THE NOVA SCOTIA MEDICAL BULLETIN

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Talent For Harvesting

Summer ends, and those of us near the coast can shake off the raindrops, peer through the clearing fog, and dry out the mildew in the warm September sun, no longer envious of the sunshine enjoyed by our more fortunate colleagues in Guysborough County and Cape Breton. We can look forward to harvesting the fruits of spring and summer; to the reunion of the family as they return one by one from camp, from summer jobs, from vacation; to waving good-bye to the children as they start back to school, to junior starting at college.

Yes, its time to get back to the projects laid aside, to the problems left unsolved by the committees that somehow couldn't manage to find a date to meet that would suit everyone, time to get to work on that report for the Annual Meeting of the Medical Society in November - and time to look around for fresh talent to contribute to the growth of our Society.

Just imagine the problems that will face the medical class now entering Dalhousie when they graduate: from our lofty eminence on the fifteenth floor of the new Sir Charles Tupper Medical Building we see the forecourt come alive with students, more numerous than ever before in the history of Dalhousie University, and drawn from the cream of the pre-medical students of many colleges, and we know for certain that medical progress will require them to be very different from the doctors of today. New methods of diagnosis, new tools of investigation, new drugs, new methods of treatment: new relations with their colleagues, with the community, and with government; new patterns of practice, perhaps new philosophies and new economics.

We welcome these new doctors in the making, as individuals, as future colleagues, and for their contribution in servicing the evergrowing need for doctors in the Maritime Provinces. And we offer them our work on their behalf, through our professional organisations, so that when they graduate, the groundwork will have been laid for the solution of the problems that will face them.

As with this year's graduating class, they, too, will be invited to join as members of The Medical Society of Nova Scotia, to bring their talents to the solution of tomorrows problems, since it is only through active recruitment and continued growth that the Medical Society can continue to be fully representative of the profession.

With rapid change, the rapid communication of ideas, problems and solutions becomes more essential, and only a strong, fully representative Medical Society can develop the resources and talent required. Each member in each Branch Society contributes to the solution of national problems, and is assisted in the solution of the problems of his own area through discussion of these at the provincial and national level, but it is only by encouraging the participation of all members of the profession in Medical Society affairs that a true consensus can be achieved.

Official invitations can seem cold and unattractive unless backed by the personal touch: recruitment is your business too. Have you spoken to the new comer in your area to urge him to join the Medical Society? - or are you leaving this new talent unharvested? □

I.E.P.

THE MEDICAL SOCIETY OF NOVA SCOTIA

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Surname Given names

Address.....

Telephone Number..... Date of Birth.....

Medical School..... Date of Graduation.....

Licensure Province..... Date Issued.....

Other Degrees.....

Post Graduate Training.....

.....

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- ☐ Anaesthesia
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Are you a Member of a Branch Society?..... Which Branch Society?.....

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	C.M.A.	M.S. of N.S.	P.G. Levy	Total
1st. Yr. Pr.**	$10.00	$ 12.00	$10.00	$ 32.00
2nd. Yr. Pr.**	15.00	45.00	10.00	70.00
Ordinary	30.00	85.00	10.00	125.00
Post-Grad Training	7.50	10.00	2.50	20.00
Husband & Wife				
1st. Yr. Pr.**	15.00	18.00	20.00	53.00
2nd. Yr. Pr.**	23.00	68.00	20.00	111.00
Ordinary	45.00	130.00	20.00	195.00
Post-Grad Training				
P. G. (outside Canada)	20.00	10.00	.....	30.00
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*Membership and fiscal year Jan. 1 - Dec. 31.
**Actual practice in Nova Scotia.

Nontuberculous Chest Diseases*

J. J. Quinlan, M.D.**

Kentville, N. S.

The marked reduction in the mortality and morbidity of tuberculosis during the past 20 years has helped to emphasize the importance of those pulmonary diseases which are not caused by the tubercle bacillus. Numerous organizations, both lay and medical, which existed purely for the study and prevention of tuberculosis, for the most part have broadened their interest to include all respiratory diseases. The marked increase in cancer of the lung and pulmonary emphysema is common knowledge to everybody. In particular, the maxim that an undiagnosed pulmonary lesion is cancer until proven otherwise is being heeded and there is a great demand for investigation and treatment of such cases.

It would appear that an ideal hospital for the study and treatment of these conditions is a chest disease hospital or tuberculosis sanatorium. In recent years, due to a decreased demand for their beds, some tuberculosis institutions have closed their doors but others have increased their facilities. These have continued to care for individuals with pulmonary tuberculosis, which is still a most important disease, but have reserved a section in the hospital for those patients with pulmonary pathology which definitely or probably is not tuberculous in nature.

From January 1950 until December 1965, 500 individuals whose symptoms, physical findings or chest roentgenograms revealed 513 chest abnormalities of a nontuberculous nature were admitted to the Nova Scotia Sanatorium for diagnosis and treatment when indicated. The detailed study of the case histories of this group of patients forms the basis of this report.

When the patient is admitted to the Sanatorium Investigation Unit, a well-established and time-tested routine is initiated. Of great importance is a very careful history noting especially the patient's habits, the occupation or occupations he has followed in his lifetime, and ascertaining in what parts of the world other than Nova Scotia he has lived. Roentgenograms of the chest are obtained in the postero-anterior and lateral projections and, if indicated, planigrams of the portion of lung under suspicion are taken. Repeated sputum specimens are collected for both bacteriological and cytological examinations. Proficiency in the identification of malignant cells in sputum has reached such a high level that this examination, coupled with the chest X-ray film, will lead to the diagnosis and localization of a lung cancer in a great many cases.

Of great importance is the tuberculin test, starting usually with the intermediate strength (5 tuberculin units) Mantoux test. If this is negative, the strongest or second strength Mantoux test of 250 tuberculin units is administered. If the tuberculin test is negative, it is relatively certain that the patient's lung disease is not tuberculosis. In most cases, a histoplasmin skin test is carried out and, when indicated, other sensitivity tests are performed as well.

If fluid is present in the pleural cavity, a specimen is aspirated and examined both for bacteria and for malignant cells: at the same time a needle biopsy of the pleura is done.

Bronchoscopy is felt to be of major importance in the investigation and, in many cases, a thorough bronchographic study is indicated. Rarely, pertinent information may be obtained from the examination of a bone marrow aspirate.

If the diagnosis is still in doubt, it is often helpful to remove a portion of the prescalene fat pad under local anaesthesia. Usually, lymph nodes are found in the fat and histological examination of these nodes will, in many cases, provide the solution of the problem. This is particularly true in patients with sarcoidosis, and the majority of patients with this disease can be diagnosed by utilizing this quite simple procedure.

If a diagnosis is still not forthcoming and the patient's condition offers no contraindication, there remains lung biopsy. Histological examination of tissue removed directly from the lung will rarely fail to be diagnostic. There are two approaches to biopsy of the lung. If the disease is localized to a segment or lobe or, rarely, to a lung, a major thoracotomy is done and a total biopsy of the lesion is carried out. In this manner, the disease is both diagnosed and receives definitive treatment at the same time. If, on the other hand, the lesion is disseminated throughout both lungs and total removal

* Presented at a meeting of the Nova Scotia Institute of Sciences, Kentville, Nova Scotia on March 7, 1966.

** From the Nova Scotia Sanatorium, Kentville, Nova Scotia.

is obviously impossible, a simple anterior thoracotomy is done through a relatively short incision. This is usually carried out on the left side, with removal of the tip of the lower division of the upper lobe. This operation carries very little morbidity and often is tolerated well even by the extremely ill patient.

In spite of the exploration of all these avenues of investigation, there will be an appreciable number of patients in whom a definite diagnosis cannot be made. In many individuals, the disease will slowly disappear and, from the standpoint of the patient, the diagnosis is now merely academic. In some, the lesion will remain the same or change little, and in a few others, progression to a fatal outcome will occur and the diagnosis will be made only at autopsy.

In this series of 500 cases of nontuberculous disease there were 303 male, and 197 female patients (Table I). The ages ranged from 7 months to 88 years, with each decade being well represented but with the greatest number in the so-called cancer age group, i.e., individuals 40 years and over.

TABLE I

500 PATIENTS WITH NON-TUBERCULOUS CHEST DISEASE
AGE GROUPS AND SEX DISTRIBUTION

Age Group	Male	Female	Both Sexes
0 – 9	4	4	8
10 – 19	17	13	30
20 – 29	28	31	59
30 – 39	32	35	67
40 – 49	60	34	94
50 – 59	76	38	114
60 – 69	55	25	80
70 +	31	17	48
ALL AGES	303	197	500

Age of youngest – 7 months
Age of eldest – 88 years

It appeared desirable at the start to attempt to rule out the presence of tuberculosis. The tuberculin status of these individuals is noted in Table II. Two hundred and sixty-eight individuals had a positive tuberculin test, with the implication that tuberculosis could be responsible for the abnormality in their lungs. In the 204 patients who failed to react to the tuberculin test, tuberculosis could be virtually ruled out. In 28 patients, the test is stated not to have been done. In most of these, the intermediate strength test was negative,

TABLE II

TUBERCULIN STATUS
OF 500 PATIENTS WITH
NONTUBERCULOUS CHEST DISEASE

Positive	268
Negative	204
Not Done	28
All Cases	500

but the patient failed to remain in hospital long enough to have the second strength test carried out, or the diagnosis was confirmed without reference to the second test.

Reference to Table III will indicate the many and varied maladies of the chest found in these patients. This table is somewhat overwhelming but it is presented to indicate the multiplicity of diseases that can and, indeed, did affect the lungs. In all, 59 pathological conditions are included in this list. They have been classified into groups, sometimes arbitrarily, and are listed in order of frequency.

The most common condition encountered was the slowly-resolving pneumonia. However, it is also noted that in 70 patients primary bronchogenic carcinoma was present. Pyogenic infections were quite common as was the presence of lung cysts, emphysema and fibrosis, and sarcoidosis. In 28 individuals, in spite of complete investigation, it was not possible to make a definite diagnosis.

Table IV summarizes the relative merits of various procedures in contributing to the diagnosis of these conditions. A definite diagnosis of any disease can be made only by histological examination or by the finding of the causative organism in tissue or secretions. Consequently, only those procedures which provide tissues or secretion for examination can indicate with finality what pathological condition is present. An exception to this is the bronchogram which will invariably demonstrate bronchiectasis.

It will be appreciated that positive findings in some of the examinations listed in Table IV were of much more significance than in others. For example, when it was stated that bronchographic examinations gave a positive finding, this might indicate a definite diagnosis such as bronchiectasis or merely that a bronchial obstruction was present in which case further investigation would be required to determine the cause of the obstruction. Similarly, a positive finding in a bronchoscopic examination would infer an alteration from a normal appearance. An endobronchial tumour might, or might not, be present. The definite diagnosis would be made following microscopic examination of tissue or secretion obtained. On the other hand, where sputum, pleural fluid, bronchial secretion, bronchial biopsy, pleural biopsy, prescalene biopsy, lung biopsy, other biopsy and sternal puncture are listed in the table as positive, it does indicate that a

TABLE III

DIAGNOSES
OF 500 PATIENTS WITH
NON-TUBERCULOUS CHEST DISEASE

Pneumoniae		132
Bronchopneumonia	101	
Lobar	25	
Atypical	5	
Lipoid	1	
Bronchiectasis and Lung Abscess		79
Bronchiectasis	60	
Lung Abscess – Acute	12	
Chronic	7	
Primary Malignant Neoplasms		75
Undifferentiated Carcinoma	31	
Epidermoid Carcinoma	29	
Adenocarcinoma	7	
Bronchiolar Carcinoma	3	
Total Primary Carcinoma	70	
Hodgkins Disease	3	
Sarcoma	2	
Cystic Changes		56
Bullous Emphysema – Local	18	
Diffuse	8	
Spontaneous Pneumothorax	13	
Cyst - Congenital	8	
Acquired	6	
Sequestration	2	
Cystic Fibrosis	1	
Emphysema and Fibrosis		51
Emphysema and Fibrosis	26	
Silicosis	10	
Fibrosis	9	
Radiation Lung	3	
Emphysema - Obstructive	1	
Hamman-Rich Syndrome	1	
Pneumonoconiosis – Unclassified	1	
Mycoses and Sarcoidosis		36
Sarcoidosis	27	
Farmers Lung	5	
Histoplasmosis	2	
Coccidioidomycosis	1	
Aspergillosis	1	
Not Diagnosed		28
Secondary Malignant Neoplasms		16
Primary Breast	3	
Ovary	3	
Kidney	3	
Colon	2	
Obscure Site	2	
Uterus	1	
Vagina	1	
Humerus (Sarcoma)	1	
Pleurisy and Empyema		13
Pleurisy with effusion, Etiology Obscure but not Tuberculous	8	
Empyema, Nonspecific	3	
Staphylococcal	1	
Pleurisy with Effusion due to Rheumatoid Arthritis	1	
Miscellaneous		9
Kartageners Triad	1	
Azygos Lobe – Cystic Degeneration	1	
Congenital Abnormality of Pulmonary Artery	1	
Oesophageal Varices	1	
Cardiac Failure, Coronary Occlusion	1	
Pulmonary Oedema	1	
Pulmonary Infarction	1	
Atelectasis, Chronic	1	
Atelectasis and Carnification	1	
Benign Neoplasms		6
Fibromyoma	1	
Neurilemmoma	1	
Dermoid Cyst	1	
Unspecified Mediastinal Tumour	1	
Granuloma, Lung – Nonspecific	1	
Pericardial Cyst	1	
Herniae		5
Morgagni	4	
Hiatal	1	
Serosal Diseases		4
Pleural Fibrosis	2	
Chronic Pericarditis	1	
Fibrothorax	1	
Injuries		3
Pneumothorax	1	
Haemopneumothorax	1	
Lung Contusion	1	

diagnosis was made by either the finding of causative organisms or by the characteristic microscopic appearance of tissue obtained by the procedure.

As to the comparative values of the various procedures in establishing a diagnosis, the major procedure of thoracotomy with lung biopsy was successful in all 79 patients. Other very important measures included examination of the sputum both for pathogenic organisms and malignant cells, bronchoscopic examination with biopsy of any endobronchial lesion or at times of grossly abnormal mucous membrane, and aspiration of secretions for cytological examination, and prescalene fat pad biopsy. This last-named procedure was found to be of the greatest importance in the diagnosis of sarcoidosis and 16 out of 27 patients with this condition had the diagnosis made by this relatively simple measure. In addition, five patients with primary bronchogenic carcinoma were spared an unnecessary exploratory thoracotomy because of the finding of malignant cells in the lymph nodes of the prescalene fat pad.

Whenever feasible, treatment was instituted for the various conditions discovered by the investigative procedures. With a busy thoracic surgical service established for the treatment of pulmonary tuberculosis more than 30 years ago, the surgical management of those conditions requiring operation

TABLE IV

SUMMARY OF POSITIVE FINDINGS IN 500 PATIENTS WITH NON-TUBERCULOUS CHEST DISEASE

Disease Condition	Number of Cases in Group	Bronchogram	Sputum	Pleural Fluid	Bronchoscopy	Bronchial Secretion	Bronchial Biopsy	Pleural Biopsy	Prescalene Biopsy	Lung Biopsy	Other Biopsy	Sternal Puncture	Histoplasmin Test
Pneumoniae	132	5	9	1	3		1			7			
Bronchiectasis and Lung Abscess	79	62	56		3					7			
Primary Malignant Neoplasm	75	2	19	8	49	9	19	5	5	28	1		
Cystic Changes	56	9	1		1					11			
Emphysema and Fibrosis	51	4			3					4			
Mycoses and Sarcoidosis	36		1		4				16	11	2	1	2
No Diagnosis	28				5								
Secondary Malignant Neoplasm	16		3	3	6		1	3		4		1	
Pleurisy and Empyema	13			1				1					
Miscellaneous	9	3								3			
Benign Neoplasms	6				1					3			
Herniae	5												
Serosal Diseases	4				1					1			
Injuries	3												
All Cases	513	85	89	13	76	9	21	9	21	79	3	2	2

could promptly be put into effect. Chemotherapy was administered when indicated. Those diseases causing diminution in pulmonary function could be ameliorated by treatment in the department of physical medicine by such means as breathing exercises, intermittent positive pressure breathing and bronchodilators.

The various modalities of treatment are outlined in Table V and here a few brief elaborations may be in order. In eight patients where resection was carried out for what proved to be pneumonia, the tentative preoperative diagnosis was carcinoma but the presence of malignancy was not confirmed on examination of the surgical specimen. The closed drainage procedures were done to treat complications of the primary disease such as empyema and pneumonia, spontaneous pneumothorax and complicating cystic emphysema. Chemotherapy refers to the use of drugs employed to combat infection and does not include the treatment of cancer by drugs. Over half the individuals in the series received no treatment. In many cases it was not required, a slowly revolving pneumonia for example having disappeared either shortly before admission or during the period of investigation. In other individuals, the disease process was such that no known treatment was available or it was so advanced that no treatment would be effective in bringing about amelioration. Many patients who are listed as having no treatment include those with extensive em-

TABLE V

TREATMENT OF 500 PATIENTS WITH NON-TUBERCULOUS CHEST DISEASE

Disease Condition	All Cases	None	Chemotherapy	Radiotherapy	Cancericidal Drugs	Isotopes	Resection	Aspiration	Closed Drainage	Repair of Chest Wall	Repair of Diaphragm	Pleurectomy or Decortication	Pneumonotomy
Pneumoniae	132	47	79				7		1				1
Bronchiectasis and Lung Abscess	79	34	15				30						
Primary Malignant Neoplasm	75	29	1	28	6	1	17						1
Cystic Changes	56	17	1				28	3	4			13	
Emphysema and Fibrosis	51	46	1				4						
Mycoses and Sarcoidosis	36	31	4				1						
No Diagnosis	28	24	2				1	1					
Secondary Malignant Neoplasms	16	13					3						
Pleurisy and Empyema	13	7	2					3	1			2	
Miscellaneous	9	3	1				4		1				
Benign Neoplasms	6	3					3						
Herniae	5	2									3		
Serosal Diseases	4	3										1	
Injuries	3								2	1			
All Cases	513	259	106	28	6	1	98	7	9	1	3	16	2

physema and fibrosis where considerable symptomatic improvement was effected by the use of such measures as intermittent positive pressure breathing.

The results of the various forms of therapy are noted in Table VI. It should be pointed out that these are immediate results and are valid in such conditions as pneumonia, but have little bearing on the eventual outcome in the case of some of the other conditions. For example. it may be assumed that the eleven patients with primary carcinoma listed as unimproved had advanced malignancies which, in time, will prove lethal. Also, it is reasonable to assume that the unimproved survivors with emphysema and fibrosis had a very poor prognosis. Deaths listed as operative include all fatalities occurring within three months of the surgical procedure. Six of these eight patients were operated on for primary carcinoma of the lung. Such individuals frequently are poor surgical risks and the operative mortality in this series compares favorably with that of most centres dealing with pulmonary malignancy.

Summary:

A study was undertaken to discover the nature of the nontuberculous chest disease in 500 patients admitted to the Nova Scotia Sanatorium from January 1, 1950 to December 31, 1965. Thirteen of these individuals had two important lesions so that the total number of diagnoses was 513.

A negative Mantoux tuberculin test in a strength of 250 tuberculin units made it possible quickly to eliminate tuberculosis as a diagnostic possibility in 204 or 40 per cent of the cases.

TABLE VI

RESULTS IN 500 PATIENTS WITH NON-TUBERCULOUS CHEST DISEASE

Disease Condition	All Cases	Cured	Improved	Unimproved	Died of Disease	Died – Operative	Died – Other Cause
Pneumoniae	132	99	26	1	4		2
Bronchiectasis and Lung Abscess	79	35	17	26			1
Primary Malignant Neoplasms	75	1	8	11	47	6	2
Cystic Changes	56	26	14	12	2	1	1
Emphysema and Fibrosis	51	2	8	37	1	1	2
Mycoses and Sarcoidosis	36		33	2	1		
No Diagnosis	28	1	6	17	3		1
Secondary Malignant Neoplasms	16	1		4	11		
Pleurisy and Empyema	13	11	2				
Miscellaneous	9	4	2	1	1		1
Benign Neoplasms	6	3	1	2			
Herniae	5	3		2			
Serosal Diseases	4		2	1	1		
Injuries	3	2	3				
All Cases	513	188	120	116	71	8	10

The various forms of pneumonia, particularly bronchopneumonia, accounted for approximately 25 per cent of these conditions. It was felt that the referrals of such cases is an indication of the awareness by the family physician of the possibility of a lung cancer lurking behind the screen of an apparently benign condition. Chronic pyogenic conditions of the lung, abscess and bronchiectasis, were present in 79 instances, primary malignant conditions of the lung in 75, various forms of pulmonary cysts in 56, and emphysema and fibrosis in 51. Sarcoidosis was the diagnosis made in 28 individuals and a great variety of other chest lesions was noted in the remaining patients.

It is felt that a tuberculosis hospital is a very appropriate place for the management of these patients with its staff especially trained in the diagnosis and treatment of tuberculosis - still the most common chronic lung infection - and with excellent equipment for the study and treatment of all chest conditions exclusive of major cardiovascular abnormalities. With an anticipated decline in the morbidity of tuberculosis in the years ahead, an ever-increasing number of patient with nontuberculous chest diseases will be admitted to tuberculosis institutions for differential diagnosis. Indeed, perhaps, tuberculosis hospitals will lose their identity as such and become chest disease hospitals, in name as well as in fact. □

FORTY YEARS AGO

From the Nova Scotia Medical *Bulletin*
September 1927

Essential Hypertension

The writer believes that the handling of this condition is often too stereotyped, that disheartening restrictions are often placed on patients in the realm of diet, exercise, etc., and that far too much reliance is still placed on drugs as vascular depressants in its treatment. By the term essential Hypertension we mean to-day a state of primary vascular hypertension with the coexistence of such demonstrable renal impairment as can be determined by any test of kidney function. (Hyperpiesia of Allbutt, and the hypertensive cardio-vascular disease of Janeway).

Because of its great frequency, obscure origin and pathogenesis, and its suspected relation to vascular, cardiac and renal disease, interest in this condition has been untiring.

A recent review of the literature recalled a paper by Du Bray, Instructor of Medicine in Univ. of California Medical School, May, 1924, which he regards as sound and rational and as representing fairly his own position to-day.

He summarizes the article for the benefit of his confrères.

What are the Underlying Factors in the Production of Hypertension.

With a mere reference to the two explanations of the increased resistance in the vascular bed which have so long held the field, viz the chemical and the mechanical, we may assume the modern position of a careful observer like Christian of Harvard, who believes that the cardio-vascular mechanism is disturbed from a multiplicity of causes. A rational therapy of any disease begins with a complete understanding of the fundamental cause. We have not yet attained this goal in essential hypertension, and it behooves us therefore to keep our views in the fluid state. The management of the condition must, therefore, be largely on an empiric base. Notwithstanding this, there is a growing feeling that much can be done in early cases by preventing premature and unnecessary break-downs.

What are the Reasons that the Early Management of Essential Hypertension is of Especial Importance?

T. Janeway's accurate observations show that death among patients in private practice occurs in the following ways, arranged in the order of their frequency: (1) By gradual cardiac insufficiency; (2) With uraemic symptoms; (3) Apoplexy; (4) from some complicating acute infection; (5) in an attack of angina pectoris. For this reason essential hypertension offers an unusual opportunity for the study and control of early disease. A large number of the patients are seen in the incipient stage, and if properly managed before too great strain has been imposed on the circulatory apparatus, much can be done to arrest, modify and retard the process.

Maintenance of Sterility in Multidose Vials

O. C. MacIntosh, M.D.* & S. Sernyk, B.Sc., R.T.

Saint Martha's Hospital
Antigonish, N. S.

Multidose vials of various pharmaceuticals are in common use in most hospitals and physicians' offices. The contents of these vials are commonly obtained by cleansing the surface of the rubber stopper with an alcohol impregnated pledget, puncturing the stopper with a needle and withdrawing a portion of the contents of the vial into a syringe. The possibility of contamination of the contents of such vials during this procedure has perhaps occurred to many, although no readily available information on this possibility is known by the authors to exist.

For this reason, it was decided to culture the residual contents of a number of such vials. The vials selected had been used in a general hospital, without any particular precautions other than those ordinarily used by nurses to protect their contents from contamination during multiple punctures of their stoppers. In order to accomplish this end, all expended, rubber-stoppered vials used in a 200-bed general hospital for a short period were referred to the Bacteriological Laboratory for examination.

The residual contents of a total of 202 expended multidose vials were examined. Included in the examination were expended vials of various local anaesthetics (22), antibiotics (103), tranquillizers (14), various smooth muscle relaxants (14), narcotics (10), and various other pharmaceuticals (39).

For the purpose of the study, it was presumed that the contents of the vials were sterile when received from the manufacturers.

When received at the laboratory, the metal retaining rings were removed from the vials and the stoppers removed under sterile precautions. The residual contents of the vial, generally consisting of a drop or two of liquid, were then used to inoculate an aerobic medium (Trypticase Soy Broth), an anaerobic medium (Thioglycollate Broth), and a plain blood agar plate. The media were incubated at 37° for 48 hours and examined for evidence of growth.

In one instance (local anaesthetic vial), an alpha hemolytic Streptococcus (Strep. Viridans) and in a second instance (smooth muscle relaxant vial), an aerobic spore bearer (Bacillus Subtilis) was recovered from the contents of the vials. The contents of the remainder of the vials proved sterile. Alpha hemolytic Streptococci (Strep. Viridans) are ordinarily of low pathogenicity, and aerobic spore bearers (Bacillus Subtilis) are ordinarily non-pathogenic. However, their presence does indicate that the possibility of contamination of such vials by a virulent microorganism cannot be overlooked.

No evidence of contamination was encountered in the large number of antibiotic vials (103) examined. It is presumed that the protective effect of the antibiotic would greatly reduce the possibility of survival of a contaminating organism in these vials. Nevertheless pharmaceuticals containing large quantities of antibiotics have been known to be contaminated with resistant pathogenic organisms and that such contamination has resulted in several instances in serious infections.[1] Furthermore, it should be recalled that in the case of narrow spectrum antibiotics, the antibiotic effect would not be universal.

The practice of wiping the surface of the rubber stopper of multidose vials with a solution of alcohol does not, contrary to the impression of many, confer complete protection against contaminating the contents during needle puncture. In order to have maximum effectiveness, isopropyl alcohol should be used and the solution strength should be 72-90% in water. Unfortunately, it often is diluted below this concentration. Such a solution, of course, has no effect on spore bearing organisms. A preferable practice would be to moisten the rubber top with a 2% glutaraldehyde solution, or a formaldehyde 20%, alcohol 50% solution[2] which are effective against spores, vegetative bacteria and viruses, and then dry it with a sterile pledget before inserting the needle.

Summary

The results of this limited study reveal that under ordinary hospital usage, the contents of multidose vials of pharmaceuticals can be contaminated, although this is a relatively infrequent occurrence.

Under these circumstances, therefore, it is necessary that nurses and other personnel be properly and carefully instructed in the use of vials of this nature. It is also necessary that continuous care be exercised to insure that adequate precautions are carried out in order to insure that the sterility of their contents is maintained. □

References

1. **Kallings, L. O., Ringertz, O., Silverstolpe, L.,** Acta pharm Suecica, **3**, 219, 1966.
2. The Medical Letter, Drug and Therapeutic Inc., New York, New York 10017, **9**:1, April 7, **1967.**

* Presently Director of Laboratories, Halifax Infirmary, Halifax, N. S.

– NOTICE –

Re By-Laws

The Council of The Medical Society of Nova Scotia and the Annual Meeting 1966 approved the following amendments to the By-Laws:

(1) (a) That Chapter IX "Council" – Article 2 (viii) – "Composition of Council be amended to read:
"Members of the Society who are members of the General Council of the Canadian Medical Association."
and

(b) That Chapter IX – Article 2 – "Composition of Council" have added:
"The Dean of Medicine, Dalhousie University."

(2) That Chapter XII "Committees" be amended to include the President Elect of the Society as a member of the Nominating Committee.

This "notice" is to conform with Chapter XVI "Amendments" of the By-Laws.

C. J. W. Beckwith, M.D., D.P.H.
Executive Secretary

MANUAL ON ALCOHOLISM

The Nova Scotia Alcoholism Research Foundation, on the recommendation of its Medical Advisory Committee, will provide copies of a "Physician's Manual on Alcoholism" to interested medical practitioners in the Province of Nova Scotia.

This 64 page publication has been prepared by Doctor Saul Cohen of Saskatchewan and has been favourably received in several Canadian provinces.

Any physician wishing to receive a complimentary copy of the Manual should forward a request to:

The Nova Scotia Alcoholism Research Foundation, 5639 Spring Garden Road, Halifax, Nova Scotia.

ACKNOWLEDGEMENT

Illustrations:—"A Country Doctor's Life, 1859-1888. By Dr. Frank W. Morse, M.D., Lawrencetown, N. S. N. S. Medical Bulletin Vol. XLVI, Number 8, P. 169, August 1967. Following many enquiries, the Editorial Committee gratefully acknowledges that the illustrations commissioned for this article were superbly executed by Mr. Robert G. MacLelland of Halifax, Nova Scotia.

ARNOLD LOGAN
Halifax, N. S.

This article won't be my usual potpourri of things layman-medical because it has a unifying bond, the telephone and the voluntary medical plan I represent.

Recently I asked our switchboard operator and her lunch hour substitutes to make a few notes on the more interesting requests they receive, and for a week or so they did that. It was my intention at the time to use them as the basis of an article for our staff paper, The Merrytimer, but when I saw the result it occurred to me you readers would like to learn something about this aspect of the only medical plan in the Atlantic Provinces SPONSORED by a medical society "through your home doctor".

This from a lawyer:

"My client has passed away. He had M.M.C. Will you people pay for the casket, opening of the grave, rental of greenery and the cost of one mourner's car?"

There's a lawyer who really works for his client.

Some claims from doctors result in the odd amusing telephone calls. Apparently a doctor's card for the treatment of "Lena" had been returned as there was no Lena listed among the subscriber's dependents. The doctor of course relayed the information to Lena's parents and Lena's mother was outraged. She grabbed the telephone and called us.

"Anyone", she indignantly pointed out to our operator, "knows that Lena is short for Alma."

Here are a number of calls, all, mark you, the result of one week's gleanings:

"Does M.M.C. pay for ears?"

"And how did you answer THAT?" I asked the PBX'er. Well she questioned her and learned the caller referred to an ear operation. Because of a smart-alecky nature I would have been hard put to it not to reply we didn't pay for ears but that we did pay for nostrils at fifty cents a nostril. I wouldn't last ten minutes as a switchboard operator for a medical plan. Matter of fact as a salesman I've frequently been interrupted by a person (during a group talk) and I barely keep from saying something that would put me among the unemployed. It's when this healthy interrupter says: "I don't get a thing out of M.M.C. I've belonged for five years and I haven't used it once!"

I'm just aching to reply: "Well, I hope you're sick soon, sir."

Back to our 'phone calls:

"When are the pill cheques going out?" This from a member who has our Extended Health Benefit Plan, one of the benefits of which is doctor-prescribed drugs. . . . . "Say, is there anything left on my Maritime Medical Care to cover Cindy's heart condition?. . . . ."Could I come down there and have my back massaged?". . . . ."My dog has a broken leg; will you pay to have a cast put on it?" . . . . .From a female: "I have to go to hospital; do I need a slip?"

If our general manager took all the calls from those asking for him, he'd have no time to manage, Here is where our switchboard operators really earn their salaries. Question the caller a bit and frequently he wants to know "what business is it of yours?" All too often it's a subscriber inquiring about a bill for his wife's operation, or his own "trouble", or why it is he wasn't in last week to pay his dues.

"I want the boss", growls a tough male voice.

"Anything I can do for you, sir?" asks our PBX.

"Are you the boss?"

"No, but I may be able to help you."

"I doubt it. My wife's going to have a baby and we've been in M.M.C. for five months. Will you pay if the baby comes NEXT month?"

"I'm afraid not, sir. There's a nine months' waiting period."

"Give me some man there if I can't get the boss."

Funny thing, that. Soon as he hears a male voice telling him the same thing, he's all sweetness and honey.

I'm convinced most of our subscribers - and we have some 220,000 members - believe we're a much smaller organization than we are. A total stranger will approach me on Barrington Street in Halifax.

"I guess you people are beginning to wonder about me at M.M.C.?" he says apologetically. "You just tell 'em I'll be in next week for sure to pay my dues." (On "pay-direct" days I couldn't get near one of our cashiers to tell them; the line-ups are too deep.)

We close down our switchboard after the day's work and individual 'phones are plugged in. After that they ring all over the place, late at night, on Sundays, on holidays. And we answer them frequently, sometimes to our regret.

I was working late at night once when the 'phone rang and like a dolt I answered. Foolhardy thing to do actually as all our records are locked up and are not available until the next day.

Anyway I answered and a hysterical female voice rang in my ear:

"Is that Maritime Medical Care?"

"Yes."

"Well my little boy just cut his finger badly and I'm sending him right down to you!"

PHEW!

In the nick of time I yelled I wasn't a doctor. Thing shook me. I've often wondered how I would have coped with the matter if she hadn't heard me in time. Could have rifled the first aid box I suppose; kept on slapping band aid after band aid over the wound until the blood stemmed.

I admire many doctors, although for certain personal reasons I think most highly of Dr. Best and the late Dr. Banting. I can recall many years ago when we were located at the corner of Duke and Hollis Streets in Halifax an elderly man dropped dead on the street not far from the office. Someone knew that our then medical director, Dr. George Bernard Shaw, would probably be on duty and he was. So he was called to the scene.

Came back within a few minutes.

"A fainting case?" I asked professionally.

"No," replied Bernie, "a heart case; he was dead." Cool as a cucumber is Dr. Shaw. He once practiced in a small P.E.I. town. One night he was called to a farmer's home to stitch up a farm hand who had suffered a severe cut. The cut was deeper than he was led to believe from the 'phone call and Bernie had brought only so much cat gut, or whatever you call the material doctors use to stitch cuts.

"Got a horse out in that barn?" asked Bernie.

"Yup".

"Well go out there, take two or three strands from his tail, boil them and bring them to me."

Man got better. I would have called for band aids, hundreds of band aids.

(Dr. Shaw now practices in a Maine town, which reminds me I read recently that out of 1,000 doctors who were graduated from Canadian medical schools last year, over 400 of them went to the U.S. to practice.)

Ha! If and when medicare comes to Nova Scotia I'll settle for the services of a V.O.N. nurse. I'll also settle for a bed in the hall of one of the two major hospitals in Halifax for five years after medicare arrives, if I can get that far. Indeed I'll sign up right now for a crib in Grace Maternity Hospital. The "Pill" is emptying more cribs and children's beds than smallpox did before Dr. Jenner, the great English doctor, refined the vaccine.

But here I'm going "potpourr-ish" again.

I'm typing this late at night at the office.

"BRRRRRRR!"

That 'phone can ring until the cows come home. Listen to the thing - EIGHT TIMES! 'Course it could be someone from my home calling; guess I'll answer it. If it's a subscriber who wants to know if he can put his common law wife on his contract, along with his legal wife ('sfact! Our operator had THAT call just a week ago), I'll pretend I'm the janitor who don't know nothing because I'm with this here cleaning service, see, and I'm just emptying waste paper baskets. . . . .

And sending some of it to the Bulletin. □

Medical-Legal Enquiries

MORE ON THE BREATHALYZER

Q: As the Breathalyzer provides a (questionably?) accurate measure of alcohol concentration in right heart or arterial blood, how can the results be considered a reasonable estimate of venous blood alcohol? All the legislation I have seen has been based on venous blood alcohol levels.

A: Breathalyzer readings have a standard deviation of 6.93 mg% as compared with 4.10 mg% for a direct blood alcohol estimation.[1,2] It is true, therefore that the estimate of blood alcohol by replicate breathalyzer sampling is slightly less accurate than a true blood method but as the range in which we are interested for legislative purposes lies between 80 - 100 mg%, this slight variability does not represent a significant inaccuracy.

It is quite true, as the questioner states, that the machine estimates arterial alcohol levels but in actual practice it is rare to find any difference between the alcohol content of venous and arterial blood.

Under experimental conditions involving the rapid ingestion of a single test dose and measurement of breath alcohol in the ensuing 30-45 minutes, arterial alcohol levels of the order of 15 mgm% (0.15%) in excess of venous levels may be seen, but no one could maintain that this is the normal pattern of drinking drivers.

At the end of 60 minutes equilibrium has almost invariably been reached and it is our experience that even if further doses of alcohol are pushed it is impossible to produce any difference between the alcohol content of venous and arterial blood if the first dose has been large enough to produce a significant level. Presumably this is due to closing of the pylorus against further insult. This is not to say that further ingestion will not continue to raise the blood alcohol level but rather that the venous and arterial alcohol levels will now rise *pari passu* due to equilibrium being reached between the rates of absorption and of distribution.

Again, in actual practice, several safeguards are employed to guard against falsely high estimates:-[3]

(a) The machine is calibrated to read 0.010% too low.

(b) When he prepares the instrument, the operator sets the pointer not on the zero mark, but 0.003% below this.

(c) In reading the dial, alcohol levels are estimated to the index next below - e.g. dial readings of 0.063 and 0.069 are both reported as 0.06.

(d) Any possible technical error such as obtaining a poor breath sample, leaks in the machine, inadequate warm-up or exhausted biochromate solution, will give a falsely low reading.

(e) As there will almost always be a period of 30 minutes to over an hour between arrest and "breath analysis", there seems to be negligible chance that there will be any difference between the alcohol content of venous and arterial blood at this time.

(f) The operators are instructed to wait 30 minutes to allow the instrument to warm up and to ensure that any fresh alcohol in the mouth will have been dispersed. If the subject belches or vomits at any time during this waiting period, the police must wait a further 20 minutes. (It would appear that by belching regularly every 19 minutes an accused person could delay analysis indefinitely without ever refusing to give a sample.)

The net result of these multiple safeguards is that estimations of blood alcohol by the Breathalyzer are almost always slightly lower than the true blood alcohol level. In a recent series involving 46 drinking subjects who were permitted to drink *ad lib* over a period of two hours, some of whom drank in excess of 14 ounces of 70 proof spirits during this period, the mean estimate of blood alcohol by the Breathalyzer was 0.02% (20 mgm%) lower than the true blood alcohol and in no case was it higher than the actual blood level. I.D.M. □

References

1. **Coldwell, B. B. & Smith, H. W.**, *Can. J. Biochem. Physiol.* 37:43, 1959.
2. **Begg, T. B., Hill, I. D. & Nickolls, L. C.**, *B.M.J.* 1:9, 1964.
3. **Borkenstein, R. F.**, *Breathalyzer Mod.* 900 *Instruction Manual*, Red Bank, New Jersey, *Stephenson Corp.*
4. *Unpublished observations.*

Clinical Staff Conferences Effective Sept. 1967

PATHOLOGY INSTITUTE

Seminars in Pathology and Bacteriology	Monday	4:00 p.m.	Lecture Rm. 327	Weekly
Orthopedic Pathology	Monday	5:00 p.m.	Lecture Rm. 327	Periodically
Surgical Pathology	Tuesday	4:00 p.m.	Lecture Rm. 327	Weekly
Gynecological Pathology	Tuesday (1st of mo.)	5:00 p.m.	Lecture Rm. 327	Monthly
Neurosurgical Pathology	Wednesday (1st of mo.)	9:00 a.m.	Autopsy Room	Monthly
Neuropathology	Wednesday	2:00 p.m.	Autopsy Room	Weekly
Autopsy Cases (Gross)	Friday	2:30 p.m.	Autopsy Room	Weekly
Autopsy Cases (Micro.)	Friday	4:00 p.m.	Lecture Rm. 327	Weekly

THE CHILDREN'S HOSPITAL

Cardiology Rounds	Monday	10:30 a.m.
Neonatal Conference (Grace Hospital)	Wednesday	12:00 noon
Admission Rounds	Tuesday	8:00 a.m.
Neurology Rounds	Tuesday	11:00 a.m.
Medical Grand Rounds	Wednesday	9:00 a.m.
Admission Rounds	Thursday	8:00 a.m.
Metabolic Conference	Thursday	11:00 a.m.
Neurology Conference (alternates weekly)		
Case Presentation	Thursday	4:00 p.m.
Orthopaedic Conference	Friday	11:00 a.m.
(alternates with Surgical Conference	Friday	11:00 a.m.
Radiology Conference (bi-monthly) Alternates with Pathology Conference	Friday	11:00 a.m.
Ward Rounds	Daily	9:00 a.m.

GRACE MATERNITY HOSPITAL

Staff Meeting Luncheon	Monday (Last)	12:00 noon
Obstetrical Conference	Tuesday (Third)	5:00 p.m.
Ward Rounds	Daily	9:00 a.m.
Journal Club Luncheon	Thursday	12:15 p.m.
Prenatal Clinic	Tuesday, Thursday, Friday	2:00 p.m.
Well Baby Clinic	Tuesday, Thursday, Friday	2:00 p.m.
Postnatal Clinic	Tuesday, Thursday, Friday	2:00 p.m.
Family Planning Clinic - by appointment	Wednesday	2:00 p.m.

HALIFAX INFIRMARY

Department of Anaesthesia			
Monthly Conference	Monday (3rd)	4:00 p.m.	O.R. Suite
Department of General Practice			
Monthly Conference	Thursday (4th)	8:30 p.m.	3C Clinic Room
Weekly Joint Conferences - attended by Department members as follows: -			
with the Department of Surgery	Wednesday	8:00 a.m.	
with the Department of Medicine	Thursday	11-12:30	
with the Department of Paediatries	Friday	11- 1 p.m.	
with the Department of Psychiatry	Wednesday	9-10 a.m.	
with the Department of Obs.-Gyn.	Friday	12- 1 p.m.	
Department of Medicine			
Grand Rounds	Thursday	11:30-12:30 p.m.	4C Clinic Room
Intern-Resident Conference	Friday	12:00- 1:00 p.m.	4C Clinic Room
Monthly Meeting	1st Tuesday	5:00- 7:00 p.m.	4C Clinic Room
Department of Obstetrics and Gynecology			
Weekly Rounds	Friday	12:00- 1:00	3C Clinic Room
Monthly Meeting	3rd Tuesday	5:00- 6:00 p.m.	3C Clinic Room
Daily Conference	Mon.-Fri.	9:00 a.m.	3C Clinic Room
Department of Ophthalmology			
Weekly Conference	Tuesday	6:30 p.m.	Outpatient Dept.
Monthly Conference	3rd Tuesday	6:30 p.m.	Outpatient Dept.
Department of Otolaryngology			
University Dept. Joint Meeting	Thursday	7:00 p.m.	Alternate hospitals
Department of Pathology			
Clinical Pathological Conference	Last Wednesday	12:00 noon	Auditorium
Department of Psychiatry			
Case Presentation	Wednesday	9:00 a.m.	2A Clinic Room
Monthly Conference	3rd Wednesday	9:00-11:00 a.m.	2A Clinic Room
Daily Ward Rounds		8:00 a.m.	Psychiatric Dept.
Department of Radiology			
Weekly Conference	Thursday	3:30 p.m.	Radiology Dept.
House Staff Conference	Tuesday	1:00: 2:00 p.m.	Radiology Dept.
Department of Therapeutic Radiology			
Grand Rounds	2nd & 4th Friday	12:00 noon	Radiotherapy Dept.
Department of Surgery			
Weekly grand rounds	Wednesday	8:00 a.m.	
Monthly Departmental Meeting	2nd Wednesday	12:30 p.m.	3C Clinic Room
Department of Urology			
Weekly Conference	Thursday	12:00 noon	Urology Dept.
Monthly Meeting	Last Thursday	4:30 p.m.	Urology Dept.

This listing is as complete as possible, and all excerpts listed are open to any interested Physician.
Information regarding other areas of the Province is welcomed and will be published when available.

VICTORIA GENERAL HOSPITAL

Department of Medicine

Cardiac Working Conference	Monday	1:00- 2:00 p.m.	X-ray Conference Room
Metabolism & Endocrinology	Monday (1st & 3rd)	1:00- 2:00 p.m.	OPD Conference Room
Renology	Monday (2nd & 4th)	1:00- 2:00 p.m.	OPD Conference Room
Medical Grand Rounds	Tuesday	8:30-10:00 a.m.	V.G. Auditorium
Cardiology	Tuesday (1st & 3rd)	1:00- 2:00 p.m.	OPD Conference Room
Pulmonary	Tuesday (2nd & 4th)	1:00- 2:00 p.m.	OPD Conference Room
Haematology (Out Patients)	Tuesday	2:00- 4:30 p.m.	OPD 3rd Floor
Neurology-Neurosurgery	Wednesday	9:00-10:00 a.m.	Pavilion Conf. Room
Haematology	Wednesday (1st & 3rd)	1:00- 2:00 p.m.	OPD Conference Room
Gastroenterology	Wednesday (2nd & 4th)	1:00- 2:00 p.m.	OPD Conference Room
Rheumatology (Out Patients)	Wednesday	11:00-12:00 a.m.	OPD 3rd Floor
Resident Orals	Thursday	1:00- 2:00 p.m.	OPD Conference Room
Neurology	Friday (1st & 3rd)	1:00- 2:00 p.m.	OPD Conference Room
Rheumatology	Friday (2nd & 4th)	1:00- 2:00 p.m.	OPD Conference Room
Cardiology	Friday	2:00- 4:00 p.m.	OPD 3rd Floor
Tumour Conference	Friday (3rd Friday)	12:30- 2:00 p.m.	Tumour Clinic

Department of Surgery

Weekly Clinical Conf.	Saturday	11:00 a.m.	5th Floor Clinic Room
Surgical Pathology Conference	Tuesday	4:00 p.m.	Path. Bldg.
Ward Rounds			
Surgery A	Saturday	9:00 a.m.	6 South
Surgery B	Saturday	8:00 a.m.	6 North
Surgery C	Wednesday	8:30 a.m.	6 South
Surgery D	Saturday	9:00 a.m.	6 North
Orthopaedics	Tuesday	11:00 a.m.	4 West
Out Patients Clinics			
Surgery A	Friday	9:30 a.m.	Outpatient Dept.
Surgery B	Thursday	9:30 a.m.	Outpatient Dept.
Surgery C	Wednesday	9:30 a.m.	Outpatient Dept.
Surgery D	Tuesday	9:30 a.m.	Outpatient Dept.

Department of Gynaecology

Ward Rounds	Daily	9:00 a.m.	5 West
Grand Rounds	Monday	8:00 a.m.	5th Floor Clinic Room
Pathology Conference	Tuesday (First)	5:00 p.m.	Path. Institute
Tumour Clinic	Tuesday & Friday	11:30 a.m.	Outpatient Dept.
Gyn. Outpatient Clinic	Monday	2:00 p.m.	Outpatient Dept.
Gyn. Endocrine Clinic	Wednesday	2:00 p.m.	Outpatient Dept.

Department of Radiology

Therapeutic Radiology Ward Rounds	Thursday	8:30 a.m.	6 South
Diagnostic Radiology Conference	Daily	3:00 p.m.	Radiology Dept.
Proven Case Conference	Thursday	1:00 p.m.	Radiology Dept.
Clinical Conference	Thursday (3rd)	5:30 p.m.	X-ray Conf. Room
Departmental Conference	Friday (Last)	1:00 p.m.	X-ray Conf. Room

Department of Psychiatry

Ward Rounds	Monday & Friday	10:30 a.m.	Pavilion
Seminar	Friday	4:00 p.m.	West Annex Conf. Rm.
Child Guidance Clinic	Thursday	9:00 a.m.	Auditorium
Case Presentations	Monday, Tuesday, Friday & Saturday	9:00 a.m.	Pavilion Conf. Room

Department of Urology

Conference	Monday Wednesday & Friday	4:30 p.m.	6 West
Seminar	Tuesday	4:30 p.m.	X-ray Conf. Room

Department of Anaesthesia

Conference	Friday (First)	3:30 p.m.	

Nova Scotia Tumour Clinic

Conference	Friday (Third)	12:30 p.m.	Tumour Clinic
Clinics			
Rectal	Thursday	10:00 a.m.	Tumour Clinic
Breast	Monday	2:00 p.m.	Tumour Clinic
Gynaecology	Tuesday	11:00 a.m.	Outpatient Dept.
Skin, Soft Tissue	Tuesday	11:30 a.m.	Tumour Clinic
Colon	Tuesday	11:30 a.m.	Tumour Clinic
Leukemia & Lymphoma	Tuesday	2:00 p.m.	Outpatient Dept.
Paediatric	Tuesday (Fourth)	2:00 p.m.	Tumour Clinic
Ophthalmology	Tuesday	2:30 p.m.	Outpatient Dept.
Head & Neck	Wednesday	11:30 a.m.	Tumour Clinic
Otholarynogology	Wednesday	11:00 a.m.	Outpatient Dept.
Neurosurgery	Wednesday	11:00 a.m.	Outpatient Dept.
Urology	Thursday	10:00 a.m.	Outpatient Dept.
Breast	Thursday	11:00 a.m.	Tumour Clinic
Pulmonary	Friday	12:00 noon	Tumour Clinic
Gastric & Esophageal	Friday	12:00 noon	Tumour Clinic
Orthopaedic	Friday (2nd & 4th)	10:00 a.m.	Tumour Clinic
Gynaecology	Friday	11:00 a.m.	Outpatient Dept.

Pulmonary Tuberculosis Among Older Persons

Evidence is presented that reactivation of a previous infection is a plausible explanation of the pathogenesis of chronic pulmonary tuberculosis even when it appears for the first time in an older person. No evidence was found to suggest exogenous reinfection in such a person.

An important factor in the continuing existence of tuberculosis in the population is the older person with active pulmonary tuberculosis. Some cases among older people are reactivations of previously known tuberculosis, but often there is no history of such a previous episode.

It is important to recognize active tuberculosis in older persons because such persons may endanger children, or, if in a nursing home, may be cared for by young adults who are tuberculin negative.

In the present study, an attempt has been made to gather two types of information: (1) the frequency with which a recent close contact with an open case of tuberculosis could be found as a source of infection in persons with primary tuberculosis, whether child or adult, compared with finding the source contact in older persons with active chronic pulmonary tuberculosis of recent onset; (2) the frequency with which evidence could be found of the previous existence of tuberculosis in the older person as revealed by roentgenograms made at least a year before hospital admission.

Frequency of recent close contact with open tuberculosis was elicited in three groups of patients:

Older adult patients. In 102 cases of active pulmonary tuberculosis in persons 50 years of age or older, only 5 patients had a significant contact with an open case within the past several years.

Children with predominantly primary tuberculosis. In a group of 136 children admitted to the sanatorium, significant close exposure to a case of contagious tuberculosis was found to have occurred within the previous year in 112 (82 per cent).

Adults with primary tuberculosis. The cases of 30 young adults (aged 17 to 30) with primary tuberculosis were reviewed. This was to combine the factor of being adult with the factor of primary infection in order to eliminate the possibility of endogenous reinfection as the mechanism.

Tuberculosis was deemed to be primary if the date of conversion of the tuberculin skin test was known to be recent or if the lesion was strictly limited to a portion of the lung commonly affected by primary tuberculosis. Close contact with an open case of tuberculosis within the previous year was established for 20 (67 per cent) of the 30 adults.

Statistical analysis of these data revealed no significant difference in incidence of source cases for primary infection between children and adults. A high degree of significance could be attached to the much lower incidence of recent re-exposure among the older adults.

The time-honored explanation that an adult has contact with so many persons as to make it extremely difficult to locate the one responsible for the "reinfection" appears to be untenable. When endogenous reactivation was eliminated from consideration in the adult patient, the source of infection was established in a high proportion of cases.

REINFECTION UNLIKELY

The unliklihood of reinfection in the majority of these cases suggested that reactivation of old disease might account for more of the cases of newly discovered active tuberculosis among older adults than is generally thought.

To evaluate this possibility, the records of 445 patients admitted to the sanatorium during a 12-month period were studied. Among 102 patients 50 years of age or older who had chronic pulmonary tuberculosis, 12 cases were reactivations of known adult lesions which had been treated from 7 to 50 years previously.

In the remaining 90 patients, no history of previous tuberculosis could be elicited. In only 5 of these was there a recent exposure to open tuberculosis. Roentgenographic evidence of antecedent disease had been present for at least one year in 51.

The observations reported offer nothing in support of exogenous reinfection and provide evidence that unrecognized latent tuberculosis is often present for years before the development of the first clinical episode of the disease in persons more than 50 years of age.

In primary tuberculosis for which an exogenous source of bacilli is necessary, it was possible to identlfy the source of bacilli in the majority of cases in adults as well as in children. Thus

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William Stead, M.D. *The American Review of Respiratory Diseases, June,* 1965.

[1]Reprinted from the Abstracts of the National Tuberculosis Association, December, 1965.
Printed through cooperation Nova Scotia Tuberculosis Association.

the reason for the difficulty in identifying sources of "reinfection" appears to be that re-exposure is not related to the development of active tuberculosis in a person who has been infected in the past. Casual contacts are unlikely to cause primary infection, much less reinfection.

Reactivation of dormant foci of previously unrecognized tuberculosis seems even more plausible as an explanation for tuberculosis in the older adult when considered with the fact that roentgenographic evidence of pre-existing tuberculosis was found in 72 per cent of older persons experiencing their *first* clinical episode of the disease.

In a large number of these persons, there was evidence of pre-existing scars on the lung from which reactivation might have occurred (often referred to as Simon foci).

SIGNIFICANT SCARS

The origin of such scars has been the subject of debate for many years. Many have considered such scars abortive episodes of post-primary tuberculos foci which should not be considered abnormal. However, the observations in this study suggest that even though they remain unchanged for years, they should be regarded as potential sources for reactivation of tuberculosis during subsequent periods of stress, hormonal changes, and advanced years.

Factors frequently related to reactivation have been old age, alcoholism, cortisone therapy, diabetes, silicosis, major gastric resectional surgery, and chronic illness due to a low-grade malignancy.

As improved and more refined techniques are sought for the control of tuberculosis in the community, more attention should be focused upon tuberculin reactors whose roentgenograms reveal scars, whether there is a history of tuberculosis or not. While a reactivation of tuberculosis occurs in only a small portion of such persons in a given year, each reactivation may delay eradication of tuberculosis by planting bacilli in a new victim.

Infection of tuberculin-negative contacts can only be prevented by detection and treatment of reactivations before liquefaction necrosis develops with dissemination of organisms into the environment. □

ADVERTISER'S INDEX