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# The Clinical Significance of Cardial Asthma

M. R. ELLIOTT, M.D.

THE past twenty years have witnessed a great many changes in our view point and understanding of the normal and pathological function of the heart. For instance, our evaluation of cardiac capacity is established on a new basis. Thus the valvular murmur has been given a minor role and the effort syndrome a major part on the stage.

We have established the mechanism of the normal heart beat but as to what is happening in the cardiac cycle, when heart failure is imminent, we have evidently not definitely solved.

In this paper I would direct your attention to some phases of cardiac failure taking the group of cases represented by the typical symptoms of cardiac asthma as the basis of consideration.

During the past two years I have had four cases in which the condition of cardiac asthma has been dramatically present. I had known the nocturnal type of asthma with pulmonary oedema during the years of practice, but these later cases have shown such definite symptoms and the attacks have recurred so frequently, that some adequate explanation seemed to be demanded. What initiated the attacks? What is the mechanism of the seizure and why are the attacks relieved? About this time I read an article of Paul D. White's on "Failure of the Left Ventricle without failure of the Right Ventricle", (*Journal of the A. M. A.*, April, 1933). White's contributions and those of Soma Weiss and George P. Robb, of the Thorndike Memorial Laboratory, have since assisted in the consideration of the subject.

The first reference to cardiac asthma in literature is from the pen of James Hope, of Edinburgh, in the year 1833. He writes at length, giving an apparently correct pathological description of the condition, stressing the underlying weakness of the left ventricle in these attacks.

Osler, in 1897, clearly defined the condition:—"In cases of advanced arterio-sclerosis there are often attacks of dyspnoea of great intensity recurring in paroxysms, often nocturnal. The patient goes to bed feeling quite well, and in the early morning wakes in an attack which, in its abruptness of onset and general features, resembles asthma. There is usually a sensation of precordial distress, a feeling of constriction and oppression. Two other features about this form of attack will attract your attention,—the evident effort in the breathing and the presence of a wheezing in the bronchial tubes and of moist râles at the base of the lungs. The patient may spring up from bed and throw open the window in his terrible air hunger and he assumes an attitude most favorable to the working of all the accessory muscles of respiration. Slight cyanosis is present, and in severe paroxysms a cold sweat breaks out in the face and limbs. The pulse is feeble, often irregular, and very small, and on auscultation one hears either gallop rhythm or the focal type of heart beat. Death may occur in the attack."

Cardiac asthma is briefly discussed in MacKenzie's "Diseases of the Heart." An interesting note by MacKenzie is that Dr. Samuel Johnson, attended by Heberden, suffered from cardiac asthma for two years, dying at 75. The great man's only relief was from tincture of opium.

► Romberg's theory of the initial inciting cause of the attack is that, with the coronary circulation narrowed by sclerosis, the blood pressure falls during sleep and becomes too low to force sufficient blood through the narrow coronary arteries. The result of this partial occlusion of the blood supply to the ventricular muscle is acute failure and cardiac asthma.

Hirschfelder, in 1918, wrote:—"Shortness of breath is usually the earliest and most common sign of cardiac failure and especially of failure of the left ventricle. . . Cough, dyspnoea, cardiac asthma, pulmonary hemorrhage constitute a group of symptoms characteristic of stasis in the pulmonary veins, that is broken pulmonary compensation, just as cyanosis, enlargement of the liver and ascending edema are characteristic of failure of the right heart."

I shall attempt to show that the condition—failure of the left ventricle without failure of the right ventricle, may be recognized as a clinical entity, and that while the condition is usually demonstrated too late to save the patient from the inevitable results, that if the early manifestations of cardiac impairment is seen in its proper clinical significance, many of these cases may be saved from early shipwreck. Of the four cases mentioned the underlying pathology was as follows: the first, marked hypertension with moderate hypertrophy; the second, coronary thrombosis and moderate hypertrophy; the third, moderate myocardial damage without marked hypertrophy; the fourth, marked myocardial damage with marked hypertrophy.

The following is the history of the first case:—

Druggist, aged 63, whom I treated for about a year. His past history was negative except for paratyphoid fever at 50. For several years he had known that his arterial tension was steadily increasing. He had noticed that there was a degree of presternal distress if he hurried up a hill. About twenty minutes previous to the time that I first attended him in an attack he had pushed his car along the floor of the garage, although he thought that he had not exerted himself unduly. When I saw him he was sitting upright, orthopnoea and dyspnoea being of the most marked degree. He was pale, skin moist. The expression was most anxious. The pulse rate was about 140 and the volume small. The terminal vessels were not distended. The pulmonic second sound was loud. The chest was filled with coarse moist râles and a large quantity of thin frothy bright blood tinged sputum was pouring from his mouth. It was necessary to use 1/20th gr. of atropine before the condition was controlled. I used the atropine on account of the massive oedema but have since learned that the atropine acts thus favorably by its improvement of the left coronary blood flow. In an hour the oedema began to subside, the pallor improved and he gradually became relieved. In two hours he was able to lie down. For the first hour I held him in my arms with his body and head bent forward, any attempt to settle back on the pillows was quickly followed by marked distress. Subsequent examinations showed a systolic blood pressure of 230 to 260 m.m. with a diastolic pressure of 140 to 160 m.m. The urinary findings were negative. A moderate degree of left and right sided hypertrophy of the heart was demonstrable. X-Ray confirmed this, and it also showed a definite increase in the general lung mark-

ings with an increase of the hilus blood vessel shadows. Fluoroscopic examination revealed an apparent increase on the right side of the heart with the aortic knob only slightly prominent but definitely visualized as was the arch and ascending aorta.

These attacks of varying intensity lasted for a year, occurring at intervals of days, weeks or months. Most of them occurred in the early evening and a satisfactory cause could be found for very few. There was marked prostration after most of the attacks so that his general program was modified to a large degree. In general, it was surprising that he recovered as quickly as he did. I never knew whether he would make the grade in any attack, death coming at last in what I considered a relatively mild attack.

I would stress several points in this case:—

1. The marked dyspnoea and especially orthopnoea.
2. The marked asthma with oedema of the lungs.
3. The pallid appearance with the lack of distension of the peripheral blood vessels.
4. The increase of the X-Ray shadows of the hilus blood vessels and general lung markings.
5. Accentuation of the second pulmonic sound.

Paul D. White claims that the conception of left ventricular failure has been neglected for many years. He states that in the majority of hearts in which some factor of strain is evident the left ventricle is under a burden much more than the right. The total cases of essential valve lesions is far greater in the community than those of mitral disease, pulmonary valve stenosis and pulmonary disease, sufficiently extensive to act as a strain on the heart. In 400 cases reported the left ventricle was under the greatest strain in 64.3%; the right ventricle in 15%; both ventricles in 14.7%, and in 6% the type of primary location of strain was not clear.

As a control study, White analyzed 100 cases of congestive heart failure with clear factors of strain as seen in the wards of the Massachusetts General Hospital, expecting to find a higher incidence of rheumatic heart disease with mitral stenosis than in general practice. This survey gave:—

- (A) Primary left ventricular strain, 61%; divided into systemic hypertension, 20%; coronary disease or thrombosis, 17%; both systemic hypertension and coronary disease, 18%; aortic stenosis or regurgitation, or both without mitral valve disease and without or with hypertension, 6%;
- (B) Primary right ventricular strain, 19%; divided into mitral stenosis, 16%; extensive pulmonary disease, 3%;
- (C) Strain on both ventricles, 20%; divided into aortic and mitral valve disease, 15% thyrotoxicosis, 3%; mitral stenosis, aortic regurgitation and coronary occlusion, 1%; mitral stenosis and systemic hypertension, 1%.

He makes a diagnosis of failure of the left ventricle on the following considerations:—

A. *Dyspnoea of Cardiac Origin without mitral valve or congenital defects.*

This kind of shortness of breath has always rightly been emphasized as evidence of cardiac weakness. Whatever its nervous mechanism may be, its

fundamental cause is almost certainly an increase in pressure in the pulmonary circulation with engorgement of the blood vessels. Resulting from this engorgement of the vessels there are two effects, an encroachment on the air spaces of the alveoli, and a stiffening of the alveoli to cause a state of functional emphysema. Distension of the systemic veins follows sometimes very quickly after engorgement of the pulmonary vessels, the first is self-evident, the latter is hard to visualize.

B. *Cardiac Asthma and Pulmonary Oedema.*

Acute pulmonary oedema may occur without asthmatic breathing but very rarely.

C. *Increase in the X-Ray shadow of the hilus blood vessels and in the general lung markings.*

D. *Alternation of the Pulse*—may or may not occur.

E. *Increase in the intensity of the Pulmonary Second sound*—a sign of increased pressure in the pulmonary circulation especially in cases of essential hypertension in which with the onset of failure of the left ventricle, the accentuation of the aortic sound gives way to that of the pulmonary second sound, with restoration of the original condition, when the failure is cleared.

In discussing the state of the circulation in this condition, Weiss and Robb of Boston describe the heart action during the attack as invariably rapid—with rarely an arrhythmia. The arterial blood pressure with rare exceptions was usually elevated to a striking degree. The venous pressure remained about the same. The oxygen saturation of the blood became slightly or markedly reduced, depending on the severity of the pulmonary oedema and bronchio-spasm. The pulmonary circulation was characterized by intense engorgement and hypertension. The volume of the blood flow remained unaltered, but the velocity of the pulmonary blood flow was regularly diminished.

What precipitates an attack of cardiac asthma? What factors tend to a cessation of the paroxysm?

A knowledge of these matters should throw light on the nature of the condition. An attack may come in the day but usually at night. The horizontal position is one of the most important predisposing factors. When patients are in the high pillowed up position, attacks are less apt to occur. Standing may give relief at once. Attacks have been experimentally induced by lowering the thorax below a certain angle. Then, increasing signs of congestion, accentuation of the pulmonary second sound, elevation of the arterial pressure, Cheyne-Stokes breathing, râles, wheezing and finally typical but mild seizures follow.

Experimentally also, change from lying on the back to lying on the abdomen with the same angle between the thorax and the body results in a cessation of the attack. This indicates that the angle and the position of the thorax, rather than the entire body, have an important bearing on the sequences of events within the thorax leading up to attacks.

The water content of the tissues seems to have some bearing on the attacks. Patients subject to cardiac asthma often show slight water retention in the form of physiologic oedema while active during the daytime. During the night fluids from the extremities tend to be transferred to the lungs. Often the induction of slight diuresis results in the prompt cessation of recurrent attacks.

What may be done to relieve the pulmonary hypertension and improve the function of the left ventricle?

1. Reduce venous return from the extremities by
  - (a) tourniquets over the extremities.
  - (b) elevation of the body.
  - (c) venesection.
2. Decrease peripheral vascular resistance by
  - (a) nitroglycerin.
  - (b) small doses of adrenalin.
  - (c) atropine (small doses).
3. Improve the coronary blood-flow by
  - (a) nitroglycerin.
  - (b) digitalis.
  - (c) large doses of atropine.
4. Relaxation of Bronchioles by
  - (a) adrenalin.
  - (b) ephedrin.
  - (c) lobelia.
  - (d) atropine.
5. Through abating excitement and depressing reflexes by morphia.

Measures that improve the reserve functional capacity of the left ventricle, decrease the excitability of the cerebral centres, prevent pulmonary congestion, decrease capillary permeability and transudation eliminate nocturnal restlessness, are efficient therapeutic measures. The administration of suitable doses of digitalis, dehydration and a high protein diet are means to the desired end.

White is most emphatic in his recommendation of digitalis, not only in treatment of this type of failure, but in that stage which precedes actual failure. If we recognize that left ventricular failure precedes that of right centricular failure, and that hypertrophy as used in the sense of dilatation and hypertrophy precedes symptoms of left sided failure, then we should bend our efforts to detect the establishment of hypertrophy and apply the suitable dosage of digitalis. This will tax our best efforts as clinicians.

I would like to advance here the views of Henry A. Christian on cardiac enlargement and cardiac efficiency. His theory is that cardiac hypertrophy instead of being a beneficent process is an injurious influence on cardiac function; the heart, once enlarged, is already on its way to decompensation; to retard hypertrophy is to prolong cardiac efficiency. Formerly hypertrophy of the heart muscle has been considered to be a way of increasing heart function, as seen in skeletal muscle, but as the heart muscle surrounds a cavity the effect of its contraction is to empty its cavity. When heart muscle hypertrophies, the cardiac cavities enlarge and contain more blood. The result is more work for the heart muscle to do. More work causes more hypertrophy and still larger cavities, with still more of a load of work. For a time hypertrophy keeps in balance with increasing load, resulting from the enlarging of the cardiac cavities. Then there develops a disproportion between thickness of muscle wall and the size of the surrounded cavity and a lag ensues in hypertrophy in relation to the work demanded of the myocardium, followed by a decreased efficiency in the heart function. Sooner or later the enlarged heart shows signs of failure.

Christian's dictum is that cardiac hypertrophy, with rare exception, is the first step in cardiac failure, though it may long antedate any symptoms or signs of cardiac insufficiency. This applies to so-called chronic myocarditis, chronic non-valvular heart disease or chronic myocardial insufficiency. He advises patients in whom there is enlargement of the heart to decrease physical exertion and take 1-1½ gr. of digitalis leaves twice daily; unless this amount produces toxic symptoms, when the dose is decreased. Digitalis for these patients is continued throughout the remainder of life. The optimum dose is that just below the one which eventually produces toxic symptoms, a dose to be determined by the method of trial and error.

To refute the old argument that digitalis would cause cardiac hypertrophy, it has been shown experimentally in animals that the giving of digitalis over a long period of time produces lighter hearts.

Observation has shown that in the ageing process the heart muscle loses water. Other observations show that one effect of digitalis is to increase hydration in heart muscle. This points to a probable therapeutic effectiveness of digitalis for elderly people, not to be expected in the young. It is believed that in this group, which show no evidence of cardiac enlargement, but in whom circulatory efficiency is lessening, digitalis increases heart efficiency and here digitalis may be said to have a definitely "tonic" effect, presumably increasing the hydration of the heart muscle.

It has been urged that if digitalis is given in the early history of heart disease that the heart may not respond when by reason of developing evidences of decompensation increased dosage may be indicated. Christian believes that pharmacologically and clinically that digitalis is an ideal drug for long dosage. He says that it is entirely possible on account of its way of action to space properly doses of digitalis so as to maintain a digitalis action throughout the twenty-four hours, with but little fluctuation from hour to hour in the intensity of its action, and to continue it practically indefinitely from day to day by suitable doses not closer together than twelve hours. He believes that digitalis has a part almost like the replacement therapy of thyroid gland in myxoedema and of liver extract in pernicious anaemia.

On the other hand, with hypertension and coronary arterio-sclerosis as the outstanding pathology of many of these cases when first seen, the practical difficulty to the medical attendant of obtaining a reasonable degree of success in treatment is self-evident. The use of digitalis here is not so easily managed. In his text-book of pathology, Bell states that 75% of all coronary cases are associated with high blood pressure. Clinically this may not be recognized as blood pressure often falls sharply when an advanced degree of coronary arterio-sclerosis develops in a case of hypertension.

Heart failure may also tend to a lowering of blood pressure, but not invariably, for many patients retain their high blood pressures despite severe degrees of failure, and severe degrees of coronary disease. The highest blood pressures do not measure the fatigue effect on the left ventricle any more than the lowest pressures do. It is the integration of the varying blood pressures over a period of time that measures the effect of hypertension on the left ventricle. As the blood pressure rises, so does the work of the left ventricle. Slowly but surely the left ventricle fatigues, and after it has overcome high blood pressure for some years, there is the beginning of heart failure. Coronary narrowing naturally hastens the condition. However, even with the pres-



ence of coronary arterio-sclerosis the left ventricle may be equal to its task for a long time if rest and appropriate therapy is carried out.

To summarize the facts upon which we base our ideas of the mechanism of cardiac asthma:—

1. There is a serious strain on the heart either from an intrinsic cause, as coronary disease or aortic regurgitation or from an extrinsic cause, such as hypertension, or quite commonly from both intrinsic and extrinsic factors combined.

2. Almost invariably the left ventricle was the chamber of the heart particularly involved.

3. The attacks usually came at night with the patient in the recumbent position or on or after exertion.

4. Relief came with the assumption of the upright position with or without the aid of morphia and atropine.

5. Digitalization and rest generally prevent the attacks for a while, or reduce their frequency and severity. Some cardiologists stress the necessity of a recognition of the early symptoms of cardiac hypertrophy, with resource to digitalization in order to prevent, or at least postpone, cardiac failure.

In conclusion I wish to point out that these remarks are only intended to introduce rather than exhaust the many features of the symptom complex of cardiac asthma following left ventricular heart failure. If detected and properly managed these patients may be spared the effects of a break in the whole circulatory system. True, the cases occur in conditions in which the pathologic changes are probably fairly advanced and progressive but when these danger signals are properly recognized appropriate measures can be immediately instituted.

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NOTE:—We are in the fortunate position of having received more material for this month than we consider advisable to use. We thank our contributors for their generous response. The remainder will appear next month—Editor.

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ADDENDUM:—Since writing this communication, the patient has developed a late broncho fistula. For some reason or other the bronchus opened on the fifty-seventh post operative day. The silver wire sloughed, or slipped from the bronchus. Unfortunately during the course of an irrigation the bronchus and trachea were flooded with solution which caused a violent spasm of coughing and some of the material was coughed into the healthy lung. The final outcome of this remains to be seen.

# Some Basic Factors in the Diagnosis and Treatment of Bronchiectasis\*

A. F. MILLER, M.D.

THERE has been considerable knowledge gained during the past ten years both as to the diagnosis and treatment of bronchiectasis. This has been brought about largely by roentgenographic study of the lungs, the employment of an opaque medium, such as Lipiodol, to outline the bronchial tree, and the application of lobectomy in carefully selected cases of bronchiectasis.

By bronchiectasis we simply mean dilated bronchus or bronchi. This condition follows as a result of an infection involving the wall of the bronchus, with inflammatory changes affecting the musculo-elastic elements, which are either completely destroyed or replaced by non-resilient fibrous tissue. As a consequence the weakened bronchus gives way under ordinary atmospheric pressure strains of respiration and dilates. The degree of dilatation will depend upon the amount of damage done to the structures comprising the wall of the bronchus. There are a number of additional factors that may produce bronchiectasis. Among these may be mentioned intra-bronchial obstruction, mucus plugs, tumor, pulmonary fibrosis resulting from tuberculosis, pneumonia, abscess, etc.; bronchial and peribronchial changes due to various causes. Bronchiectasis is essentially a disease of the lower lobes of the lungs. It may be unilateral or bilateral, localized or diffuse, tubular, fusiform, sacular.

*Basic Points in Diagnosis:* The importance of a well taken clinical history needs only to be mentioned. Careful enquiry is always to be made as to previous attacks of bronchitis, influenza, the pneumonias following the exanthemata, especially whooping cough, measles. It is well to remember that nasal-sinus disorders of the upper respiratory tract may be almost as significant as those of the lower respiratory tract. Bronchiectasis generally comes on insidiously. Cough, expectoration, may be the only noticeable symptoms over a long period of time. The sputum is usually muco-purulent in character and has an offensive odor, not as marked, however, as in pulmonary abscess, in about half the cases. Haemoptysis is a frequent complaint, more so even than in tuberculosis, and occurs in about half the cases. The bleedings vary in amount from mere streaking to moderate and even profuse haemorrhage.

As to the physical examination of the chest there are no typical findings that are exclusively characteristic of bronchiectasis. Localized signs, especially in the lower lobes of the lungs, when the upper third of the chest is free from adventitious sounds, may indeed be suggestive of bronchiectasis. These findings to be of value must be supported by a positive lipiodol injection x-ray picture.

It may not be without interest to mention that a large number of the cases of bronchiectasis sent to the sanatorium come either for diagnosis or with

From the Nova Scotia Sanatorium, Kentville.

\*Read before the Dalhousie Refresher Course, Halifax, Aug. 28, 1935.

a diagnosis already established as having tuberculosis. I must confess it is not always an easy matter to differentiate between bronchiectasis and tuberculosis. We have to employ every means at our disposal, clinical, x-ray, laboratory, before we are able to arrive at a satisfactory decision. Our difficulty appears to be with patients who give a history of a small or moderate sized hemoptysis with accompanying symptoms such as are commonly associated with tuberculosis.

I recall one woman, with a history of having had a recent hemoptysis, who had a localized lesion at the base of one of her lungs. Repeated sputum tests were negative for tubercle bacilli. We finally decided that the affection in the lower lobe was a bronchiectatic one, yet on the eighth or tenth sputum examination, tubercle bacilli were found to be present for the first time.

It is worth remembering, in differentiating bronchiectasis from tuberculosis, the following points: (a) the persistent absence of tubercle bacilli in purulent sputum; and here I might remind you that at least six consecutive specimens of sputum should be examined for acid-fast organisms. Concentration and culture methods should invariably be employed to determine the type of organisms; (b) the location of physical signs is usually at the base of the lungs while the upper third of the chest is free from rales; (c) suggestive x-ray findings, usually at the base of the lungs, pointing to dilatation of the bronchi.

There are also a number of other respiratory diseases which may at times cause difficulty in coming to a correct diagnosis. Among these may be mentioned, chronic abscess of the lung, unresolved pneumonia, pulmonary fibrosis, anthracosis. With careful clinical history, repeated sputum tests and thorough x-ray investigation, we may differentiate the majority of these conditions from bronchiectasis.

*Bronchoscopy:* The use of the bronchoscope in the hands of an experienced bronchoscopist is undoubtedly of value in the diagnosis of bronchiectasis, especially so when we desire to rule out such conditions as bronchostenosis, the presence of a foreign body, new growth, etc., in the bronchial tree.

Unfortunately, this measure is not always available to the needs of the general practitioner. My own feeling is that almost equally good results may be obtained, following postural drainage of the lung, from the introduction of lipiodol into the bronchial tract. This diagnostic aid may be carried out by any physician who is competent to give a careful throat examination.

*X-Ray Findings:* While fluoroscopic examination of the chest is mentioned as a helpful procedure in the diagnosis of bronchiectasis, we have not found it to be of much value in determining, among our patients, the presence or absence of bronchial dilatation. The x-ray film is of much greater worth but even here the roentgenogram often does not show pathological changes in spite of the fact that bronchiectasis is present in the lung. Early lesions, and those situated behind the dome of the diaphragm or heart, or those superimposed on a dense pleural shadow are usually not to be demonstrated. The questions of unilateral or bilateral involvement, the type and extent of the dilatations, are difficult to determine, unless supported by an injection picture with the use of iodized oil.

*Lipiodol as a Means of Diagnosis:* The use of an opaque oil, such as Lipiodol, Skiagenol, or Neohydriol, is generally employed to outline the bronchial tree. There are four methods in common use: *first*, the supra-glottic;

*second*, the transglottic, that is where one introduces a catheter or cannula between the vocal cords and expresses the iodized oil into the bronchial tract; *third*, the sub-glottic, that is where one pierces the crycothyroid membrane with a needle and injects the oil directly into the trachea; *fourth*, by way of the bronchoscope. The latter is indeed the most exact method but, unfortunately, one that may be employed only by a person who has had special training in the use of the bronchoscope.

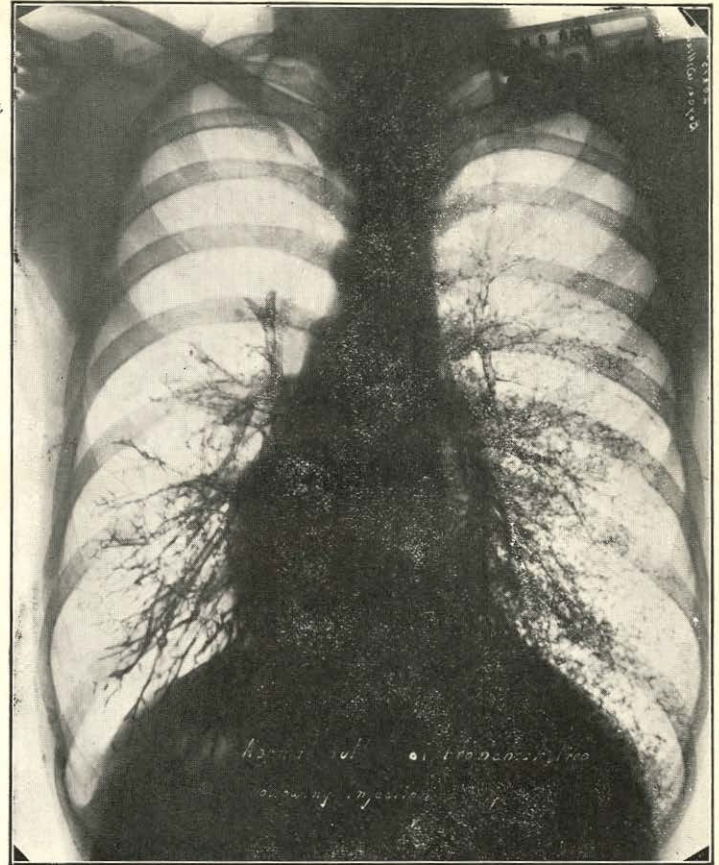
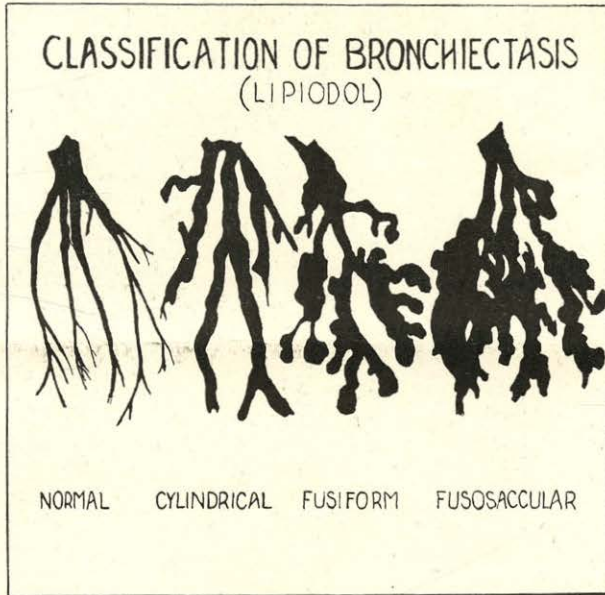
On account of its simplicity, I will briefly describe to you the supraglottic method which we make use of at the sanatorium. In a small number of cases it may not even be necessary to employ a local anaesthetic. However, if your patient is apprehensive and has a sensitive upper respiratory mucous membrane, it is advisable to swab or spray the posterior pharynx with a five per cent. solution of cocaine. In a few instances it may even be necessary to instil 1 or 2 cc. of a two per cent. solution of cocaine into the larynx. Wait for the anaesthetic to take effect, about five minutes. Now have the patient face you, leaning him towards the side in which you suspect a lower lobe bronchiectasis. The tongue is grasped with a piece of gauze and drawn well out of the mouth. A syringe filled with warmed lipiodol is now passed close to the posterior pharynx and the patient is instructed to breathe deeply through the open mouth, not to cough nor to swallow, as the iodized oil is permitted to flow. The oil collects in the interarytenoid fossa and then trickles down between the vocal cords during the respiratory act, and is aspirated into the bronchial tree. Permit 20 to 30 cc. of oil to flow. Now have the patient stand up and have him immediately x-rayed; films are to be taken in the antero-posterior and lateral positions.

For a bronchiectatic condition of the middle lobe, the patient lies on a table, in a semi-recumbent position, on the suspected side. The same procedure of introducing the oil is carried out. About 15 cc. of lipiodol is required to outline the mid-lobe trunks. For apical bronchiectasis the patient is placed in a similar position. After the introduction of the oil he is tipped head downward for half to one minute so that the oil will gravitate to the upper divisions of the bronchial tree. The patient now stands up and the usual films are taken.

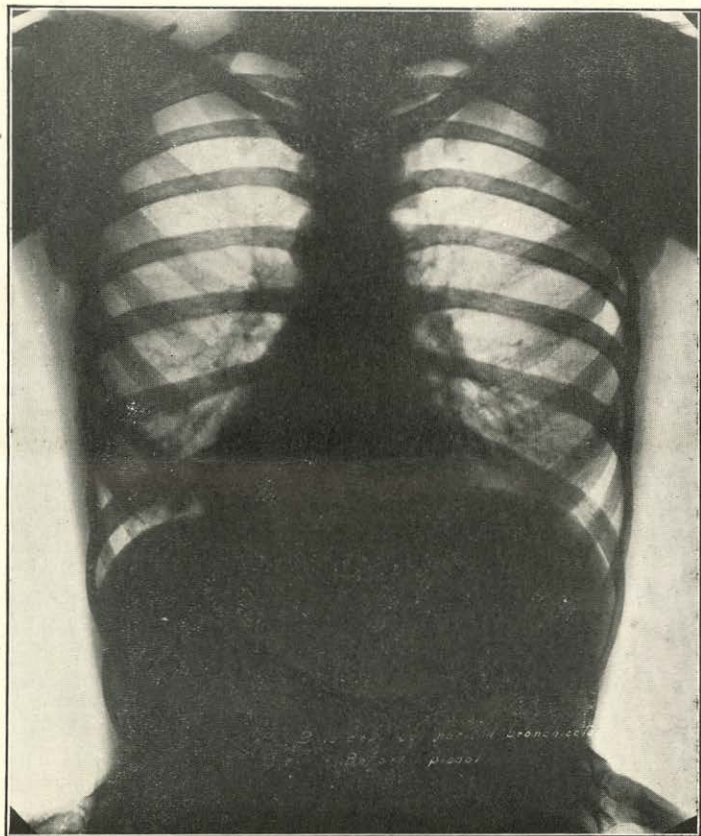
By means of an opaque oil we are able to classify dilatations of the bronchi as follows: 1. Normal outline; 2. Tubular or cylindrical. 3; Fusiform; 4. Fuso-saccular.

*Case 1*—Female—age 22. Since 1931 patient has been troubled with cough, muco-purulent sputum, two ounces in amount, and loss of strength. At this time she had a hemorrhage of six ounces. Her physician suspects tuberculosis and has sent her to the sanatorium for diagnosis. Laboratory report: All specimens of sputum negative for tubercle bacilli. Physical examination: Negative findings. No rales. X-Ray: There appears to be pathology of some nature below the fourth rib in both lungs. Nothing, however, to indicate tuberculosis. Lipiodol investigation: Bilateral cylindrical bronchiectasis. Points to remember: (1) The symptoms are suspicious of tuberculosis, the muco-purulent sputum, however, is persistently negative for tubercle bacilli. (2) Physical examination of the chest shows the upper

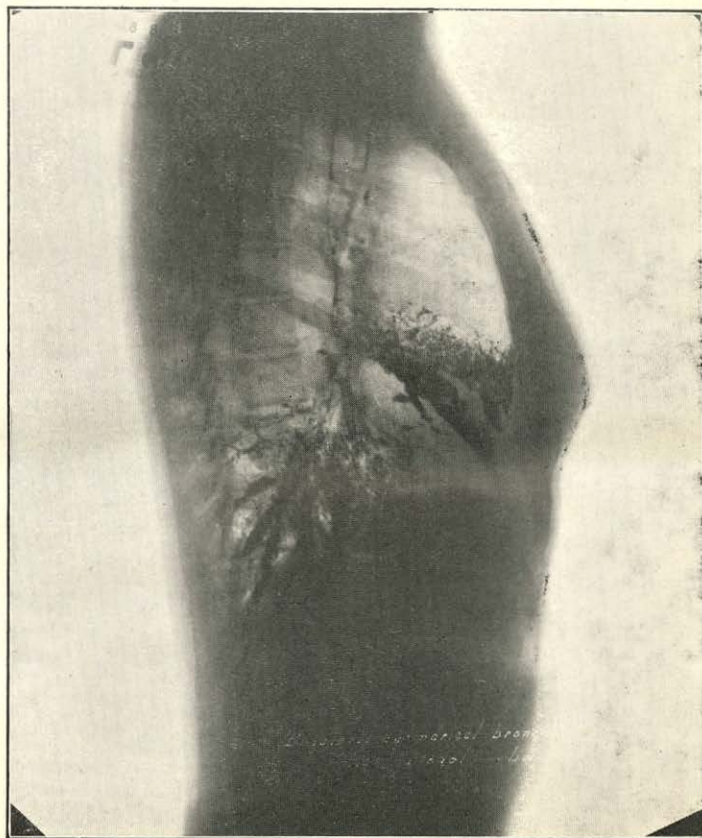
This address deals with some fifty cases of bronchiectasis. The writer has selected six case reports which are characteristic of bronchial dilatation.



Normal outline of bronchial tree following injection of lipiodol.



Bilateral cylindrical bronchiectasis before lipiodol.



Bilateral cylindrical bronchiectasis after lipiodol—Lateral.

third of the lung to be free from rales. (3) X-Ray findings show no pathology in the upper third of the lung. For this reason it appears that we are dealing with some non-tuberculous affection in the lower part of the chest. (4) Lipiodol shows the location and type of bronchiectasis.

*Case 2*—Male, age 48, coal miner. This ex-service man was admitted to the sanatorium on three occasions, 1926, 1927, 1932. He gives a history of loss of strength, weight and appetite, cough and expectoration. Also states that he had three pulmonary bleedings, half an ounce to six ounces in 1918, 1921, 1924. On account of the hemoptyses his physician believes his patient is suffering from tuberculosis. The Pensions authorities, Halifax, have sent the man to us so that we may check up his respiratory complaint. Our physical findings are negative so far as tuberculosis is concerned. No rales to be heard in either lung. Sputum persistently negative for tubercle bacilli—10 examinations. The radiographic report is in accord with the clinical findings and points out that the increased markings throughout the lungs are more in the nature of a bronchitic condition, possibly beginning anthracosis. We therefore decided, in view of these findings, that the disabling condition from which the patient suffers is due to some cause other than tuberculosis. He subsequently came up for discharge from the sanatorium. In 1932, he was again admitted to this institution still complaining of the same respiratory symptoms. Clinical and x-ray examinations remain negative for tuberculosis. On account of his continuing to bring up daily a quantity of muco-purulent sputum, we decided to introduce lipiodol into the bronchial tree. Lipiodol investigation: Right: Saccular bronchiectasis of the lower lobe trunks. Left: No evidence of bronchiectasis. Points to remember: 1. The respiratory symptoms are suggestive of tuberculosis. 2. The physician had reason to believe at the beginning that the pulmonary bleedings were due to tuberculosis. It must not be forgotten, however, that there are other causes, apart from tuberculosis, that may produce pulmonary hemorrhage. 3. In view of the negative clinical, x-ray and laboratory findings, over a period of years, tuberculosis has had to be ruled out. 4. Lipiodol shows the location and type of the bronchiectasis.

*Case 3*—Male, age 52, coal miner. This ex-service man was admitted to the sanatorium in 1917. Diagnosis, pulmonary tuberculosis, moderately advanced stage. Discharged two years later. Re-admitted to the sanatorium, 1933, that is sixteen years later. Complaint: Slight loss of strength and appetite, slight cough, and two ounces of muco-purulent sputum daily. Physical examination reveals coarse rales and rhonchi over the left lung. X-ray shows throughout the left lung multiple honeycomb areas of cavitation surrounded by areas of patchy infiltration. On account of our former findings, we considered for a time that we were dealing with a case of progressive pulmonary tuberculosis. As the sputum examinations, 12 in number, continued to be negative for tubercle bacilli, we came to see that we were dealing with a non-tuberculous respiratory affection, probably bronchiectasis. For this reason we decided to introduce lipiodol into the bronchial tree. Lipiodol investigation: Uni-lateral saccular bronchiectasis. Points to remember: 1. For a time we were led astray by our former diagnosis. The persistent absence of tubercle bacilli in muco-purulent sputum finally led us to suspect that we were dealing with a non-tuberculous affection of the lung. 2. Lipiodol enables the x-ray to show the location and type of the bronchial dilatation.

*Case 4*—Male, age 35, railroad brakeman. For three years this man has been troubled with loss of strength, appetite, and shortness of breath, cough, slight expectoration, 2 drams a day. Following an attack of influenza, 1932, symptoms have become considerably worse. Present complaint: Frequent cough, four ounces purulent sputum daily, marked loss of strength, fever 99° to 100.5°F. Physical examination: Right: coarse rales and many rhonchi from 3R and 4V.S. to base. Consolidation with multiple cavitation in lower lobe. Left: A few scattered moist rales to 5V.S. X-ray report: Right: Multiple areas very suggestive of honeycomb cavitation and sacculation in the lower lobe of the lung. Below the 10th rib inner half of the lung field, there is a dense uniform opacity probably atelectasis. In the outer half of the lung there is an annular shadow of lessened density. Left, mottling in 2nd, 3rd and 4th interspaces. Laboratory report: Sputum negative for tubercle bacilli—8 specimens. Lipiodol investigation: The lower lobe bronchi in the right lung reveal definite and marked cylindrical sacculation. On account of the condition of the patient, no attempt was made to outline the left bronchial tree. Diagnosis: Cylindrical bronchiectasis, associated with multiple lung abscesses. The condition in the left lung is secondary and probably due to aspiration of infective sputum.

Points to remember: 1. Physical and x-ray findings point to a respiratory affection in the lower two-thirds of the right lung. The upper third of the chest is apparently free from pathology. This in itself is usually indicative of a non-tuberculous condition of the lung. 2. Persistent absence of tubercle bacilli in purulent sputum. 3. Bilateral bronchiectasis, associated with areas of suppuration in a patient with toxic symptoms is of a serious significance. Medical and surgical measures generally of little help. This patient passed away within a year following his discharge from the sanatorium.

*Case 5*—Female, age 36. In the spring of 1934, patient noticed she had loss of strength, weight, appetite. By the fall these symptoms had become more marked and it was thought she had pulmonary bronchitis. Her chief complaints were pain over the chest, and offensive muco-purulent sputum, 2 ounces daily. In November she had an haemoptysis of two ounces. For this reason a diagnosis of tuberculosis was established and the patient treated at home at rest in bed. As no improvement had occurred she was sent to the sanatorium for advice and treatment. Physical examination: Right: There is marked dulness from 3R and 5V.S. to base. Moist rales to 3R and 5V.S. Left lung, normal findings. X-ray findings show that there is a dense uniform opacity over the lung. There is apparently a localized collection of fluid from 2R to base. Laboratory report: Sputum negative for tubercle bacilli, many specimens. Patient running a continuous fever 99° to 101°F., pulse rate 115-130. There is a septic condition of some kind with which we have to deal. Diagnostic aspiration: 125 cc. thick, yellow, foul smelling pus, strongly suggestive of spirochaetal and mixed infection, withdrawn. A few days later, under local anaesthesia, a portion of the 7th rib was removed. There was an escape of a large quantity of foul pus. Convalescence uneventful. Temperature in time gradually came to normal. Patient continued to bring up muco-purulent sputum from her lungs. All specimens negative for tubercle bacilli. Lipiodol investigation: Saccular bronchiectasis in the middle and lower lobes of the right lung. No broncho-pulmonary fistula to be demonstrated. Diagnosis: (a) Chronic mixed infective empyema. (b)



Saccular bronchiectasis. Points to remember: 1. History of symptoms is suggestive of tuberculosis. While an unexplained haemoptysis should generally be considered as due to tuberculosis, one must not forget that pulmonary bleeding is a common symptom of bronchiectasis. 2. The physical signs in this woman's chest indicate that fluid is present, probably empyema. One should never fail under such circumstances to introduce a needle into the pleural space to rule out effusion. The measure is a simple, safe and valuable one. 3. X-ray examination is a helpful aid in diagnosis and should never be omitted.

*Case 6*—Male, age 35, steelworker. For the past six years patient complains of occasional attacks of morning cough and expectoration, three ounces in amount. The sputum is of bad odour and purulent in character. Since April, 1935, he has noticed increasing loss of strength, appetite and weight. Cough and expectoration have become more frequent, and he also complains of some shortness of breath. No haemoptysis nor pleurisy. On physical examination a few rhonchi are heard at the base of the right lung, also more numerous rhonchi in the left lung below the third rib and seventh vertebral spine. Laboratory reports: Sputum persistently negative for tubercle bacilli. The summary of the x-ray reads "We can detect no tuberculous pathology in the right lung. We draw attention, however, to some slight fibrotic changes in the apex. The left lung appears to be normal in appearance." Lipiodol investigation: "Studies of the left lung with lipiodol present the following findings: The posterior inferior branch of the lower lobe bronchi located behind the heart shows evidence of a fusiform bronchiectasis. The proximal portions of the upper lobe trunks are outlined, also the remainder of the lower lobe bronchus and no abnormality can be detected. The right middle and lower lobe bronchi are outlined by the opaque oil and present a normal appearance."

Points to remember: 1. A chronic respiratory infection of several years standing. 2. Persistent absence of tubercle bacilli in sputum. 3. The clinical examination suggests bronchitis, possibly bronchiectasis. 4. The x-ray examinations fail to locate, in the absence of lipiodol, the presence of bronchial dilatation which was obscured by the shadow of the heart. 5. Lipiodol in this case was of particular value as it shows the location and type of bronchiectasis.

*Treatment.* Medical measures have generally proved disappointing for most persons suffering from true bronchiectasis. This may readily be understood when we consider the nature of the anatomicopathological changes that have occurred as a result of damage done to the bronchial wall. Every effort should be made to ward off the development of bronchiectasis by appropriate treatment of infections of the upper and lower respiratory tracts. These unquestionably predispose to this condition.

*Postural Drainage:* Postural drainage of the lung is undoubtedly of considerable worth in early bronchiectasis and even when dilatations are well established, treatment of this kind, carried on over a long period of time, will bring about symptomatic relief to many patients. This measure has proved of value in our hands. The method to employ for lower and mid lobe lesions may be (a) continuous, (b) intermittent. Continuous postural drainage may be carried out by elevating the foot of the bed. This posture may be maintained day and night with small inconvenience to the patient. If expense is of little consideration, there is a special hospital bed manufactured with levers

to give the desired position that is required to provide adequate drainage of the lung. Intermittent postural drainage is best carried out by means of a tilting table at an angle of 50 to 75 degrees. At the beginning of the treatment two minutes at one time is long enough to keep the patient in the tipped position. Later the time may be increased to five minutes. Repeat the treatments two or three times during the day. If a table of this kind is not available, the patient may lean well over the side of the bed, with his hands on a chair or stool. Drainage of the bronchi carried out in this way will certainly bring symptomatic relief to many patients and permit them to carry on their work with little discomfort.

*Intrabronchial Injections:* Intrabronchial injections with iodized oil may prove of benefit in early bronchiectasis. While lipiodol has no definite bactericidal properties, a number of patients undoubtedly feel better as a result of such injections. The treatments are given once a week for a period of three or four months. The course should be repeated from time to time during the following two years.

As to other measures such as rest, drugs, vaccines, endobronchial lavage, inhalations, intravenous injections with nearsphenamine, heliotherapy, these have all been tried and have proved to be of little value. While authorities claim there is not much to be gained from a change of climate, I am inclined to feel that patients with chronic respiratory infections do better in localities where there is considerable dryness and sunshine. These persons should, if possible, avoid regions where there is much fog and dampness and occupations also that expose them to the effect of irritating dust.

*Surgical:* Bronchoscopy: Even in the best of hands bronchoscopic aspiration will not accomplish much more than postural drainage in the absence of bronchostenosis. Unquestionably this means is of value but, while it usually relieves symptoms, it rarely leads to permanent cure when true dilatations exist. This measure, however, may be tried out when you have an experienced bronchoscopist at your service.

*Artificial Pneumothorax:* For a number of years artificial pneumothorax has been carried out as a therapeutic aid in selected cases of bronchiectasis. This measure appears to have a definite field of usefulness in the treatment of early unilateral conditions. I question, however, even when full compression of the lung is obtained, whether or not true bronchial dilatations may be completely obliterated. Thickening and cicatricial stenosis of the walls of the bronchi, with sclerotic changes in the parenchyma of the lung prevent an effective compression. This is shown to be so when lipiodol is introduced into the bronchial tree. Compression of the lung should be kept up for a long period of time. Relief of symptoms, with reduction both in cough and expectoration, may be expected in a considerable proportion of cases. If improvement does not come about within six months, little benefit is likely to occur. Cases of long standing, three years or more, usually do not respond to this measure.

*Phrenicectomy:* Favourable results have been reported as a result of phrenic nerve paralysis. As you well know following phrenicectomy the diaphragm becomes relaxed, rises to the full expiratory position in the chest, and diminishes the volume of the lung about twenty to thirty per cent. Unfortunately, in a fair proportion of cases of bronchiectasis, the diaphragm is

fixed by pleural adhesions and no appreciable rise through phrenicectomy may be brought about. There seems to be a field for this operation in early unilateral, lower and mid lobe dilatations. When the rise of the diaphragm is satisfactory, cough may be greatly improved and expectoration diminished, in some instances to a marked degree. In long standing cases, however, the results from phrenicectomy are less encouraging.

In a recent publication by Singer, Graham and Ballou, these authors have this to say as to the value of phrenicectomy in bronchiectasis: "One may say that apparently an individual patient with bronchiectasis has only a relatively small chance of being improved by the operation of phrenicectomy and, on the contrary, a definite chance of being made worse. Moreover, even when improvement occurs it is not lasting".

*Thoracoplasty:* Extra-pleural thoracoplasty may be considered for extensive unilateral bronchiectasis. The operation is best carried out in several stages and involves the resection of the upper eleven ribs. Hedblom up to 1931, had reported on 32 patients. In a small proportion of his cases symptomatic cure was brought about; while in others marked decrease in cough and in the amount of sputum occurred. This authority considers that, of all the methods for producing pulmonary collapse, thoracoplasty is the most effective. He points out that in case the degree of compression does not sufficiently relieve the symptoms, it prepares the way for later lobectomy or cautery extirpation. The consensus of opinion among experienced surgeons, both in Europe and in America, seems to be that the curative results so far reported from extra pleural thoracoplasty are not as yet sufficiently encouraging to warrant its more frequent use in bronchiectasis. Cases must be rigidly selected. Patients who show evidence of multiple abscess in the lung with septic temperature, should not be subjected to an operative measure of this kind.

*Cautery Pneumectomy:* Rib resection for exposure and cautery destruction of the diseased portion of the lung have been carried out by Sauerbruch, Graham and a number of other thoracic surgeons. The risks of hemorrhage and embolus make the operation a formidable one. Cautery extirpation of the lung is recommended for those who have failed to respond to ordinary measures, and for whom neither thoracoplasty nor lobectomy is possible. E. A. Graham, Barnes Hospital, St. Louis, reports 54 cases of chronic pulmonary suppuration treated by cautery pneumectomy: Definitely improved 63 per cent., moderately improved 1 per cent., not improved 1 per cent., operative deaths 11 per cent., later deaths not due to operation 22 per cent.

*Lobectomy:* During the past few years there has been a striking drop in the mortality rate from lobectomy in bronchiectasis. Up to 1933, Graham, Singer and Ballou report on 212 collected cases from all sources of total or subtotal lobectomy. In 99 or 47 per cent. the operation was decidedly satisfactory, that is to say, symptomatic cure, or considerable improvement was brought about by this means; while 72, or 34 per cent, have died as a result of the operation. Later results from many sources, especially from 1933 on, are much more encouraging. This has been attained through more careful selection of cases and improvement in surgical technique. In 19 cases of lobectomy reported by F. T. Lord, at the Massachusetts General Hospital, 1929 to 1934, there have been only two operative deaths, a mortality of 10.5

per cent. John Alexander, Ann Arbor, reports on 12 cases of lobectomy with a mortality of 16 per cent.; Edward Archibald, Royal Victoria Hospital, Montreal, reports 9 cases with an operative mortality of 22 per cent.

Lobectomy is to be considered for chronic unilateral bronchiectasis, confined to the mid and lower lobes, which does not respond to any other form of treatment. On the other hand it is contraindicated for cases with extensive bilateral disease. E. A. Graham considers lobectomy "one of the most serious procedures in the surgical repertory". Further this authority states "If only the more recent and more favourable figures are taken we still see that a patient with bronchiectasis who submits to lobectomy runs about twenty per cent. risk of dying because of the operation, and if he recovers from the operation he has about sixty-five per cent. chance of having a thoroughly satisfactory result with solid healing of the wound". Recently Graham reports on six lobectomies with only one operative death.

#### *Summary:*

1. Conservative measures have usually proved disappointing in cases of true bronchiectasis.
2. Preventive treatment is more satisfactory. Infections of the respiratory tract, upper and lower, should be promptly treated and not allowed to become chronic. This applies particularly to the pneumonias, following the exanthemata, whooping cough, measles, and nasal sinus disease.
3. Advances in roentgenography with investigation of the bronchial tree by the aid of an opaque medium, such as lipiodol, show that bronchiectasis occurs more frequently than we formerly believed. Early accurate diagnosis is made possible by this means.
4. As a preliminary try-out in the way of treatment, postural drainage should first be employed. While this means will usually lead to improvement in the respiratory symptoms, it may have to be followed later by some compression measure, such as pneumothorax, intrapleural pneumolysis, etc., before resorting to one of the more drastic surgical procedures.
5. When other measures have failed lobectomy, in carefully selected cases of bronchiectasis, is warranted as it offers the hope of cure.

# The Operative Treatment of Bronchiectasis

By V. D. SCHAFFNER, Kentville.

IN this paper no attempt is made to set forth any new or original ideas. Everything that is to be said has already been many times discussed and proposed. However, when one stops to think how relatively common the disease bronchiectasis is, and the relatively few of these who are offered, or know of the possibility of surgical relief, a brief review of the subject is probably justified. Doubtlessly too many of the profession take the statement of the majority of the text books of "no specific treatment" as fact. As recently as March, 1933, Alexander was able to collect reports on only 242 cases treated by lobectomy. With the improved results and lowered mortality of the operation that is obviously too low a number, considering the relative frequency in which the disease is encountered.

In this paper the pathogenesis, the symptomatology and pathology of the disease will not be discussed. These general aspects have been taken up by Dr. A. F. Miller in another paper.

The development of the surgical treatment of bronchiectasis has made a most interesting chapter in the history of surgery. The physicians long ago became discouraged and gave it up as a bad job. The surgeons accepted it as one of their problems and have been struggling with it since and have succeeded in establishing at least one fact, and that is that the treatment is surgical.

Various procedures have been tried to control the symptoms and combat the disease and the majority of them have been found wanting. Postural and broncho scopic drainage accomplishes really nothing beyond clearing the patient of his secretions for a few hours and giving him a period free from cough and sputum. The beneficial effects of phrenicotomy and thoracoplasty on tuberculosis were noted, and these procedures were applied in the treatment of bronchiectasis and the results observed were decidedly disappointing. When one stops to consider the pathological condition present in a bronchiectatic lung and compare it to a tuberculous lung, the cause of failure is obvious. Seldom has thoracoplasty or phrenicotomy aided a bronchiectatic patient and in the majority of instances they have rendered him decidedly more miserable. Thoracotomy and drainage was found useless. The bronchiectatic lung being a marsh of multiple pools of pus separated by fibrotic lung, it is obviously impossible to bring about effective drainage by opening into one or two of them.

Sauerbruch first proposed, and executed, the removal of the diseased lobe by multi-staged cauterizations. The credit of the development of this operation, however, really goes to Evarts Graham of St. Louis. Up to 1933 he reported 54 personal cases done by this method. Of his series 67% improved, 9% slightly improved, 12% not improved and 11% mortality. Persistent bronchial fistula was present in 40%. Out of 11 cases done by Dr. Archi-

bald by this method nine died. The operation consists of opening the chest down to the adherent lobe and destroying it, or attempting to destroy it, by the actual or electro cautery, doing only a small portion at one sitting. It has much to be said against it as a surgical procedure. Although Graham's mortality figures are fair, the general mortality figures are high. Fatal air and septic emboli are common occurrences and the patient is repeatedly subjected to these dangers. It is almost impossible to eradicate the whole of the diseased lung and as a consequence the percentage of cures are small. Again the percentage of persistent bronchial fistula is high.

With these procedures more or less discarded the treatment boils down to the final operation, that of complete eradication of the diseased lobe or lobectomy.

It is the most rational and most surgically sound of all. Although still one of the gravest of surgical procedures, with the improved technique of the past few years guarding against its special dangers, it is rapidly becoming a relatively safe operation, provided it is done by one especially trained in thoracic surgery.

Before proceeding to discuss the technique, errors and safeguards of lobectomy, it would perhaps be well to discuss briefly the types of bronchiectasis or the phases of the disease, because the success or failure of the operation depends so much upon the class in which a particular patient fits.

In evaluating expected results and mortality no better classification can be used than that of Dr. Archibald. He divides bronchiectasis into three distinct classes and in discussing the disease from a point of view of operative risk, these various classes have to be kept clearly in mind. Just as the operative mortality of thoracoplasty, in the treatment of tuberculosis, varies greatly with different states of the disease so it does with lobectomy.

In the first class is placed those patients who complain only of cough and sputum. Beyond this they are not disabled. They have no fever and the general condition is good. They are usually regarded as severe cases of bronchitis. Usually they are able to get rid of their sputum during one or two bouts of coughing in the morning. The sputum is mucoid or muco purulent. Lipiodol X-Rays show cylindrical dilations without evidence of abscess and there is no evidence of old unresolved pneumonitis in the paranchyma of the lung. Let it be said here that these patients are excellent operative risks and, in my opinion, should not be allowed to progress to the more unfavorable state of the second or third class.

In the second class are placed those patients who are neither really good risks nor are they very poor ones. They have more sputum. There are periods when it is foul and periods when it is not. They may have occasional attacks of fever and pneumonitis. Drainage being fair they are able to do a quantity of work, but at the same time are distinctly handicapped. The X-Ray shows cylindrical or fusiform dilations or even small sacculations, but no definite abscess formation. There is some parenchymatous fibrosis from surrounding pneumonitis. These patients are still reasonably good operative risks and although they may go on for a number of years without marked progressions, they eventually end up in the unfavorable third class. I can find no good statistics where cases have been so classified from a point of view of operative risk. It would seem, however, that in class 1 lobectomy should be performed with from 5 to 10% mortality. In class 2 it should not exceed 20% while in class 3, about to be described, it is doubtful if it can be

done with less than a 50% mortality. In the Brompton Hospital a number of unselected cases treated "medically" were followed over a period of five years. They showed a mortality rate of 51%. Bearing this in mind the relatively high mortality of lobectomy in class 3 is still not a barrier to the operation.

In class 3 is to be placed those extremely unfortunate patients who have constant cough with large quantities of foul, nasty sputum. The sputum is a fluid pus. They are extremely incapacitated and miserable and have frequent attacks of pneumonitis and bouts of fever. They are toxic the most of the time and are semi-invalids and unable to work. Their life is a curse to themselves and to those who have to live with them. The X-Ray shows large sacculated dilations with abscess formation and extensive parancymatous fibrosis. These are the poor risks, but the majority of them are willing to take any chance in the hope of being cured of this disease. A 50-50 chance to regain health is usually snapped at. They have nothing to lose and everything to gain.

Having discussed briefly these various classes one can now proceed to enumerate the dangers of lobectomy and it at once becomes obvious that these dangers are present to a much greater degree in the more advanced cases of bronchiectasis. To Dr. Archibald goes the credit of carefully and methodically working these out and taking steps to safeguard against them. I will merely set them down as he has in previous articles and addresses. The dangers of lobectomy can be divided into three main groups. 1. Cardio-respiratory insufficiency incident to the large open pneumothorax. 2. Infection-Empyema, contralateral pneumonitis, septicaemia, or mediostinitis. 3. Accidents connected with the operation itself, namely: hemorrhage, air embolus, etc.

In discussing the first of these dangers it is well understood by all that if a large open pneumothorax is created, it will result in death, provided there is no fixation of the lung or mediastinum and provided the opening in the chest is sufficiently large to admit a quantity of air equal to that of the vital capacity of the individual. Flapping mediastinum will also result which decidedly embarrasses the heart action. This danger is not encountered, of course, when the whole lung is adherent. When the lung is not adherent, the mediastinum can be fixed by the induction and maintenance of pneumothorax over a period of three or four weeks. To further stabilize it the upper lobe is made adherent to the chest wall at the end of pneumothorax treatment. Various procedures have been advocated to bring this about, but undoubtedly the best to date is that proposed by Dr. Bethune of Montreal. His method consists of blowing iodized talc over the surface of the lung by means of a special blower under vision of the thoroscope and immediately extracting the air from the pleural space, thus bringing the treated visceral pleura against the parietal pleura. This produces a chemical pleuritis which results in adhesions sufficiently strong to hold the lobe in a period of three weeks. As will later be pointed out this also prevents the spread of empyema up over the upper lobe. If during operation there is undue collapse of the lung, the conditions of the patient may be aided by the use of positive pressure anaesthesia.

The second, and probably the greatest danger is that of infection. With present methods it is almost impossible to avoid it to some degree. This infection may manifest itself in several ways. First of all fluid pus may be squeezed out of the diseased lobe during manipulation with dissemination

through healthy lung with resulting fatal pneumonitis. To combat this accident, the pus must obviously be trapped and held in the diseased lobe during the entire manipulation. The Archibald balloon is a very effective means of accomplishing this end. This consists of an inflatable rubber tip on the end of a long catheter. This is introduced into the bronchus of the diseased lobe, and when in place, is inflated by means of a rubber bulb affixed to the upper end of the catheter. The lobe is thus effectively and absolutely corked and there is no chance for the escape of pus into healthy lung tissue. To introduce this balloon deep anaesthesia is necessary to abolish the cough reflex and it must be induced by a non-irritating anaesthetic. Chloroform seems best to meet these requirements. Once the balloon is in place the anaesthetic is switched to gas and oxygen. When in place the breath sounds disappear over the affected lobe, but reliance is not made on this alone and an X-Ray is immediately taken and developed to show the position of the catheter. This device alone cuts down the mortality of the operation equally or more than any other safeguard as contralateral pneumonitis has always been the great bug bear.

The second great site of infection is in the pleural cavity and spreading from it to the chest wall. Unless special precautions are taken to guard against them, these empyemata are severe and vicious and rapidly kill the patient. They are chiefly anaerobic and gangrenous infections which do not yield to the simple drainage treatment as the milder pneumococcal empyemata. It seems almost impossible to completely eradicate pleural infection, but with certain precautions it can be reduced to a minimum. Infected tissues have to be cut across in order to remove the lobe and infected surfaces have to be left behind in the pleural space. In the first place adhesions themselves are infected; their presence depends upon infection. These have to be separated. Beside this the lung stump is infected and this infected area cannot be tied off and turned in like the stump of an appendix.

To minimize infection, the lobe having been freed and pedicled, and the tourniquet applied the cavity is packed all around with strips of gauze down to the hilus. The lobe is now brought through a hole in a large piece of rubber dam and the dam fixed together about the hilus. This rubber dam thus forms an invested tent with the lung coming through the apex. All the operating is now finished within the tent of rubber dam. The lobe having been removed the stump is attended to and the rubber removed. If there has been any soiling of the underlying gauze, the soiled part is removed and replaced with clean gauze, otherwise it is left in place. This gauze promotes granulations and thickening of the pleura and so makes it more resistant to infection. The ends of the gauze are brought out both ends of the wound to be removed in several days time.

To safeguard against a massive empyema, the upper lobe is made adherent to the chest wall (provided it is not already adherent) previous to the operation. This is best accomplished by means of the Bethune powder blower. The patient receives two or three weeks pneumothorax treatment and then an iodized talc is blown over the surface of the upper lobe until it has the appearance of icing on a cake. This is done under vision with the thoracoscope. The air is immediately extracted and the lung brought against the chest wall. Firm adhesions are thus created in two or three weeks. For complete description of this method reference is made to Bethunes article (*The Jour. of Thoracic Surg.*, Feb. 1935).



To prevent the formation of bronchial fistula, the bronchus is cauterized with phenol and alcohol and closed with silver wire. The percentage of fistula following silver wire closure is considerably smaller than when cat gut is used.

The third route of infection is from the stump into the mediastinum with resulting mediastinitis or septicaemia. This, however, is relatively uncommon and is not to be feared to the same extent as the other two.

The third set of dangers arise from the operative act itself. In particular among these may be named hemorrhage and air embolus. Hemorrhage may be immediate from the wounding of the pulmonary vein or artery or may be secondary from sloughing in the stump. If lung tissue is torn, the danger of air embolus is great. Tension pneumothorax may develop several days after the operation from leakage from the stump, but this danger is greatly lessened by using silver wire to tie off the bronchus and also using sufficient drainage.

Only the single stage operation has been discussed. There are other methods of performing lobectomy. They will merely be mentioned as in a paper of this scope their relative merits cannot be argued. Instead of removing the lobe at the first operation, it may merely be freed, wrapped in a sheet of rubber dam to prevent it again becoming adherent and then removed at a later operation. There are no doubt instances when this operation is to be preferred over the one stage procedure. Again the hilus may simply be ligated with chain sutures or the lung tourniquet and left to slough off by itself. This method has one potent disadvantage in that bronchial fistula has to be accepted in all instances.

So much for lobectomy, its possibilities and dangers. In concluding I would like to present a case which I have recently had the opportunity to do. The patient was referred by Dr. Malcolm MacAuley, of Sydney, who has had her under careful observation for some time, and has been successful in saving her from several attacks of pneumonitis. It will be observed that she belongs to a poor class 111. Her life was so miserable that she and her parents were willing to accept any risk in the hope of relief. As she herself expressed it, "she had nothing to lose."

#### Case History.

October 11th, 1935.

D. S., Age 19. Single.

*Complaints:* 1. Cough. 2. Expectoration. 3. Lassitude. 4. Repeated attacks of "pneumonia". 5. Total inability to lead a normal life.

*History of present illness:* The patient states that she was quite well up until the age of 4 years, at this time she was having some tonsillar infection, and the tonsils were removed. There appeared to be no complication at the time of the operation, but one year later, she developed what was called a pneumonia on the left side. This illness was long and protracted and recovery was slow; following it she had some chronic sputum and cough. She, however, recovered to a fair extent but again developed a left pneumonic attack two years later. Recovery was again slow. There was an increase in the chronic cough and sputum. Following that she had pneumonic attacks about every two years and with each one, was very sick and recovered slowly. She has been an invalid for periods as long as a year. Her last pneumonic

attack was in May, 1935. This was also on the left side. She was in bed in the hospital for a period of three weeks and after coming home, had a relapse and was very sick for some weeks to follow. Following the very first attack of pneumonia, cough and sputum made itself apparent and this has been increasing with each subsequent attack of pulmonary infection. The sputum is brought up chiefly in the morning in large quantities. It is thick, and foul smelling. At the present time she is expectorating about 8 ounces daily and sometimes as much as twelve. This is brought up in spasms during the day. It settles out into the typical three-layer bronchiectatic sputum. Blood was noted in the sputum for the first time following her last flare up. At this time she was coughing up considerable old blood mixed with the sputum. Since then she has been streaking frequently. During all these years she has not run a fever, except with her acute flare-ups, and except during these periods she has maintained her appetite, strength and weight well. She, however, is completely incapacitated on account of cough and large quantity of expectoration and is always in fear of acute flare-ups.

*Personal History:* Had measles 16 years ago. Whooping cough, 4 years ago. Had influenza in the spring of 1933 which caused no progression in her disease. No history of scarlet fever, diphtheria, or rheumatic fever. No symptoms referable to any of the systems. Menses 15/4-5/28. No pain.

*Local Condition:*

*Inspection:* Fairly well developed chest, possibly slightly retracted on the left at base.

*Palpation:* Slightly increased respiratory movement on the right. Vocal fremitus increased at left base.

*Percussion, Right:* Slight dulness to 3rd rib and 7th vertebral spine. *Left:* Slight dulness to 3R and 6V.S., dulness to base front and back.

*Auscultation, Right:* Broncho vesicular breathing, roughened to 3R and 6V.S. increased vesicular to base front and back. Numerous rhonchi over chest but these cleared on coughing, only an occasional rhonchi being constant. Vocal resonance slightly increased over apex. On coughing an occasional rale at base posteriorly and in lower axilla.

*Auscultation, Left:* Roughened vesicular breathing at 2R and 6V.S. then breath sounds are bronchial in character, very roughened, near base and area of bronchi vesicular breathing. Numerous friction rubs 3R and 7V.S. to base. Numerous rhonchi over chest, especially near base. Vocal resonance considerably increased 7 to 9V.S. On coughing numerous moist, coarse rales 3R and 6V.S. to base. Probable vomica opposite 8V.S.

*General Physical Examination:* Well developed, and apparently well nourished, white female, appearing about the stated age. There is some acne vulgaris about the face and neck. *Head,* hair and scalp normal. *Eyes,* pupils equal, react to light and accommodation. No ptosis and strabismus. Ocular movements good and equal in all directions. *Ears,* hearing normal, and no discharge. *Nose:* no discharge, no obstruction. *Mouth:* Slight reddening and infection of the gums. *Throat:* Clear.

*Glandular System:* No enlarged or tender lymph nodes. Thyroid, not enlarged.

*Respiratory System:* See local condition.

**Cardio-Vascular System:** Pulse 100—regular, good volume and tension. Blood pressure—106/76. Artery wall—not palpable. Heart—not enlarged to percussion. Sounds well heard and regular. No accentuations and no murmurs.

**Gastrointestinal System:** Abdomen flat, moves well. No points of tenderness. No masses felt. Liver and spleen not palpable.

**Genito-Urinary System:** No costolumbar tenderness. Kidneys not felt. Bladder not distended. Vaginal—not done.

**Locomotor System:** Muscle tone fair. Nutrition fair. No atrophy or paresis present. The joints are movable and painless. No deformities. Spine flexible and not tender. No tenderness over the long bones.

**Nervous System:** Cranial nerves intact. Superficial and deep reflexes present and active. There are no abnormal reflexes.

**Special Examination:** Urine, acid—1018; albumen, none; sugar, none; W.B.C., rare; R.B.C., none; no casts.

Mosenthal Test:	Spec.	Vol.	Spgr.
	1	480	1008
	2	135	1018
	3	150	1021
	4	180	1017
	5	180	1021
	6	255	1015
	Night	310	1023

**Blood Chemistry:** Uric acid—2 mg. percent. Blood Urea—2 mg. percent. Urea Nitrogen—9.3 mg. percent.

**Blood Sedimentation Rate:** 50 millimeters.

**Blood Count:** W.B.C., 14,200; R.B.C., 3,750,000; Haemoglobin, 78%; Color Index, 1; Polys., 58%; Eosin., 4%; Small Lymph, 35%; Mono., 2%.

**Sputum Examination:** Separates in three layers. Heavy pus layer at the bottom. Fluid layer on top. Purulent character. Pus. No secondary organisms recorded. Tubercle bacilli not found.

**X-Ray Examination: Right:** The lung markings are increased throughout to a uniform degree. No parenchymatous pathology noted. Hilus is within normal limits. The descending trunks are somewhat thickened, especially just below the hilus. Diaphragm is fairly regular.

**Left:** Except for a slight accentuation of the first inter-space trunks, the upper lobe is free from pathology. The markings surrounding the hilus are definitely increased and appear rather soft. From the 4th rib and 9th V.S. downward there is a soft confluent infiltration, chiefly noted at base of lung and probably extending behind the heart. There is a small but distinct thin walled cavity seen in the 5th I.S. middle zone. Diaphragm is obscured. Basal pleura shows moderate thickening. Heart, mediastinum and trachea show moderate retraction to this side.

**Summary, Right:** There are congestive changes seen probably secondary to the findings present in left lower lobe; however, it might be well to have the lower lobe bronchus investigated with lipiodol.

*Summary, Left:* There is a lower lobe pathology which is probably non tuberculous. A lower lobe bronchiectasis must first be considered, especially in view of previous x-ray findings. When previous reports are compared, the condition shows no great change. However, lipiodol investigation is indicated.

### Lipiodol Investigation

Sept. 17th, 1935.

Studies of the left lung following the injection of lipiodol presented the following findings: The left main stem bronchus was somewhat narrowed; there were numerous sacculated areas in mid portion of chest somewhat laterally, indicative of a saccular bronchiectasis. Behind heart were several honeycomb dilatations not filled with the lipiodol.

*Summary:* Saccular lower lobe bronchiectasis.

### Lipiodol—Right.

Sept. 20th, 1935.

Studies of the right lung following the injection of lipiodol revealed a satisfactory visualization of the right lower lobe bronchus and its branches. We can detect no evidence of dilatation or sacculation. The middle lobe bronchus and its branches were also injected and normal findings are noted.

*Summary:* No evidence of right sided bronchiectasis (middle and lower lobes).

### Lipiodol—Left.

Sept. 24th, 1935.

Further studies of the left lung with lipiodol show more of the terminations of the lower lobe bronchi (behind the heart) filled with oil. Numerous sacculated areas are seen in this locality as was suspected by previous examination. The oesophagus is probably retracted to this side by adhesions.

### Oesophagus.

Oct. 1st, 1935.

Studies of the oesophagus and stomach with barium presented the following findings: The lower third of the oesophagus showed moderate retraction to the left but no angulation or stenosis was present. The diaphragm was seen to be irregular and somewhat flattened causing an irregular flattened cardia as seen on the film taken in the prone position. Examination of the small bowel was carried out at 2 and 3 hours as well as 6 and 8 hours following the ingestion of the barium and none of the opaque mixture was seen in the honey-comb trabeculated areas presumably lying above the diaphragm. The stomach itself was of a fish hook type and presented nothing abnormal.

*Special Procedures:* Pneumothorax was attempted on three different occasions at various sites. Pleura was found to be completely adherent.

Sept. 26th—Anterior trials (2) Posterior—no reading. Anterior trials 4-8. On introducing 10 to 15 cc air 14.

Sept. 27th—Punctures have been given in 2nd, 3rd, 4th and 5th I.S. Inoperable—pleural adhesions.

Sept. 30th—Further trials 2 and 3 I.S. No readings.

*Lobectomy:* Date. Oct. 16, 1935.

*Anaesthetic:* Preliminary Chloroform, Gas and Oxygen.

Under deep chloroform anaesthesia the intra tracheal balloon was placed in the left lower lobe bronchus. Physical signs and X-Ray showed it to be in proper position and the anaesthetic was immediately changed to gas and oxygen, and the patient turned on her right side. An incision was made over the 6th rib and this was removed subperiosteally from the angle forward. The incision was then carried through the periosteal bed into the pleural cavity and while the pleural cavity was being entered slightly positive pressure anaesthesia was used. It, however, was not necessary as dense adhesions were encountered from the first. Separation was first carried through the inter lobar fissure thus freeing the lower from the upper lobe. The lower lobe was densely adherent and, in fact, fused to the chest wall, diaphragm and mediastinum. However, by aid of the trans-illuminating light these adhesions were separated without cutting through lung tissue. The pulmonary ligament was cut upward and the lobe pedicled. During the manipulation, pus could be felt and heard to squish about in the lobe, but there was no escape into healthy lung. The balloon was effective in trapping it in the lobe. The lobe being freed, the hilus was controlled by the lung tourniquet. The chest was then packed off with gauze and a considerable amount of packing was put in the spinal gutter behind the heart. The rubber tent was then applied over the lobe and the hilus cut across with scissors. During removal there was an escape of a small amount of pus from the lobe which trickled down through the opening in the rubber tent into the underlying gauze. The bronchus was cauterized with phenol and alcohol and closed with silver wire. The vessels were caught and tied and the tourniquet released. The remaining small cuff of lung was then turned over the stump and sewed with cat gut. The removed lobe proved to be a honey comb mass of bronchiectatic abscesses, some being as much as 3/4" in diameter. The paranchyma was made up chiefly of hard fibrotic tissue, there being practically no normal lung tissue. Microscopic sections confirmed these gross findings.

Following operation the patient was rather profoundly shocked, due no doubt to the extensive separation of pleural adhesions. She was given a transfusion of 500 cc. of citrated blood that night followed by a slow intrademaclysis of saline. Improvement was marked. Four days after operation infection of the cavity was obvious. The packs were removed and the cavity irrigated twice a day with boracic and acriflavine solution. The discharges were foul and stinking and the pulse and temperature were elevated. She, however, had no cough and no sputum and one could fill the cavity with irrigating fluid without inducing cough. This indicated that no bronchial fistula was present.

By constant irrigations and another blood transfusion, the fever and pulse dropped and the discharges were no longer foul. No fistula developed. At the present time the empyema cavity is closing well. She has the appearance of perfect health and has no cough or sputum.

\*See Addendum on page 637.

## CASE REPORTS

### SEMINOMA OF THE TESTICLE.

THE patient, a man of 34 years, complained in the summer of 1933 of a dragging sensation along the right spermatic cord. He had never had gonorrhoea or syphilis; the Kahn reaction was negative. Some years before while in the Tropics he had malaria. There was no family history of Tuberculosis, and no history of pleurisy or any lung trouble.

Examination showed a somewhat relaxed scrotum but no varicocele. There was no appreciable difference between the two testes; no nodules in Vas Deferens or Epidymis. Testicular sensation was normal. He was advised to wear a suspensory bandage which he did with relief for the symptom complained of, viz. dragging sensation along cord.

About the first of November, 1933, he again presented himself because of a rapid enlargement of the right testicle. There was no pain but only discomfort due to the increase in size and weight of the organ.

Examination showed a greatly enlarged organ, smooth with diminished sensation. The testicle proper and epidymis could not be differentiated. The swelling while firm was not tense. The swelling was not translucent.

Operation was advised and carried out on November 14, 1933. The right testicle which was removed measured 4" from pole to pole. The swelling was all confined within an apparently intact Tunica Albuginea. A small hydrocele was present. The vas deferens was free from nodules and the cord structures apparently normal. On section there was no clear demarcation between testes proper and epidymis.

The report on the tissue sent to the Provincial Pathologist was as follows: "The gross and histological appearances here are those of a seminoma of the testes, regarded as an Embryoma by Ewing. The cells show many nutoses and the condition must be regarded as definitely malignant."

In view of the operative findings and Pathologist's report the patient was sent away for Deep Therapy X-ray in December, 1933, and again in March, 1934. Flat plates of the abdomen and pelvis were negative. His general health continued good and he made a trip to England in the summer of 1934, and while there consulted a first rate radiologist who took plates and considered further irradiation unnecessary.

The patient enjoyed fairly good health until April, 1935, when he complained of pain in the right hip. This persisted all spring. He also complained of vague abdominal symptoms—distress after meals, constipation, and passage of mucus. In July he had a thorough X-ray examination—Barium series, flat plates of abdomen and pelvis, chest plates, all with a view to finding possible metastasis or a focus of infection to account for the pain in the hip. The examination was negative.

His pain became worse and he became very nervous. He was seen in consultation on September 2nd at which time nothing could be found. In a few weeks, however, a mass the size of an orange appeared in the epigastric region slightly to the right of the midline. He was sent again for Deep Therapy which caused a decrease in the size of the mass and to a certain extent relieved

the pain, but there is now marked rigidity of the muscles of the upper part of the abdomen with the appearance of distended veins over the lower chest and epigastric region.

H. E. KELLEY, M.D., Middleton.

### Gangrenous Appendicitis.

Patient Mrs. R. P., age 27 years., taken ill July 9th, 1935 with abdominal pain and vomiting. Delayed sending for her physician until the 14th inst. Admitted to hospital on the 14th and operated upon. Badly gangrenous appendix was removed in pieces, appendix was located well back over the psoas muscle and walled off with much strong adhesions. Two drains were inserted. Drains were removed gradually; much pus (green) kept draining away day after day, probably a pint or more in the twenty-four hours. Syringed with Dakins' solution and kept on hot fomentations, but the profuse discharge still kept coming. Patient becoming thinner, losing more and more weight, appetite poor, temperature remaining up to 100 and 101 daily. Hair began to fall until patient was nearly bald. Was giving her Blaud tablets during this time. Finally began to give ultra violet-ray treatments all over the body daily. Patient began to respond slowly—a little later I started her on mixed serum. It was not very long before I noticed a slight swelling in back on the right side opposite to where appendix was located. Made an incision and struck copious amount of pus; was able to syringe through this incision to the sinus in front. From this time on patient began to improve quickly and left the hospital well on the 10th of November.

The points that I wish to bring out in this case are the value of the ultra-violet-ray treatments, good drainage, with opening at the lowest level so pus can drain away itself. In this case I feel that the mixed vaccine helped a lot. Lastly, don't get discouraged. It seemed that this patient would never stop draining, but with the help of the ultra violet-ray vaccine and extra drainage, etc., she finally came through.

W. R. DICKIE, M.D., Digby, N. S

### Malignancy of the Tongue.

Patient C. D. Male, war veteran, heavy build, age 40.

Consulted me on August 10th, of this year, for a growth on his tongue, which had appeared from ten to twelve months previously and had steadily increased in size; other than this, he felt perfectly well.

On examination a large flat indurated area, with some evidence of supuration was seen on the left upper half of the tongue, in the anterior third; also a sessile marble shaped mass on the right upper side, at the tip. Both were very hard to the touch.

Leucoplakic patches were present on the remaining surface of the tongue. No enlarged glands were palpable in the neck or chin.

A clinical diagnosis of malignancy of the tongue was made and a small section of the growth was excised and sent to the laboratory. The report on

this was that of a simple squamous papilloma, with hyperkeratosis. A consultation was held with Dr. V. D. Schaffner, who confirmed the clinical diagnosis.

A second and larger portion from the centre of the growth was sent, the report on which was that of a squamous celled epithelioma.

A Kahn test was taken and was positive (four plus). The patient, however, denied any knowledge of specific infection.

Anti-syphilitic treatment was given and he was advised that the tongue should be removed. Several septic and decayed teeth were extracted and a mouth wash given.

On September 19th, a tracheotomy was done, under local anaesthesia and a tube inserted.

One week later a general anaesthetic was given through the tracheal opening. The throat well packed off with gauze and the tongue removed in toto, through the mouth.

Dr. V. D. Schaffner assisted at the operation.

The technique followed, was as follows: A ligature was passed through the tongue, which was well drawn forward. Lateral incisions were made at the junction of the tongue and the floor of the mouth. The whole organ was separated and dissected back to the root, where it was removed at its junction with the pharynx. All bleeding points were picked up and clamped, both ranine arteries being tied off, at their entrance into the tongue proper, before being severed.

The severed mucous membranes were approximated and stitched together. Packing was placed in the mouth and left for twenty-four hours.

The tracheotomy tube was removed on the fifth day and the opening allowed to close.

He made an uneventful recovery, with good function remaining, as he masticates well and speaks clearly.

Anti-syphilitic treatment is being continued.

J. P. McGRATH, M.D., Kentville, N. S.

#### Haemorrhage of the New-Born.

Mrs. W. W. delivered of an eight and one-half pound baby December 1st. Baby was normal in every way as far as I could determine. The birth was not a hard one, labor lasting only five hours. On the afternoon of the second day the nurse called me on the phone and said the baby was haemorrhaging from the bowels. On closer examination I found the blood coming from the vagina. I immediately thought of "Precocious menstruation" and on account of the large amount of blood used drop doses of Ergot every hour. A little later the baby began vomiting, coffee-ground vomitus. When I discovered this I injected 5 cc. Haemostatic serum into the buttocks. The blood gradually became more scanty, vomiting stopped and on the fourth day was normal again. This condition evidently was "Melaena" of the new-born. There was also considerable blood in the stools. The baby must have lost half its supply of body blood.

W. R. DICKIE, M.D., Digby, N. S.



# Department of the Public Health

## PROVINCE OF NOVA SCOTIA

Office—Metropole Building, Hollis Street, Halifax, N. S.

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<b>Divisional Medical Health Officer</b> - - - -	<b>DR. J. J. MACRITCHIE, Halifax.</b>
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<b>Pathologist</b> - - - -	<b>DR. R. P. SMITH, Halifax.</b>
<b>Psychiatrist</b> - - - -	<b>DR. ELIZA P. BRISON, Halifax.</b>
<b>Superintendent Nursing Service</b> - - - -	<b>MISS M. E. MACKENZIE, Reg. N., Halifax.</b>

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Hill, F. L., Parrsboro.  
Eaton, R. B., River Hebert (Joggins).  
Withrow, R. R., Springhill.

Communicable Diseases Reported by the Medical Health Officers  
for the month of November, 1935.

County	Chickenpox	Diphtheria	Infantile Paralysis	Influenza	Measles	Mumps	Paratyphoid	Pneumonia	Scarlet Fever	Typhoid Fever	Tbc. Pulmonary	Tbc.-other Forms	V. D. G.	V. D. S.	Whooping Cough	Conjunctivitis	German Measles	Erysipelas	TOTAL
Annapolis.....	1	2	..	..	3	43	..	1	..	..	..	..	1	..	30	..	..	..	81
Antigonish.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cape Breton...	..	3	..	..	..	..	..	..	2	..	..	..	..	..	3	..	..	..	8
Colchester.....	..	..	..	2	2	..	..	1	4	..	..	1	..	..	25	..	..	..	35
Cumberland...	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Digby.....	30	..	..	..	..	31	..	..	5	1	..	..	1	..	7	..	..	..	75
Guysboro.....	..	..	..	..	1	..	..	..	..	..	2	..	..	1	5	..	..	..	9
Halifax City..	4	4	..	..	7	..	..	..	23	2	2	..	..	..	..	..	..	..	42
Halifax.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hants.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inverness.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kings.....	..	..	..	6	3	..	..	..	..	..	..	..	..	..	..	..	1	..	10
Lunenburg.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pictou.....	3	..	..	3	..	..	..	1	5	..	..	..	1	..	8	..	..	..	21
Queens.....	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1
Richmond.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Shelburne.....	..	..	..	..	..	10	..	..	..	..	..	..	..	..	..	..	..	..	10
Victoria.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Yarmouth.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<b>TOTAL.....</b>	<b>38</b>	<b>9</b>	<b>..</b>	<b>11</b>	<b>16</b>	<b>84</b>	<b>..</b>	<b>3</b>	<b>40</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>78</b>	<b>..</b>	<b>1</b>	<b>..</b>	<b>292</b>

Positive cases Tbc. reported by D. M. H. O's. 81.

RETURNS VITAL STATISTICS FOR OCTOBER, 1935.

County	Births		Marriages	Deaths		Stillbirths
	M	F		M	F	
Annapolis.....	15	15	10	8	7	2
Antigonish.....	9	12	12	3	8	2
Cape Breton.....	99	91	100	41	46	10
Colchester.....	20	17	23	17	6	1
Cumberland.....	43	35	28	18	14	7
Digby.....	10	15	13	5	5	0
Guysboro.....	9	21	6	7	2	0
Halifax.....	99	108	83	57	51	6
Hants.....	16	16	22	7	10	0
Inverness.....	15	11	18	7	6	0
Kings.....	20	34	24	15	14	2
Lunenburg.....	14	18	19	7	6	4
Pictou.....	30	30	49	21	16	3
Queens.....	6	7	9	2	3	0
Richmond.....	13	11	5	5	5	2
Shelburne.....	12	13	9	6	3	2
Victoria.....	4	4	3	1	1	0
Yarmouth.....	18	11	13	5	8	2
	<b>452</b>	<b>469</b>	<b>446</b>	<b>232</b>	<b>211</b>	<b>43</b>

## DIGBY COUNTY

McCleave, J. R., Digby.  
Rice, F. E., Sandy Cove (Mcpy.).  
Belliveau, P. E., Meteghan. Clare Mcpy.

## GUYSBORO COUNTY

Chisholm, A. N., Port Hawkesbury  
(Mulgrave).  
Sodero, G. W., Guysboro (Mcpy).  
Moore, E. F., Canso.  
Monaghan, T. T., Sherbrooke (St. Mary's  
Mcpy).

## HALIFAX COUNTY

Almon, W. B., Halifax.  
Forrest, W. D., Halifax (County).  
Glenister, E. I., Dartmouth.

## HANTS COUNTY

Bissett, E. E., Windsor.  
MacLellan, R. A., Rawdon Gold Mines  
(East Hants Mcpy).  
Reid, A. R., Windsor (West Hants Mcpy).  
Shankel, F. R., Windsor (Hantsport).

## INVERNESS COUNTY

MacLeod, J. R., Port Hawkesbury  
Chisholm, D. M., Port Hood.  
Chisholm, M., Margaree Harbour (County).  
Ratchford, H. A., Inverness.

## KINGS COUNTY

Bishop, B. S., Kentville.  
Bethune, R. O., Berwick (Co. and Town).  
deWitt, C. E. A., Wolfville.

## LUNENBURG COUNTY

Marcus, S., Bridgewater (Mcpy.).  
Rehfuss, W. N., Bridgewater.  
McKinnon, C. G., Mahone Bay  
Zinck, R. C., Lunenburg.  
Zwicker, D. W. N., Chester (Chester Mcpy).

## PICTOU COUNTY

Crummy, C. B., Trenton.  
Blackett, A. E., New Glasgow.  
Chisholm, H. D., Springville, (County).  
MacMillan, J. L., Westville.  
Stramberg, C. W., Trenton.  
Sutherland, R. H., Pictou.  
Benvie, R. M., Stellarton.

## QUEENS COUNTY

Ford, T. R., Liverpool (County).  
Hebb, F. J., Liverpool.

## RICHMOND COUNTY

Deveau, G. R., Arichat (County).

## SHELburnE COUNTY

Brown, G. W., Clark's Harbour.  
Churchill, L. P., Shelburne.  
Fuller, L. O., Shelburne.  
Banks, H. H., Barrington Passage  
(Barrington Mcpy).  
Herbin, C. A., Lockeport.

## VICTORIA COUNTY

MacMillan, C. L., Baddeck (County).

## YARMOUTH COUNTY

Blackadar, R. L., Port Maitland (Mcpy).  
Burton, G. V., Yarmouth.  
O'Brien, W. C., Wedgeport.  
Siddall, A. M., Pubnico (Argyle Mcpy.).

Those physicians wishing to make use of the free diagnostic services offered by the Public Health Laboratory, will please address material to Dr. D. J. MacKenzie, Public Health Laboratory, Pathological Institute, Morris Street, Halifax. This free service has reference to the examination of such specimens as will assist in the diagnosis and control of communicable diseases; including Kahn test, Widal test, blood culture, cerebro spinal fluid, gonococci and sputa smears, bacteriological examination of pleural fluid, urine and faeces for tubercle or typhoid, water and milk analysis.

In connection with Cancer Control, tumor tissues are examined free. These should be addressed to Dr. R. P. Smith, Pathological Institute, Morris Street, Halifax.

All orders for Vaccines and sera are to be sent to the Department of the Public Health, Metropole Building, Halifax.

### Report on Tissues sectioned and examined at the Provincial Pathological Laboratory from November 1st., to December 1st., 1935.

The number of tissues sectioned is 181.

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## Correspondence

Curling, Newfoundland,  
Nov. 26th, 1935.

Dear Dr. Burris:—

I want to write to someone in Nova Scotia to express my feelings regarding the passing of Dr. M. A. B. Smith, and as you were a student under him at Dalhousie and were afterwards associated with him by practising in the same town I am taking the liberty of writing you.

My memory of Dr. Smith goes back, of course, to the days when he was a very active practitioner and what I remember most about him was his enthusiasm in all medical matters especially in diagnosis. In 1905 I was an interne under him at the V. G. Hospital and I can see him now making his ward rounds. At this time he became an enthusiast in blood analysis and I look upon him as a pioneer in blood analysis at the V. G. H. He went down to Baltimore that year and after his return expressed a desire for a red count and a differential white count in every medical case. That was a big order for the Lab. man in those days in that little Lab. at the head of the stairs you, no doubt, remember.

They surely are passing one by one—dear old Norman, Dr. Chisholm, D. A. and G. H. Campbell, Dr. Hogan and now M. A. B. Smith.

It is difficult to class Dr. Smith. He was in a class by himself. At least from the standpoint of enthusiasm he was in a class by himself and no doubt you noticed that enthusiasm in practice and at medical meetings.

I am sure his rest is very peaceful as he was a good man and always wished to do good to others.

I ask you, Doctor, to extend to Mrs. Smith at some time my deep sympathy.

With kind regards and good wishes, I remain

Sincerely yours,  
(Sgd.) J. I. O'CONNELL, M.D.

We are publishing this appreciation of the late Dr. M. A. B. Smith, which came to us through Dr. M. G. Burris.

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## SOCIETY MEETINGS

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The semi-annual meeting of the Western Nova Scotia Medical Society took place at Yarmouth, Tuesday evening, November 26th. There were in attendance some thirty members. The two speakers were Dr. Robert T. Phillips, resident physician of the Robert Bent Brigham Hospital, Boston, who gave a very practical discussion on rheumatism, and Dr. H. G. Grant from Halifax, who discussed the practices and application of active immunity. Following this a moving picture (difficult labor) was shown.

**BULLETIN FORUM**

Curling, Newfoundland,  
Nov. 28th, 1935.

N. S. Medical Bulletin,  
Halifax, N. S.

Enclosed \$3.18 on acct. I do not know how I stand and I ask you to kindly let me know.

Yours,  
(Sgd.) J. I. O'Connell, M.D.

To Dr. Gosse,  
The Bulletin is splendid and is always welcome.

J. I. O'C.

**OBITUARY**

The death took place on November 21st at the Saint John General Hospital, Saint John, N. B., of Dr. I. F. Longley. Dr. Longley, a native of Granville, N. S., was a graduate of Queen's University and following graduation practised in Regina. He had a brilliant career overseas in medical service during the World War. Since that time he practised with much success at Saint John, N. B. He is survived by four sisters, Mrs. Samuel Churchill, of Marlboro, Mass., Mrs. Atherton Marshall, and Mrs. Cyril Marshall, both of Bridgetown, and Mrs. Alexander Cantvell of Worcester, Mass., and by two brothers, Reginald and Clarence, both living on the homestead at Upper Granville.

**The Kolmer Vaccine.**

Our local press, which some few months ago lauded the Kolmer Vaccine as a God-send and featured one of our local nurses as one of the heroes of Medicine, now comes out with headlines telling us the vaccine is not safe. There is usually a small element of truth in press articles concerning medical matters. The Kolmer Vaccine has now been used on 12,000 persons; the vaccine of Park and Brody of New York on 8,000 persons. There is a difference in these two vaccines. In the Kolmer vaccine the virus of infantile paralysis is attenuated by the use of sodium ricinoleate; in the Park and Brodie, formalin is used. Recently vaccines to produce immunity against infantile paralysis have been criticised by many authorities. Kolmer will not acknowledge any serious results in using his vaccine and claims immunity in a high percentage of cases. (Animal experimentation is used to determine immunity). Park and Brodie claim the same thing for theirs. Rivers of the Rockefeller Institute and Leake of the United States Public Health Service do not, however, concur in this. They both maintain that Kolmer's vaccine is dangerous and that Park and Brodie's product, although not dangerous, is of no use. These are the facts to date on the most important question of active immunity against infantile paralysis.

H. G. G.

## Personal Interest Notes

Dr. G. L. Covert, graduate of Dalhousie, 1934, who has spent a year and a half at Radcliffe Infirmary and County Hospital, Oxford, England, has arrived home to spend the holidays with his parents, Lt.-Governor and Mrs. W. H. Covert.

Dr. W. Alan Curry and Dr. S. R. Johnston, both of Halifax, have returned from a two week's trip to the United States where they visited several well-known clinics.

Dr. and Mrs. W. R. Dickie, of Digby, were visitors to Halifax recently.

### To England.

Dr. Frank Hebb, formerly of Halifax, who has practised for the last two years in Liverpool, will leave shortly for London, England. Dr. Hebb plans to spend some time in post-graduate work and then settle in the Old Country.

Dr. Hugh MacKinnon, of Berwick, who disposed of his practice to Dr. Roy A. Moreash, of Halifax, has recently returned from the Old Country where he spent the last year in post-graduate work.

Dr. and Mrs. A. R. Reid, of Windsor, have returned from a visit to Port Washington, L. I., where they were guests of Dr. Reid's uncle, Mr. A. C. Falconer and Mrs. Falconer.

### Dr. Bates Honoured by Members of the A. O. H.

Following the close of the annual convention of the A. O. H. held at New Aberdeen during the early part of November, Dr. Fabian Bates was presented with a beautiful gold emblem of the order. The address was read by Mr. Charles Donnelly and the presentation made by Mr. Harold Rogers.

### Generous Gift Makes Annex Available for Treatment of Tuberculosis.

The announcement was made some few months ago of the gift to the Amherst Tuberculosis Council of the residence of the late J. R. Lamy. The property was given to serve as a tuberculosis annex. The Committee, made up of Dr. J. J. MacRitchie, of Halifax, Dr. David Drury, of Amherst and Mrs. J. A. Hanway, are deciding whether the premises will be suitable for the purpose in question.

The wedding took place in Saint John, N. B., on Wednesday, November 20th, of Dr. Peter J. Dowd, son of Mr. and Mrs. Wm. J. Dowd, Saint John, and Miss Clara J. Fabean, R. N., member of the staff of the Saint John General Hospital. Dr. Dowd is a graduate of Dalhousie University Medical School, 1933.

EMMENIN—*the orally-active, oestrogenic hormone of the placenta, prepared and biologically standardized in accordance with the technique of Dr. J. B. Collip, Dept. of Biochemistry, McGill University.*



"It should be emphasized that Emmenin therapy is essentially safe. In a group of ten cases, Emmenin was administered daily (except during the periods) for several months without disturbing the normal menstrual cycles. . . . The administration of Emmenin does not prevent impregnation nor interfere with gestation."

—*Annals of Internal Medicine,*  
Vol. 71, No. 3, Sept., 1933.

## IN THE TREATMENT OF DYSMENORRHOEA

### *Emmenin . . . a valuable form of supplemental hormone therapy*

" . . . Our results from the administration of Emmenin have convinced us that it is a valuable form of supplemental hormone therapy, when the pains have a definite origin from forcible uterine contractions . . . "

C.M.A.J., 1935, 32:609

Important findings from the use of Emmenin in the treatment of dysmenorrhoea appeared in the C. M. A. J., June, 1935. A full report of this work, carried out under the Department of Gynaecology, University of Toronto, is now available in reprint form. Copies on request.

Emmenin is offered in original, specially-sealed bottles of four fluid ounces.

AYERST, McKENNA & HARRISON  
LIMITED

Biological and Pharmaceutical Chemists

MONTREAL

CANADA

The BULLETIN extends sympathy to Dr. C. A. Donkin, of Bridgewater, in the death of his father, Mr. Fred C. Donkin, of Amherst, which occurred November 17th.

#### **Hospital Site Chosen in Lunenburg.**

The Hospital Committee, an organization which has been working for the past few years, announces through the press of November 20th the purchase of the property of H. H. MacIntosh for a community hospital. The initial installation will include six beds; the staff two nurses and a housekeeper. The Committee have already received several generous donations and expect that further contributions will be forthcoming to carry on this work.

#### **Dr. J. G. MacDougall of Halifax Honoured.**

Dr. J. G. MacDougall, surgeon, of Halifax, was appointed to the Board of Regents of the American College of Surgeons at the recent clinical congress at San Francisco. The duties of the regents, sixteen in number, consist in administrating the affairs of the College, involving decisions often of great importance to the welfare of the surgeons of America and the public at large. In the past, as in this year, this group contains the flower of American surgery and election to it is regarded as a signal honour, it was said. The BULLETIN congratulates Dr. MacDougall on this great honour.

#### **The Victoria General Hospital at Halifax Graduates Twenty-one Nurses.**

Twenty-one young Nova Scotia women were presented with diplomas from the Victoria General Hospital School of Nursing on the occasion of the graduating exercises at the Nova Scotian on November 20th. The gold medal given by the clergy of St. Mary's Cathedral was awarded to Miss Dorothy Gill, of Pictou, the presentation being made by Rt. Rev. C. E. McManus. The prize awarded by the Victoria General Alumnae for efficiency in practical nursing was presented by Miss Gertrude Crosby, President of the Alumnae, to Mrs. Myrtle J. MacPherson, of Port Howe. Addresses were given by Mr. C. J. Burchell, Chairman of the Board of Commissioners; Hon. F. R. Davis, Minister of Public Health, and Hon. A. L. MacDonald, Premier of Nova Scotia. Following the exercises a dance was held in the ballroom.

#### **Dr. A. F. Miller of Kentville addresses the Rotary Club at Halifax.**

On November 19th the Rotary Club of Halifax were addressed by Dr. A. F. Miller on the life of Trudeau, also on the crusade against tuberculosis which has followed Trudeau's work. In that part of his address dealing with tuberculosis Dr. Miller stressed the need of institutional care and also made a plea for greater efforts to wipe out the Great White Plague.



## AGOMENSIN "CIBA"

The Hydrosoluble Ovarian Substance, which provokes hyperaemia of the female sexual organs, stimulates ovarian function and *activates menstruation.*

●

## SISTOMENSIN "CIBA"

The Liposoluble Ovarian Hormones standardized by the Allen and Doisy and growth test, indicated in cases where there is *need for the ovarian hormones*, especially in cases of structural abnormality.

●

## PROKLIMAN "CIBA"

An association of Ovarian Hormones with sedative, decongesting and laxative substances and an agent regulating the cardiovascular system, for the rational treatment of *climacteric disturbances.*

●

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