SYMPTOMS	
None	0
Pain only	2
Dyspnea only	21
Pain and Dyspnea	18
Pain, Dyspnea, Fever, Prostration	1
	42

(b) ONSET OF SYMPTOMS

Rest	7
Moderate Exertion	31
Unusual Exertion	4
	42

TABLE 4
Physical Signs

Hyperresonance and diminished or absent breath sounds	27
Diminished or absent breath sounds only	4
Normal findings	11
	42

The degree of lung collapse was greater than 30% in 35 of the 42 episodes. Table 5 indicates that in 10, the collapse amounted to more than 60%, while total atelectasis was seen in four patients. The degree of collapse was not correlated with physical signs; of those 11 patients with normal physical signs, five had less than 30% collapse, but six showed evidence of collapse between 30-60%.

TABLE 5
Degree of Collapse*

Less than 30%	7
30% to 60% collapse	21
More than 60%	10†
Atelectasis, Total	4
	42

*Of the eleven with normal physical signs, 5 had less than 30% collapse and 6 had 30 - 60% collapse.

†Two cases with more than 60% collapse also had partial atelectasis.

Table 6 details *etiological factors*. Bleb formation appeared to be the cause in 18 patients. The remainder had evidence of emphysema, while one episode of spontaneous pneumothorax was caused by rupture of a tuberculous cavity. Table 7 indicates that the rate of recurrence of pneumothorax was about 35%. The presence or absence of pleural fluid is shown in Table 8, of interest because it was once believed that if fluid developed, the etiology was likely to be tuberculous. In the present series, serous fluid was noted in three, while in four episode, a small hemothorax was found.

TABLE 6
Etiology of Spontaneous Pneumothorax

Bleb*	18
Bullous Emphysema†	12
Generalized Emphysema†	11
Tuberculosis	1
	42

*All patients but one with pneumothorax due to bleb rupture were in the 10 - 39 age group.

†Only one of the emphysema patients was under 39.

TABLE 7
Frequency

First Pneumothorax	30
Second Pneumothorax	8
Third or more	4
	42

TABLE 8
Nature of Fluid

Blood	4
Serous	3
Blood & Serous Fluid	2
Blood & Purulent Fluid	1
None	32
	42

The immediate *management* of our patients is summarized in Table 9. In 17 cases, the lung re-expanded without active treatment, and in 5, all that was required was needle aspiration. In 20, however, intubation of the pleural cavity and closed drainage became necessary. Table 10 details the late phase of treatment. Thoracotomy was done in 18 patients. In three, no bleb, bulla, or lung leak was found, and pleurectomy was performed; in two, a lung leak was repaired and pleurectomy performed; local excision of a bulla, together with pleurectomy, was carried out on one occasion; in nine cases, wedge resection of tissue and pleurectomy, was performed; and two patients had lobectomy. The one case of spontaneous pyopneumothorax due to tuberculosis was managed successfully by thoracoplasty. Twenty-three of the patients in our series had neither recurrence nor complication and so did not require late treatment.

TABLE 9
Treatment - Immediate

Needle aspiration	5
Closed drainage	20
No immediate treatment	17
	42

TABLE 10
Treatment - Late

Chemical pleurodesis	1
Pleurectomy	3
Repair of lung & pleurectomy	2
Excision of bullae & pleurectomy	1
Thoracoplasty	1
Wedge resection & pleurectomy	9
Lobectomy	2
No late treatment	23
	42
No treatment either immediate or late	8

TABLE 11
Results

Cured	39
Unexpanded	1
Died	2
	42
LATE DEATHS	
Pneumonia	1
Generalized emphysema	1
Cancer of caecum	1
Emphysema	1
Bronchopneumonia and recurrent pneumothorax	1
Myocardial infarction	1
Pulmonary tuberculosis	1
	7

It is of interest that 8 patients required no active treatment, either early or late; observation and bed rest only were sufficient.

The results are tabulated in Table 11. The lesions in thirty-nine patients were cured. One patient with extensive bilateral emphysema had repeated alternate bilateral spontaneous pneumothoraces, and eventually died of cor pulmonale. A second fatality was that of a 45-year old woman who died, following a left pulmonary resection and pleurectomy, of a coronary occlusion. Seven individuals were classified as having late deaths, all in older patients whose underlying disease was generalized chronic obstructive emphysema. □

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Nontuberculous Disease of the Chest

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Summary: *The Nova Scotia Sanatorium, originally designed for the treatment of tuberculosis, has steadily modified its facilities so that today all types of chronic respiratory disease are investigated and treated. A review of the experience at the Sanatorium of nontuberculous chest disease during the past three years is presented in order to inform the medical profession of trends in nontuberculous disease and of the facilities available. In the period under review, even though one-quarter of the bed space was allocated to nontuberculous patients, 431 such patients were admitted, as compared to 272 tuberculous patients. The commonest conditions seen were chronic obstructive pulmonary disease and cancer, but the variety of other conditions encountered was legion. These are tabulated. The management of these conditions is also discussed in this evaluation of the work of a modern Sanatorium.*

In a previous communication, it was pointed out that the marked decrease in the morbidity and mortality of tuberculosis over the previous 20 years resulted in an excess of sanatorium beds.¹ Many sanatoria were reconverted to manage completely alien types of chronic illness, some were demolished but many, including the Nova Scotia Sanatorium, had their facilities increased so that not only tuberculosis but all types of chronic chest disease could be investigated and, if necessary, treated. While many physicians in Nova Scotia remain unaware that the institution will admit patients who have disease other than tuberculosis, many more have accepted this new pattern, largely through the efforts of the various directors of the Provincial Health Units. These physicians, who have had special training and long experience in chest disease, are often the first to be consulted about the management of a patient with a chronic respiratory illness, and a great many of the referrals to our Investigation Unit are at the suggestion of these directors.

The routine followed in the investigation of the individual who seems not to have tuberculosis has been previously reported, and has changed little, although our facilities for investigation and treatment have become more varied and sophisticated. In spite of the limitations imposed by space, the activities of the Department of Physical Medicine, and in particular, inhalation therapy, have increased fourfold. This is mainly a reflection of the increasing havoc that chronic respiratory disease is causing in the population and, as noted previously, the realization by the family physicians that their patients with chronic bronchitis and emphysema can be referred to the Nova Scotia Sanatorium without delay for further investigation and overall management.

While chronic obstructive pulmonary disease and bronchogenic carcinoma continue to be the most common diagnosis made in individuals admitted to our Investigation Unit, almost every condition described in any modern textbook on chest disease is encountered at some time or other.

Three years' experience

To inform the medical profession in Nova Scotia of the management of nontuberculous chest disease at the Nova Scotia Sanatorium, a review has been made of all admissions to the Unit for the immediate past three years, covering the period from June 1, 1968, to May 31, 1971. During this three-year period, 431 patients who did not have tuberculosis were referred to the Sanatorium for the first time for investigation and, in many cases, treatment. Many of these patients, particularly those suffering from chronic obstructive pulmonary disease and bronchial asthma, have required several readmissions. By comparison, the original report from this institution on nontuberculous chest disease covered a period of 16 years during which a total of only 500 such patients were admitted.¹

It should not be forgotten that we still continue to treat tuberculosis. In fact, only about a quarter of our beds are available for patients who do not have tuberculosis. Tuberculous patients account for by far the largest proportion of our patient-days, but, because of their longer stay, during the period under review there were only 272 individuals admitted for the first time with tuberculosis, compared to 431 with nontuberculous chest disease.

A perusal of Table 1 emphasizes once again that chronic respiratory disease is predominantly an illness of middle-aged and elderly males. There is a striking male preponderance in those patients of 50 years and over, with a total of 192 men but only 70 women.

*Surgeon, Nova Scotia Sanatorium.

†Medical Record Librarian, Nova Scotia Sanatorium.

TABLE 1
Age and Sex

Age Group	Male	Female	Both Sexes
0 - 9	2	1	3
10 - 19	9	12	21
20 - 29	20	18	38
30 - 39	19	15	34
40 - 49	44	29	73
50 - 59	73	28	101
60 - 69	82	21	103
70 - 79	32	19	51
80+	5	2	7
	286(66.3%)	145(33.7%)	431

TABLE 2
Source of Patients

Local hospital	22
Other Kings County hospitals	30
Other hospitals in Fundy Health Unit	19
Hospitals outside of Fundy Health Unit	46
Mental hospitals	5
From home	309
	431

28% of patients were admitted *directly* from another hospital.

The source of referral of the patients in the group is summarized in Table 2. It will be noted that 28 percent of the patients were admitted directly from another hospital and, interestingly enough, more than one-third of these hospitals were outside the limits of the Fundy Health Unit which includes the counties of Hants, Kings, and Annapolis. Actually, of late years, our patients are coming from all parts of the mainland, although the majority is still referred from the Annapolis Valley and Southwestern Nova Scotia.

Table 3 has been made long and complicated purposely, to emphasize the great variety of chest diseases seen in our Investigation Unit. There are several diseases of particular importance. It will be noted that we have preferred to regard true bronchial asthma as separate from chronic obstructive lung disease. While many of the difficulties encountered in the patients in this latter category are related to bronchospasm, and often severe paroxysmal bronchospasm, these patients do not have true bronchial asthma. While many of them had been treated as such with adrenalin, aminophylline, and other bronchodilators, the basic cause of their condition was often disregarded and once the acute symptoms had subsided they went again on their way, smoking their daily package of cigarettes. It will be noted that the largest single group of patients had chronic obstructive lung disease and the second, bronchogenic carcinoma. Bronchial asthma was the next most

common, occurring in 32 patients. Other important diseases, numerically, were sarcoidosis and, surprisingly, pyogenic lung disease. In recent years we have tended to consider lung abscess and bronchiectasis as relatively rare conditions, but it will be noted that there were 18 patients with lung abscess, and 15 with bronchiectasis. Severe chest trauma is being referred to us with increasing frequency.

TABLE 3
Diagnoses

No significant disease	18
Chronic obstructive lung disease	94
Bronchial asthma	32
Acute pneumonia	16
— bacterial	8
— viral	8
Eosinophilic pneumonia	2
Loeffler's Syndrome	1
Slowly resolving pneumonia	20
Lipoid pneumonia	2
Organizing pneumonia	2
Mycobacteriosis	3
Lung abscess	18
Bronchiectasis	15
Farmer's Lung	3
Bird Fancier's Lung	1
Anthracosilicosis	4
Byssinosis	1
Sarcoidosis	24
Polyarteritis nodosa	3
Collagen disease — nonspecific pneumonia	1
Pleurisy with effusion — etiology undetermined	20
Bronchogenic cyst	7
Giant cyst	3
Bronchogenic carcinoma	43
Secondary carcinoma of lung	13
Primary — kidney	2
breast	3
intestinal tract	4
pancreas	1
undetermined	3
Mediastinal tumor	6
— lipoma	4
undifferentiated	1
osteoma	1
Mediastinal cyst — pericardial	2
Spontaneous pneumothorax	9
Chest trauma	13
— mild	1
moderate	1
severe	11
Foreign body, lung or bronchus	4
Hemoptysis — cause undetermined	10
Carcinoma of larynx	3
Pulmonary infarction	2
Hamman-Rich Syndrome	2
Miscellaneous*	26

*See Table 3(a)

Many of these patients have sustained crushing injuries with flail chest. Here, prompt endotracheal intubation and/or tracheostomy with the use of volume controlled respirators can quickly reverse the condition of a patient who may appear almost moribund. Twenty-six patients are listed as having miscellaneous conditions, and these are identified in Table 3(a).

TABLE 3(a)
Diagnoses
Miscellaneous Group

Subacute bronchitis	1
Chronic pneumonitis	1
Obstructive pneumonitis with pericardial effusion	1
Broncholithiasis	1
Aspergillosis (mycetoma)	1
Esophageal hiatus hernia	1
Eventration of diaphragm	2
Postoperative atelectasis	2
Pulmonary fibrosis, etiology undetermined	1
Pleural plaque	1
Fibrothorax	1
Intercostal regeneration of rib	1
Osteochondroma of rib	1
Hydrothorax due to renal failure	1
Paroxysmal bronchospasm	1
Esophageal perforation	1
Intercostal neuralgia	2
Anxiety neurosis	1
Cat scratch fever	1
Lymphadenitis — etiology undetermined	2
Acute myocardial infarction	1
Mitral stenosis and regurgitation	1
	<hr/>
	26

TABLE 4
Treatment

MEDICAL	
Inhalation and/or physiotherapy	80
Inhalation and/or physiotherapy plus drugs	108
Drugs only	70
No medical treatment*	173
	<hr/>
	431
<hr/>	
SURGICAL	
Had surgical treatment	95
No surgical treatment*	336
	<hr/>
	431

*Includes 51 who had surgical treatment

*Includes 122 who had neither surgical nor medical treatment

TABLE 5
Surgery

	No. of Patients
Pulmonary resection	40
Pleurectomy	4
Closed drainage, pleural space	11
Tracheotomy	9
Thoracentesis	14
Bronchotomy	1
Bronchoscopy (removal of foreign body)	2
Repair of abdominal viscera	2
Suturing of laceration	2
Removal of foreign bodies (open wound)	1
Repair of eventration of diaphragm	2
Nephrectomy	1
Resection of rib	1
Pericardotomy	1
Removal of pleural plaque	1
Excision of mediastinal lipoma	1
Removal of osteomata	1
Excision of pulmonary cyst	1
	<hr/>
	95

The type of treatment administered to these individuals is outlined in Table 4. In 122 cases, no treatment whatsoever was given. This group would include patients with advanced carcinoma, slowly resolving pneumonia which was on the point of resolution, and many cases of sarcooidosis. It also includes individuals who had bed rest and general supportive treatment only. Eighty-nine patients required surgery, the great majority in the form of pulmonary resection. Because of the preponderance of patients with chronic obstructive lung disease and bronchial asthma, it will be appreciated that inhalation and physiotherapy constitute a most important and frequently used form of treatment in our Unit.

While a great variety of surgical procedures are listed in Table 5, most of them necessitated thoracotomy which was carried out in 52 of the 95 patients. The main indications for pulmonary resection were bronchogenic carcinoma, or in patients where malignancy was suspected but where subsequent pathological examination of the specimen disclosed a benign condition. Other conditions treated by resection in this series included bronchiectasis, bronchogenic cysts, and one individual had a solitary metastatic lesion removed from the left lower lobe: the primary, a hypernephroma, had been treated by nephrectomy 21 years previously. □

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3. Books and Men

William Osler*

It is hard for me to speak of the value of libraries in terms which would not seem exaggerated. Books have been my delight these thirty years, and from them I received incalculable benefits. To study the phenomena of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all. Only a maker of books can appreciate the labours of others at their true value. Those of us who have brought forth fat volumes should offer hecatombs at these shrines of *Minerva Medica*. What exsuccous, attenuated offspring they would have been but for the pabulum furnished through the placental circulation of a library. How often can it be said of us with truth, "*Das beste was er ist verdankt er Aendem!*"

For the teacher and the worker a great library such as this is indispensable. They must know the world's best work and know it at once. They mint and make current coin the ore so widely scattered in journals, transactions, and monographs. The splendid collections which now exist in five or six of our cities and the unique opportunities of the Surgeon-General's Library have done much to give American medicine a thoroughly eclectic character.

But when one considers the unending making of books who does not sigh for the happy days of that thrice happy Sir Thomas Browne whose pocket library sufficed for his life's needs, drawing from a Greek testament his divinity, from the aphorisms of Hippocrates his medicine, and from an Elzevir Horace his good sense and vivacity. There should be in connexion with every library a corps of instructors in the art of reading, who would, as a labour of love, teach the young idea how to read. An old writer says that there are four sorts of readers: "Sponges which attract all without distinguishing; Howre-glasses which receive and powre out as fast; Bagges which only retain the dregges of the spices and let the wine escape, and Sives which retain the best onely." A man wastes a great many years before he reaches the "sive" stage.

For the general practitioner a well-used library is one of the few correctives of the premature senility which is so apt to overtake him. Self-centred, self-taught, he leads a solitary life, and unless his every-day experience is controlled by careful reading or by the attrition of a medical society it soon ceases to be of the slightest value and becomes a mere accretion of isolated facts, without correlation. It is

astonishing with how little reading a doctor can practise medicine, but it is not astonishing how badly he may do it. Not three months ago a physician living within an hour's ride of the Surgeon-General's Library brought to me his little girl, aged twelve. The diagnosis of infantile myxoedema required only a half glance. In placid contentment he had been practising twenty years in "Sleepy Hollow" and not even when his own flesh and blood was touched did he rouse from an apathy deep as Rip Van Winkle's sleep. In reply to questions: No, he had never seen anything in the journals about the thyroid gland; he had seen no pictures of cretinism or myxoedema; in fact his mind was blank on the whole subject. He had not been a reader, he said, but he was a practical man with very little time. I could not help thinking of John Bunyan's remarks on the elements of success in the practise of medicine. "Physicians," he says, "get neither name nor fame by the pricking of wheals or the picking out thistles, or by laying of plaisters to the scratch of a pin; every old woman can do this. But if they would have a name and a fame, if they will have it quickly, they must do some great and desperate cures. Let them fetch one to life that was dead, let them recover one to his wits that was mad, let them make one that was born blind to see, or let them give ripe wits to a fool — these are notable cures, and he that can do thus, if he doth thus first, he shall have the name and fame he deserves; he may lie abed till noon." Had my doctor friend been a reader he might have done a great and notable cure and even have given ripe wits to a fool! It is in utilizing the fresh knowledge of the journals that the young physician may attain quickly to the name and fame he desires.

There is a third class of men in the profession to whom books are dearer than to teachers or practitioners — a small, a silent band, but in reality the leaven of the whole lump. The profane call them bibliomaniacs, and in truth they are at times irresponsible and do not always know the difference between *meum* and *tuum*. In the presence of Dr. Billings or of Dr. Chadwick I dare not further characterise them. Loving books partly for their contents, partly for the sake of the authors, they not alone keep alive the sentiment of historical continuity and in the profession, but they are the men who make possible such gatherings as the one we are enjoying this evening. We need more men of their class, particularly in this country, where every one carries in his pocket the tape-measure of utility. Along two lines their work is valuable. By the historical method alone can many problems in medicine be approached profitably. For example, the student who dates his knowledge of tuberculosis from Koch may have a very correct, but he has a very incomplete, appreciation of the subject. Within a quarter of a century our libraries will have certain alcoves

*Osler needs no introduction, nor should there be hesitation in going back 70 years in selecting a short address Osler gave at the dedication of the Boston Medical Library, January 12, 1901. Not only was Osler the greatest of Canadian physicians, but he was a world figure; and much of his "reserves" he gained from regular habits of reading. — Ed. (Reprinted from *Boston Med. Surg. J.* 144: 60, 1901, by permission, Editor, *New England Journal of Medicine*.)

devoted to the historical consideration of the great diseases, which will give to the student that mental perspective which is so valuable an equipment in life. The past is a good nurse, as Lowell remarks, particularly for the weanlings of the fold.

Tis man's worst deed

To let the things that have been, run to waste
And in the unmeaning Present sink the Past.

But in a more excellent way these *laudatores temporis acti* render a royal service. For each one of us to-day, as in Plato's time, there is a higher as well as a lower education. The very marrow and fatness of books may not suffice to save a man from becoming a poor, mean-spirited devil, without a spark of fine professional feeling, and without a thought above the sordid issues of the day. The men I speak of keep alive in us an interest in the great men of the past and not alone in their works, which they cherish, but in their lives, which them emulate. They would remind us continually that in the records of no other profession is there to be found so large a number of men who have combined intellectual pre-eminence with nobility of character. This higher education, so much needed to-day is not given in the school, is not to be bought in the market place, but it has to be wrought out in each one of us for himself; it is the silent influence of character on character and in no way more potent than in the contemplation of the lives of the great and good of the past, in no way more than in "the touch divine of noble natures gone."

I should like to see in each library a select company of the Immortals set apart for special adoration. Each country might have its representatives in a sort of alcove of Fame, in which the great medical classics were gathered. Not necessarily books, more often the epoch-making contributions to be found in ephemeral journals. It is too early, perhaps, to make a selection of American medical classics, but it might be worth while to gather suffrages in regard to the contributions which ought to be placed upon our Roll

of Honour. A few years ago I made out a list of those I thought the most worthy which I carried down to 1850, and it has a certain interest for us this evening. The native modesty of the Boston physician is well known, but in certain circles there has been associated with it a curious physical phenomenon, a conviction of the utter worthlessness of the *status praesens* in New England, as compared with conditions existing elsewhere. There is a variety to-day of the Back Bay Brahmin, who delights in cherishing the belief that medically things are everywhere better than in Boston and who is always ready to predict "an Asiatic removal of candle-sticks," to borrow a phrase from Cotton Mather. Strange indeed would it have been had not such a plastic profession as ours felt the influences which moulded New England into the intellectual centre of the New World. In reality, nowhere in the country has the profession been adorned more plentifully with men of culture and of character — not voluminous writers or exploiters of other men's brains — and they manage to get a full share on the Roll of Fame which I have suggested. To 1850, I have counted some twenty contributions of the first rank, contributions which for one reason or another deserve to be called American medical classics. New England takes ten. But in medicine the men she has given to the other parts of the country have been better than books. Men like Nathan R. Smith, Austin Flint, Willard Parker, Alonzo Clark, Elisha Barlett, John C. Dalton, and others carried away from their New England homes a love of truth, a love of learning, and above all a proper estimate of the person character of the physician.

Dr. Johnson shrewdly remarked that ambition was usually proportionate to capacity, which is as true of a profession as it is of a man. What we have seen to-night reflects credit not less on your ambition than on your capacity. A library after all is a great catalyser, accelerating the nutrition and rate of progress in a profession, and I am sure you will find yourselves the better for the sacrifice you have made in securing this home for your books, this workshop for your members. □

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Selected abstracts

Surgical treatment of coronary artery insufficiency. — R. G. Carlson *et al.* in *NEW YORK STATE J. MED.*: 71, 1721, 1971.

Coronary disease causes about 600,000 deaths each year in USA. Since 1946, when Vineberg in this country introduced mammary artery implantation as a surgical method of overcoming myocardial ischemia due to coronary artery stenosis, many other workers have sought to revascularize ischemic myocardium. The latest technique is end-to-side anastomosis of a vein bypass between ascending aorta and distal coronary arteries; thousands of this type of operation have now been done, for it is highly successful and it is applicable to over 90% of patients with coronary artery insufficiency.

All patients with significant coronary artery stenosis are candidates for aortocoronary bypass operation. Selective coronary arteriography and left ventriculography are the main methods of determining patient suitability; the types of patients who are considered for arteriography are those with any of the following: angina, a history of previous myocardial infarction, unexplained heart failure, and atypical chest pain; those with compromised left ventricular function, failure of the right ventricle, massive aneurysm, a noncontracting myocardium, or disease of the left main coronary artery are also suitable for investigation. Failure of the main body organs, however, is regarded as a contraindication.

The authors state that in their most recent vein grafts, there were 95% survival rates and 90% patency rates. Hospital survival rates were related to ventricular function; survival in those with angina and a history of old myocardial infarction was 99% while those with left heart failure and a poor myocardium as shown by ventriculogram had 70-85% survival rates. Even so, this last survival rate is an improvement on the nonoperative survival rate. Improvement in the surgical patients was assessed by objective tests as well as subjective patient improvement; reversal of ischemic myocardial lactate metabolism, and exercise tolerance measured by bicycle ergometry, were the chief criteria of improvement following the authors' surgical treatment of coronary artery insufficiency.

Premonitory falls. — T. H. Howell, in *PRACTITIONER*: 206, 666, 1971.

A series of 46 old patients studied by the author showed a sequence of falls followed by sudden and usually fatal illness. Ten patients were nonagenarians, 25 were octogenarians, 11 were septuagenarians; there were 37 females and 9 males.

The sequelae of the falls were as follows: bronchopneumonia in 11 cases, cerebrovascular accident in ten, lowered blood pressure in six patients and heart failure in six; terminal deterioration ensued in five patients and diarrhea was noted in four as was the onset of mental abnormality; there were two cases respectively of urinary tract infection, retention of urine, severe anemia, and fracture, and one each of abdominal distension, spreading senile gangrene, and toxic erythema. The total number of episodes was 60, since some patients had a combination of sequelae. The falls were therefore premonitory; the mechanism appeared to be mainly circulatory, and the author believed that in 44, the sequel was likely to have been associated with a fall in blood pressure.

The Intern and sleep loss. — R. C. Friedman, J. T. Bigger, and D. S. Kornfield, in *NEW ENGLAND JOURNAL OF MEDICINE*: 285, 201, 1971.

Sleep loss impairs emotional and intellectual function; interns regularly work under conditions of repetitive sleep deprivation. The authors undertook an investigation to determine whether sleep loss affects the performance and psychological state in the daily work life of this important group of medical personnel.

Three tests were given to 14 medical interns aged 25-27 years; each served as his or her own control, the tests being conducted when the interns were both rested and fatigued (defined as states following mean periods of sleep, respectively, of 7 and 1.8 hours). The tests were designed to test intellectual functioning, mood, and physiological, perceptual, and cognitive aspects of the psychophysiological state; an electrocardiographic arrhythmia detection test, a Mood Adjective Checklist, and a modification of the Jarvik Questionnaire were directed at the interns. All tests indicated significant impairment, and fatigued interns are likely to experience transient psychopathology and inefficiency of performance. The conclusion of this study is that work schedules which deprive interns of normal sleep clearly may lead to negative mood changes and a decrease in vigour, elation, and social affection in such interns as well as a significant deterioration in job performance. □



COLOURFUL CASTS

Why should plaster casts be the rather unsightly stained, grubby or, at best, the dead white things they usually are?

Since October 1970 my wife, Catherine Weld, has been going to the surgical wards of the Isaac Walton Killam Hospital for Children in Halifax once a week, on Saturday or Sunday mornings, to paint pictures or designs on the plaster casts of the children.

As would be expected, they love it and every time the artist appears there is the cry, "Here is the painting lady", and they come crowding around. The most popular items are quick, stylized, amusing sketches of such things as snakes, rabbits, mice, trains, sailboats, cats, and fish. Sometimes older children ask for something more esoteric such as the Unesco peace symbol, but completely abstract designs are not popular. The size and subject of the sketch depends somewhat on the area available.

Casts get first attention, but those children without casts don't want to feel left out and eagerly extend hands, arms or legs for something — and they get it. Pictures go very well on bandages or on bare skin. If there is no suitable area of healthy skin the child is often satisfied with a picture on a card or even a piece of paper to take away with him.

The artist, through practice, has become so adept that only a very few minutes are needed for each picture, and it is surprising how many children get decorated in each 1½ - 2 hour session. An occasional child is timid or suspicious and keeps away for a time but soon the example of his enthusiastic friends will bring him in. No attempt is made to push him against his will.

The artist uses acrylic paints that are thinned with water for use. They dry quickly and are waterproof when dry. The pictures can readily be removed from the skin by vigorous washing with soap and water but they do not run and come off with casual wetting as would ordinary water colours. These paints are latex or emulsion paints and are porous so they do not prevent the passage of water vapour through the paint film. No lead pigments are used. Only a few colours are needed and a bright yellow, a red, a black, and white seem to be about enough.

The project has had the approval and blessing of the surgical staff, and the nurses seem to enjoy the sessions as much as the children.

The project seems to be highly successful, and the idea could well spread and be used in other hospitals both for children and adults. I know, too, of many young children of neighbours and friends who have gone eagerly to school with paintings on arms or tummies or backs to show to their teachers and classmates. □

C. B. Weld.

* * * * *

AN INTERVIEW WITH MR. STANFIELD

The recent visit to China of a prominent Nova Scotian was of interest to me for several reasons. Canada and China are, of course, very different nations: we have a brief history, a small population, and yet a sophisticated and Western technological society; China with its ancient culture, including notable scientific and pharmacological contributions, and its vast population of inscrutable and perhaps disturbingly clever Orientals, typifies the antithesis to our own way of life, in the impenetrable "wisdom of the East". But both countries are colossal, fertile, and neighbours to today's giants, the USA and USSR; they have ties through Canada's Doctor Norman Bethune; and presumably both have a common problem in delivering health care to populations inhabiting widely separated regions. My interest in China grew when I lived in Hong Kong, and the recent prominence given to the Chinese medical therapy of acupuncture as an anaesthetic technique stimulated my curiosity as an anaesthetist. So when I had the opportunity to talk to former Premier Robert L. Stanfield about his journey to China, I was anxious to interview someone who was really in a small minority — those who have actually seen modern China.

Mr. Stanfield saw much and I formed the impression that he found it an interesting trip, one which will provide him with much food for thought in the future. Politically, he was witness to the emergence of an old and most civilized nation into a modern, primarily technological era; he stressed the egalitarian nature of Chinese society today, and also the observation that while the Chinese are very proud of various aspects of their progress, their goal is other than primarily creating material prosperity or becoming a great power. However, as always, time and population are on their side: they can afford to wait, and now that they obviously and so readily can, like Japan, utilize Western techniques whenever they wish, isn't their future in the world one which Canada would do well to consider seriously, and to capitalize on the goodwill that exists between the two countries?

It was unfair, perhaps, to expect Mr. Stanfield to answer too many searching questions on health care in China; he visited only Canton, Peking and Shanghai and the environs of these cities. But he did say that the people looked healthy, and that the cities he visited were clean: he

remarked that he saw fewer flies than he was accustomed to seeing in Halifax! Mr. Stanfield was uncertain as to the amount of modern facilities that were available, and the Canton Teaching Hospital No. 2 that he visited was built as long ago as 1835. He also visited a hospital in a commune; he thought that this hospital was similar to our more familiar cottage hospital. Two observations were of interest to Mr. Stanfield: one was the ubiquitous presence of Army personnel, the other the custom of "intellectuals" having to spend some of their time working in the country, in communes.

The incorporation of professional persons, such as doctors, into communist society, was also remarked by Mr. Stanfield. He formed the impression that professional people did become "sold" on the Marxist analysis of society. However, he did not have the opportunity to discuss this point with more than one or two persons, but it would appear to be consistent with other observations which he made.

Chinese medicine, to Westerners, must be most difficult to interpret, and acupuncture is a case in point. Mr. Stanfield witnessed part of a thyroidectomy being performed under anaesthetic conditions induced and maintained by means of acupuncture; he merely corroborated the stories of other well known visitors to China from the Western hemisphere such as Prince Bernhard of the Netherlands and James Reston of the New York Times. Acupuncture appears to be used for a variety of purposes other than surgery; Mr. Stanfield mentioned its use in cases of chronic headache, deafness, heart disease, and menstrual irregularities. Obviously, acupuncture is as difficult to explain as hypnosis — and for us to accept. But it seems to work, and presumably our minds must for the moment remain open.

The spectrum is a spectrum only because certain characteristics, however apparently different, are basically related. Can this be applied to attempts to understand what goes on in a totally different political and medical community? Mr. Stanfield's celebrated virtue of honesty is surely an attempt at understanding, and it would not be surprising if leaders of Canadian medicine sometime follow Mr. Stanfield's low-key exploration. □

D.A.E.S.

The Medical Secretary: a trained and valuable aid

For most physicians, the trained medical secretary is an important administrative, accounting and public relations asset to the doctor's office. She should receive the consideration and remuneration commensurate with her potential and with the services she renders. Is she sometimes, however, undervalued and underpaid?

Investment of extra dollars in the salary of a competent medical secretary provides dividends of more than income alone. Delegation of the many tasks now performed by the doctor enables the medical practitioner to allocate valuable time to medical performance and to family affairs. Realizing this, Mount Saint Vincent University has been conducting medical secretarial courses for 14 years. Included in these are: Accounting 1, Business orientation, Communications, and Transcription. Specific training for the doctor's office includes classes in medical terminology, medical ethics, MSI procedures, medical inventory control, and medical office supervision. Students are also taught how to react to emergencies, and how to maintain good doctor-patient relations by telephone and appointments.

The medical secretary who graduates at Mount Saint Vincent University has completed two years in the Bachelor of Arts program. However, because challenging remunerative positions were not available when they graduated, most of these women (many of them the brightest students) have been lost to the medical profession in the Maritimes and, perhaps, to the profession generally. They have been absorbed by other professions and industrial concerns, although interest at one time was all that the title "medical secretary" implies.

Since classes at the Mount close around the end of April each year, doctors interested in securing the services of a graduate should make their needs known early to the campus Manpower office. This year Mount Saint Vincent University will sponsor an exhibit at the November Medical Association annual meeting. Why not discuss your medical secretary problems with members of the University faculty when you attend the annual meeting? □

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* * * * *

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* * * * *

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Clerk: "Yes, sir. And to make sure that everyone saw it, I marked it on all four sides."

* * * * *

The wisdom of the wise is an uncommon degree of common sense.

— Dean Inge

It's A Wise Teacher . . .

There's one foresighted grade school teacher, according to Ike London, who sends the following note to parents at the start of each school year: "If you promise not to believe everything your child says happens at school, I'll promise not to believe everything he says happens at home."

— Forethought

Teller to bank manager: "Is it OK to wear hot pants to work?"

Manager: "I hardly think they are appropriate."

Teller: "Why not? After all, they are ordinary pants, seasonally adjusted."

— Ontario Medical Review

NEW MEMBERS

The Physicians listed below have joined The Medical Society of Nova Scotia between July 1, 1971 and August 31, 1971. A most cordial welcome is extended from the Society.

- | | | | |
|----------------------|---------------|---------------------|-----------------|
| Dr. M. S. Akhter | Halifax, N.S. | Dr. M. S. Ramsey | Halifax, N.S. |
| Dr. T. P. Corkum | Halifax, N.S. | Dr. G. A. Sapp | Halifax, N.S. |
| Dr. J. F. S. Crocker | Halifax, N.S. | Dr. James G. Seaman | Kentville, N.S. |
| Dr. P. J. Davis | Halifax, N.S. | Dr. J. A. Shah | Halifax, N.S. |
| Dr. V. M. Hayes | Amherst, N.S. | Dr. Aidan Stokes | Halifax, N.S. |
| Dr. D. D. Imrie | Halifax, N.S. | Dr. D. A. Taylor | Halifax, N.S. |
| Dr. N. M. Kraw | Halifax, N.S. | Dr. G. H. L. Vallet | Halifax, N.S. |



Personal Interest Notes

A happy tribute was paid Dr. and Mrs. John R. McCleave, of Digby, in July. Dr. McCleave was honoured as Digby's "citizen of the year" during the town's natal day program. Among guests were Premier Gerald Regan, provincial Opposition leader John Buchanan, and Digby's MLA Joseph H. Casey. Dr. McCleave also attended a testimonial and reception in his honour, at which the guest speaker was Dr. Percy McGrath, of Kentville.

* * *

Yarmouth physicians seem to be continuing the local tradition of family medicine; Dr. and Mrs. W. I. Morse's son, Ewart A. Morse, recently won the Dr. W. Sidney Gilchrist prize in preventive medicine.

* * *

In Yarmouth, the Fuller and O'Brien families are also well known for their medical contributions. Which set alight a flame of enquiry as to how many doctors in Nova Scotia are part of a father and son, or even a three or four generation, membership in the medical profession. The only trouble about compiling any such list is that some names are bound to be forgotten: for which apologies are asked in advance. Some names, then. Acker, Barton, Burton, Cook, Felderhof, Gass, Graham, Goldbloom, Gosse, Hammerling, Hebb, Hines, Holden, Holland, House, Langille, LeBrun, Kinley, MacDonald, MacInnis, MacMillan, MacNeil, Mack, Marshall, Maxwell, McCleave, Morton, Pollett, Shlossberg, Siddell, Siengewicz, Smith, Steeves, Stoddard, Tompkins, Weir, Wickwire, Wiswell . . . a remarkable directory — and there must be others, not to mention the fair sex!

* * *

By now the summer season is over and the vacations are memories. The Personal Interest Notes column, however, like Mrs. Hubbard's cupboard, is bare — of news about members' trips and interesting experiences. Branch Secretaries, please note: this column depends largely on what we in the Medical Society office hears from you. So please send in any worthwhile news of members' activities. □

Appreciation

R. G. A. Wood

The sudden death of Ray Wood on July 22, 1971 came as an unbelievable blow to the community of Lunenburg, and indeed of the South Shore. His bustling figure and cheery presence are sadly missed. He was the epitome of the busy family practitioner and his patients knew they could rely on him for sound treatment and advice when they needed it. He did not suffer fools gladly, but after an initial outburst would patiently solve the problem or indicate the line to be followed. He was Mayor of Lunenburg for thirteen years, and his knowledge of procedure was often called upon at meetings of the Medical Staff of the Fishermans' Memorial Hospital to untangle some confused piece of business. For Ray was essentially a practical man, and had the knack of bypassing theoretical trimmings and coming straight to the point at issue. He fostered and worked for the establishment of the Home for Special Care in Lunenburg and was proud to be its first President and physician-in-charge. All his life he was interested in the community and gave freely of his time and energy in projects which would enhance the welfare of the town and its people.

He drove himself hard and uncomplainingly and, as many of us remember, was a stickler for punctuality. He

had to be, in order to accomplish all that he fitted into a day.

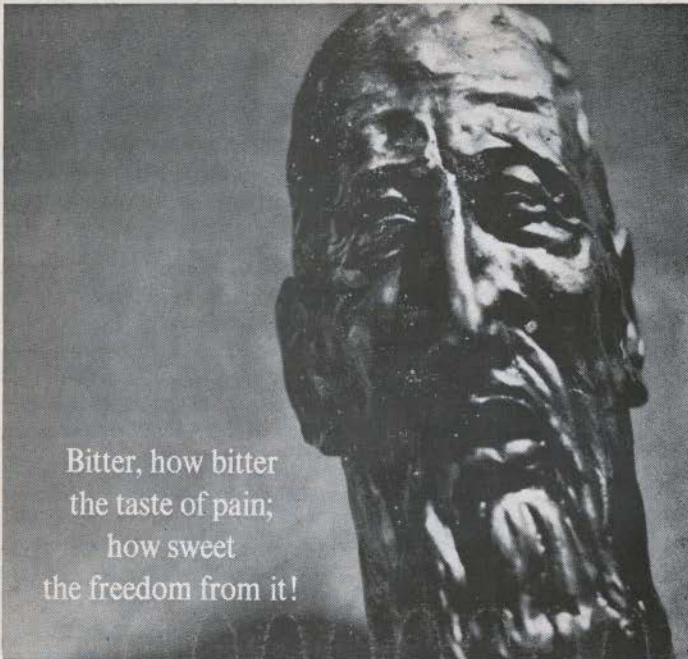
He was happy in his home, in his rose garden and in his family life; his wife Barbara and the members of his family who survive him deserve our deepest sympathy.

His medical interests included being a member of the general Council of the Canadian Medical Association, a president of the Lunenburg-Queens' Medical Society, chairman of the Medical Staff of the Fishermans' Memorial Hospital twice, chairman of the Lunenburg district campaign to help Crippled Children, director of the Nova Scotia Society for Crippled Children, and director of Maritime Medical Care Inc.

His other interests included membership of the Lunenburg Yacht Club and Curling Club, the Royal Canadian Legion. While Mayor of Lunenburg he was chairman of the board of school commissioners. He was a member of the Masonic Order and was charter president of the Lunenburg Lions Club; he was also a member of St. John's Anglican Church and the vestry committee.

Rayfield Wood led a busy and fruitful life and his passing has left a gap that is hard to fill; such a man is not often to be encountered. □

R. N. Hetherington



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Conference on Learning Disabilities

If we are going to move towards implementation of the CELDIC report, *One Million Children*, and to improve the life chances of the many children and their families struggling with emotional and learning disorders, parents and professionals will have to find ways of working together for planning, assessment, and treatment. Many teachers and parents are prepared to work with these children, but are constantly facing the frustration of inadequate medical and psychological assessment. To this end, the First Atlantic (Interdisciplinary) Conference on Learning Disabilities, "Right to Learn", is being presented by the N.S. Branch of the Canadian Association for Children with Learning Disabilities, at Dalhousie Student Union Building, October 21, 22, 23.

Of special interest to physicians will be the participation of Dr. Sylvia Richardson, paediatrician and teacher of handicapped children, from the College of Medicine, University of Cincinnati. Further details may be obtained from: "Right to Learn", CACLD, Box 34, Dartmouth, N.S.

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