

Carcinoma of the Breast *

by

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THE subject I am talking on to-night is one of perennial interest, I think, to us all, for it is, after all, one of the very commonest forms of cancer to which the body is subject. Not only that, but being on the surface of the body it is easily observed and one might suppose that therefore it should be one which should be most easily cured. The natural history of cancer of the breast is more fully known than most forms of cancer and yet the cure has been difficult. It is my intention to speak in quite a general way, I shall not subject you to any statistical deluge but rather make remarks based on forty years of professional experience and, incidentally, I am afraid I must submit you to a brief historical survey because one cannot fully appreciate the present day treatment of any particular condition unless one surveys to some extent the history of its evolutions.

Now I maintain that complacency in any form of surgery is an exceedingly dangerous thing. Further than that I think that often complacency arises from orthodoxy and I must warn you at this point that I am not orthodox. Orthodoxy in surgery is like orthodoxy in other departments of the mind. It starts as a tentative belief in some particular course of action but later begins almost a challenge comparison with religion. It comes to be held as a passionate belief and the absolute rightness of that particular view. A dissentient view is regarded as a criminal subversion of the truth and the holder is sometimes exposed to slander and abuse. In the history of Medicine it was this attitude that maintained the orthodoxy of the views of Galen for twelve hundred years or more. It was the dead hand of orthodoxy that delayed the advance of knowledge throughout the Middle Ages and even today the same oppressive mask is apt to sit too long upon the face of that particular aspect of the Goddess Clio who presides over the history of Medicine and Surgery.

In speaking today of the unorthodox view of treatment of carcinoma of the breast I do not mean to suggest that orthodoxy has been manifested in its more violent forms. None of us has been burned at the stake, but feelings have run pretty high. It may therefore be of interest if I present to you, in moderate terms I hope, the views of a more or less an unorthodox practitioner. It is often difficult to say exactly where orthodoxy begins. It grows slowly at first and then, with apparent suddenness, it becomes the accepted view to the exclusion of all others. Surgery of the breast was crude both in diagnosis and treatment up to the time of John Hunter and beyond. It was only when Pathological knowledge began to infiltrate into surgical consciousness that practice was altered and refined and a new orthodoxy began to hold its sway. The early operations for carcinoma of the breast had been extensive and usually done in the late stages of the disease. Ambroise Paré in the second half of the sixteenth century had noticed the secondary spread — “When the cancer possesses the breast it often causes inflammation to the

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arm-holes and sends the swelling even to the glandules thereof"— and had further warned against doing too much. "In decayed bodies whose strength fail, especially if the cancer be inveterate, we must not attempt the cure neither by instrument nor with fire, neither by too acrid medicines and potential cauteries, but we must only seek to keep them from growing more violent and from spreading further by gentle medicines and a palliative cure; for thus many troubled with a cancer have attained even to old age."

During the first half of the nineteenth century operations on the breast tended to become less and less extensive until in 1867 Charles Moore of the Middlesex Hospital was moved to protest against the influence of the inadequate operation. Moore was fully aware of the "follow-up" principle and had made a study of a series of patients with recurrences. He was willing to allow that tumours of the breast were now removed earlier than formerly, but complained that the technique of the operation was worse than it was one or two centuries before. Then a wide removal had been the rule, but now the skin, he said, was undermined by dissection and, after removal of the tumour, was laid down again. Sometimes even the nipple and areola were allowed to remain. Moore enunciated two principles of importance, firstly, that the tumour should not be cut into and should, indeed, not be seen at all during the operation, and secondly, his belief that the recurrence of cancer was determined by centrifugal dispersion from the primary growth and not by any independent organic origin. Moore's advanced views were further reflected in his three main conclusions, firstly, that cancer of the breast called for careful extirpation of the whole organ, secondly, that removal of the breast is most likely to be incomplete at the sternal edge, and thirdly, that unsound adjoining tissues, especially the skin, should be removed in continuity with the main mass of the disease. At the time that these most sensible views were finding expression Lister was practising free removal of the breast with the help of his antiseptic principle and Sir James Paget was at work at St. Bartholomew's. Thus surgery advanced while post-operative sepsis receded and contributions to literature by competent observers multiplied. One of the most influential of these observers was Samuel Gross of Philadelphia, who in 1880 showed that the principles enunciated by Charles Moore in 1867 were to be strictly observed and even extended. He insisted that in the most fashionable circumstances, namely when the tumour was of small size and devoid of superficial and deep attachment, without any enlarged axillary glands, then the proper procedure was to remove the entire breast by a circular incision, to dissect away the fascia covering the pectoral muscles and to prolong the incision into the axilla which should be dissected clear of lymph glands even when apparently free of disease. All this was more than the beginning of orthodoxy, it was orthodoxy itself very much in the form in which we have known it ourselves during the last half-century. Gross had enunciated for the first time the fundamental principle of recent practice and further developments were really only modifications of what he had laid down.

At much the same time Mitchell Banks in 1882 in England was supporting Charles Moore's protest against inadequate operations, surgeons were persuading patients, he said, that they had removed their cancers and almost persuaded themselves, but there was always that little bit left, which they fondly hoped would not grow because it was *such* a little bit. They did it better, he repeated, as Moore had said, one hundred and fifty years earlier. The breast was then seized with great pincers, struck off with an enormous

knife and the cut surface seared with a red-hot poker. Now surgeons, he complained, remove a little elliptical bit around the nipple, and the remaining skin, full of cancer germs, was carefully laid down again. Banks advocated a much wider excision than was usually practised though, like Gross, he did not remove the pectoral muscles. In the absence of rubber gloves he would pinch away the axillary lymph nodes with the nails of his thumb and forefinger. Patients were followed-up, but so imperfectly that Banks was inclined to believe that if a patient remained well for three years she was permanently cured.

In 1887 a lively discussion took place at a surgical meeting in London. Mitchell Banks was repeating his belief that extirpation of the axillary glands was a necessary part of the operation, but other eminent surgeons criticised this view. Sir Thomas Smith of Bart's expressed the reactionary opinion that it was a question for consideration whether a local excretion, as they called it, of cancer did not render patients less liable to constitutional disease. Sir Tom Smith, always a somewhat aggressive character, even asserted that the patient lived longest who had never been operated upon, thus echoing Paré's dictum from the sixteenth century and representing unorthodoxy in its crudest form. All experienced surgeons, even of the present day, have seen patients whose survival in good general health for many years in spite of extensive growth might lend support to this uncomfortable view. In the discussion Sir Henry Butlin, lent the weight of his great experience to the conservative view. He said that very free removal in every case was an unsurgical and unscientific procedure since the operation bore no relation to the extent of the disease. He would not open the axilla unless enlarged glands could be felt. When no glands could be felt the disease was less malignant and therefore the result better. He was, in effect, distinguishing what has until recently been called Stage I from the later stages. His figures showed that only half as many patients were treated in Stage I as in the later unfavourable stages, but in spite of his unorthodox view the three year survival rate was 18% as compared with only 5% in the later stages. The operative mortality of the bigger operation was, however, double that of the lesser, due, as Banks suggested later, not only to sepsis but to lowering of the vitality of the patient by the cooling effect of the Listerian carbolic spray. It was difficult in fact to eliminate the influence of factors other than the disease in any statistical review of the results.

During the ten years following this discussion the main advance in the treatment of carcinoma of the breast was made in the United States. Halsted, working at the Johns Hopkins Hospital, Baltimore, reviewed his patients over a period of ten years and in 1898 showed that the radical operation for cancer of the breast had, by this time, been carried to its logical extreme. So much skin had been removed that it was often necessary to cut grafts larger than a hand from the patient's thigh to cover the raw area on the chest wall. The pectoral muscles were removed and not only was the axilla dissected clear of lymph nodes, but also the supraclavicular region, part of the clavicle being removed at first to make this easier. On three occasions Halsted's then unknown assistant, Harvey Cushing, cleaned out the anterior mediastinum for secondary cancer and felt it likely that in the near future this would be done at primary operation. Halsted and Cushing found operating for cancer of the breast to be a very great labour; they took two to four hours and they never attempted more than one of these operations in a day. This was orthodoxy pushed to the limit of what both patients and surgeons could stand.

The orthodox operation of the present day is usually called Radical Mastectomy, but until recently it was often called Halsted's operation. It does not, however, really carry out the master's principles, since infection of the supraclavicular region usually indicates extension to the mediastinum which is beyond the reach of surgery, so that an operation of this kind is likely to carry an increased operative morbidity and mortality, and is also likely to be palliative only. At this time, around 1900, the value of simultaneous removal of the ovaries was also being discussed. The general opinion agreed with the view held at the present time that its effect, though often good, was only temporary.

It will be appreciated by this point that after the year 1900 it was going to be difficult to introduce into the surgery of the breast anything that was really new. Nevertheless the work of Sampson Handley, whose book on the Mammary Gland was first published in 1906, is usually regarded as the next land-mark in this history. Handley's aim was to put operative surgery as applied to the breast on a scientific basis by picturing accurately the microscopic ramification of a cancerous growth and its mode of dissemination. In effect, however, Handley was restating the principles enunciated forty years earlier by his predecessor, Charles Moore, at the Middlesex Hospital, the doctrine of centrifugal permeation being his central theme. Moore's ideas were amplified and demonstrated under the microscope, centrifugal growth being shown to be often followed by centrifugal death, cancer cells in the lymphatics being destroyed by tissue reaction between the primary growth and the head of the advancing column. Handley did not overlook the importance of the local spread of the disease by infiltration, but he laid the emphasis on permeation through the main highway of the lymphatic plexus in the deep fascial layer. He based his operations on this, maintaining that, as the growing edge of a permeating cancer cannot be recognized, its presence must be assumed. On this basis Handley insisted on a wide removal of skin with a still wider removal of deep fascia together with the muscles beneath it. He also insisted, as Moore had done before him, that the tissue removed including the contents of the axilla should be dissected away in continuity so that the permeated lymphatics should not be cut across. Handley's scientific-sounding thesis had immense influence during many succeeding years and thus was orthodoxy rammed home into our consciousness during our youth until, in our maturer years, it took on the sinister appearance of a dogma. A rule of thumb had been established which eliminated the necessity of further thought. Handley's radical operation was now to be performed for every carcinoma of the breast whether early or late, and it began to be believed that little further improvement was possible. I can remember maintaining in argument with my shrewd and clear-sighted chief, the late George Gask, that the earlier the growth the more radical should the operation be, so plain did it seem to my over-enthusiastic mind that an increased percentage of apparent cures would follow an ever wider removal of tissues. The earlier the growth, the more radical the operation was the slogan of the moment.

It is perfectly true that the publication of Handley's work in book form was followed by a great improvement in the general results of the surgical treatment of the breast cancer. The first shock to complacency came from a Ministry of Health Survey published in 1924 maintaining that the improved results of surgery were due, in large measure, to earlier diagnosis of the disease and not very much to the technical improvement in the operation. Never-

theless, this warning was largely ignored, orthodoxy by then being firmly entrenched. It is now half a century since most of the work described in Handley's book was done and probably has few readers at the present time. Like many classics it is greatly respected, but never read. For this reason it is not generally appreciated that its conclusions are vitiated by a fundamental flaw in his premises. If it is looked into carefully it will be found that all the pathological material was taken from patients who had died of the disease. In other words, a wholly abnormal state of affairs was taken as the basis for a system of treatment which was to be applied indiscriminately to all stages of the disease, early as well as late. Handley, it has long seemed to me, laid too much emphasis on the importance of centrifugal permeation of the lymphatics, leaving the impression that the spread by this method takes place equally in all directions. Many of his conclusions seem anyway to be contrary both to experience and to common sense.

In the 1930's, J. H. Gray working under Wollard, Professor of Anatomy at St. Bartholomew's, carried out some very important investigations into the anatomy of the lymphatics. By injecting thoratrast and barium he made lymphatic channels visible in x-ray films and to the naked eye in tissues subsequently rendered semi-transparent with glycerine. It was shown by this technique that there is no lymphatic plexus in the deep fascial layer beneath the breast. The lymphatic system lies in the gland and on its surface, the main trunks passing around the fold of the axilla to the axillary nodes. He found no evidence whatever in support of the theory of centrifugal permeation. On the other hand, normal lymphatic channels were found to connect a carcinoma with infected lymph nodes, the only possible inference being that carcinoma cells passed to the nodes as emboli without forming intermediate points of growth. It is, I think, now generally accepted that dissemination of cancer of the breast takes place mainly by emboli passing along the larger lymphatic channels and by direct invasion of venous channels. The lymphatic emboli will naturally travel along the line of least resistance, that is the main trunk to the axilla, and clinical experience agrees that this area is almost always the first to show evidence of secondary infection. When this channel is blocked, then other abnormal channels may develop such as those supposed by Handley to proceed by the fascia of the rectus abdominus and the falciform ligament to the liver. These channels, with others send those supposed to cross the midline to the other breast, are not known to anatomists and do not, in fact, exist, except possibly in the abnormal conditions described by Handley. There can, however, be no doubt that the position of the primary growth is of great importance in determining the spread. Charles Moore pointed out that extirpation of the disease was always more difficult when it was started near the sternum edge of the breast, the reason for this being the lymphatic channels piercing the intercostal spaces to terminate in the internal mammary lymph nodes. The existence of these was suspected by Sampson Handley and recently proved by his son Richard, who in 1954 made an important contribution to knowledge by following Harvey Cushing's example and diving into the anterior mediastinum. Systematic removal of these lymph nodes has shown the presence of cancer cells in 41% of 139 patients and they were three times more frequent when the primary growth was in the inner half of the breast than in the outer half. In eight patients the internal mammary chain was involved although the axilla was clear, so that these observations seem rather to make nonsense of our conventional staging. Some American surgeons

have recently designed operations designed to extirpate the internal mammary area as well as everything else, but Dick Sampson Handley does not himself favour this operation as a routine. This question of ever more extensive operations is one which has exercised my mind for many years.

The routine performance of the so-called radical operation should perhaps be regarded as an over-simplification of the problem and it may be that I have made the same mistake by taking the line, for more than the last twenty-five years, that the operation is useless in the later stages and unnecessary in the earlier. I have not indeed performed it for nearly thirty years and I have long been sure that my patients have not suffered thereby, but my practice has been profoundly influenced by the simultaneous use of irradiation in its different forms. An experiment in the use of radium was initiated by Professor George Gask at St. Bartholomew's and he briefed me in 1922 to find out what could be done with radium needles in carcinoma of the breast. For some years this treatment was applied only in the inoperable stages of the disease. Later, when the efficacy of radium seemed to have been established, it was cautiously applied to the earlier stages. It was these experiments that gave rise to the belief that I never use anything besides radium needles in treating cancer of the breast. Once a label of this kind has been applied it is very difficult to get it unstuck again, and this reputation pursued me long after I had moved on to a combination of conservative surgery and irradiation, adapting the treatment to the needs of the individual patient. I believe that any rule of thumb in surgery is wholly pernicious and that is what the radical operation had become. It is obvious, however, that I was quite unorthodox. By 1937 a total of 325 patients had been treated and it was found that the three and five year survival rates were not significantly different from those obtained by orthodox surgery, with the advantage of less mutilation and less post-operative morbidity, this being especially obvious in the absence of the disabling oedema of the arm which so often follows radical surgery.

A recent estimate, in 1954, (Hall-Smith and Haber) states that 70% of patients after radical mastectomy suffer from this oedema of the arm though not all those, of course, can be of serious degree. Many of my patients have been subjected to such conservative surgery that it was not obvious afterwards that they had had any operation at all. How much this can mean to a woman is difficult for us men to appreciate. All my statistics were prepared by Lady Jane Forber, a trained statistician, who worked for the Ministry of Health, so that all bias was as far as possible eliminated. The ten year results were never completed because for six years I was in the Royal Air Force and no follow-up was possible and my investigation collapsed. In 1953, however, three independent investigators from St. Bartholomew's Hospital, a radiologist, a young surgeon and a statistician carried out an elaborate analysis of all the patients treated at that hospital for cancer of the breast in the years 1930 to 1939. This included a large number of my patients, though the investigation was done without my knowledge and I was pleased to find that the final assessments of the results in over 1000 patients led to the conclusion that "where efficient radio-therapy is available radical mastectomy should be abandoned in favour of conservative surgery." It seemed therefore that my patients had not suffered from the unorthodoxy of my surgical approach and I was recently informed by I. G. Williams, the radio-therapist of the team, that they had now worked out the ten year results and find that the figures are even more in my favour than before, but these, I think, have not yet been published. Mean-

while Robert McWhirter, who served his radio-therapeutic apprenticeship at St. Bartholomew's, had been interested by what he had seen of the results of conservative treatment of my patients. When he moved on to Edinburgh he resolved to pursue the matter further and, as you know, performed the astonishing feat of persuading all the surgeons working in that area to abandon radical operation so that the results of conservative surgery combined with high-voltage x-ray treatment could be properly assessed over a long period. A careful follow-up system was, of course, an essential part of the scheme. It had been difficult to obtain a clear comparison of McWhirter's results with those of orthodox surgery, but he claims that his overall results are better among the patients regarded as operable. Interpretation of the term "operable" has been various and I am quite sure that many radical operations have been done by others on patients whom McWhirter and I would have regarded as inoperable, at any rate until they had had a full course of deep x-ray therapy.

Wise radiologists do not claim that they can extirpate the disease with x-rays alone, though the activity, even of large tumours, can be damped down to an astonishing degree. It is also a matter of observation that secondary lymph nodes are more sensitive to radiation than most other forms of carcinoma. Another important point favouring conservative surgery must be emphasized. The radical operation, removing everything except skin and ribs, and I recall being taught to leave the skin with almost no subcutaneous fat, offers a field that is most unfavourable for subsequent irradiation. It is hardly possible to give adequate treatment to skin and bone without risk of injury, whereas with the better depth of tissue left after conservative operation full advantage can be taken of the greater penetration of high voltage x-rays.

I may add that since 1939 I have completely abandoned the use of radium needles in favour of deep x-ray therapy, the high voltages producing an effect approximating that of radium, one of the virtues of radium being the local intensity of its radiation. At the same time radium did tend to produce, because of this intensity, an undesirable degree of fibrosis in the irradiated area, leading to unnecessary secondary operations by other surgeons for supposed recurrences which were, in fact, lumps of harmless fibrous tissue. Occasionally, too, ribs were devitalized by the radium and gave rise to pathological fractures years later. Thus, you will see, the supposed radium monomaniac had in fact moved on to an entirely different position in which he advocated varying degrees of conservative surgery combined with deep x-ray therapy, usually given after operation, but with a liberal interpretation of the term "inoperable," any large tumour being subjected to pre-operative irradiation. The operation mortality is nil.

The result of this system I have found to be extraordinarily gratifying with negligible morbidity after completion of the treatment. There have sometimes been amusing exchanges over American patients with cabled altercations across the Atlantic. Thus an American lady who had a tiny carcinoma of the breast, proved microscopically, arrived in New York with her breast apparently intact. Immediate radical operation was strongly urged but the patient remained loyal to my principles and in the end one of the most convinced American radicalists acknowledged most handsomely that I was right. As I observed before, orthodoxy dies hard, but I have been noticing with great interest how the pendulum is swinging. Even in my own hospital the Senior Surgeons, one by one, are changing over and of the Junior Surgeons only one or two are fully orthodox.. At the same time it is plain that conser-

vative surgery can only be practised successfully where first-class radiotherapy is available and where surgeons and radio-therapists work as a team in close co-operation. Where these conditions do not obtain, then orthodox radical surgery is no doubt the best alternative.

But even when all this has been said, the general position is still open to attack. A very interesting paper by McKinnon (1954), of Toronto, was published recently in the *Lancet*. The paper dealt with "The Control of Cancer Mortality" in general, but illustrated the theme mainly by considering cancer of the breast, since this, being one of the most accessible forms of cancer, should surely give improved results with earlier diagnosis. It was found, however, that the provision of free clinics for diagnosis in several Canadian States failed to effect any appreciable control, although patients came in large numbers. McKinnon maintains that this failure is due to the fact that the remote metastases which are the almost invariable cause of death, occur early in the blood stream. A leading article in the *Lancet* (1954) refers to this contention as a "heresy" though I should have thought that we should all subscribe to the belief that the patient dies from the blood-borne metastases and not from the primary lesion nor from the lymphatic metastases — unless anyone still believes with Sampson Handley that cancer cells reach the liver via the falciform ligament and the vertebrae via the lymphatics of the thoracic wall. McKinnon also maintains that many pathologists do not distinguish histologically between true cancer and what he calls a "sclerosing adenitis." Claims that earlier diagnosis improves the survival rate he attributes to the inclusion of non-lethal types of lesion in the stage I figures. In other words, it has not been proved that the five year survival rate is affected in any way by the method of treatment, since it cannot control the incidence of early spread by the blood stream. The evidence of many observers is summed up as showing that if treatment is effective it cannot do more, at the very best, than increase the overall five year survival rate by 5-10 per cent.

I do not really quite accept this defeatist view, for it seems irrational to maintain that every lethal type of growth will metastasise by the blood stream within the first few weeks of its appearance. As Coley, one of the early advocates of careful follow-up, asked in 1877 "Have you ever imagined what the results would be if all cancers were thoroughly excised when they were no bigger than peas?" Nevertheless, McKinnon's views, based as they are on evidence drawn from a wide field, do provide some ammunition in support of the unorthodox view. It must clearly be true that many patients with relatively non-lethal lesions are subjected to totally unnecessary mutilation and morbidity. As R. S. Murley (1954) one of the St. Bartholomew's team, remarked in the correspondence that followed their paper "Since it is clearly difficult to effect any appreciable addition to the **quality** of life, more attention should be paid to the **quality** of life." It is, I submit, particularly on this side of the question that the unorthodox view has the advantage.

It may be that McKinnon's lethal and non-lethal types will prove to have some relation to those now differentiated as pituitary-dependent or not. It seems certain that estimation of the pituitary trophic hormones in women past the menopause is becoming an important part of the investigation of patients, enabling the surgeon to decide whether adrenalectomy or removal of the anterior pituitary is likely to help or not. This can be done directly by biological assay of the amount of gonadotrophin in the urinary deposit, or indirectly and more simply by a vaginal smear method now being investigated at University College Hospital and by Allen of Johannesburg.

It is already known that bilateral adrenalectomy is of value in relieving the pain of metastatic deposits and actual regression of a growth may be obtained. But the improvement is usually temporary, rarely for as long as 18 months, and the treatment is often totally ineffective. Presumably the failures are in those patients whose tumours are not pituitary dependent, and these can now be eliminated beforehand, thus sparing them a severe and useless operation.

Summary

Patients do not die from local recurrences, but from blood-borne metastases which will be unaffected by the particular form of local treatment.

The survival rate for any given period will not be greatly affected by the form of the operation; larger and larger operations are to be deprecated. Advance will not come that way.

Conservative surgery combined with radio-therapy will give results as good as, or a little better than those following radical surgery, with certain advantages to the patient.

Patients should be treated as individual problems, not as material for the application of a rule of thumb.

Recent advances in treatment by adrenalectomy or testosterone will occasionally have startling results in advanced disease, but it is usually temporary. We must think chiefly of the average patient and of the value of early diagnosis.

I should venture to predict that within the next ten years the radical operation for cancer of the breast will have become exceptional rather than orthodox; but, of course, I cannot guess exactly what will have taken its place. It may not be the current unorthodoxy, nor even adrenalectomy or testosterone, but something else, something novel and at present unpredictable.

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Atherosclerosis, Diet and Stress *

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It is universally recognized that our food intake is composed of carbohydrates, fats, proteins, minerals and vitamins.

In recent years chief attention in the treatment of atherosclerosis has been focused upon the use of diets with chief emphasis on restriction of cholesterol, fat and caloric intake. Extensive trial of diets, low in cholesterol alone, has failed to show crucial changes in the cholesterol concentration of the plasma or in most of the essentially pathologic features of lipid composition in persons especially susceptible to the development of atherosclerosis. The restriction of fat and calories, on the other hand, appears to be somewhat more helpful. It has recently been reported by several observers that predictable reduction of serum lipids has followed the use of diets containing vegetable but no animal fat.

It is no new doctrine that gluttons have a relatively high morbidity and mortality from vascular disease, or that there is greater average longevity and relative freedom from vascular accidents among the spare and the frugal. More recent evidence has strengthened this traditional impression. It is stated with statistical support that the obese have a greater incidence of hypertension and that atherosclerotic plaques develop earlier and more abundantly in the overfed. This circumstantial evidence seems to indicate that while waiting for more effective means of treatment, a low fat, low but adequate caloric diet may be advised with the expectation of partial protection against the rapid development of the complications of atherosclerosis.

Plasma Proteins

The plasma proteins may be defined as compounds of high molecular weight, consisting of chains of α -amino acids united in peptide linkage.

Identity of Proteins

The heterogeneity of the plasma proteins is readily demonstrated in the ultracentrifuge or by electrophoresis which is reflected in the wide range of molecular weights.

Albumin fraction.....	69,000	—	
A-globulin group.....	200,000	—	300,000
B-globulin ,, 	150,000	—	1,300,000
gamma globulin group.....	150,000	—	300,000
fibrinogen.....	400,000		

Plasma Lipids

Phospholipids, cholesterol and neutral fat are the most abundant lipids in the plasma.

State of Lipids in Blood: Lipoproteins. Practically all of the lipids of plasma are present as lipoprotein complexes. Electrophoretic studies of plasma protein fractions have disclosed the presence of two groups of lipoproteins, one migrating with the α 1-globulins, the other with the β 1-globulins.

The plasma lipoproteins contain cholesterol (free and esterified), phospholipids, neutral fat, and traces of the lipid-soluble vitamins and the steroid hormones. The α 1-lipoprotein referred to above contains 12 per cent chole-

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terol, 21 per cent phospholipid, and 57 per cent protein, whereas the B1-lipoprotein contains about 30 per cent cholesterol, 25 to 29 per cent phospholipid, and 23 to 25 per cent protein, in addition to traces of vitamins A, D, and E, of estrogens.

Pathogenesis of Atherosclerosis

During the past century various theories have been proposed regarding the pathogenesis of atherosclerosis. The relative merits of a particular theory depend upon the degree of factual support that can be obtained from epidemiologic data, etiologic considerations, and observations of the pathologic process in man and experimental animals.

TABLE 1

Theories on the Pathogenesis of Atherosclerosis

1. Senescence theory (aging of colloids, wear and tear, circulatory trauma).
 2. Theory of fatty degeneration of clotted blood in mural thrombi (Duguid) or subintimal hemorrhages (Winternitz).
 3. Intimal plasma cholesterol infiltration theory.
 4. Colloidal-macromolecular theories:
 - A. Macromolecular instability theory (Hueper).
 - B. Lipoprotein theory (Golman).
 - C. Chylomicron theory (Moreton-Necheles).
1. Senescence theory. This theory is based on 2 chief premises:
 - A. Inasmuch as all tissues undergo some degenerative changes with advancing age, and inasmuch as atherosclerotic lesions are most frequent and most marked in elderly individuals, it is concluded that atherosclerosis is the result of physiologic senescing processes.
 - B. Inasmuch as senescing processes in arteries primarily affect the media, leading to degeneration of the muscle and elastic tissues with secondary scarring, it is proposed that the fibrotic intimal cushions located above such medial changes are of compensatory nature, whereas formation of atheroma in such plaques is the result of subsequent fatty degenerations. This concept was first developed by Thoma in 1880, was discarded by 1900, and was recently revived by Blumenthal and Lansing.
 2. Theory of fatty degeneration of clotted blood in mural thrombi and hemorrhages of vascularized subintimal tissue. It has been claimed that atheromatous lesions, especially those involving the coronary arteries, originate either from the liberation and phagocytosis of fatty matter from mural thrombi that are attached to the intima and are subsequently covered by endothelial lining, or from liberation and phagocytosis of hemorrhagic material from newly formed capillaries located in the subintima. Although atheroma-like lesions might be formed occasionally through such mechanisms, the bulk of present evidence from man and experimental animals, refutes the general applicability of these concepts to the pathogenesis of atherosclerosis.
 3. Theory of intimal infiltration with plasma cholesterol. Fatty elements contained in the plasma (especially those of lipemic type) are presumed to enter the arterial wall, by trans-intimal diffusion, whenever plasma is pressed into the subintima under the force of normal or abnormal intravascular pressure. Inasmuch as the regions of bifurcations, curves and narrows are

particularly subject to the effect of these circulatory forces, these sites are most frequently affected by atheromas, according to the supporters of the infiltration theory.

4. Colloidal-macromolecular theories. The various colloidal-macromolecular theories in some respects have evolved from the same basic observations as the infiltration theories, inasmuch as all of them deal with the role that plasma cholesterol supposedly has in atherogenesis. In the colloidal-macromolecular theories, however, the emphasis is placed not so much on the quality of plasma cholesterol as on its physicochemical status, i.e., the size of its micellar aggregates, the density and size of its macromolecular complexes, and on the stability of these colloidally dispersed particles in the plasma. In fact, the lipoprotein and chylomicron theories are essentially modifications and specializations of the macromolecular theory, because they fundamentally substitute the specific concept of lipoproteins and chylomicrons for the general concept of colloidally unstable cholesterol micels or other macromolecular aggregates.

TABLE 2

The Macromolecular Theory of Atherosclerosis

- I. Primary diseases causing:
 1. Disturbances of the lipid metabolism (hypercholesteremia).
 2. Deficiencies in colloidal stabilizers (albumin, phosphatides, fatty acids) of cholesterol aggregates.
 3. Deficiencies in degrading and dispersing agents of lipoproteins and cholesterol micels.
- II. Secondary colloidal plasmatic disturbances (plasmatic colloidal instability) produced by:
 1. Cholesterol containing particles (micels, lipoproteins, chylomicrons) of proper size suitable for endothelial phagocytosis.
 2. Cholesterol containing particles of proper low density for accumulation in marginal plasmatic stream.
 3. Cholesterol containing particles of labile colloidal state favoring conglomeration and precipitation through vibration and turbulence.
- III. Localization of atheromas favored by:
 1. Areas of transitory blood stagnation and vibration (coronary arteries).
 2. Areas of plasmatic turbulence at sites of intimal irregularities (bifurcations, orifices, retractions, elevations, narrows, fixation, curves).

Kellner says that the early lesions of atherosclerosis that we see with the naked eye or with the microscope result from the infiltrations of lipid material through the presumably intact endothelium into the intima of the blood vessel. There it is quickly taken up by phagocytes so that the first thing one sees is a tiny yellowish pin point or fleck on the vessel wall. Early in life one sees these in the aorta and very commonly on the aortic leaflet of the mitral valve. These small lipid aggregates at this stage are probably reversible. It is quite likely that before any other tissue changes ensue the lipid may disappear and leave little or no trace. However, in most human beings the process is a slowly progressive one, perhaps a cyclical one,

and more lipid continues to be deposited in the vessel wall. As it does, the small lipid-rich plaques becomes larger and larger, protrude into the lumen and over a period of months and years, undergo secondary changes. These secondary changes are breakdown of the fat-containing cells with liberation of the fat, fibrosis, hyalinization and calcification. As the plaque gets larger and larger and as the lipid in the central portion of the plaque breaks down, blood vessels grow into the periphery of the plaque. Some of these vessels may rupture, producing hemorrhage into the plaque. As the plaque expands, the lumen becomes compromised; it becomes narrower and narrower and finally may be completely occluded. The lumen may become closed by the plaque itself or by thrombosis or hemorrhage superimposed on the plaque. Though we are all deeply interested in the phenomena that produce disability and death in atherosclerosis, namely, occlusion, thrombosis and hemorrhage into the plaque. Important, to be sure, but nevertheless secondary. The underlying process is the infiltration of lipids into the vessel wall. Thrombosis and other disastrous accidents that occur are but the sequelae to this process.

There is almost universal acceptance today of the idea that some metabolic defect is the cause of atherosclerosis. There is no agreement whatsoever on what this metabolic defect is. It is believed by some that this metabolic defect is manifested by an increase in the beta-lipoprotein levels in human beings. Beta-lipoproteins are specified rather than cholesterol levels because the bulk of the evidence today seems to indicate that the beta-lipoproteins play a special role in the development of the arterial lesions, a more specific role than does the serum cholesterol taken as an entity. For instance, the normal human being will have an average serum cholesterol level of about 200 mg. per cent. The average dog also has a serum cholesterol level of 200 mg. per cent but in the human being about 150 mg. of this 200 is present in the beta-lipoprotein fraction. In the dog only 40 to 50 mg. is present in the beta fraction. If by feeding cholesterol we increase the serum cholesterol level in a dog to 400 mg. per cent, a level which we might expect to produce atherosclerosis, we find there is no change in the ratio between the alpha and beta-lipoproteins. The cholesterol in the beta fraction only reaches 80 to 100 mg. per cent, a value still much lower than the level of beta-lipoprotein normally found in most normal human beings. Under these conditions the dog does not develop atheromatous plaques. However, if we can maintain the serum cholesterol level of the dog at 400 to 500 mg. per cent and at the same time produce a change in the distribution of the cholesterol between the alpha and beta fractions, so that the dog now has 150 to 200 mg. per cent of cholesterol in the beta fraction, the dog will develop atheromata. It may be that in clinical disease this abnormally high beta-lipoprotein level is superimposed upon other factors, which cause local damage to certain portions of the arterial tree. Waters showed that young dogs injected with certain pressor amines, including epinephrine, develop lesions in their coronary arteries and nowhere else. These lesions are not atheromatous. They would be described as arteritis. But if the concentration of beta-lipoprotein is increased, the lesions assume the appearance of typical atheroma.

Kellner believes that hypertension has an important effect upon the development of atherosclerosis, an important accelerating effect. Lipids permeate the walls of blood vessels and the higher the inherent pressure in the vessel, the more lipid will permeate. In general, the higher the pressure, the more rapid and the more severe the development of atherosclerosis.

During the last 6 months the English literature and more recently the American Medical Journals have published articles about the Essential Fatty Acids (EFA). The following abstracts are taken from an article by Sinclair of Oxford University.

"The most important E.F.A. is the Vitamin arachidonic acid with four double bonds, tetraenoic. This can be formed in the body from linoleic acid, but vitamin B6 is needed for the conversion. The body probably has some slight ability to synthesise E.F.A."

"Cholesterol is normally esterified mainly with unsaturated fatty acids and when these are extremely deficient in the body it is esterified with much more saturated fatty acids synthesised in the body from carbohydrate. Thereby, I believe, abnormal esters are produced which tend to be deposited in tissues. Such deposition would be enhanced by a diet relatively high in saturated fat or high in cholesterol. A diet deficient in vitamin B6 and relatively low in arachidonic acid would act similarly."

"For many years and particularly in recent years animal fats and more especially vegetable fats have become increasingly oxidised and deprived of E.F.A. before being eaten. Vegetable oils, in many cases rich in E.F.A., are hardened by hydrogenation: margarine and shortenings are produced by hydrogenation of cotton-seed and soybean oil, some peanut-oil, and certain other oils; during this hydrogenation much of the E.F.A. are destroyed and unnatural fatty acids are formed. Unnatural fatty acids are formed not only during hydrogenation but also during the practice of deep-frying. Whale-oil is sometimes added to margarine, and this, like other marine oils of plant and animal origin which contain a variety of highly unsaturated fatty acids, is deodorized and hardened by hydrogenation. Some people who consume high-fat diets, such as some Norwegians and also Eskimos uncontaminated by so-called civilization, fare well by taking marine foods."

Conclusions

In summary, Kellner's thesis is that the dietaries of the more highly civilised countries are becoming increasingly deficient in the essential fatty acids. Since the requirement of males for E.F.A. is much greater than that of females, the consequences are more serious in males. These consequences may include the following:

1. Cholesterol becomes esterified with abnormal or unusually saturated fatty acids, and these abnormal esters are less readily disposed of and so cause atheroma.
2. Phospholipids contain abnormal or unusually saturated fatty acids, and these abnormal phospholipids, being less readily disposed of, are retained in plasma and increase the coagulability of blood thereby contributing to coronary and cerebral thrombosis.

Schroeder from Washington University St. Louis, Mo. says this: "We cannot wait, however, until all of the metabolic pathways of fatty acid, cholesterol, and collagen metabolism are clearly understood before attempting therapy by lowering plasma-cholesterol in man. Tools are now offered which will do this without hazard or excessive inconvenience. During the present interesting interim between the state of knowledge now and the advent of specific therapy, it has been our practice to lower blood-cholesterol in our patients by (a) reducing the intake of saturated fat by about 50%, (b) pro-

viding about 0.5 g. linolenate per day by the use of soybean oil in salad dressing, sauces, and cooking, (c) giving the calcium complex of E.D.T.A. in doses of 1.0 g. per day orally, and (d) giving an adequate intake of pyridoxine, on purely theoretical grounds (5 to 10 mg. per day). It may be a long step, however, between low plasma-cholesterol levels and demonstration of reversal of the arterial lesions."

Medical Abstracts

Studies in the Home Treatment of Streptococcal Disease*

It would appear from this study that, for keeping the throat free of beta-haemolytic streptococci, a single injection of benzathine penicillin is more effective (94.4 per cent of patients for 21 days) than a seven-day course of penicillin by mouth (82.9 per cent for 10 days). Also benzathine penicillin has the advantage of being less expensive than other standard forms of therapy for streptococcal pharyngitis now in use and eliminates the problem of patient reliability in taking oral medication.

It should be borne in mind that this study reveals circumstances that develop in problems of patient management in an uncontrolled environment in which the opportunity for reinfection and relapse is most likely. The results obtained under such adverse, but nevertheless realistic, conditions indicate that effective treatment could be obtained with benzathine penicillin in approximately 95 per cent of patients.

Of 127 patients with acute pharyngitis due to the beta-haemolytic streptococcus treated at home with a seven-day course of penicillin by mouth, 22, or 17.3 per cent, had bacteriologic recurrences during a ten-day follow up period. Of 196 patients treated at home with a single injection of benzathine penicillin, 11, or 5.6 per cent, had bacteriologic recurrences during a three-week follow up period.

Of the patients receiving benzathine penicillin, approximately 70 per cent complained of discomfort at the site of injection for an average of two and a half days.

There were four possible systemic penicillin reactions observed after 510 injections of benzathine penicillin, a frequency of 0.8 per cent.

It is concluded that a single injection of benzathine penicillin is effective therapy for pharyngitis due to the haemolytic streptococcus, the main advantage over penicillin by mouth being that it assures the patient of receiving the intended therapy. The observations presented here deal with a comparison of intramuscular injection of benzathine penicillin G and should not be interpreted as implying any comparison with the oral route of administration of benzathine penicillin G, which was not used.

Mohler, D.N., Wallin, D.G., Dreyfus, E.B., and Bakst, H.J., *New England Journal of Medicine*, 254: 45-50. January 12, 1956.

*From Medical Abstracts, December, 1956.

The Present Status of Tuberculosis in Canada And The Atlantic Provinces*

J. E. Hiltz, M.D.**

THE topic of this paper presents a scope impossible to encompass in a half hour and so your indulgence is implored if references are made to Nova Scotia as being representative of the Atlantic Provinces.

Let us not, however, be too insular nor too narrow in our outlook. The tubercle bacillus knows no geographic boundaries. It is a world traveller.

In order to bring into focus our position in respect to tuberculosis, a few tables will be presented. As death is such a clearly defined entity and so very definite it may be well to start with mortality statistics for a number of countries in various parts of the world.

Table I¹
MORTALITY FROM TUBERCULOSIS - VARIOUS COUNTRIES - 1953

Rate per 100,000 population			
Australia.....	11	Luxemburg.....	17
Belgium.....	28	Netherlands.....	9
Canada.....	12	New Zealand.....	12
Denmark.....	10	North Ireland.....	23
Eire.....	40	Norway.....	16
England and Wales.....	20	Portugal.....	63
Finland.....	45	Scotland.....	26
France.....	37	Spain.....	14
Germany.....	21	Sweden.....	15
Iceland.....	9	Switzerland.....	23
Italy.....	23	U.S.A.....	12

It is with some justifiable pride that we may note the Canadian position as compared to other countries recorded in Table I. It is equaled by the U.S.A. and bettered only by Australia, Denmark, Iceland and Holland. Note the continuing high rates still existing in such countries as Ireland, Finland, France and Portugal.

Table II²
TUBERCULOSIS MORBIDITY BASED ON MASS X-RAY SURVEYS OF
FLUOROSCOPY

Various Countries

Country	Morbidity percentage	Country	Morbidity percentage
Algeria and Tunisia.....		Mexico.....	1.2
University students.....	1.4	China	
Students (6-14 yrs.).....	0.8-4.8	Factory workers.....	5.5-13.0
Union of South Africa		India.....	1.0-3.4
Native miners.....	0.8	Japan.....	6.1
Native population.....	2.3	Phillipines.....	17-21.0
Argentina.....	3.0	Scotland (1955).....	0.55
Brazil.....	0.5	England.....	.06-0.28
Chile.....	3.5	Canada.....	0.025-0.1
Jamaica.....	1.8	U.S.A.....	0.04-0.09

*Paper presented at the Institute on Tuberculosis Nursing, Dalhousie University, February 27th-March 1st, 1957.

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It is difficult to obtain comparable figures respecting the incidence or morbidity of tuberculosis but Table II does present some information regarding this obtained from mass X-ray survey statistics. It is to be seen that in Canada only 1/40 to 1/10 of one per cent of those examined yielded active tuberculous disease. Compare this to Argentina (3%), Chile (3.5%), Japan (6%), China (13%) or the Phillipines (21.0%).

As a better index of the problem, let us look at the percentage of positive tuberculin reactors in some of these countries at the age of 15 years, comparable to our senior high school agés.

Table III¹

POSITIVE TUBERCULIN REACTORS AT AGE 15 - VARIOUS COUNTRIES
(expressed in percentage)

		Urban Areas	Rural Areas
Taiwan (Formosa)	1951-52	66	40
Egypt	1950-52	52	51
Algeria	1949	66	47
Morocco	1949-51	69	43
Ecuador	1950-51	60	40
Greece	1948-51	54	26
Yugoslavia	1948-50	65	58
Austria	1948-49	37	34
Hungary	1948-49	60	n.s.
Eire	1951-52	68	18
England and Wales	1949-50	38 (S. England)	53
		51 (N. England)	

In many parts of Nova Scotia now not over five per cent of the high school population have positive tuberculin reactions, indicating either old or new, inactive or active tuberculous disease. Note our favourable position compared to some other countries listed in Table III. The rates, as would be expected, are higher in urban than in rural areas. This Table is one answer to those persons who say that tuberculosis is beaten as a world health menace. It must not be forgotten, too, that our world is getting smaller and the speed and facility of travel has made close neighbors of those who were once remote.

Now, how about Canada? The above comparisons may have caused our chests to swell with pride of accomplishment but it is to be hoped that our heads have not swelled at the same time.

Table IV²

TUBERCULOSIS: NEW CASES FOUND, MORTALITY AND FIRST ADMISSIONS TO INSTITUTIONS IN CANADA 1937-1956

(Rates per 100,000 population)

Year	Pulm. Cases	Deaths	1st Adms.	Year	Pulm. Cases	Deaths	1st Adms.
1937	76.8	60.5		1947	109.7	43.5	69.9
1938	81.6	55.0	57.5	1948	96.6	37.3	67.7
1939	90.5	53.1	61.0	1949*	97.6	32.0	71.4
1940	90.0	50.9	65.5	1950	90.8	26.2	69.0
1941	91.2	52.8	67.5	1951	79.7	24.4	66.2
1942	103.2	51.4	67.2	1952	72.8	17.1	65.6
1943	106.3	52.4	67.4	1953	71.6	12.3	64.4
1944	128.2	48.0	66.0	1954	69.1	10.3	62.1
1945	118.9	46.0	69.7	1955	65.3	8.9	64.7
1946	124.4	47.4	77.2	1956	57.8		

*Nfld. added.

Reference to Table IV suggests that in the years 1937 to 1941 we were not searching hard enough for new cases of tuberculosis but that we improved our case finding program during and after World War II. We know that this is the case and certainly this table indicates that the increased efforts produced results. Since 1950, there has been improvement in the form of a lessening of the number of new cases found in spite of the addition to our figures of new cases from the Province of Newfoundland which were included for the first time in 1949. However, in 1956, in Canada, we still found almost 58 new cases of tuberculosis per 100,000 population and we still lost, by death from tuberculosis, in 1955, 8.9 persons per 100,000 population or a total of 1399 Canadians in that single year.

Table VI⁴

CHEST X-RAY SURVEYS - CANADA - 1953

Type of Survey	Number of X-Rays	Active Tb.	%
Clinic Examinations	628,947	5,034	0.80
Northern Surveys (Indian and Northern Health Services)	91,099	1,329	1.45
Hospital Admissions (6 provinces)	333,661	432	0.13
Community Surveys (6 provinces)	1,434,025	926	0.06

To deflate us further, Table V shows us that in six Canadian provinces in 1955, for every 1000 examinations the yield of **active cases of tuberculosis** was as follows: in clinics, 8; in Northern surveys, 14.5; in hospital admission programs, 1.3; and in community surveys, 0.6.

Table VI

TUBERCULOSIS MORTALITY RATES - CANADA - 1948 - 1956

(Per 100,000 population - 1956 tentative only)

	1948	1949	1950	1951	1952	1953	1954	1955	1956
Canada	38.0	32.5	26.7	24.8	17.6	12.6	10.5	9.0	
N.W.T.	631.3	443.8	506.3	343.8	475.0	287.5	170.6	94.4	
Newfoundland	—	82.6	70.4	70.8	46.8	29.0	26.4	19.8	
Quebec	58.5	48.9	39.6	38.3	26.5	19.8	16.3	13.5	
British Columbia	40.9	36.5	27.5	25.1	17.9	11.9	9.7	11.0	
Manitoba	38.6	29.6	23.3	20.3	14.4	11.0	8.6	8.5	
New Brunswick	46.2	38.4	31.1	26.0	19.0	12.9	9.3	7.7	
Alberta	30.3	23.8	18.7	15.5	12.9	6.8	6.1	7.6	
Nova Scotia	39.5	29.3	27.6	19.6	14.4	10.9	11.3	7.0	6.2
Saskatchewan	27.3	22.2	18.4	18.8	12.3	10.1	4.8	6.4	
P.E.I.	39.8	23.4	30.2	17.3	23.3	12.3	9.5	5.6	
Ontario	19.3	15.7	13.1	12.6	8.4	6.4	6.1	4.7	

What then is our position in regard to tuberculosis in this Atlantic Province? Table VI indicates the decrease of the mortality rates from tuberculosis in the various provinces of Canada over an eight year period. In the "old days," the Maritimes were thought to be the Canadian stronghold of the tubercle bacillus. By 1955, however, Prince Edward Island and Nova Scotia were among the four provinces with the lowest mortality rates in our Dominion. It should be remembered that streptomycin did not become available for general use in Nova Scotia until 1947 and, therefore, this table reflects to a considerable degree the effect this and subsequent antimicrobials had upon limiting the number of deaths from the disease.

However, between 1931 and 1955 in Canada, the chance of dying from tuberculosis declined by nearly 88 per cent but the chance of contracting tuberculosis in the first place dropped only six per cent.

Table VII

MORTALITY FROM TUBERCULOSIS - ALL FORMS - NOVA SCOTIA

Year	No.	Rate	Year	No.	Rate	Year	No.	Rate
1908		208	1933	478	91.0	1945	388	54.6
1909		207.6	1934	467	88.0	1946	382	62.6
1911	1022	207.6	1935	488	91.0	1947	309	50.2
1911-15		178	1936	485	89.3	1948	247	39.5
1921	702	134	1937	461	84.0	1949	184	29.3
1926	665	129.1	1938	415	74.8	1950	176	27.7
1927	658	127.8	1939	428	76.3	1951	126	19.6
1928	578	112.3	1940	415	72.8	1952	94	14.4
1929	534	103.7	1941-	429	74.2	1953	72	10.9
1930	552	107.4	1942	379	64.1	1954	76	11.3
1931	524	102.2	1943	417	68.8	1955	48	7.0
1932	518	100.0	1944	357	58.4	1956	43	6.2

Table VII shows in detail the changes in the number of deaths from tuberculosis and the mortality rates 1908 to 1956. It is worth noting that in the year 1911, even with a population much smaller than at present, there were lost by death from tuberculosis over 1000 Nova Scotians whereas, in 1956, only forty-three persons so died in our Province.

This is great progress. Yes, but it is not enough to prevent death alone, we must prevent the development of tuberculosis and bring about permanent inactivity of that disease which has occurred already.

During 1956, there were found in Nova Scotia over 350 new active cases of tuberculosis and over 100 cases of doubtful activity as well as almost 350 new presumably inactive cases which will need careful assessment every few months. In addition about one quarter as many old cases are reactivating each year as there are new active cases found. This means that there is much work to be done in the years ahead and this is in the direction of

- More intensive treatment of known cases to help prevent reactivations
- More intensive case finding to ascertain the presence of new cases when the disease is in an early stage and so most responsive to treatment
- More intensive protection of exposed persons
- Greater health education of the public, of our tuberculous patients and of those of us who are providing care for the tuberculous.

In regard to our case finding programs, it goes without saying that our efforts in this direction must be intensified.

Table VIII

TUBERCULOSIS CASE FINDING - NOVA SCOTIA
Tuberculosis Clinics

	1954	1955	1956
Total number of persons examined.....	23,759	22,990	26,252
Number with no significant abnormality.....	18,304	16,091	19,649
Tuberculosis Suspects.....	173	243	205
Number with tuberculosis.....	4,128	4,975	4,919
Active cases			
— new.....	330	229	266
— old.....	401	326	256
Doubtfully active			
— new.....	135	93	77
— old.....	315	392	251
Rate per 1000 examinations—new actives.....	1.4	1.0	1.0

Table VIII indicated our findings among those persons who attend tuberculosis clinics. These are contacts of known cases of tuberculosis and those who seek medical attention. Such groups yielded about one new case per 1000 persons examined in 1956.

Table IX

TUBERCULOSIS CASE FINDING - NOVA SCOTIA
Mass X-Ray Survey

	1954	1955	1956
Total number of persons examined.....	33,929	58,942	56,494
Number with no significant abnormality.....	32,921	57,155	54,671
Tuberculosis suspects.....	69	330	15
Number with tuberculosis.....	577	843	525
Active cases			
— new.....	45	60	57
— old.....	20	140	30
Doubtfully active			
— new.....	55	23	12
— old.....	28	34	20
Rate per 1000 examinations—new actives.....	1.3	1.0	1.0

Table IX shows the results of examining persons on the streets, in the villages, in industry and on the bye-ways by means of mass surveys with miniature X-ray films. These surveys, too, yielded approximately one new case per 1000 examinations.

Table X

TUBERCULOSIS CASE FINDING - NOVA SCOTIA
General Hospital Admissions

	1954	1955	1956
Number of hospitals involved*.....	17	17	18*
Total number of persons examined.....	29,694	39,175	42,789
Number with no significant abnormality.....	26,607	35,446	38,027
Tuberculosis suspects.....	604	363	478
Number with tuberculosis.....	439	699	523
Active cases			
— new.....	68	65	34
— old.....	27	50	23
Doubtfully active			
— new.....	18	27	23
— old.....	7	10	9
Probable new case load.....	120	152	89
Rate per 1000 examinations—new actives.....	1.4	1.7	0.8

*includes Grace Maternity, Roseway General Hospital.

The X-raying of the chests of patients at the time of their admission to general hospitals yields not only an appreciable number of unsuspected new cases of tuberculosis but brings to the attention of the staff old cases which also would be a health hazard for the professional staff giving them hospital care for some other condition. Table X indicates a yield of 0.8 to 1.7 new cases of tuberculosis per 1000 examinations during the past three years.

Table XI

TUBERCULOSIS AMONG HUNGARIAN ESCAPEES - PORT OF HALIFAX
December 16, 1956 - February 16, 1957

Total X-rayed.....	3,102
Not tuberculous.....	2957
Tuberculous.....	145
Active.....	26
Inactive.....	82
Doubtfully active.....	37

We must not forget our new Canadians especially the Hungarian escapees who, in the early months, came to Canada without the possibility of X-ray screening before leaving Europe. Table XI indicates that this group yielded nine active cases of tuberculosis and twelve of doubtful activity per 1000 examinations or an additional total case load of 145 tuberculous persons who needed either treatment or periodic careful assessment.

The protection of persons exposed to infectious cases of pulmonary tuberculosis is accomplished by two main means:

1. B.G.G. vaccination
2. Isolation of the known case

It is to be remembered that B.C.G. vaccination gives good, but only partial, protection against the development of tuberculosis. Generally speaking, it is reserved for those persons who experience the occupational or environmental hazard of exposure to tuberculosis. The degree of protection is about 85 per cent.

Table XII

B.C.G. VACCINATIONS - NOVA SCOTIA - 1955 AND 1956

	1955	1956
1. Nurses (a) Graduates.....	26	16
(b) Students.....	482	1164
(c) Other.....	62	78
2. Other hospital personnel.....	39	126
3. Medical students.....	69	141
4. Eskimos and Indians (a) newborn.....	0	0
(b) adults and children.....	0	0
5. All others (a) newborn contacts.....	14	0
(b) adults and children—contacts.....	639	712
(c) newborn—not contacts.....	0	0
(d) adults and children—not contacts.....	12	1909
TOTAL.....	1343	4146

It is to be noted that almost 1200 student nurses were so protected in 1956. The great increase in the number of adults and children, non contacts, vaccinated in 1956 (1909) as compared to 1955 (12) reflects the localized program among high school students in Halifax City being carried out on a research basis.

The other method of protecting exposed persons is by separating the known cases from their uninfected or undiseased contacts. This means treatment given in institutions.

Table XIII

TUBERCULOSIS TREATMENT BEDS - NOVA SCOTIA

	1953	1956	1957
Nova Scotia Sanatorium.....	400	400	400
Point Edward Hospital.....	187	180	180
Roseway Hospital.....	142	142	142
Camp Hill Hospital (D.V.A.).....	150	119	to close in May
Halifax Tuberculosis Hospital.....	122	85	to close (?)
St. Martha's Unit—Antigonish.....	52	52	to close April 15th
St. Joseph's Unit—Glace Bay.....	48	closed	closed
Glace Bay General Unit.....	45	45	to close April 30th
City of Sydney Unit.....	38	closed	closed
Highland View Unit—Amherst.....	17	closed	closed
Lourdes Sanatorium, Pictou Co.....	15	closed	closed
Total.....	1216	1023	722

Table XIII indicates that we had in Nova Scotia over 1200 beds in 1953 for the treatment of tuberculosis. At that time, too, some of the institutions had small waiting lists. By December 31, 1956, approximately 200 beds had been closed out and by the middle of 1957, it has been possible to close another 300 approximately.

This sounds exceedingly good, but it has a very serious side. At the same time that so many beds were left empty in tuberculosis hospitals, over 250 patients were undergoing treatment at home, many of them a very considerable health menace to their family contacts.

Table XIV

DEATHS FROM TUBERCULOSIS - NOVA SCOTIA
By Domicile at Time of Death - 1952 - 1956

	1952		1953		1954		1955		1956	
	No.	%	No.	%	No.	%	No.	%	No.	%
At home.....	17	18.4	16	23.5	14	17.7	6	12.0	13	30.2
Mental or Municipal Institution.....	9	9.8	6	8.9	9	11.3	3	6.0	2	4.7
General Hospital.....	18	19.6	10	14.7	17	21.5	9	18.0	4	9.4
Sanatorium or Tuberculosis Hospital.....	48	52.2	36	52.9	39	49.4	32	64.0	24	55.8
TOTAL.....	92	100%	68	100%	79	100%	50	100%	43	100%

Further in support of this premise, Table XIV shows where our tuberculous patients are dying. It must be remembered that a dying patient is a careless and a dangerous patient. He should die, if die he must, in a tuberculosis hospital away from home contacts and yet, in Nova Scotia in 1956, almost one third of all deaths from tuberculosis occurred in their homes. These people may have died happy but they will lie restless in their graves in the knowledge of those they may have infected during their last days on earth.

And now, what of the future?

- A. We must not falter. We dare not slacken our efforts. Our case finding programs must be intensified, especially among our older age groups where lie many of our great unsuspected pools of infection.
- B. Institutional treatment of tuberculosis must be relied upon for the protection of family and social contacts and for the most rapid and most permanent recovery of the patient.
- C. Let us not forget the existence of tuberculosis among the inmates of our mental hospitals and municipal homes. They contribute approximately 275 patients to our tuberculosis case load.

Table XV

PULMONARY TUBERCULOSIS IN MENTAL HOSPITALS AND HOMES
Nova Scotia - January 31, 1957

	Active	Arrested	Inactive
Minimal.....	10	9	109
Moderately advanced.....	55	26	43
Far advanced.....	17	0	5
Non pulmonary.....	1	0	0
All forms.....	83	35	157
Total case load.....	275		

D. Let us seek out new and relatively unexplored sources of infection.

Table XVI⁴

CANADA - X-RAY SURVEYS 1955
National Sanitarium Association - Toronto

Group	No. X-rays	Active Tb.	%
Community surveys.....	161,631	61	0.038
Pre-employment.....	22,272	21	0.061
Food handlers.....	18,308	24	0.131
Adult contacts.....	6,077	13	0.213
Hairdressers and Barbers.....	3,964	10	0.252
Misc. (mainly self referred).....	30,135	79	0.262
Positive tuberculin only.....	1,238	4	0.323
Referred from physicians.....	22,272	21	0.382
Jail inmates.....	6,839	53	0.599
TOTAL.....	258,212	287	0.111

We have always felt that our most productive source of new patients was the examination of contacts of known cases or the examination of positive tuberculin test groups. A recent survey in Toronto (Table XVI) has indicated, however, that jail inmates in that city yielded more cases of active tuberculosis than the other two groups combined. We have just started to explore this field in our Province.

In closing, it may be fitting to quote from a recent article by Dr. G. J. Wherrett⁽⁵⁾.

"The doctor does not spend anything like as much time as he did a few years ago with each patient. When we were not able to give a miracle drug, we gave more of our time and the result was a patient-doctor relationship which helped patients stay the course. The confidence they had in their doctor who, they felt, was a personal friend helped them withstand the tediousness of institution life.

"The nurse-patient relationship also tends to be changed by modern treatment. It does not take very long to give a shot of streptomycin. The nurse had more time to listen to the patient's problems and talk them over in the day when she gave bed baths. Now the patient takes his own, or a nurse's assistant does the job.

"There is no question of going back to old methods, but can we not make an effort to get back to the warmth and humanity of the preantibiotic days?"

And finally, it is to be mentioned again that the tubercle bacillus is ubiquitous. We must intensify our efforts against it and we must be prepared for a lengthy battle.

The tubercle bacillus, like the river
Flows slowly o'er the land.
Thru centuries it has wound its way
Relentless here, abating there—
Fickle unto death
Sometimes wide and shallow—
Sometimes deep and narrow,
Weaves it back and forth
From one shore to another,
Lest some brief illusion o'ertake
Men who build a little dam

To hold its flood—
To build a safer bank
Takes time—
Since the tubercle bacillus, like the river,
Flows slowly o'er the land.

(Patrick Morman).

REFERENCES;

1. DROLET, G. J. and LOWELL, A. M.: Am. Rev. Tuberc., 72, 419-452, 1955
2. BENJAMIN, P. V.: Bull. Internat. Union againsr Tb., 26, 573, 1956
3. MEMORADUM: DOMINION BUREAU OF STATISTICS, Tuberculosis Trends, 1956
4. WHERRETT, G. J.: Bull. Internat. Union against Tb., 26, 616, 1956
5. WHERRETT, G. J.: Canad. M. A. J., 76, 125, 1957

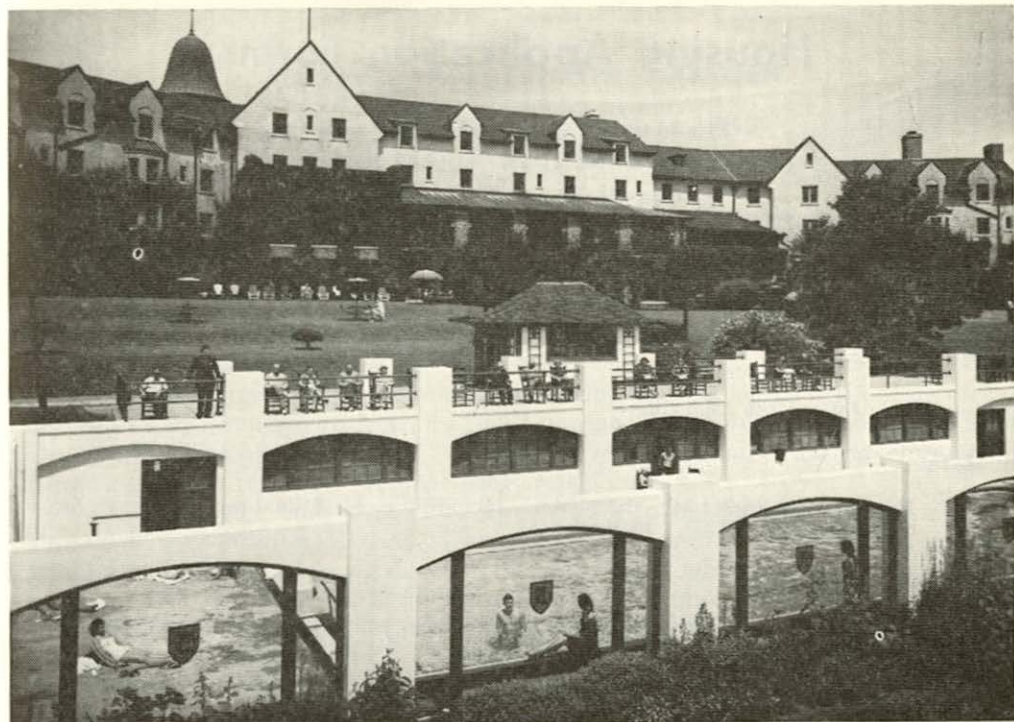
Personal Interest Notes

Children's Hospital Staff Changes

Dr. W. A. Curry, Professor of Surgery, Dalhousie University, has retired from the staff of the Children's Hospital. Following his retirement he was appointed to the honorary consulting staff. Dr. E. F. Ross was appointed Surgeon-in-Chief of the Children's Hospital on Dr. Curry's retirement.

Other staff changes instituted at this time were—Dr. Jack Acker was appointed chief of the re-organized Orthopedic service, with Dr. B. F. Miller as associate. Dr. J. H. Charman was appointed Assistant Surgeon to the General Surgical Staff.

Doctors H. K. Hall, J. F. Nicholson and R. O. Jones, all of Halifax, attended the annual meeting of the American Psychiatric Association in Chicago from May 13th to May 17th. Doctor Jones has been invited to be the external examiner for the Diploma of Psychiatry at the University of Toronto in the May examinations.



104TH ANNUAL MEETING MEDICAL SOCIETY OF NOVA SCOTIA— DIGBY PINES—AUGUST 28TH-31ST.

The 104th Annual Meeting of The Medical Society of Nova Scotia will be held at the Digby Pines, Digby, N. S., August 28th to 31st, 1957.

Executive Committee will meet on Wednesday August 28th at Digby Pines. Please note that although registration is on Thursday August 29th from 8-9 a.m. followed by the general sessions, it is planned to have Drs. C. A. Gordon and F. Dunsworth present the final medical observations relative to the Springhill Mine Disaster. This will be **Wednesday evening, August 28th from 9-10 a.m.**, and will be followed by a "get together" in the lounge. It is expected that this will encourage arrival at the hotel early Wednesday evening.

Preparations for an interesting business, scientific and social programme are well advanced. Members are urgently requested to apply at once for accommodation using Housing Application Form on Page 186. I stress this, as space in the hotel is limited.

Your committee has included on the programme two round-table presentations of special interest to all doctors.

The social programme will include a "Shore Dinner" of delectable lobsters and clams, a golf tournament, and plans are being made for a colored photographic show composed of "shots" which any doctor wishes to show.

For the ladies, arrangements are being made for a trip to the beautiful Lakeside Inn in Yarmouth.

A detailed programme will be printed in the next issue of the Bulletin. Any suggestions pertaining to the programme will be very welcome.

D. E. LEWIS, M.D.,
Chairman.
Programme Committee.

Housing Application Form

The Medical Society of Nova Scotia
 Digby Pines Hotel, Digby, N. S.
 August 29, 30 & 31, 1957.

MR. HOWARD WALKER,

Manager.

Digby Pines Hotel,
 Digby, N. S.

Please reserve for me the following:—

In Hotel

- () Double room with bath—twin beds—including meals \$12.00 per person per day—
 minimum rate \$24.00. (2 Persons)

In Cottage

- () Cottage with sitting room and two twin bedded bedrooms—including meals \$13.25
 per person per day—minimum rate \$53.00 per day. (4 Persons)
- () Cottage with sitting room and three twin-bedded rooms—including meals \$13.25
 per person per day—minimum rate \$79.50 per day. (6 Persons)

I WILL ARRIVE AUGUST..... A.M..... P.M.....

I EXPECT TO DEPART.....

Name of persons who will occupy above accommodations:

Name (Dr. & Mrs.).....

Address.....

In view of the large attendance expected, no single rooms will be available at the Digby Pines Hotel, unless cancellations permit. If coming alone, please check here.....(v) if you are willing to share a room. If you have a preference for some party to share a double room with (or couple(s) to share a two or three bedroom cottage with) please insert name (s) below:—

I would prefer to share accommodation with

Name.....

Address.....

Name.....

Address.....

Public Relations Corner

Your Guide to Better Press Relations

One of the major PR ills afflicting the medical profession is press relations. Why? Fundamentally it is due to fear and misunderstanding resulting in distrust.

Many doctors, when approached by newsmen, fear sensationalism, distortion, gross error, criticism by colleagues. The media accuse doctors of obstructionism and unco-operativeness.

There is no one simple answer to this problem. In many cases understanding and trust have grown from frequent contact between doctor and newsman. Group meetings of doctors and representatives of the news media have sometimes helped to improve medical-press relations.

Acutely aware that these two approaches to better PR left too much to chance, The Canadian Medical Association began working four years ago on a **Code of Co-operation** for doctors and newsmen, medical societies and news media. That project has been completed. On June 1 copies will be sent to each member of the Association with his issue of the Canadian Medical Association Journal. About the same date copies are to be sent to every managing editor of Canadian newspapers and to the managers of radio and television stations.

But distribution alone is not sufficient to make the **Code** a success. This can only be accomplished through active application of the **Code's** principles by every doctor in his day-to-day activities. By the same token, newsmen and the media they represent, must abide by the philosophies expressed in the **Code** and attempt to understand the doctor's point of view and the ethical and legal restrictions placed upon him.

Only by this dual acceptance and application can the **Code** be truly a co-operative guide.

Organized medicine can do much to stimulate use of the **Code**. Branch societies should call attention to the document and urge each member to read it and apply it in his relations with local press, radio and TV. Local meetings between doctors and news media representatives should be organized to discuss the **Code** and its implications. These gatherings have the added advantage of bringing doctors and newsmen together out of which contact, as has been said, understanding and confidence frequently develops.

Obviously a document of this type is not going to receive the approbation of every member of the medical profession nor of all news media. However, during the four years of development of the **Code**, every effort was made to obtain the opinions of as many doctors and newsmen as was physically possible. Each successive draft of the **Code** was reviewed by the Committees on Public Relations of the Divisions and subsequently by representatives of the media. The finished product, therefore, reflects the composite opinions of profession and news media.

The **Code of Co-operation** is not a static document. After it has been in use for a period of time it will be reviewed to correct its inadequacies. These will only come to light if the constructive criticisms and recommendations of both doctors and newsmen are received.

In summary, it is strongly recommended that doctors:

- (1) Read and study the **Code of Co-operation**.
- (2) Use the **Code** as a guide in his relations with the news media.
- (3) Discuss the **Code** with newsmen.
- (4) Recommend through Divisional PR Committees ways in which the **Code** may be improved.

The units of organized medicine should:

- (1) Exhort their members to read and use the **Code**.
- (2) Arrange for discussions with news media.
- (3) Implement those parts of the **Code** which are directed at medical societies.

The Canadian Medical Association's medical-press **Code of Co-operation** will be sent with the June 1 issue of The Canadian Medical Association Journal.

Group Life Plan

The Executive Council at a recent meeting decided to amend the Group Life Plan changing the anniversary date from July 1st to October 1st to facilitate the administration of the Plan.

Consequently the premium notice you will receive shortly will be for the period July 1st, 1957 to September 30th, 1958. Subsequent premium notices will be on an annual basis.

Your attention is again directed to the benefits offered by the Group Life Plan.

This plan was introduced in 1951 and provided a death benefit of \$5,000.00. Since that time the North American Life Assurance Company has increased the benefit to \$6,500.00 without an increase in premium.

In addition to the death benefit the plan also provides a waiver of premium benefit in the event of total disability prior to age 60.

There is also a conversion privilege for the basic \$5,000.00 which can be exercised up to age 65.

Although the Society is not engaged in the business of insurance it is aware of many of the needs of its members. It is gratifying to know that the Society can make available a Group Life plan of this nature.

A booklet describing the plan together with an application can be secured from the Secretary of the Society.

It is recommended that this plan receive your serious consideration.

Secretary's Page

Further Report on "An Act respecting the Practice of Chiropractic Bill No. 82"

At the time of last writing the results of the consideration by the Law Amendments Committee of this Bill were not available. On April 12th Hon. Mr. Donahoe, Chairman of the Law Amendments Committee, moved that "further consideration of this Bill be delayed until this day three months hence." This was carried. The remarks of the Chairman and the statement are as follows:

Hon. Mr. Donahoe:

Mr. Speaker, as Chairman of the Committee on Law Amendments, I am directed to report that the Committee has considered Bill No. 82, an Act respecting the Practise of Chiropractic, and the committee recommends that further consideration of this bill be delayed until this day three months hence.

"Mr. Speaker, I move that further consideration of this bill be delayed until this day three months hence.

"I would like to say that this bill, of all the bills that came before the Law Amendments Committee, received the most careful consideration, the longest attention and consumed the most time of the committee. There were many representations made to us, there was a public hearing held in connection with it, many representations from private citizens, both in favour of the bill and opposed to it, were received and were perused and considered by your committee, and the committee felt that in view of the motion that has just been made that there should be a statement emanating from the committee and the statement is as follows, Mr. Speaker:

"The committee felt, after careful and long consideration, that some regulation of choropactors was desirable. The bill as proposed met with determined opposition from the medical profession, on the ground that as proposed it in effect permitted chiropractors to practise medicine. It was urged upon the committee that the definition of chiropractic, as proposed, had inherent in it the right of diagnosis.

"The Committee was of the opinion that appropriate measures for the regulation of chiropractors require further study and consultation between the groups concerned. In view of submissions made on behalf of the medical profession, and the fact that Medical Society had taken no steps to curtail the activities of the sponsors of this bill or to clarify the proper extent of their functions, it is the feeling of the committee that for the protection of the people of Nova Scotia, The Medical Society should make its best offices available in conjunction with the chiropractors, to frame a bill for future consideration by this House which will safeguard the interests of all concerned.' "

The Committee on Legislation, The Medical Society of Nova Scotia, has the matter under consideration. Any comments or suggestions relative to this will be welcome. Will you please address them to the Executive Secretary, The Medical Society of Nova Scotia.

Membership in The Medical Society

A complete review of membership records in the files of The Medical Society has been made and reported to the Executive Committee. The fol-

lowing table summarizes the findings—all classifications, of which "ordinary" is one, are included in this summary.

Membership The Medical Society of Nova Scotia 1956

Branch Society	Members in good standing 1956	Dues not paid 1956	Dues not paid prior to 1956	Total in arrears
Antigonish-Guysborough	13	0	1	1
Cape Breton	65	11	10	21
Colchester-East Hants	28	0	2	2
Cumberland	23	3	0	3
(Eastern)*	5	0	0	0
Halifax	205	7	5	12
Lunenburg-Queens	27	1	1	2
Pictou	25	1	0	1
Valley	41	5	2	7
Western	22	5	1	6
Not in Nova Scotia	15	0	0	0
	472	33	22	55

*Status of a Branch Society being explored.

Notes: (1) This means that, as of December 31, 1956, 90 per cent of the recorded membership was in good standing (all classifications) and hence 10 per cent were in arrears.

(2) The number of those in arrears for 1956 was reduced from a total of 62 to 33 as a result of follow up letters after October 1, 1956.

(3) Our files show that there are 16 physicians practising in Nova Scotia who did not become members of The Society in 1956.

Following a directive of the Executive Committee at its meeting March 18, 1957, a further approach is being made to all members who are in arrears. The reality of the situation will be studied by the Executive Committee and reported to the annual meeting.

In the meantime the co-operation of all, especially the Branch Societies, is requested in achieving a Medical Society which is completely representative of the profession.

The reaction to this report was one of considerable satisfaction. The Executive Committee studied the matter in detail and decided that those members in arrears again be approached, outlining the requirements of the constitution; the objective is to ascertain the facts about those in arrears and to take appropriate but definite action in each case. Letters have been sent to those in arrears for 1956 and one is being prepared for those in arrears over a longer period.

It is the belief of the Executive Committee (the members being representative of each Branch Society) that, with the joint co-operation of physicians, Branch Societies and this office, the membership standing can be brought to approximately 100 per cent of those practising the profession of medicine.

C.J.W.B.

Obituary

The death is reported from Germany of Major Earl Howard Anderson, D.S.O., age forty-four. He was born in Digby in 1913 and received his early education at the Digby Academy. Following his graduation from the Digby Academy, he entered Acadia University, Wolfville, where he received his B.Sc. He was a graduate from McGill University Medical School where he had taken a keen interest in neurology and diabetes.

A large part of his young life had been spent in the Armed Forces. From 1940 to 1945 he served as Medical Officer of the Seaforth and Black Watch Regiments, and Field Ambulance Units. While serving in Italy he was awarded the D.S.O. Following his discharge from the Army he took up civilian medical practice in Digby. In 1950 he re-enlisted in the Medical Corps and saw service in Korea as Commanding Officer of the Twenty-fifth Field Ambulance. After the close of the Korean War, Major Anderson chose to stay in the Army. He was posted to Germany in 1956, and at the time of his death was head of the Royal Canadian Army Medical Corps.

Major Anderson had always been a great athlete and was prominent in discus throwing and other field sports. On April 24, Earl Anderson competed in a Canadian Army athletic meet where he won three events. The following morning, although he was not feeling well, he got in his car to drive a distance of twenty miles. It was during this drive that he was seized with an acute coronary attack which caused his car to leave the road.

Major Anderson took an active interest in all community affairs. For a number of years he headed the Digby Recreation Commission, and it was through his efforts that an artificial ice-rink and curling club were established in Digby.

He is survived by his wife, the former Joyce Atherton, R.N., formerly of Amherst, and two children, Leslie, eleven, and Ian, ten. His mother, Mrs. F. L. Anderson of Digby also survives him, as does a sister, Jean, Mrs. T. L. Rogers, Yarmouth.

Dr. Harold E. Killam, age seventy-nine, died suddenly on Wednesday, April 17, of a heart attack. Dr. Killam had practised for forty years in Kentville. In his early years he had gone to Provincial Normal College in Truro, and following graduation he taught school for four years. He then enrolled at the Dalhousie Medical College, Halifax, where he graduated with his M.D. C.M. in 1906.

He held a number of appointments in Kings County. He was the Medical Health Officer, and visiting physician at the Kings County Hospital, and the Kings County Hospital at Waterville. He was also the Medical Health Officer for the Kings County Militia Unit at Aldershot.

Dr. Killam always had shown a keen interest in church affairs. He was a member of the Wesley Knox United Church, and was also a member of the church choir for many years. Always interested in the apple industry, he became a well-known fruit grower himself, and his apple orchards were known as among the finest in the Annapolis Valley.

Surviving him besides his wife, the former Ora Louise Webster, are two sons, Fred and Harold of Grafton, and three daughters, Margaret, Mrs. C. Atwood of Toronto, Joyce, Mrs. M. T. Barkhouse of Montreal, and Kathleen, wife of Dr. L. E. Cogswell, Berwick, and eighteen grandchildren.

The Bulletin extends sincere sympathy to Doctor and Mrs. C. B. Smith of Pictou on the death of their son, Charles Everett Smith, who was killed in a car accident at Kempton on April 23rd.

Termination of Ventricular Fibrillation in Man by Externally Applied Electric Countershock*

Ventricular fibrillation was terminated 11 times in four patients by **externally** applied countershock. These episodes occurred in the course of an acute myocardial infarction, after the intravenous administration of procaine amide for a rapid arrhythmia, in digitoxin intoxication and in Stokes-Adams disease. The patient with Stokes-Adams disease, who was defibrillated promptly in three separate occasions, recovered completely.

Zoll, P. M., Linenthal, A. J., Gibson, W., Paul, M. H., and Norman, L. R., *New England Journal of Medicine*, 254: 727-732, April 19, 1956.

Evaluation of Hydralazine (Apresoline) in Fixed Hypertension*

Among approximately 300 patients with hypertensive disease 38 patients were found to have fixed hypertension, even during sleep. These were all treated with hydralazine. Thirteen patients with hydralazine also received hexamethonium.

Thirty-two per cent have been maintained at normotensive levels for 5 to 33 months, an average of 19 months. Two patients in this group required hexamethonium also. Eight per cent had an inconstant response to medication. Eleven per cent had an excellent response to hydralazine but it was discontinued because of side effects. Eighteen per cent did not respond to maximum medication. Thirty-two per cent discontinued treatment because of side effects.

The side effects are reviewed and a death presumably due to prolonged hypotension is described.

Drenick, E. J. and Kalmanson, G. M., *Angiology*. 7: 368-377, August, 1956.

CHRONIC COUGH*

A study of chronic cough was carried out in two separate groups of men. There were geographic, residential and occupational differences between the two groups. These factors, together with those of previous pulmonary infection, smoking habits and age, were evaluated relative to the incidence of chronic cough.

Correlation was found between cigarette smoking and chronic cough. This was demonstrated in several ways. No direct correlation was seen with any of the other factors except age, and this was of importance chiefly in those who smoked cigarettes.

It is suggested that, in view of this, certain factors commonly considered as related to the causation of chronic bronchitis may need reevaluation. Comparison between smokers and nonsmokers would seem necessarily to be an integral part of such studies.

The high incidence of chronic cough in the older age group of cigarette smokers, together with its duration, may well have relationship to structural changes in the lungs of such individuals.

Phillips, A. M., Phillips, R. W., and Thompson, J. L., *Annals of Internal Medicine*. 45: 216-231, August, 1956.
*From Medical Abstracts, December, 1956.