Radioactive Iodine In The Diagnosis Of Thyroid Disorders

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THE relatively recent introduction of radio-iodine as an aid in the evaluation of thyroid status has had widespread acceptance. While marked degrees of thyroid dysfunction are confidently diagnosed clinically, it is in the borderline cases of thyroid dysfunction that such laboratory tests are of most value and we hope to illustrate this from the results obtained so far at the Victoria General Hospital.

The primary function of the thyroid gland is to secrete a specific hormone, chiefly thyroxin, at a rate and quantity consistent with a normal state of health, and any deviation gives rise to a diseased state. Regulation of the thyroid gland is controlled by the anterior pituitary, the hypothalmus and the concentration of circulating thyroid hormone.

Iodine is absorbed rapidly from the gastro-intestinal tract and is distributed in the extracellular body fluids. It is secreted by the stomach and salivary glands so that even if the iodine is injected intravenously it appears both in the gastric and salivary secretions. There is competition for the iodine in the body fluid between the thyroid gland and the kidney. The rate at which the iodine is trapped in the thyroid gland is enhanced by thyroid stimulating hormone (TSH) secreted by the pituitary, and inhibited by antithyroid drugs, or certain anions such as thiocyanate. Within the gland most of the iodine is converted into the amino acid, thyroxin, and the remainder stays in the gland as iodide ion. The hormone is stored as thyroglobulin but when circulating the thyroxin is bound to one of the plasma proteins. When metabolized in the body cells iodine is released and becomes available once more for renal excretion or hormone synthesis.

Collection of iodine from the plasma by the thyroid may be impeded by inorganic ions, the most powerful being the perchlorate ion. If the iodine is successfully trapped by the thyroid gland, there may be blocking of its organic binding into thyroxin, and the antithyroid drugs such as propylthiouracil work in this manner. Even if iodine trapping is normal and there is no hindrance to its amino acid binding within the gland, function may still be disturbed because of failure to complete thyroxin synthesis.

The ready availability of radio-iodine has increased greatly the quantitative information which may be obtained concerning the physiology of the thyroid gland. The radio-isotope of iodine, I-131, is indistinguishable chemically from the naturally occurring stable element, I-127, and there is no reason to believe that tissue cells treat the two isotopes differently. A tiny amount of radio-iodine can readily be detected, in the body and in tissue fluids, by modern instruments and consequently dynamic measurements of characteristics such as the rate of accumulation of iodine by the thyroid gland and its excretion by the kidney can be easily obtained.

Method

The investigation of thyroid function with I-131 at the Victoria General Hospital began in August 1956 permitting advantage to be taken of recent progress in instrumentation. The development of scintillation counting technique in recent years has made possible the construction of radiation detectors at least fifty times more sensitive than the Geiger-Mueller counters in general use. A typical scintillation counter consists of a cylindrical crystal of sodium iodide (activated by thallium) one inch in diameter and one inch long bonded to a light sensitive photomultiplier tube, both of which are mounted inside a lead shield. An opening in the lead shield allows radiation to strike the crystal and this produces minute flashes of light within the crystal, the intensity of the light depending on the energy of the radiation. The photomultiplier detects these minute flashes and produces an electrical pulse proportional to the brightness of the scintillation. These pulses are fed into a spectrometer, another recently developed instrument, which can be set to record only pulses of a given energy. Radio-iodine emits gamma rays of many energy levels but with predominence at two characteristic levels. Since the radiation that is scattered and degraded by partial absorption in the tissues of the patient's neck has assumed an energy level below the characteristic peaks, the spectrometer can be set to record only radiation travelling directly between the source of the isotope and the counter. Consequently the accuracy of the measurements obtained is greater than using the more conventional counting apparatus.

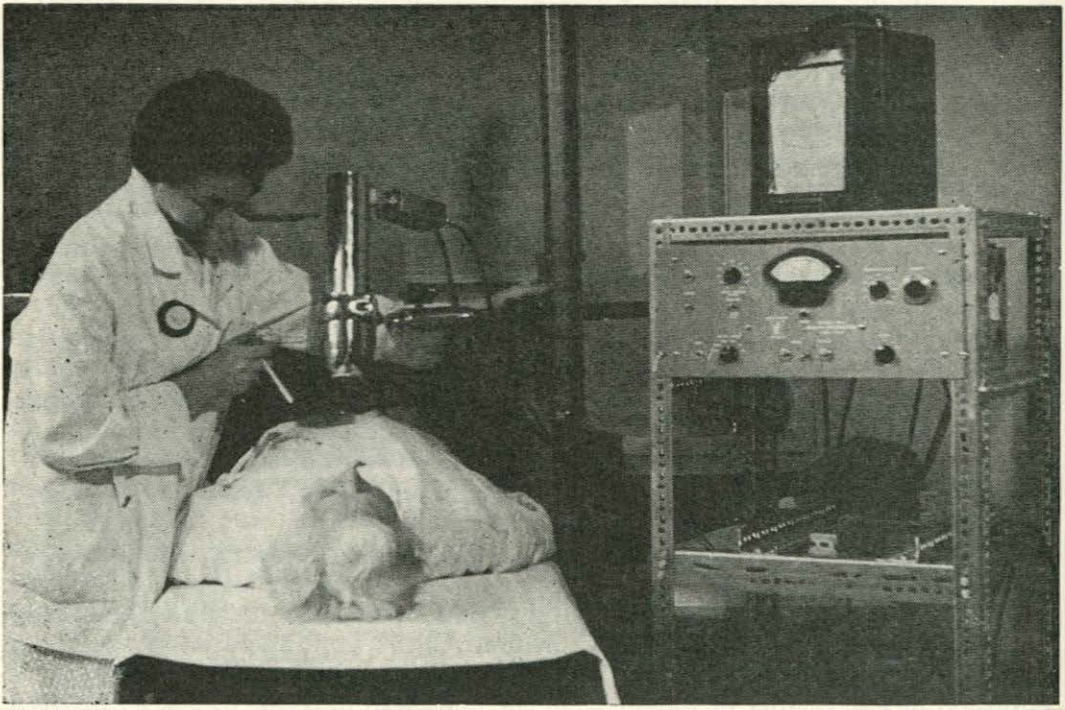

Figure 1. Patient being positioned under scintillation counter with spectrometer and recorder on right.

Although radio-iodine tests have a smaller radiation hazard than some common diagnostic X-ray procedures it is important that dosage be reduced to a minimum as a patient may require multiple determinations. With the equipment now in use satisfactory radio-iodine tests have been performed at this hospital with less than five microcuries of I-131 (each microcurie indicates 37,000 disintegrations per sec. and for this isotope weighs only 0.008 mgm.). Weekly consignments of I-131 are received at the Victoria General Hospital by air express from Abbott Laboratories, Oak Ridge, Tennessee. The radioactive material has been deposited in a dry state on the inside of the gelatin capsules. A radio-iodine test commences when the patient swallows one or more of the capsules. For measurement of the uptake of radio-iodine in the thyroid gland the patient is placed with the neck at a fixed distance from the scintillation counter at certain time intervals after receiving the isotope. A measurement is also done at the same distance over the thigh, in order to determine the amount of radio-iodine in the general circulation; this reading is subtracted from the neck measurement to obtain the amount in the thyroid gland alone. These measurements are compared with readings from a reference capsule placed so as to simulate the thyroid in the neck.

When a knowledge of the rate of excretion of the radio-iodine in the urine is required, specimens are collected at fixed intervals in waxed paper cartons and the radioactive content determined by placing them directly on the upturned scintillation counter. These determinations are compared with measurements done at the same time on a radioactive solution made up in the same type of carton, the solution being made by dissolving a calibrated capsule in tap water.

Material

Thyroidal uptake was measured on 116 patients at approximately 2, 7 and 24 hours after a dose of radio-iodine. Most of the patients had signs or symptoms suggesting the possibility of thyroid disease. No patient has been included in the study who had been exposed to the following substances within the period stated because of their known influence on thyroid function:

1. Iodine (as medication or by intravenous pyelogram) within three weeks of the test. A period of six months was allowed after a cholecystogram.

2. Antithyroid drugs within two weeks of the test.

3. Desiccated thyroid or thyroxin within three weeks of the test. Only three days were allowed after exposure to triiodothyronine.

In order to evaluate radioactive iodine as an indicator of thyroid function it was necessary to estimate thyroid function by independent techniques. For this purpose the history and physical findings of all patients were reviewed by two of the authors independently. Where differences of opinion occurred, that the author most familiar with the patient was accepted. For many of the patients one or more of the following laboratory procedures were available: serum protein bound iodine (PBI), basal metabolic rate (BMR), and serum cholesterol level. The results of these tests were considered along with the clinical findings in reaching a final evaluation of thyroid function for comparison with the radioactive iodine tracer studies.

Results

Radioactive Iodine as an Indicator of Thyroid Function

Figure II illustrates the normal rate and amount of radioactive iodine accumulation in the thyroid gland as well as the normal rate and amount of excretion of radioactivity during the first twenty-four hours after the patient receives a tracer dose of this material.

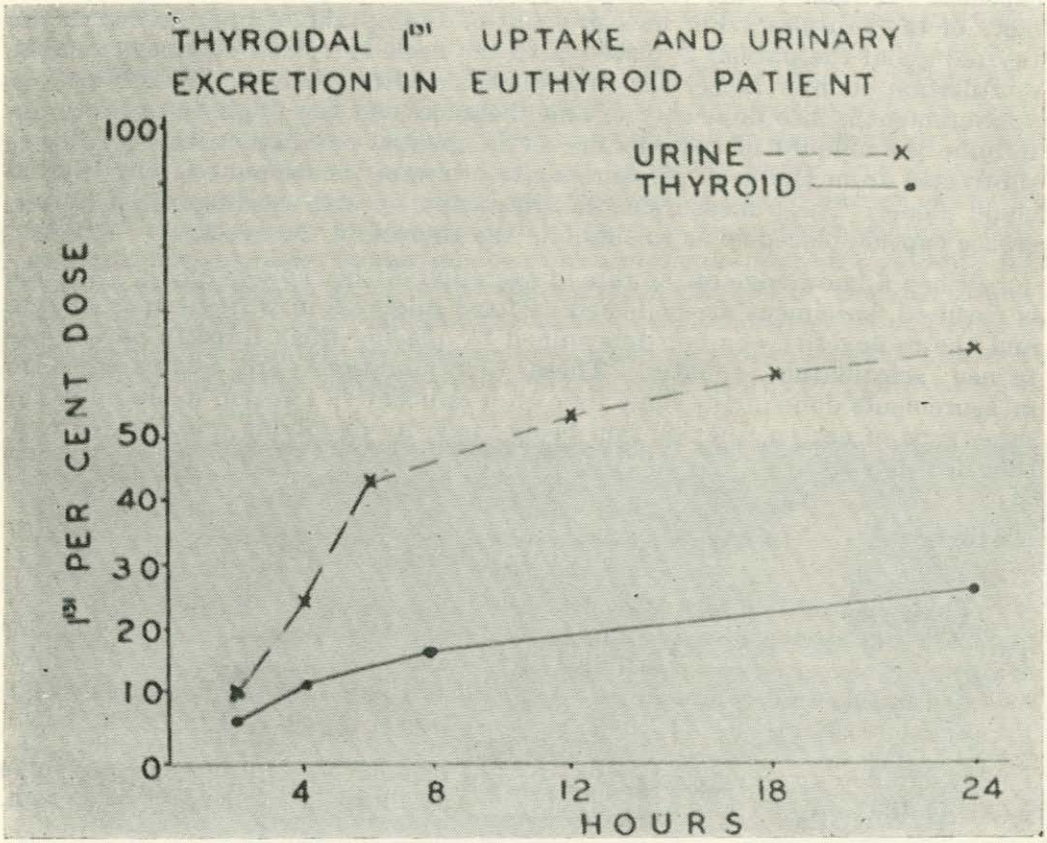

Figure 2

Figure III presents the same data for a hyperthyroid patient, illustrating the rapid accumulation of a large proportion of the dose in the thyroid within the first twenty-four hours and the consequent reduction in the amount that is excreted.

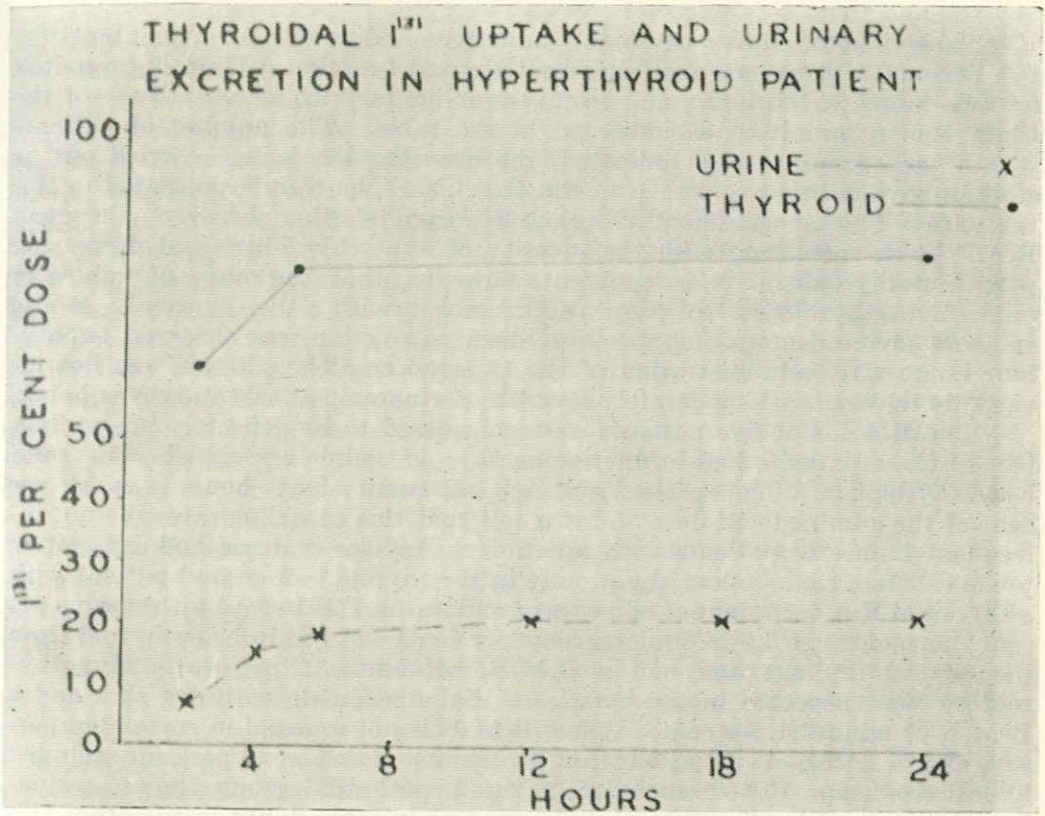

Figure 3

In hypothyroidism the reverse may be expected to occur, namely a small or negligible uptake of radioactive iodine by the thyroid and consequently a large urinary excretion of the isotope.

TABLE 1

Thyroidal Radioactive Iodine (R.A.I.) Content Expressed as Percent of Administered Dose in Normal and Abnormal Thyroid Function.

	2 hour ± 0.5			7 hour ± 2			24 hours ± 3		
	Cases	R.A.I.		Cases	R.A.I.		Cases	R.A.I.	
Normal	55	6	(0-18)	50	17	(3-38)	75	26	(11-43)
Hyperthyroid									
+	7	24	(2-61)	7	47	(13-86)	9	60	(26-98)
++	5	43	(9-83)	5	68	(24-106*)	6	77	(43-103*)
+++	4	62	(39-85)	4	88	(80-93)	5	82	(63-96)
Hypothyroid	8	2	(0.2-8)	7	3	(0.4-7)	8	5	(0.2-14)

Figures within brackets following mean values indicate range. Normal range includes 95% of the observed values. Hyperthyroid and hypothyroid values indicate extreme range. Eighteen patients considered hyperthyroid on the basis of history and physical examination alone were omitted because of evidence (Table 2) that a hyperthyroid group selected without use of laboratory criteria showed lower R A I levels. *Because of variations in thyroid anatomy errors in excess of 6 per cent of the reported values may be expected in some cases. A technical modification should eliminate this error.

Table I shows mean thyroidal radioactive iodine (R. A. I.) contents for 104 persons with normal and abnormal thyroid function. Data is presented for two hours, seven hours and twenty-four hours, with some latitude of the timing being permitted as indicated in the table. The number of patients within each group is also indicated, the classification being carried out as stated above without reference to the R.A.I.'s. The results presented in this table are in general agreement with those reported by other observers, the mean R.A.I. levels increasing with the severity of hyperthyroidism and decreasing with hypothyroidism. It is apparent, however, that the range of values in mild hyperthyroidism overlap appreciably with the normal group. In more severe degrees of hyperthyroidism no overlap was observed twenty-four hours after administration of the tracer dose although this was not invariably the case with moderately severe hyperfunction at two and seven hours.

The R.A.I.'s of five patients were considered to be definitely misleading. One of these patients had a functioning thyroid nodule associated with mild hyperthyroidism. This patient's R.A.I. at twenty-four hours was 34 per cent of the administered dose and it is felt that this case illustrates the not infrequent failure of patients with functioning nodules or toxic nodular goitres to concentrate radio-iodine abnormally in the thyroid. A second patient with a thyroidal R.A.I. content of 66 per cent and serum P B I of 9.4 micrograms per cent (normal range 3.5 to 8 micrograms per cent) was felt to be euthyroid from the clinical findings and had a B.M.R. of minus 22 per cent. Hypothyroidism was suspected in one emaciated diabetic female with dry skin and a B M R of minus 31 per cent. A low B M R is not unusual in emaciated persons and in retrospect it was felt that her 24 hour R.A.I. of 14 per cent excluded hypothyroidism. (The remainder of the hypothyroid group showed values below 9 per cent.) The clinical diagnosis was in some doubt in the other two patients and other laboratory tests were not available or inconclusive.

TABLE 2

Mean Thyroidal Radioactive Iodine Content at 24 Hours In Patients with Clinical Diagnosis of Mild Hyperthyroidism

	Clinical Diagnosis Supported	Clinical Diagnosis Incorrect (Euthyroid)	Clinical Diagnosis Only
Number of cases (total 29)	9	8	12
Mean R.A.I. (24 hour)	60%	28%	48%

Although the diagnosis of severe hyperthyroidism is usually obvious from the history and physical examination, the findings in this study suggest a significant limitation in the accuracy of these techniques when applied to mild hyperthyroids. Table 2 indicates that the initial impression of mild hyperthyroidism proved incorrect in eight out of seventeen patients where P.B.I.'s,

B.M.R.'s and/or cholesterol levels were available to aid the appraisal of thyroid function, and the corrected impression of euthyroidism was supported by the R.A.I. levels. In twelve additional "mild hyperthyroids" where only history, physical examination and R.A.I. levels were available, it is note-worthy that the mean value for the latter is only 48 per cent at twenty-four hours, suggesting that this group contained euthyroid as well as some mildly hyperthyroid individuals. Difficulty in differentiating mild hyperthyroidism from emotional and other types of disorder has been experienced by all physicians. It is well illustrated by the fact that two of the authors reviewing the history and physical findings on the same seventy-four patients (forming part of this series) reached different conclusions in fourteen instances. It is further illustrated by the observation that of 45 individuals finally classified as euthyroid when P B I, B M R and/or cholesterol levels were considered along with clinical findings, eleven were classified to be otherwise on clinical findings alone. For eight of these patients the alternatives were mild hyperthyroidism or euthyroidism and for three cases the question lay between mild hypothyroidism and euthyroidism.

While we have measured urinary 1-131 excretion in selected cases as a check on the accuracy of the thyroidal uptake, and regard its performance as desirable, the practical difficulties of complete urine collections have ruled it out as a routine procedure.

It will be recalled that the demonstration of hypothyroidism does not indicate primary thyroid disease in all instances because lack of pituitary thyroid stimulating hormone (T.S.H.) will give rise to the same result. This secondary type of hypothyroidism can be recognized by repeating the R.A.I. level twenty-four hours after administering 10 units of T.S.H. intramuscularly. If a definite increase occurs one may conclude that the previously subnormal R.A.I. was due to pituitary rather than thyroid failure. To illustrate the usefulness of this procedure one may compare the R.A.I. rise from 27 to 110 per cent in an individual with normal thyroid function, with a hypothyroid individual in whom hypopituitarism was suspected but was not substantiated by the continuing failure of the thyroid to concentrate radioactive iodine after T.S.H. stimulation. It was considered desirable to evaluate thyroid function in a third patient who was receiving desiccated thyroid daily and was clinically euthyroid. The low R.A.I. level was inconclusive in this patient because pituitary stimulation of the thyroid gland would be much reduced in normal persons when hormone was administered orally. However, this patient's failure to increase the R.A.I. level above 3 per cent after T.S.H. injection indicated that the thyroid gland was in fact primarily at fault and that thyroid hormone substitution should be continued. The rise in serum P.B.I. after T.S.H. may also be used to differentiate primary thyroid disease from the pituitary suppressing effect of oral thyroid hormone or disturbance of pituitary function. Potential thyroid function was conclusively demonstrated in a thyroid treated patient where the P.B.I., following T.S.H. stimulation, rose from 2 to 6 micrograms per cent.

It is recognized that iodine deficiency and some other causes of non-toxic goitre may be associated with an abnormally high R.A.I. level; also that some patients with hyperthyroidism may show levels close to the upper limit of normal. Further evidence of hyperthyroidism may be sought in such patients by using the R.A.I. to measure the effect of attempting pituitary suppression with desiccated thyroid, thyroxin, or triiodothyronine. The exhibition of

any of these will be followed by an impressive drop in the R.A.I. level in the absence of hyperthyroidism, but this change is absent or minimal in the presence of the latter. Because of the rapid onset and short duration of action of triiodothyronine, this has proved to be the most convenient agent to test the suppressability of the pituitary. The triiodothyronine (T3) is given in a dosage of 25 micrograms every twelve hours or twenty micrograms every eight hours for five days when performing the test at this clinic, the R.A.I. being repeated during the last of the five days. The normal response will be illustrated by a patient with a non-toxic goitre whose R.A.I. dropped from 40 to 15 per cent during T3 suppression. By contrast one patient with a post-operative recurrence of hyperthyroidism showed a rise on T3 from 88 to 101 per cent; another hyperthyroid individual sustained a rise from 86 to 99 per cent.

The R.A.I. is being used in this clinic to aid the evaluation of therapeutic procedures for malignant exophthalmos, a complication of Graves' disease sometimes precipitated by rendering the patient euthyroid. A patient in which this sequence of events had occurred was placed on desiccated thyroid, the dosage gradually being increased to 5 grains daily. The radio-iodine uptake remained in the vicinity of 22 per cent indicating failure to suppress the pituitary output of T.S.H. and in all probability failure to suppress pituitary output of the exophthalmic factor (an effect possibly attributable to T.S.H. itself). Because of failure of the eye symptoms and signs to improve this patient subsequently underwent a course of roentgen therapy to the pituitary gland with a temporary drop in R.A.I. to 14 per cent of the administered dose. However, his hyperthyroidism recurred a few months later and the most recent R.A.I. level was about 70 per cent. His symptoms are once again those of hyperthyroidism while the eye signs have shown slight improvement. The failure of this patient's pituitary to be suppressed by thyroid hormone is not illustrative of the pattern in all patients with marked exophthalmos. Another case, whose eye signs were precipitated by thyroidectomy, showed an R.A.I. level of 14 per cent while receiving four grains of thyroid daily as compared with 28 per cent in the absence of orally administered hormone.

Radioactive Iodine to Demonstrate the Location of Thyroid Tissue

The actual shape and size of the thyroid gland and the distribution of radioactivity within it can be demonstrated in pictorial fashion by the Scintiscanner. This unit consists of a scintillation counter with a small (one-quarter inch) aperture which mechanically scans to and fro over the neck of a patient lying underneath. After several pulses from the counter have been registered a signal is supplied to a marking stylus. When radioactivity from that part of the neck passing beneath the counter is high, the marks will be close together; when the activity is low, the marks will be widely spaced.

The making of such scintigrams is a useful adjunct to the study of thyroid function in the following instances:

1. When there is some doubt as to the location of functioning thyroid tissue—e.g. substernal thyroid.

2. To determine the character of nodules palpable in the thyroid. "Hot" nodules may account for the presence of symptoms of hyperthyroidism in a patient with a normal radioactive iodine uptake. The discovery of nonfunctioning nodules in the thyroid gland is a signal to seek surgical consultation, for one in four of such nodules will be found to be malignant.

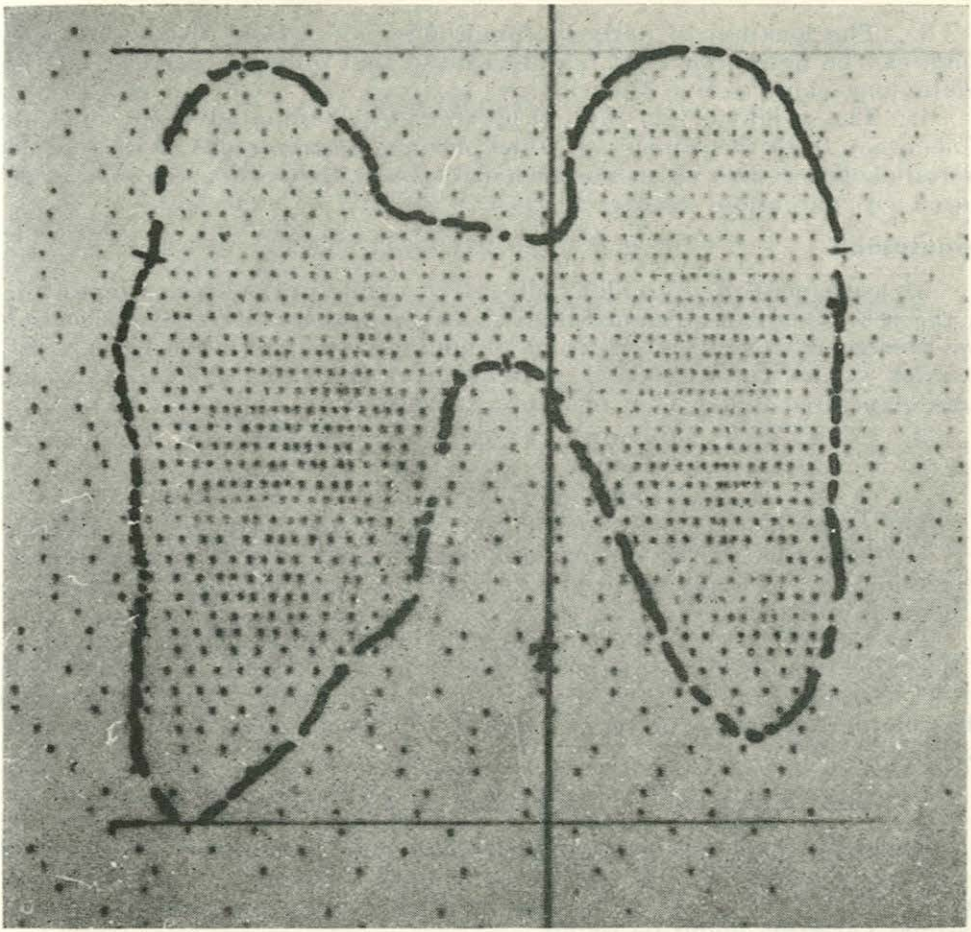

Figure 4. Scintogram showing pattern of normal thyroid gland.

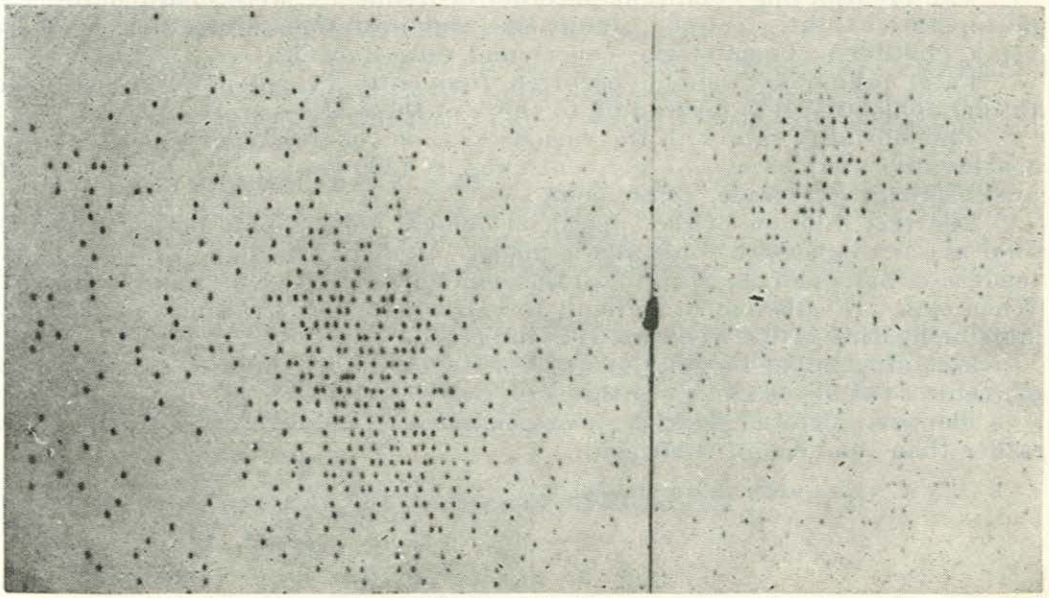

Figure 5. Scintogram of patient with thyroid mass showing asymmetrical pattern. The mass subsequently proved to be carcinoma.

3. The location of actively functioning metastases from thyroid carcinoma can be determined—it is unfortunate that only ten per cent of thyroid carcinomas show active function.

4. The weight of the thyroid gland can be estimated with some degree of accuracy from the scintigram, thus placing the treatment of thyroid disease by radioactive iodine on a more scientific basis than when the weight is estimated by palpation.

Conclusion

Measurement of thyroidal radioactive iodine uptake is a worthwhile aid in the assessment of thyroid function in the absence of recent desiccated thyroid treatment and administration of iodine or antithyroid drugs. In this hospital values for euthyroid patients have indicated the following normal range expressed as per cent of administered dose:

2 hours.....	0-18%
7 hours.....	3-38%
24 hours.....	11-43%

The range of usefulness of the test can be extended by the exhibition of T S H or thyroid or triiodothyronine in conjunction with a repeated R A I determination. Finally, scintigram tracings of thyroid tissue are shown to be of some importance.

The authors wish to acknowledge the large contribution of the following in the collection of the data reported herein: Dr. J. Cairns, Dr. A. MacDonald, Dr. C. Young, Mrs. D. Archibald, Miss N. Chisholm, Miss M. Youngman. The photographs were prepared by Mr. C. Sewell. The figures were drawn by Mrs. B. Ottey.

Phlebitis, A Study of 748 Cases at the Boston City Hospital*

Seven hundred and forty-eight cases of phlebitis seen at the Boston City Hospital over the past decade are reviewed. Eighty-three per cent of the patients were over forty years of age; the mortality increased with age. No seasonal variation could be found.

The predisposing conditions in order of frequency were: cardiac disease, postoperative state, trauma, idiopathic manifestations, infection, varicose veins, childbirth, haemiplegia, cancer and miscellaneous.

Fatal pulmonary emboli occurred frequently in phlebothrombosis and thrombophlebitis; it is misleading to think of these as separate entities.

The mortality rate with the various methods of treatment was as follows: conservative (347 cases), 37 per cent surgical (369 cases), 2.1 per cent; and anticoagulant (32 cases), 29 per cent.

Bilateral division of the superficial femoral veins should be performed as soon as the diagnosis of phlebitis is made. If there are thigh signs (oedema, tenderness and evidence of trauma) the common femoral vein should be divided When clots are adherent or difficult to extract, further treatment (anticoagulants or ligation of the vena cava) is indicated.

Phlebitis should be actively treated before embolization occurs since 84 per cent of the initial emboli in this series were fatal.

The postphlebitic syndrome is associated with the severity of the phlebitir rather than the type of treatment.

Byrne, J. J., New England Journal of Medicine. Vol. 253, No. 14, 1955.

Epidemiology in the Service of Clinical Medicine

An Introduction to the Epidemiologic Investigation of Chronic Neurological Disorders in Halifax County, Summer 1957.

JOHN O. GODDEN, M.D.*

(On March 13, 1957, the Halifax Medical Society endorsed a proposal for the evaluation of the incidence of multiple sclerosis, myasthenia gravis and several other neurological disorders in the population of Halifax County. This study is one of several collaborative research programs of the National Institutes of Health, the Multiple Sclerosis Society of Canada and medical centers in the United States and Canada. The purpose of the study is to determine the frequency and distribution of a number of neurological, neuromuscular and ophthalmological conditions of unknown etiology over the great land mass of these two countries.—Editor's Note)

EPIDEMIOLOGY, or better, the epidemiological approach in medicine, concerns, first, the circumstances under which illness arises whether they be environmental, genetic, occupational or social and, second, with the course of action to be undertaken in relation to these factors. It is the purpose of this paper to discuss the epidemiological approach to diseases of unknown etiology; to illustrate this approach by examples drawn from current problems in clinical medicine and, finally, to describe the object and methods of the chronic neurological disease survey now in progress in Halifax County.

The usefulness of epidemiologic surveys and the need for population statistics in preference to random clinical impressions is firmly established in modern medical investigation. Some discussion of the special advantages and the limitations of this discipline are now undertaken to illuminate the background of the present study. Lilienfeld[1] defines epidemiology in the following terms: "Epidemiology may be defined as the study of the distribution of a disease or condition in a population and of the factors that influence that distribution." Thus the epidemiologist is interested in variations in frequency of diseases with reference to such characteristics as age, sex, race, social class and occupation. This knowledge is useful for the following reasons:

(1) It permits the development of hypotheses concerning etiological factors. Thus if a disease is observed to be more frequent in a particular population group than in others, hypotheses are developed to explain this increased frequency.

(2) It can be used to test hypotheses developed in the laboratory or clinic. It is important to determine if an etiological hypothesis based on laboratory or clinical observations is consistent with the known distribution of the disease in human populations. To the extent that it is not consistent the hypothesis will have to be modified.

(3) It provides a scientific basis for Public Health administrative measures to control the disease. Even if knowledge of etiological factors is inconclusive or erroneous epidemiological data may still be used for such control measures as case finding and the early detection of affected individuals, e.g. in cancer.

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An epidemiological study provides data from which may be derived a series of statistical associations between a disease and various characteristics of the population. From this pattern of statistical associations biological inferences may be drawn. These inferences can then be tested either in the laboratory on experimental animals or in clinical or epidemiological studies of human populations. The populations may be collected through demographic data, i.e.: the scrutiny of vital statistics or through so called "control" series of persons in hospital populations or elsewhere in the community. In the selection of populations for the latter types of study much effort is expended to ensure that populations A and B, to be compared, differ significantly in respect to the characteristic being studied but not otherwise. Complete similarity between two populations cannot be obtained but experience and proper design eliminate the most common sources of error.

The clues regarding etiology of disease, called "biological inferences" above, gain immediate support if current medical knowledge contains a physiological or other biological explanation for the connection between the characteristic observed and the disease process. Historically, chance clinical observations on the causation of disease have anticipated the discovery of the true etiology by a century or more. When first set forth, these observations were discounted by the profession at large because they did not fit the current medical theory. An example of this is seen in Snow's investigation of cholera. Snow observed an association between the ingestion of polluted water and the development of cholera between 1849 and 1854. At that time, prior to the establishment of the germ theory of disease, the accepted etiological hypothesis for cholera was the miasmatic theory, i.e. that disease was due to the inhalation of a noxious effluvium. Snow's observations were not generally accepted since they did not conform to this theory. After the germ theory of disease was established, Snow's statistical association was consistent with the germ theory and hence it was accepted. It should be stressed that epidemiology alone does not prove or disprove anything. It just allows the development of promising theories or directs medical suspicion to certain fruitful areas.

After an epidemiological survey has suggested statistical association between two factors, what methods are used to support or deny significant association between these factors? Lilienfeld[1] cites a series of biological considerations. The first is the ability to experiment with a human population. This ability to experiment is only available in the rare instance where nature presents us with a ready-made experiment, i.e. a population in an isolated situation. Naturally we cannot manipulate large numbers of people to produce these situations de novo. The second factor concerns the degree of observed association. If the degree of association is very high our confidence in a significant connection between these two factors is naturally greater. Thirdly, if the association observed finds support in current biological theory we also gain support. Finally, if animal experiments provide information that supports the statistical association demonstrated, we have confirmatory evidence in some situations.

The principal non-biological consideration is the individual's attitude toward accepting the causal inference suggested by statistical association. One's attitude will be moulded by the course of action to be taken once an inference is accepted as well as by one's outlook, background and responsibilities. For example, a research scientist without any direct responsibility for the health

of the population might require a very high degree of plausibility before accepting a causal inference and recommending definite action. On the other hand a practising physician or health officer directly responsible for the health of a population may accept a lower degree of plausibility as sufficient to warrant preventive action. He may therefore, accept a causal inference when he thinks that it has a good chance of being correct but before it is definitely proven. The present controversy over the inferences arising from the cigarette smoking-lung cancer association is largely concerned with the degree of plausibility. All agree that the evidence is sufficiently suggestive to warrant further investigation. There is also general agreement that the evidence is not sufficient to warrant a statement that a causal hypothesis is definitely proven. The major issue is whether the causal inference is sufficiently plausible for a public statement that cessation of cigarette smoking would diminish the risk of acquiring lung cancer. Since the degree of plausibility cannot be directly assessed, differences of opinion have naturally developed. While this paper was in preparation the British Ministry of Health issued a statement that excessive cigarette smoking was an important factor in the marked increase in deaths from cancer of the lung. This step has been urged upon the Ministry since 1955 by such bodies as the National Research Council and the National Association for the Prevention of Tuberculosis. The desire of all these agencies is to reach young people who do not smoke as yet, or who are not confirmed in the smoking habit

Recent Additions to Medical Knowledge Arising from Epidemiological Studies

Amyotropic Lateral Sclerosis

This is a neurologic disorder of unknown etiology which occurs in adults. It is invariably fatal; there is no recognized therapy. In the past progressive muscular atrophy and progressive bulbar palsy were considered as separate clinical entities, but today most authorities on neurology consider them as components of the amyotropic lateral sclerosis symptom complex.

From investigations carried out on the island of Guam by Kurland[2] and others since 1950, it has been established that the incidence and mortality from this disease on this island is much in excess of that occurring in the rest of the world. Base line prevalence data for amyotropic lateral sclerosis was obtained from mortality statistics in Canada, the U. S. and several European countries and through survey data in Rochester, Minnesota. It was estimated at 4 to 6 per hundred thousand population in these areas. However, the estimated prevalence among the Chamorro people, the original natives of the Mariana Islands, based on an extensive survey of these islands and an intensive survey of selected villages is about 420 per hundred thousand population. Among the Chamorros 8%-10% of all deaths in adults is due to ALS. Among these people the disease shows a definite tendency to familial incidence. The corresponding death rate shows in continental U.S.A., Canada, Great Britain and Norway is about 0.1%.

From these studies it is hypothesized that an underlying constitutional factor, perhaps often inherited, may be responsible for the degenerative changes that occur so selectively in the motor neurones of the central nervous system in amyotropic lateral sclerosis. It is also suggesed that an hereditary form of ALS was introduced into the isolated populations on Guam when that population consisted of only a small number of families as it did in the early 18th

century. There is real hope, from recent developments arising from the study cited above, that an exact etiology may soon be identified for this disease.

Multiple or Disseminated Sclerosis

This is a disorder of the white matter of the central nervous system of man. Its prominent identifying features are:

(1) Widespread symptoms and signs of nervous dysfunction which are due to multiple discrete lesions of the white matter of the brain and spinal cord. Histologic sections show demyelinization of the white matter with relative sparing of nerve cell elements.

(2) A clinical course that is variable, although a general pattern common to most cases is recognized. This course is marked by remissions and exacerbations although progressive and fulminating forms are also recognized.

(3) Reversibility of the lesion in the earlier stages of the disease in many patients permits complete or partial, but usually temporary, recovery from symptoms. The majority of patients eventually develop permanent lesions with associated clinical progression which ultimately leads to death.

From an epidemiological point of view the most interesting fact which has come to light is the apparent association of high prevalence of this disease with cold climate[2] although there is no seasonal variation. The frequency of multiple sclerosis as measured by mortality statistics was found to be greater in Canada and in the northern United States than in the southern United States. Following intensive statistical surveys in several cities of the United States and Canada, it was found that the frequency of the disease as measured by prevalence, incidence and mortality was greatest in Winnipeg, Boston and Denver, slightly lower in San Francisco and considerably lower in New Orleans.

The average age at onset was about 30 years for females and 34 years for males. These ages are several years later than those reported in direct clinical investigations. The age at onset was lowest in the cities reporting the highest prevalence ratios suggesting that the inciting factor (presumably associated with climate rather than latitude per se) not only acts to a greater degree in cities of high prevalence but also affects patients earlier. However, the life expectancy after the onset of multiple sclerosis did not differ greatly between Winnipeg and New Orleans. It seems that once the inciting factors have begun to work they are little influenced by changes of climate. Multiple sclerosis is principally a disease of young adults, perhaps occurring to a greater extent in females, although this latter fact cannot be settled on available evidence. Cases were found in non-whites as well as in whites. It is the impression of experienced workers that it occurs to about the same degree in non-whites as whites. The average life expectancy after onset of the illness as determined by "life-table" techniques is estimated as 21 years. This figure is considerably longer than that reported in most clinical studies.

In a subsequent study, re-evaluation of prevalence following examination of patients by a neurologist indicated that the prevalence ratio was about six times higher in Winnipeg than New Orleans. No significant difference in the clinical picture of the patient groups in these two cities was established during this study. In a final study of this series information secured by interviewing the Winnipeg patients was compared with information secured from a control group of individuals representative of the general population of the same city. The comparisons revealed no important differences in numerous environmental

features studied. The patients and the controls appeared similar in respect to national origin as well as to economic and social status.

Coronary Artery Disease

Ancel Keys, one of the principal workers in this field, first became interested in the role of diet in heart disease when, during nutrition studies carried out for the U. S. Army early in World War II, he noted that cholesterol levels in young men went down during starvation. After terminating starvation, the levels returned to normal again. This observation led Dr. Keys and his colleagues to carry out numerous surveys[3] in various parts of the world studying serum cholesterol levels and details of diet. These surveys have shown that population groups with high serum cholesterol levels such as Americans, Europeans living in Capetown and the upper classes of Madrid have a high incidence of atherosclerosis. On the other hand populations with low serum cholesterol values such as the Sardinians, Bantus and the poorer classes in Madrid have a low incidence of atherosclerosis. Analysis of the population groups cited above reveals that groups with a high incidence of atherosclerosis also have a high dietary fat intake. These population groups are prosperous and are accustomed to diets containing fat in excess of 20% of the caloric intake.

Additional evidence came to light during the course of World War II in Norway. There was an involuntary but nevertheless sharp decrease in fat consumption in Scandinavia. In Norway after a period of two years a striking decline in mortality from coronary artery disease was noted which was maintained until the end of the war. When food became more plentiful fat consumption increased and mortality from coronary artery disease returned to pre-war levels. Denmark, which was more fortunate in that no reduction in dietary fat became necessary during the German occupation, was less fortunate in that no decline was noted in mortality from coronary artery disease. All the wartime surveys have not been published but those that have been consistently show a sharp decline in coronary artery disease wherever the population was forced to change to a relatively low fat diet. Another interesting observation is that along with the decline in coronary artery disease a similar decline in the incidence of postoperative thromboembolic complications also occurred. More details of these studies can be found in an article by Gunnar Biorck "Wartime Lessons on Arteriosclerotic Heart Disease from Northern Europe."[4]

An interesting example of the contrast in dietary habits is furnished by the Bantu and European populations of Capetown. The Bantus ingest a diet containing only 10%-17% of the calories as fat. This discrepacy in fat intake is reflected in differences in serum cholesterol values with the Bantus having an average level of 168.5 mgms % and the Europeans an average level of 241.8 mgms %. Pathological studies carried out by Higginson[5] in South Africa demonstrate that Bantu hospital patients drawn from a population habituated to a diet low in fat have a lower incidence of severe atherosclerosis than Danish and American hospital populations. A series of out-patients from these hospitals living on a diet characterized, among other things, by relatively low fat content have low serum cholesterol concentrations.

On the opposite side of the world epidemiological and pathological studies were carried out by Keys, Kimura and others. An analysis of the diet in Japan reveals that fat made up less than 10% of their calories as compared with 40% in the typical U.S. diet. Yet the Japanese diet was nutritionally adequate. The city people in Japan eat slightly more fat than those in the

country (9.7% as compared to 6.4%) but there was no important difference between the urban and rural populations in the rate of coronary artery disease as judged by autopsy reports. However, there is about a tenth as much coronary disease in Japan as in the United States.[6] Keys, White, Bronte-Stewart and Kimura studied the diet of Japanese living in Japan, Hawaii and Los Angeles. Coronary heart disease is rare in Japan and is moderately frequent in Hawaii among the Japanese, although much less frequent than among the Caucasians there. In Los Angeles the frequency of coronary artery disease in Japanese seems to be much the same as among their white counterparts. In America the Nisei (second generation Japanese) have adopted the American diet. Cholesterol studied on these populations are noteworthy, confirming the finding noted above; i.e. that populations with low fat intake have low values of serum cholesterol, populations with high fat intake have high cholesterol values. This study shows an impressive correlation among the Japanese in the three areas between the incidence of coronary artery disease and the proportion of fat taken in the diet.

J. N. Morris[7] studied the incidence of coronary disease in population groups in England. Dr. Morris made the following observations on coronary heart disease as it affects middle aged men in Britain today:

(1) Men in the upper classes and higher income groups have the highest mortality and the mortality declines with descent in social status. Taking the national average as 100, the professional and business men have a mortality ratio of 150 This ratio falls almost to half in the lower social classes.

(2) Townsmen have a somewhat higher mortality than country-folk. Farmers and agricultural workers have a notably low mortality, ratios of 65 and 63 respectively, but these two groups of men along do not fully account for the rural advantage. Women have the same low mortality in the town as in the country.

(3) Men doing work that requires relatively little physical activity appear to have more coronary heart disease than men of similar social economic status engaged in physically active work. Thus London bus drivers seem twice as likely to die suddenly of this disease as bus conductors. (The vehicles are double decker.) Post office telephone operators are twice as likely to suffer a rapidly fatal heart condition as postmen who walk, bicycle and carry mail a good deal. Clerks have a particularly poor record with a mortality ratio of 138. Dr. Morris goes on to discuss what, in his opinion, these observations mean in respect to the prevention of this disease.

Carcinoma of the Lung

This brief review of the contribution of epidemiology to clinical medicine would not be complete without some reference to the current tobacco lung cancer controversy. As Wynder[8] remarks statistical and epidemiological evidence linking smoking to cancer of the lungs, and also to cancer at other sites along the upper respiratory tract, is so extensive that it hardly needs to be commented upon for the general physician who has followed these data. Sixteen separate investigations from seven different countries studying smoking habits of over 6,000 patients with lung cancer are all in agreement that lung cancer patients smoke significantly more than any group of controls and that the relative risk of developing lung cancer bears a direct relation to the amount of tobacco, particularly the number of cigarettes, consumed. Two prospective studies carried out in England and in the United States that followed popula-

tion groups whose smoking habits were known also showed that the heavy cigarette smoker has a far greater chance of developing lung cancer than the non-smoker. In fact, the study by Hammond and Horn[9] indicates that for a person smoking 40 cigarettes a day, this chance was 70 times greater than for a non-smoker. To account for such magnitude of difference on the basis of statistical error would require error of equal magnitude, such errors have so far not been demonstrated.

Bias in interviewing and some, but not all, of the other objections can be avoided in prospective studies where smoking habits are determined in a large number of individuals to be observed subsequently for three to five years for the appearance of carcinoma or other disease. Thus Doll[10] distributed questionaires regarding smoking habits to 59,000 registered physicians in Great Britain and, after discarding females and males under 35, secured 25,000 usable records. In the follow-up period 28 months later 789 deaths were reported including 35 cases from bronchogenic cancer. Among these 35 cases, as well as among deaths from coronary thrombosis, the rate per thousand increased as the amount of smoking increased quite in harmony with his retrospective studies. The numbers are small but the agreement is good.

The Chronic Neurological Disease Survey

The specific aims of the neurological survey being conducted in Halifax County this summer are:—

(1) To obtain through collaboration with the National Institute of Neurological Diseases and Blindness (NINDB) appropriate statistical data for selected neurological, myopathic and ophthalmologic disorders as follows:—

(a) Incidence, prevalence and mortality rates and estimates of life expectancy.

(b) Data for a collaborative study on geographic distribution of certain of these diseases in the United States and Canada.

(c) Data on differential incidence or population selectivity, (e.g. with respect to age, sex, race and various levels of economic and social status) whichmay be related to etiology.

(2) To conduct appropriate epidemiologic and genetic investigations to explain the absence or undue concentration of cases in the community.

There are few reliable statistics on the frequency, geographic distribution and population selectivity for most neurological, myopathic and ophthalmologic disorders. Basic statistical data are needed first. Evaluation of such data will result in epidemiological investigations to explain the absence of, or unusual concentrations of, cases which in turn should provide the basis for definitive laboratory or clinical research. Statistical data are also needed in planning for the best utilization and future needs of research and medical care facilities.

In the past statistics have come from proportionate autopsy or hospital admission rates which have been published by different investigators in different lands and often using different diagnostic criteria. Such reports provide some general information on frequency of disease but are subject to such diverse bias that they have little value for comparative studies of geographic distribution and population selectivity. Over the broad expanse of the United States and Canada there are many variations in climate, topography, race and national origin. Yet over most of this same area a single language, relatively

high standards of medical practice and uniform systems of hospital and mortality coding provide a unique opportunity for comparative statistical studies.

For properly selected disorders, surveys of the recently diagnosed cases using all local sources of medical information in specified populations are of proven value. If the resident population of relatively "isolated" (geographically) medical teaching centers of similar size are surveyed for the appropriate disorders, reasonably complete and comparable statistics on prevalence and incidence can be obtained. In such communities specialists' records and records from hospitals and clinics are the principal source of information but where long term care is needed the general practitioner must also be queried if the bulk of diagnosed cases is to be located. It is such a survey that is now being carried out in Halifax County.

The general method which is being followed by the local group working on this project is as follows:—

A survey is being made of all sources of medical information to bring to light all instances of diagnosed cases of selected neurological and ophthalmological diseases in Halifax County. All sources of medical information are being surveyed as follows:—

(a) The aid of all practising physicians will be sought regarding patients observed or treated over the previous 5 years for each of several groups of diagnosis. Medical student surveyors will be available to assist in record abstracting at the request of each physician.

(b) For the previous 10 years abstracts of selected diagnosis are being obtained from record systems in all local hospitals, clinics, nursing homes and departments of public health.

(c) Arrangements will be made at a later date through private physicians or through clinics to examine selected patients for classification. It is desirable to examine all patients with rare neurological disorders. Only samples of the cases with more prevalent diagnosis will be examined.

(d) Statistical analysis will be applied to the diagnostic groups to provide data on incidence, prevalence, mortality and life expectancy with reference to appropriate population characteristics.

(e) Appropriate epidemiological investigations may be carried out at a later date to determine reasons for absence or unusual concentration of cases in this area or in segments of the local population.

Initially the following groups of clinical diagnosis form the basis for the current survey:

(1) Severe congenital anomalies, including myelodysplasias, encephalodysplasias, mongolism and congenital hydrocephalus.

(2) Other nervous system conditions: brain and spinal cord tumors, convulsive disorders, chorea, cerebral palsy, Parkinsonism, multiple sclerosis, lateral sclerosis, sub-acute combined degeneration of the cord, cerebroretinal degeneration, hepatolenticular degeneration, epiloia, the encephalitides, optic and retrobulbar neuritis, cerebellar degeneration and ataxia, tic douloureux.

(3) Various muscular and neuromuscular disorders such as myotonias, dystrophies, atrophies and myasthenia gravis.

(4) Selected eye disorders such as tumors, glaucoma and cataract.

Halifax and Halifax County have been selected as an area in the north temperate zone rather closely resembling the city and county of Charleston, South Carolina in size, geographic characteristics (both are built on peninsulas on the Atlantic Ocean) and population composition. Both cities have medical centers which have maintained rather detailed and complete medical records during the period being studied.

The opportunity presented to Dalhousie Medical School to collaborate with the National Institutes of Health (U.S.) and other medical centers in investigating these diseases is an exceptional one. We, as a profession, can improve our knowledge of the nature and extent of these chronic diseases in Halifax County. At the same time, this City and this Medical School are being established as a likely source for further research in these diseases. An attempt is being made to make this survey as comprehensive as possible in order to provide raw data for future studies by local physicians. The data accumulated by the survey will remain at this University to be available for future workers in this field.

At present the personnel of this survey consists of Dr. Milton Alter (U.S. Public Health Service Fellow in Neurology) and five student researchers, Messrs. K. G. Ellis, P. K. Kavanagh, R. V. Snow, H. O. Nason, and a visiting student from Ohio State University, George W. Bowersock. Dr. Alter directed the companion survey in Charleston, South Carolina and is training the student workers in the methods and techniques of the survey. Dr. R. S. Allison of the Department of Neurology, Royal Victoria Hospital, Belfast, Northern Ireland, will come to Halifax and examine the cases uncovered by the survey to confirm the diagnosis. Dr. Allison will have previously examined all cases discovered by the companion survey in Charleston, South Carolina. Thus, comparability of the material in the two areas will be assured. Follow up studies will be carried out as indicated by the results of this survey.

Summary and Conclusion

This paper has outlined some of the features of the epidemiologic method as applied to chronic diseases of unknown etiology. It has set out some examples of recent contributions to medical knowledge arising from population studies. A discussion of some of the uses and limitations of the epidemiologic approach is included to clarify the objectives and methods of such surveys. Finally, this paper has outlined the purposes and techniques of the chronic neurological disease survey now in progress in Halifax County. The physicians of Halifax City and Halifax County are being informed of the nature of the survey, so that they will be able to co-operate with the workers in order that the study will be carried out in a thorough and worthwhile manner. This will enable Dalhousie Medical School and the profession in this area to make some contribution to the elucidation of the enigma of chronic neurological disease.

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Diet Therapy In Gastro-Intestinal Diseases*

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DIET, as a therapy, is almost as old as man. Despite our increase in knowledge of nutrition and digestion there is much that is empirical in diet therapy. Many faddists are in this field, and one is frequently encountering fanatics who, with great zeal, extol the virtues of their belief and practice, and scorn your ignorance of the revelations of Nature.

In opening the second half of "A Week in Medicine" in which we are to discuss gastro-intestinal diseases and disorders, it was suggested that we could briefly review some principles of diet therapy. This forms a part of treatment of the different diseases we shall be considering during the next few days.

PEPTIC ULCER

Even in this well known, and common, condition there is no absolute uniformity in details of diet therapy. However, there can be little quarrel with the aim of giving a food that induces a minimum of stimulation of gastric secretion and a maximum of neutralizing effect. In our Victoria General Hospital Diet Manual we have settled on four diet stages; Gastric 1, Gastric 2, Gastric 3 and a Bland diet or Modified Sippy diet. The first consists of hourly feedings of milk and cream and is seldom used. The Gastric 2 diet is also hourly feedings, but allows a little more variety, and is seldom used for more than a week. More commonly used is the Gastric 3 diet, which is essentially a two hourly feeding of more varied soft foods which may be continued for several weeks, if necessary, until the patient can tolerate a Modified Sippy diet. The latter is sufficiently liberal to enable patients to carry on indefinitely as far as calories, proteins, vitamins and minerals are concerned.

Patient Education. For success in treatment it is imperative that patients understand the rationale of therapy. It is our responsibility to teach the patient how to look after himself in this disease of many years duration with periods of remission and relapse. We aim to assist in lengthening the remissions and curtailing the relapses. It is unreasonable to expect a patient to understand the rationale for some aspects of his diet without explanation by the physician. Once he is told of the great stimulating effect of consomme, or beef broth, he may more happily adjust to less palatable milk soups and teach himself to enjoy them.

When a patient realises the neutralizing effect of frequent feedings it is easier for him to adjust to between meal snacks and make this a lifelong habit. In some occupations it is difficult to arrange such five minute breaks in mid-morning and mid-afternoon—but most of these patients can find time and opportunity to have a smoke. With encouragement, and a rational explanation, many may be converted to a routine of between meal snacks with therapeutic benefit.

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*Paper delivered at "Week of Medicine" of Dalhousie Post Graduate Committee of Faculty of Medicine, March 25th-29th., 1957.

Many patients with active ulcer symptoms find their customary morning orange juice irritating. Instructing the patient to take it at the end of breakfast, rather than at the beginning, will eliminate this symptom and allow adequate Vitamin C intake.

Pureed Foods. In ulcer therapy one aims at a mechanically non-irritating food, and this is the rationale of pureed foods. However, the unappetizing appearance of such foods is such that, with rare exceptions, I believe there is no place for them in adult diets. Palatability is an aspect that all of us are liable to overlook in prescribing diets. If a diet is to be continued for any appreciable period, this quality is most important. In the currently popular low salt diet, the number prescribed would be drastically reduced if the physician sampled it for one day! In ulcer management it is advisable to discuss details of what, and when, favourite foods should be added to a basic diet.

Instructions should be given to the patients to puree their own food by proper mastication. This requires adequate teeth or dentures, and dental attention should be considered an adjunct to ulcer therapy. In refractory patients it may be advisable to place them on a diet of pureed foods for a few days to impress on them the need of learning the habit of adequate mastication.

Night Feedings. Certain patients are more troubled at night, than in the day time, and will awaken with a nocturnal pain during an acute exacerbation. In such patients a bedtime snack may not be enough, even when combined with medication. Such patients may have a more restful night's sleep, and be sympton-free, by setting the alarm for an half-hour before the accustomed time of awakening and, at that time, taking a previously prepared snack kept at the bedside. This simple procedure is too frequently neglected by the physician.

Obesity. With most ulcer patients the problem of excess weight does not arise. However, in a few it is present, and the placing of the patient on an ulcer diet aggravates the obesity. This may be overcome by a special diet, using skim milk in place of whole milk and making other reductions in fat content, while still allowing the principle of three meals a day and three snacks.

LIVER DISEASE

Earlier studies on hepatitis and related liver diseases in man and, more especially, animals, led to the widespread use of Low-fat diet for almost all patients with liver disease. This practice is still adhered to by many in treating hepatitis. More recent studies have shown clearly that patients do as well on regular diet, or high-fat diet, as they do on low-fat diet. It is a well observed fact that patients in the acute phase of hepatitis have a marked anorexia and the prospect of a pork chop would be revolting in the extreme. On the other hand, once the appetite returns, there is little reason why the patient cannot be gradually advanced up to a normal diet. In my opinion there are many hepatitis patients who are caught in the vicious circle of post-hepatitis fatigue, restricted diet, inadequate caloric intake, increased weight loss, and other restrictions by the physician. The end result is a patient who is a semi-invalid—partly attributable to undernutrition and partially to unjustified concern engendered by the physician. Frequently such a patient has a minor variation in one or other non-specific flocculation test, and this may undermine

the physician's judgment and encourage him to treat a "test" rather than the patient.

GALL BLADDER DISEASE

This is an area where many feel on firm ground in prescribing diets—usually low-fat. Personally, I have many misgivings. It is certainly true that some patients with gall bladder disease have fat intolerance, but so do patients with functional dyspepsia in the absence of gall bladder disease. Other patients with cholelithiasis have little indigestion or fat intolerance and the presence of stones is discovered only after an acute biliary colic. In such patients it does not seem rational to place them on a low-fat diet when all one has done is to remove a stone-filled non-functioning gall bladder that had gone undetected until the offending stone moved into the duct. On the other hand, if there is associated obesity, as so often occurs, then it has merit on the basis of its lower caloric content.

ULCERATIVE COLITIS

In this disease the diet problem is a major one. The ideal diet is one low in residue so that there is a minimum of bulk to further stimulate the hyperactive bowel. The patient has a fever with its increased metabolism, so needs extra calories. He has excessive caloric and protein loss in feces, including exudate and blood from the ulcerating mucosa and needs high protein and high calorie content to prevent further weight loss. Extra vitamins and minerals are desirable. In summary, one has an impossible situation of a very ill patient with little appetite, in whom one desires a high protein, high caloric, high vitamin diet of low residue.

In reaching the best possible compromise one needs the closest liaison between the physician and dietitian. This is truly a case where the dietitian has to "special" the patient. If one uses a Minimum Residue Diet, in contrast to Low Residue Diet, milk, fruit, and vegetables are all eliminated and this is a grossly deficient diet of about 1,000 calories daily, and should only be used for a few days. If the patient is that ill it is probably better to support him on intravenous feedings for the short acute phase. Day by day decisions should be made as to what liberties are justified in the interest of nourishing and appetizing foods.

In some series of patients with ulcerative colitis, in whom the mainstay of treatment was "tender loving care," patients were allowed to eat what they wished. While subscribing to the need of sympathy and understanding on the part of doctor, nurse and dietitian in such cases. I also believe that selection and guidance as regards food is advisable. In recent years, the use of corticoid therapy has greatly assisted the managment of the acute case, whether one is carrying on medical treatment or preparing for radical surgery, and it allows one to make advances in diet which, a decade ago, would not have been possible.

SMALL BOWEL DISEASE

Most of the remarks on Ulcerative Colitis are applicable to diseases of the small bowel. In regional enteritis, or following resection of large portions of the food absorbing small bowel, one has the problem of minimizing residue, avoiding irritation and obtaining maximum nutrition despite the deficiencies of absorbing area.

Sprue and Coeliac Disease These conditions are characterized by a defect in fat absorption from the small intestine. There are other disturbances of absorption and motility, and the resulting clinical picture reflects the absorption insufficiency which may vary from case to case. In one patient a nutritional macrocytic anaemia may present, while another has tetany with hypocalcemia, and a third has spontaneous bleeding from hypoprothrombinemia due to faulty absorption of fat soluble Vitamin K. In recent years there has been great progress in our knowledge following the discovery that many of the symptoms and signs could be altered by a gluten-free diet. In some cases the results are spectacular, but the diet must be continued for a long period if relapses are to be prevented.

FUNCTIONAL GASTRO-INTESTINAL DISTURBANCES

In most of these conditions, whether it be functional dyspepsia with heartburn, regurgitation or belching as the major symptom, or whether it be colon disturbance of either the atonic type or spastic constipation type, usually the dietetic factors are of less importance than the emotional or environmental factors. However, the patient believes firmly in the dietary factors, so one should consider some of these aspects briefly.

Functional dyspepsia. In this condition it is the rule to find the patient with many preconceived ideas of food intolerance which have little scientific basis. They have usually been on a diet of some sort or other, and many come to the conclusion that they have intolerance to almost all foods. The air swallower who has troublesome distress and belching, and blames it on this or that food, has a convenient mental blank of what causes his belching in the morning before he has breakfast. To tell such a patient that he can eat what he wants to eat is often considered heresy, and yet the sooner he knows that food intolerance or "food souring in the stomach" is a myth, the sooner he can get on with correcting his trouble. Such patients should know that if they take a fatty meal, such as fried sausages, the fat causes a physiological delay in gastric emptying and, probably, there will be some residue in the stomach for 3 or 4 hours. If with that meal the patient takes food containing a volatile oil, such as onion, it is only natural that if they regurgitate or belch they should expect to taste the onion. If that is too great a price to pay for fried onions they had better leave them alone.

Functional Colon Disturbances. In treating these it is first necessary to know what is the disturbed physiology that has produced the symptoms. If the constipation is of the faulty habit type, Dyschezia as called by Hurst, where the patient has repeatedly failed to answer the call to stool until he has lost the reflex, it is expecting too much to think that diet plays anything but a minor role in such treatment. On the other hand, the patient with a spastic constipation who has marked narrowing and spasm of the sigmoid and small hard feces accompanied by mucus (or perhaps the symptoms have been alternating constipation and diarrhea) usually has experimented with diet. Few of these have not succumbed to the advertising of our large cereal producers and, in fact, many have been perplexed to find that All Bran has aggravated their symptoms. Such patients need an explanation of the rationale of a low residue diet which, at times, may be all that is necessary along with the reassurance that they do not have cancer. Others, of course, may need further help with their emotional or environmental factors and temporary assistance with medication.

SUMMARY

In concluding these remarks one wishes to emphasize the need for each of us to think of diet as an adjunct to therapy of most diseases of the gastro-intestinal tract and, in fact, to many other systemic diseases. It should be used intelligently and not indiscriminately. Just as with drugs, a cardinal rule is that special diets should not be used unless there is a rational reason for changing from a patient's normal diet—if that is adequate. This does not exclude one from a therapeutic trial of a diet. In fact, in a difficult diagnostic problem between atypical peptic ulcer and functional dyspepsia, at times it may be resolved by such a therapeutic trial of diet and medication, when radiological and clinical evidence was non-conclusive.

Trends in the Management of Tuberculosis in Children*

Proper care of the child at the time of his first tuberculosis infection may give a considerable degree of protection against future relapse—a matter of both individual and public health concern. In that public sanitation makes exogenous re-infection improbable, the problem is to make relapse of the primary lesion, or endogenous re-infection just as unlikely. Accordingly, the approach to the management of tuberculosis in children should be: (1) to obtain maximum stability and security for each active primarylesion by optimum drug therapy; (2) to follow each child with a positive tuberculin reaction for many years.

It is proposed that anti-tuberculosis drug treatment be given to the following categories of children with positive tuberculin reaction: (a) all children with evidence of recent tuberculin conversion (one year); (b) all children of three or less who are found to have a positive tuberculin reaction; (c) all children with roentgenologic or bacteriologic evidence of active disease. There is no direct evidence to support the theory that drug therapy will prevent subsequent endogenous re-infection, but the quantity of infectious material remaining in the child's body, the authors believe, can be reduced by drug therapy, and must, therefore, diminish the opportunity for re-infection as well as the probable dosage of bacilli in the event of re-infection.

Verhoeff, D. and Peck, W. M., North Carolina Medical Journal. 16: 511 - 514, November, 1955.

"Coin" Lesions of the Lung*

Medical literature contains reports of 729 pulmonary "coin" lesions. This paper adds 124 such lesions from the Allegheny General Hospital and the University of Pittsburg Medical Centres. The dangers of diagnosis without thoractomy are emphasized and a definition for the term "coin" lesion is offered in the statement that a "coin" lesion is a well-circumscribed tumor between one and four centimeters in diameter which is surrounded by lung and does not present evidence of major bronchial obstruction.

Histologically, twelve different lesions were found. Fifty-two and four-tenths per cent of the total number of tumors were bronchogenic carcinoma. Considerable emphasis is given the point that a much higher incidence of cancerous "coin" lesions are proved in the patients above thirty years of age.

Of the benign lesions, 71.19 per cent were granulomas which were thought to be tuberculomas but were classified only as granulomas since no effort to culture fungi or tubercle bacilli was made.

Exploratory thoractomy is recommended as a diagnostic procedure since it is no longer dangerous and provides the only definitive diagnostic approach

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The Management of Constipation*

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

THE tempo of modern living has increased the frequency of many conditions. Diseases such as Peptic Ulcer, Hypertension and Ulcerative Colitis are seen more often than they were 20 or 30 years ago. Constipation is also on the increase and said to be the commonest complaint referable to the G.I. tract. It seems that people in our fast-moving modern age do not seem to have the time to attend to the basic bodily functions. I am sure that hardly a day goes by that many of you are not called upon to treat constipation.

In discussing constipation, I wish to limit my remarks to the management of Chronic Functional Constipation, eliminating any organic condition or disease that might account for intestinal stasis. According to Tice's System of Medicine, this will account for nearly 85% of all complaints of constipation.

What the Patient Means by Constipation:

When a patient complains that he or she is constipated, it is important to find out just what they mean, as there are few conditions in which such a variability of opinion occurs:—

1. Does he mean that he does not have a bowel movement every day?
2. That the stools are too hard, or too small?
3. Is it that he does not have the feeling of complete evacuation after a bowel movement?

What the Doctor Means by Constipation:

Because of this difference of opinion concerning constipation, it might be well to define just what we, as doctors, mean by constipation. The best definition, I believe, is the following:—

> "that the residue of food taken one day is not passed in the stool in 48 hours."

This definition, while it may be applied to the majority of individuals, of course, cannot be applied to everyone. We all know persons who normally have 2-3 bowel movements daily and if they should miss a day, they might complain of constipation. There is also the perfectly normal individual who has a movement every three days. He may go 5 or 6 days before he feels that he is constipated.

Many investigations have been carried out in an attempt to find out just how long it normally takes food to pass through the gastro-intestinal tract. Studies have been done with barium, charcoal biscuits, carmine dye markers and even coloured beads and the consensus of opinion is that food normally passes through the G.I. tract in 48 hours.

PHYSIOLOGY OF THE LARGE BOWEL

As many of the causes of constipation lie in the large bowel, I think it would be of value to say a word about the nerve supply and the passage of food through the colon.

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* Presented at "Week in Medicine" Dalhousie Post-Grad. Course, March, 1957.

** Chief of Service-Medicine, Queen Mary's Veteran's Hosp., Montreal.

Nerve Supply to the Bowel:

The colon, along with the stomach and small intestine, is supplied by two sets of involuntary nerves usually with opposing action. The parasympathetic, is the motor and secretary nerve to the gastro-intestinal tract and it causes a relaxation of the sphincters and an increase in peristaltic movements. The other, the sympathetic, usually causes spasm of the sphincters and a retardation of peristalsis. The Vagi which supply the stomach, small intestine, and right colon are parasympathetic and thus the motor nerves to this part of the gut. The left colon and rectum are supplied by parasympathetic nerves from the sacral area and the sympathetic nerves are from the lumbar area.

Passage of Food Through the Colon:

As food residue passes from the small bowel through the ileocaecal valve into the caecum, the food mass, or "chyme" as it is called, varies in consistency from thin mush to liquid. Water is gradually absorbed, as the chyme passes through the large bowel, so that by the time the food residue reaches the rectum, it has become a soft plastic mass.

Transport through the bowel is achieved primarily by waves of mass peristalsis. These waves occur usually after meals, especially after breakfast, and are known as "gastro-colic reflexes." The waves traverse long distances in the colon carrying all bowel contents with them before they fade out. The stool is then left relatively undisturbed until the next wave picks it up and carries it further distally, perhaps into the rectum, where the rise in intra-rectal causes a desire to defaecate. If this call is not answered, the sensation passes off and will not return until more bowel contents are carried into the rectum, again increasing the rectal pressure. With normal defaecation the lower sigmoid and rectum are emptied, and frequently all bowel contents distal to the splenic flexure are eliminated.

TYPES OF CONSTIPATION

In 1921, Sir Arthur Hurst of Guy's Hospital, London. published a monograph on "Constipation and Allied Intestinal Disorders," and many of his ideas advanced at that time are applicable today. He felt that constipation should be divided into two broad groups:—

1. **Passage through the colon delayed**—COLONIC STASIS.
2. **Elimination from the rectum delayed**—RECTAL STASIS.

Frequently, there is a combination of colonic and rectal stasis and in later years, Sir Arthur Hurst felt that in nearly all types of functional constipation, rectal stasis or "dyschezia," as he called it, was present. If a rectal examination is done immediately after a bowel movement and bowel contents are felt, it suggests that rectal stasis is present.

CAUSES OF CONSTIPATION

1. **Man's Upright Posture:**

When man assumed the upright posture, it modified to some extent the position of the abdominal viscera. The upright posture has caused the viscera to sag toward the pelvis. Thus the stomach, coils of small intestine, and the colon sag between fixed attachments which tends to encourage sharp angulations and which may retard the onward movement of faecal residue.

Further, certain muscles which supported structures in the quadruped and aided bowel evacuation have atrophied and disappeared. The abdominal muscles which are so important in four legged animals have been relegated to the role of supporting structure. Much of the increased pressure aiding in defaecation comes from our abdominal muscles.

Thus, where the abdomen has become distended or weakened due to childbirth, lack of exercise or frequent abdominal operations, the abdominal muscles loose their tone and constipation often results.

2. **Lack of Regularity:**

One of the primary causes of rectal stasis is due to lack of regular habits of bowel evacuation. Often the difficulty stems from absence of training in childhood. For children the use of adult toilets with their feet dangling off the floor may be the start of early difficulty.

In others the trouble is due simply to failure to allow sufficient time for defaecation:—

(a) The high pressure business man who rushes to work in the morning;
(b) The school boy who gets up just in time to gulp his breakfast;
(c) The fastidious person who dislikes the unsanitary toilet facilities he must use.

All have habitually disregarded the advantage of establishing a regular time for defaecation for so long that the coordination necessary to a regular stool evacuation is lost.

This may be further aggravated by the inability or the disinclination to answer the call to defaecation when it does occur. If this happens, the rectum adjusts itself to the increased pressure and, if continually disregarded, all rectal sensation may be lost.

3. **Psychogenic Causes:**

Psychogenic factors frequently play a prominent role in developing functional constipation. The nerve supply to the colon is in a delicate balance between the two branches of the autonomic nervous system, the **Parasympathetic** and the **Sympathetic**. This balance may be upset by emotional factors producing spasm of the lower bowel and interfering with normal bowel activity.

This has been confirmed by experimental work carried out at the Cornell Medical Centre. They have shown that stressful circumstances, either painful, or emotional in normal persons, produce changes in the colon. Such experiments as:—

(a) flexing the hand for 15 minutes with B.P. cuff on the arm;
(b) tightening the screws on a metal head band to a point of pain;
(c) the discussion of acute emotional problems

all produce general bodily changes and frequently changes in the colonic mucosa. It has been readily shown that emotions of—

FEAR and ANXIETY—cause a pallor of the mucosa and decreased peristalsis;

ANGER, RESENTMENT and HOSTILITY—produce redness, increased secretion and increased peristalsis.

This latter is thought to be one of the etiological factors in non-specific Ulcerative Colitis.

Thus in certain individuals, often women, who are susceptible to stress-producing life situations, there develop alterations in normal bowel function. If these emotional factors persist over long periods of time constipation frequently is the result.

4. **Laxative Abuse:**

Laxatives have been known for centuries. Hippocrates prescribed mercurial purges and the early Egyptians employed senna. The use of axatives in England in the 17th Century was aptly described by Gulliver in his travels and his remarks may be applied to present day:—

> " . . they take in at the orifice above, a medicine, equally annoying and disgustful to the bowels, which relaxing the belly, drives down all before it and this they call a purge."

Our modern civilization has produced many new and varied types of laxatives. Such cathartics may be classified according to their intensity of action —laxatives, purges and drastics. However, they are usually divided into groups according to their mechanism of action and chemical nature.

One has little quarrel with the use of bulk laxatives or mineral oil in selected patients. However, there is seldom any excuse for using the irritant cathartics which cause vigorous peristalsis in both the small and large intestine. Even in our modern times there persists in people's minds the idea that a weekly cleaning out by a strong purge is beneficial to the body. Such a purge is always followed by a day or two of constipation and then it takes 3 or 4 more days for the bowel to revert to its normal rhythm.

Sometimes our "pill-taker" is worried following such a purge by the fact that his bowels do not move for a day or two, and he takes another cathartic and then another,—keeping the bowel in a constant state of unrest. This habit of taking laxatives is responsible for a great number of patients with functional constipation.

5. **Inadequate Diet and Water Intake:**

The lack of roughage in our modern diet leaves very little residue on which the bowel musculature may act, usually leading to colonic stasis. Partially digested, highly nutritious foods have supplanted bulkier and more fibrous foods in our diet. Also, our modern culinary art with its tempting foods such as concentrated sweets and sauces usually leave little residue.

Another very important factor is that many individuals drink very little water. It often has surprised me to find out that some women almost never drink water! This leads to increased dryness of the faeces and difficult evacuation.

THE MANAGEMENT OF CONSTIPATION

In the examination of a person who has complained of constipation it is of course just as essential to take a careful history and carry out a complete physical examination as for any other condition. It is important to find out just what the patient means by constipation and for how long it has been present. One can learn a great deal about the psychological and emotional side of the patient and whether, in your opinion, such factors are playing a part in the production of his complaints.

The physical examination is essential to rule out any organic causes. For example a rectal examination may reveal a tight sphincter or a fissure that has

been responsible for constipation for years. If feasible, a Barium Enema X-ray and a Sigmoidoscopic examination will help to eliminate organic disease, as well as give some idea of the tone of the lower bowel.

1. **Regularity and Psychological Factors:**

Before starting on any form of treatment, I believe that the most important thing is to obtain the co-operation of the patient. By explaining the essentials of bowel function and the proposed management of the condition, he will understand what is being done. To have any sort of success it is essential that all therapy be directed toward helping the patient return to normal evacuation. Use should be made of the "gastro-colic reflex" after meals and sufficient time should be set aside to encourage the reflex act of defaecation.

If it is felt that psychological problems are an important factor in producing constipation, allowing the patient to unburden his worries may help a great deal. In tense, overwrought individuals, a mild sedative during the day, (such as **phenobarbital** gr. ½ twice or three times daily) may help to relieve such a condition.

2. **Discontinuing Laxatives:**

It is essential that all irritating laxatives be discontinued. It may take a great deal of persuasion, but there is no use in attempting to re-establish normal bowel habit if the bowel muscle is being kept in a continued state of unrest.

If the laxative habit has been so ingrained that something must be taken for a time by mouth, nightly doses of **mineral oil,** ½ to 1 oz. are of value. It also helps to soften the stool, and assist in evacuation. It is not wise to take mineral oil indefinitely because it interferes with the absorption of Vitamin A.

3. **Diet:**

One of the most important aids in the management of this condition is a diet with sufficient residue. It is much better to give the patient a written diet, going over the different foods with him, rather than just telling him to take plenty of fruits and vegetables.

Such vegetables as beans, parsnips, peas and squash, and such fruits as berries, apples and pears all have a high fibrous residue.

Prunes often have a marked laxative effect and patients should be encouraged to take stewed prunes each morning for breakfast.

It is especially important to have the patients take 4-6 glasses of water a day outside of meals. One is often gratified to find that just the addition of water to the diet is sufficient for a daily normal bowel movement.

4. **Bulk Producing Substances:**

As an adjunct to diet, especially in seasons when fruits and vegetables are unobtainable, it is of considerable help to add one of the bulk producing hydrophilic colloids. Bran, saraca, psyllium seeds are of value taken on cereal. More recently, synthetic cellulose products such as **methyl cellulose** have been introduced and are perhaps easier to take as they are put in tablet form. Two tablets with each meal is sufficient to add bulk to the food residue. The patient should be advised to drink plenty of water when taking the bulk producing substances, and to chew the tablets before swallowing them.

5. **Faecal Softness:**

A recent addition to the long list of substances used in the treatment of constipation is **Dioctyl Sodium Sulphosuccinate.** This agent differs from other substances used in the treatment of constipation since its action is solely that of a faecal softener.

The faecal softening action of Dioctyl sodium sulphosuccinate depends upon reducing the surface tension at the oil-water interface in the heterogeneous faecal material. As a result, a softer and more homogeneous faecal mass is formed. Its best use is probably in the milder forms of functional constipation, especially those resulting from reduced activity of patients forced to stay in bed in hospital. It is able to soften abnormally hard faeces and in many patients, combined with an oil laxative, seems to achieve quite good results.

6. **The Use of Enemas:**

There is a great difference of opinion concerning the use of enemas in the treatment of constipation. However, there is no question that the habitual use of enemas upsets the normal rhythm of the bowel and makes it impossible to re-establish a normal bowel movement. I am not convinced that the taking of enemas causes harm to the bowel unless a strong soap is used in a soap-suds enema, which may irritate the bowel mucosa. It is much better to use a saline enema—one tablespoon to one quart of warm water.

There is, however, a definite place for a small enema in the management of constipation. In attempting to initiate the defaecation reflex, 4-5 oz. of warm olive oil may be instilled into the rectum through a syringe at night. If the oil can be retained until morning, it often enhances the "gastro-colic reflex," helping to start the normal bowel movement.

7. **Drugs:**

Drugs are frequently of value in the management of constipation. If spasm or markedly increased tone of the colon is present, **Atropine** gr. 1/100 twice daily, or **Tinct. Belladonna** M 10-20 after each meal may be used. It should be remembered, however, that in some patients they may decrease bowel activity. **Urecholine**, a parasympathetic stimulant drug (5 mgm. tablets after meals) may help to initiate peristalsis. I do not believe that **Pituitrin** is of much value in correcting this condition.

8. **Other Aids to Constipation:**

The taking of sufficient exercise is an extremely important factor, especially if the exercises are directed toward strengthening the abdominal muscles. Such exercises as lying on the floor and bicycling, or slowly raising the feet are of great value. Walking is good exercise and even encouraging people to own a dog that has to be taken for a walk twice daily, may help to overcome constipation.

In children, the placing of a stool in front of the toilet, in order to elevate the feet and flex the thighs on the abdomen helps to increase the intra-abdominal pressure and often is of considerable help.

CONCLUSION

Thus, in the management of constipation, any or all of the above factors may be employed in order to assist the patient re-develop a normal bowel elim-

ination reflex. If the constipation has been present from childhood, the chance for success is much less than if it has developed in adult life. However, even if it is not possible to assist the patient to resume a completely normal bowel habit, one can do much toward helping him to live with his colon.

This may be paraphrased in the words of Sir James Goodhart writing a number of years ago in the Lancet when he said:—

"Bowels were made for man, not man for his bowels."

Physician's Colour Slide Exhibition

Digby Pines, Digby, N. S.
August 29 - 31, 1957.

Dear Doctor:

1. This is your invitation to take part in the Colour Slide Show to be held during the Annual Meeting of The Medical Society of Nova Scotia meeting at Digby in August this year.
2. Here is what you do to enter; read carefully the conditions of entry listed here.
   (1) List the titles, process and value of your entries on the Entry Form. Add your name and address.
   (2) Detach the entry form and mail or deliver it to C. J. W. Beckwith, M.D., Executive Secretary, The Medical Society of Nova Scotia, Dalhousie Public Health Clinic, University Avenue, Halifax, N. S.
   (3) Mail your slides with the entry form to arrive in Halifax by August 1, 1957.
3. Exhibitors may submit up to three slides and may be 35 mm. mounted in standard 2″ x 2″ size; or $2\frac{1}{4}$″ x $2\frac{1}{4}$″ mounted in $2\frac{3}{4}$″ x $2\frac{3}{4}$″.
4. Each slide must be clearly marked with title, name and address of the owner. You are urged to use glass mounts as we cannot be responsible for damage to slides not protected by glass.

Physician's Colour Slide Exhibition

ENTRY FORM

NO.	Title	Process	Value
1.			
2.			
3.			

Name.....

Street.....

City.....

Secretary's Page

REPORT ON
MEETING OF GENERAL COUNCIL OF C.M.A.
Edmonton June 17 & 18th, 1957

THE General Council of the C.M.A. is a body, the membership of which is made up as follows:

(a) The Executive Committee of the C.M.A.
(b) Officers and Officials of the C.M.A.
(c) The Presidents and Secretaries of the Division of the C.M.A.
(d) The Divisional Representatives, including nominees to the Executive Committee and Nominating Committee.
(e) The Chairman of the Standing Committees of the C.M.A.
(f) The Chairmen of Sections of C.M.A. organized for business purposes.
(g) Past-Presidents of C.M.A.
(h) The Deputy Minister of National Health.
(i) The Director General of Treatment Services of D.V.A.
(j) A representative of the Association of Canadian Medical Colleges, who is a Dean and a member of C.M.A.
(k) Representatives of affiliated bodies.

The number of Divisional Representatives is decided by formula. The basis is entitlement to elect five representatives to serve on General Council for its membership in C.M.A. of fifty or less; one additional representative for its membership fifty-one to one hundred; one additional from 101 to 300; and thereafter one additional representative for every 300 above 300. One such Divisional Representative is to be named as its nominee to the Nominating Committee.

There was a total of 163 entitled to sit on General Council for the 1957 Meeting. The seating arrangements were impressive and effectual. The Chairman of the Executive Committee of the C.M.A. (Dr. N. H. Gosse) is the Chairman of General Council. The Chairman was on the platform with the President of the Association (Dr. J. R. Lemieux of Quebec) to his right and the General Secretary of the Association (Dr. A. D. Kelly) to his left. The members of the C.M.A. Executive Committee were seated at tables on either side and facing the Divisional representatives and others. The Divisional representatives were identified by a large card with the name of the Division placed on the table where they sat. The Chairman had a microphone and there were two microphones in the centre aisle. Any member wishing to speak was first recognized by the Chair and then proceeded to a microphone where he addressed the Chair and the General Council. If he was not in order the Chairman stated so but this rarely occurred. Motions and resolutions from Divisions or individuals had to be in the hands of the General Secretary by a stated time and were passed on to a "Steering committee" for study before they were presented and discussed. All members were given a mimeographed copy of such resolutions prior to actual discussion.

With these arrangements and excellent Chairmanship, a great volume of business was transacted. "The Reports for the General Council at the 90th

Meeting of C.M.A." made up 60 pages of double columns and represented reports of the Executive Committee and Standing Committees together with comments by the Executive Committee at the end of each report. General Council had three sessions on Monday, June 17th, in the morning, afternoon and evening, and two on Tuesday in the morning and afternoon.

The Nova Scotia Division was entitled to nine representatives. Five of the original nominees found it impossible to attend and had been replaced by Doctors J. C. Ballem, C. B. Stewart, F. J. Dunsworth, R. C. Dickson and J. R. Macneil. The nine representatives of this Division attended all sessions.

The "Reports for the General Council" had been received on May 21. They were reviewed by the individual representatives from this Division and were studied on June 4th in Halifax by those representatives as a group who could attend that meeting. Another group study period was convened in Edmonton on Sunday evening June 16th. This resulted in decision on points which were to be discussed and consideration of amendments or motions to be presented to General Council.

A resume of the proceedings will be published in the C.M.A.J. and it is therefore, not considered necessary to give any detailed remarks here. It is recommended, however, that each member of the Association should take the time to read the published material since many matters of great importance were discussed and action was taken on each. Among these were the following:—

(a) The Report of the Committee on Bye-Laws. During the year a Committee on Organization of the C.M.A. had reported to the Executive Committee making certain recommendations for what might be termed "streamlining" the C.M.A. Organization to make it more effective in the presence of recently developed demands for policy, etc. That Committee found that the changes required could be made within the framework of the Constitution and with some changes in the bye-laws. The Bye-Laws Committee had been instructed to study and modify bye-laws to accommodate the recommendations of the Committee on Organization. The review by General Council was detailed, much discussion occurred, and several further modifications passed and in one instance a bye-law relative to "Sections of C.M.A." was referred back for further study. The following is one example of a change effected by General Council:—A Standing Committee had been named "Advisory Committee to the Department of National Health and Welfare." This name was changed by amendment to "Advisory Committee to the Federal Government." It was decided as a result of motion that the nucleus of this committee "shall consist of not less than five members of the Executive Committee (of the C.M.A.) appointed by the Executive Committee." The Chairman of the Committee has power to add according to the requirements of the Committee for the specific task at hand. A further amendment was adopted which read as follows: "This Committee shall present to the appropriate Department of the Federal Government, the views of the Association on such matters of national concern as may arise, either at the volition of the Department or of the Association." This is a good example of the effective work accomplished.

(b) The Report of the Committee on Medical Economics led to a prolonged and most interesting debate. The report was reviewed paragraph by paragraph, each leading to at least some discussion and some to resolutions or amendments. As an example, paragraph 129 of the "Reports" reads as follows: At the last Meeting of General Council the following resolution was

passed: "That the Executive Committee set up a special Committee or, alternatively, assign the duty to an existing Committee for the purpose of preparing a plan or plans for:

(a) Comprehensive Hospital Services.
(b) Diagnostic Services.
(c) Physician's Services, based on principles approved by this Association."

Part of the comment on this is as follows: "The Executive Committee referred this question to the Committee on Economics (1) To determine if it is in the profession's interest to set down a plan acceptable to the profession, and (2) If such is the case then a study Committee should develop a plan or plans for submission back to the Executive." The Nova Scotia Division considered that the resolution had been adopted in 1956 by General Council and that following that adoption it had not been properly handled. Consequently the following resolution was introduced by the Nova Scotia Division.

Moved by Dr. C. B. Stewart,
seconded by Dr. R. O. Jones,

WHEREAS the General Council passed a resolution at its 89th Annual Meeting in 1956 instructing the Executive to prepare a plan or plans for hospital, diagnostic and medical services based on the principles approved by the C.M.A.,

AND WHEREAS the General Council approved this resolution after hearing a discussion of various difficulties and possible dangers,

AND WHEREAS these same difficulties and dangers are now presented by the Committee on Economics as the reasons for taking no action at this time.

AND WHEREAS the practical implementation of the C.M.A. Statement on Health Insurance is very difficult and a guide is urgently needed for C.M.A. members in consultation or negotiations with Government.

BE IT RESOLVED

1. That the General Council confirm its decision that the C.M.A. take effective action on its 1956 resolution.
2. That, as a first step, the Executive Committee review the "Statement of Principles" with a view to indicating methods which would be acceptable to the C.M.A. for implementing these principles, and methods which would be unacceptable."

This resolution precipitated a lively debate of approximately one hour with the result that an amendment was proposed to paragraph one of the resolution. That amendment was defeated after which the resolution as a whole was unanimously adopted.

(c) The "Supplementary Report of the Committee on Income Tax," having to do specifically with "the task of devising the optimum plan for retirement savings to permit self-employed Canadian Physicians to take advantage of tax deferment" is reprinted herewith for the information of the profession. This report was adopted.

"Supplementary Report of the Committee on Income Tax"

"Mr. Chairman and Members of the General Council:

Since the Budget announcement of an amendment to the Income Tax Act, your Committee has been engaged in the task of devising the optimum plan for

retirement savings to permit self-employed Canadian physicians to take advantage of tax deferment. In this we have been materially aided by our consultants in The Wyatt Company and particularly by the studies conducted over the past two years by the Committee on Pensions and Insurance of the Ontario Division.

After an extensive exchange of correspondence and the circulation of documents, your Committee met in Ottawa on Sunday, May 5th in the office of our consultant. Representatives of L'Association des Medecins de Langue Francaise du Canada were present in the persons of Dr. J. M. Laframboise and Dr. R. L. DuBerger. Mr. B. E. Freamo, Assistant Secretary (Economics) of the Ontario Medical Association rendered most valuable assistance.

A thorough debate of the possibilities resulted in the unanimous recommendation of the Committee, as follows:

(1) That there should be established under C.M.A. auspices a group retirement savings plan eligible for registration under the recent amendments to the Income Tax Act.

(2) That the plan should offer to physician subscribers two avenues of investment:

(a) In a fixed dollar fund in the form of an annuity, underwritten by a life insurance company and providing for variable annual contributions;

and (b) In a common stock fund administered by a trust company or similar corporation eligible under the provisions of the Income Tax Act.

Each participating member will be permitted to select the proportion of his annual savings to be invested in one or other of the funds.

In view of the plans of certain of the Divisions to assume administrative responsibilities for the receipt, allocation and transmission of members' contributions, it is proposed that agreement be reached with a single carrier in respect of each of the funds. Administrative arrangements to permit Divisional participation will be sought and where no Divisional participation is contemplated, direct contribution to the designated carrier by the individual physician will be arranged.

To permit the selection of a carrier in both categories specifications have been circulated to all companies licensed to underwrite annuities and to trust companies and related organizations. When the information requested is received, your Committee will arrive at a recommendation of a carrier of each fund and it is proposed that the Executive Committee be empowered to enter into the necessary agreements on behalf of The Canadian Medical Association.

The essentials of the new legislation providing for income tax deferment on personal contributions to a retirement savings plan are as follows. Effective for the year 1957 self-employed taxpayers enrolled in a registered retirement savings plan will be permitted to defer taxation on a sum representing 10% of earned income or $2500., whichever is the lesser. Retirement savings plans eligible for registration include individual annuity contracts, and corporate trustee investment funds. While individuals may invest their savings in any registered plan, it is considered by your Committee that advantages will accrue to the participation in a group.

It should be recognized by all concerned that the funds invested in retirement savings plans are effectively locked in. They may not be used for loans

or otherwise hypothecated and may only be utilized at retirement (prior to age 71) for the provision of annuity for life, or a joint annuity for the annuitant and his spouse for their lives, including on an optimal basis a guaranteed term, **not exceeding fifteen years.** In the event of death, refund of premiums and profits will be made to the estate subject to a 15% income tax on this amount in the year of death.

Your Committee would call attention to the desirability of considering the investment of a portion of the funds in fixed return annuities. Government Annuities are not included in this group approach because they may be purchased almost as advantageously on an individual basis. The growth possibilities of the common stock fund should be recognized despite the fact that loss, as well as profit, is possible and the amount available for annuity purchase at retirement cannot be predicted with accuracy.

Anticipating that the membership would authorize the formation of a C.M.A. group for a retirement savings plan, your Committee has proposed what appears to be the most advantageous and flexible approach, within our current knowledge. The General Council is asked to consider whether membership in The Canadian Medical Association should be a condition of participation in the group plan or, alternatively, membership in L'Association des Medecins de Langue Francaise du Canada, if that Association should decide to join with the C.M.A. in a single plan. If authority is granted to the Executive Committee to enter into an arrangement with selected carriers, it is proposed that descriptive literature be prepared and made available to all interested members of The Association Tax deferment applicable to 1957 will be available until February 28th, 1958, a circumstance which permits a careful consideration of all aspects of the plan.

All of which is respectfully submitted."

R. M. MITCHELL, M.D.
Chairman.

Many other items deserve reference, but time and available space place restrictions on these remarks. It should be noted that several motions and resolutions were defeated. The general impression left with the Nova Scotia representatives was that each and every Division had spent time on review of "the reports," that there was a full expression of the thoughts and opinions of those who spoke and that General Council made decisions in an effective manner. It was a very interesting and instructive experience to see Canadian Medicine doing its business.

C.J.W.B.

RETIREMENT SAVINGS PLAN

Information from the General Secretary of the C.M.A. states that the Executive Committee had a thorough discussion of the Income Tax Committee Report on June 20th when it was adopted Since that time, developments have been occurring rapidly and it is anticipated that the August 1 issue of the C.M.A.J. will contain "an announcement of the formation of the Canadian Medical Retirement Savings Plan and conveying the suggestion that members would be well-advised to await the details of the doctors' plan before making other commitments."

The Round Table of Medical Economics (see Annual Meeting Programme), will be prepared to discuss this matter and answer questions.

PROGRAMME
104th ANNUAL MEETING

THE CANADIAN MEDICAL ASSOCIATION

NOVA SCOTIA DIVISION

THE MEDICAL SOCIETY OF NOVA SCOTIA

Halifax, N. S.

August 28-31, 1957

Registration Wednesday, August 28, 1957, 6:00 p.m. to 9:00 p.m.
Thursday, August 29, 1957, 8:30 a.m. to 6:00 p.m.
Friday, August 30, 1957, 8:30 a.m. to 6:00 p.m.

Tuesday, August 27, 1957

9:00 a.m.	Executive Committee Meeting.
2:30 p.m.	Executive Committee Meeting.

Wednesday, August 28, 1957

9:00 a.m.	Executive Committee Annual Meeting.
2:30 p.m.	Executive Committee Annual Meeting.
1:30 p.m.	Golf Tournament, (1).
8:30 p.m.	"Medical, Surgical and Psychological Sequelae of Springhill Mine Disaster," Doctors, C. H. Gordon; F. H. Dunsworth; J. Carson Murray; J. K. B. Purvis.
9:30-11:30 p.m.	Refreshments and Dancing in Lounge.

Thursday, August 29, 1957

9:00-10:30 a.m.	Business Session, (2).
10:30-11:00 a.m.	Visit to Exhibits and Coffee.
11:00-11:30 a.m.	"Malabsorption Syndrome"—Dr. K. J. R. Wightman, Toronto.
11:30- 1:00 p.m.	Round Table— Subject—Medical Economics—Moderator: Dr. N. H. Gosse.
2:30- 4:30 p.m.	Business Session, (2).
4:30- 5:00 p.m.	"Sulphonylureas in the Treatment of Diabetes."—Film.
6:00- 8:00 p.m.	Shore Dinner on Beach, (3).
8:30- 9:30 p.m.	Colored Photograph Exhibition (4).
9:30-11:30 p.m.	Dancing in Lounge.

Friday, August 30, 1957

9:00-10:30 a.m.	Business Session, (2).
10:30-11:30 a.m.	Visit to Exhibits and Coffee.
11:00-11:30 a.m.	"Present Status of Surgery in Thyroid Disease." Dr. H. C. Richard, Edmonton.
11:30- 1:00 p.m.	Round Table— Subject—Public Relations—Moderator: Dr. F. J. Barton.
2:30- 4:30 p.m.	Business Session, (2).
6:30 p.m.	President's Reception.
7:30 p.m.	Annual Banquet—Guest Speaker—R. J. Rankin, President, A.P.E.C. Subject—"The Atlantic Provinces Look Ahead."
9:30 p.m.	Dancing in Lounge.

Saturday, August 31, 1957

9:30 a.m. First Meeting of New Executive.

FOOTNOTES

(1) Golf Tournament—It is expected that arrangements will be made for golf during the meeting for those unable to play at this time.

(2) Items to come up at each business session, will be posted on a Bulletin Board at the Registration Desk, prior to each business session.

(3) This function to be held on the shores of Annapolis Basin, will provide lobster, clams, cold cuts, etc. Dress to be as informal as desired. Orchestra will be in attendance.

(4) Application forms in this issue.

LADIES' PROGRAMME

Arrangements will be completed to enable the ladies to participate in golfing, swimming, tennis, miniature golf, shuffleboard and scenic drives, as well as an opportunity to relax.

PLEASE NOTE

It is the hope of the Programme Committee that the excellent programme for Wednesday evening, August 28th, and the golf tournament Wednesday afternoon, will lead to early registration of members, so that there will be good attendance for the business session to start Thursday, August 29th, at 9:00 a.m.

Physicians are again reminded to send the Housing Application Form, so that accommodation will be assured. This form has been in the last several issues of the Bulletin and appears again in the July issue—as of July 3rd, 140 reservations had been confirmed.

PROGRAMME COMMITTEE

Chairman—Dr. D. E. Lewis—Digby—Entertainment.

Members

Dr. A. S. Brennan, Digby, Pharmaceutical Exhibitors and Exhibits.
Dr. P. G. Black—Housing.
Dr. D. I. Rice—Halifax.
Dr. C. A. Gordon—Halifax.
Dr. C. J. W. Beckwith, Halifax, Secretary.

RE MEMBERSHIP

As of July 15, 1957, there are 401 members of the Medical Society of Nova Scotia who have paid 1957 dues. This number includes 22 new members and 326 "ordinary members." A "second round" of bills was sent May 21st, 1957, as a result of which 60 members have paid dues. The Executive is desirous of having all dues paid preferably before June 30, but certainly prior to the date of the Annual Meeting. May we have the co-operation of those who have not yet paid their 1957 dues and save the office the chore of sending out another series of bills! Thank you.

C.J.W.B.

Nova Scotia Festival of Arts

A combination of outstanding cultural entertainment and refreshing outdoor holiday relaxation will again be available during the second Nova Scotia Festival of the Arts. The place is Tatamagouche. The dates this year are August 9, 10, 11 and 12.

Any physician who locks his office door and, with his family, heads for Tatamagouche and the Festival will find a fascinating experience within, at most, a days drive from his practice in the province.

There will be at the Festival cultural entertainment that could previously be duplicated only by lengthy travel at various times of the year not just throughout the province, but in Europe as well. For talent at the Festival comes from all over Nova Scotia, in all fields of the arts, and some of it includes top artists of Europe now living in the province.

Festival auditorium programs include the instrumental and vocal music of the concert stage; the drama of the legitimate stage; ballet, interpretative and exhibition ballroom dancing.

On an outdoor stage at the Festival there are colorfully costumed folk dancers, square dancers and bands.

In flag decked tents are exhibitions and demonstrations of oil and water color painting, photography, crafts, historic relics and books by Nova Scotia authors are also on display.

Grounds attractions include dressage, Indian dances and music and scenic movies.

At the beaches are swimming, sunbathing, boating and water skiing.

The Festival takes place in and around the big, white, colonial-style rural high school at Tatamagouche. Festival grounds cover about 35 acres of cleared, grassy fields. Ten of these acres are used for parking.

Overnight accommodation is available in hotels, motels and cabins in the area and in private homes in and around Tatamagouche. Noon and evening meals are served on the Festival grounds.

Last year's Festival, first of its kind on this continent, attracted thousands of people. They came from all over Nova Scotia, from other parts of Canada and from the United States.

All six auditorium concerts and recitals were sold out and hundreds of people were unable to obtain tickets. Arts and crafts tents were crowded.

The answer this year was to make the Festival twice as long, double the auditorium performances and order two new tents, each 40 feet by 60 feet, for arts and crafts.

The Festival was established as a showcase for the top talent of the province and to provide a Foundation Fund for assisting this talent.

It grew out of the work done in the School of Community Arts for the past few years at Tatamagouche.

The Festival operates with a government grant and donations from organizations and interested individuals.

Part of the profit from last year's Festival went toward securing the Festival for the future and part of it went to the Nova Scotia Talent Trust for assisting talent in the province.

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.....

Society Meetings

ANTIGONISH-GUYSBOROUGH MEDICAL SOCIETY

The regular annual meeting of the Antigonish-Guysborough Branch of The Medical Society of Nova Scotia was held at St. Martha's Hospital on June 2, 1957, at 3.30 p.m. Doctor MacCormick acted as secretary in the absence of Doctor C. N. MacIntosh.

Present were Doctor and Mrs. R. Sers, Doctors R. C. Griffin, G. L. Silver, O. C. MacIntosh, R. H. Fraser, S. B. Donigiewicz, J. J. Carroll, D. Chisholm, W. Guzdziol, E. Dunphy and J. A. MacCormick.

The Minutes of the last meeting were read and adopted. No business arose from the reading of the minutes.

In the absence of the Treasurer there was no financial report.

The following letters from the Executive Secretary, Doctor C. J. W. Beckwith, The Medical Society of Nova Scotia, were read and discussed.

Number 1, December 15, 1956. A letter concerning the suggestion of establishing a Mediation Committee for Branch Societies to deal with complaints by members of the public against doctors of a nature not covered by the terms of the Medical Act. It was moved by Doctor O. C. MacIntosh, seconded by Doctor J. J. Carroll, that such a committee to consist of three members be appointed for this Branch. Carried.

Number 2, December 15, 1956. A letter re the Standing Committee on Fees stating that this committee is now ready to receive representations from individuals or groups relative to fees. This was discussed by the meeting but no representations were forthcoming at present.

There was no new business for discussion.

President—Doctor R. C. Griffin, Antigonish.
Vice-President—Doctor C. N. MacIntosh, Antigonish.
Secretary-Treasurer—Doctor J. A. MacCormick, Antigonish.
Executive of Branch Society—Doctors E. Dunphy, S. B. Donigiewicz, R. Sers.

Member to Nominating Committee of The Medical Society of Nova Scotia—Doctor J. J. Carroll, Antigonish; alternate Doctor T. B. Murphy, Antigonish.

Nominee to the Executive Committee of The Medical Society of Nova Scotia—Doctor J. A. MacCormick, Antigonish; alternate Doctor C. N. MacIntosh, Antigonish.

Nominee to Maritime Medical Care Incorporated—Doctor T. B. Murphy, Antigonish.

Mediation Committee—(President)—Doctor R. C. Griffin, Antigonish.
(Vice-President)—Dr. C. N. MacIntosh, Antigonish.
Dr. G. L. Silver, Sherbrooke.

Following this Doctor R. C. Griffin took the chair. The motion for adjournment was received.

The group then adjourned to the classroom of the Nurse's Residence where two motion pictures were shown, viz.:

Number 1: Replacement Transfusion in Erythroblast—osis foetalis.

Number 2: The Role of the Ion in Electrolyte Balance.

Lively discussion followed these excellent films. The thanks of this group were tendered to Mr. O'Brien, the representative of Baxter Laboratories of Canada who supplied the films.

Following this a very enjoyable dinner was served through the kindness of the Sisters of St. Martha's Hospital.

J. A. MacCORMICK, M.D.,
Secretary-Treasurer.

COLCHESTER-EAST HANTS MEDICAL SOCIETY

At a meeting of Colchester-East Hants Medical Society on June 5, 1957, the following slate of officers were elected:

Hon. President—Dr. Dan Murray, Tatamagouche.
President—Dr. James A. Muir, Truro.
Vice-President—Dr. D. F. MacInnis, Shubenacadie.
Secretary—Dr. R. C. C. Sodero, Truro.

Executive—Dr. E. M. Curtis, Truro and Dr. Ross MacInnis, Shubenacadie

Nominee to the Executive Committee of The Medical Society of Nova Scotia—Dr. S. G. MacKenzie, Jr., Truro, alternate, Dr. H. R. McKean, Truro.

Advisory Committee to M. M. C. Taxing Committee—Dr. H. D. Lavers and Doctor B. D. Karrel, Truro.

T. C. C. SODERO, M.D.,
Secretary

CAPE BRETON MEDICAL SOCIETY

The Annual Meeting of the Cape Breton Medical Society was held May 30th. There were 30 members in attendance.

In deference to the guest speaker the minutes of the previous meeting were deferred.

No pressing business matters were up for consideration. Members of the Nominating Committee named by the Chair consisted of Doctors Gordon Macdonald and John R. Macneil.

During the interval awaiting the deliberations of the Nominating Committee, the Presidential Address and Secretary-Treasurer's report were read.

Visiting guests included the Hon. R. A. Donahoe, Doctor C. J. W. Beckwith and Doctor O. C. MacIntosh.

The Noninating Committee brought in the following slate:

President—Doctor W. J. Lamond, Sydney Mines.
Vice-President—Doctor J. A. McDonald, Glace Bay.
Secretary-Treasurer—Doctor H. R. Corbett, Sydney.

Members Cape Breton Executive—Doctors James B. Tompkins, A. L. Skinner, H. J. Devereux.

Nominating Committee The Medical Society of Nova Scotia—Doctor A. L. Sutherland, Sydney; alternate Doctor J. A. McDonald.

Nominees to the Executive Committee of The Medical Society of Nova Scotia—Doctor A. W. Ormiston, Sydney, Doctor H. J. Martin, Sydney Mines; alternates Doctor H. F. Sutherland, Sydney, Doctor Gordon Macdonald, Sydney.

Public Relations—Doctors N. K. MacLennan, Sydney and John R. Macneil, Glace Bay.

The honoured guest, Mr. R. A. Donahoe, Minister of Health and Attorney-General, presented a detailed and exhaustive address concerning the present

status of the proposed Hospital Insurance plan for the Province. He was given a vote of thanks by Doctor Gordon Macdonald.

The Executive Secretary of The Medical Society of Nova Scotia, Doctor Beckwith, made a brief talk and answered several questions pertaining to the affairs of The Society.

Next meeting to be held in St. Joseph's Hospital, third Tuesday of June.

Meeting adjourned at 10.30 p.m.

H. R. CORBETT,
Secretary-Treasurer.

NOTICE OF INCREASE IN SCHEDULE OF INSURANCE

North American Life Assurance Company is pleased to announce that, as a result of favourable experience of the Medical Society of Nova Scotia's Group Life Plan, a bonus in the form of a 40% increase in the amount of insurance with no change in the schedule of premiums, will be effective 1st July, 1957.

All conditions of the policy affecting the payment of insurance shall apply to the payment of the bonus except that if conversion is requested 115% of the basic amount (excluding rerating) may be converted.

This rerating is in lieu of all previous reratings and is effective 1st July, 1957, and thereafter until notice to the Society.

"The Medical Society Group Life plan has been in force since July 1st, 1951. The original contract calls for a principal sum of $5,000. Since that time, due to a favourable mortality experience within the Group, the following bonuses have been granted. The percentages expressed below are, in each case, an increase over the original amount of $5,000.

Bonus	Effective Date	Amount of Insurance
20%	July 1st, 1955	$6,000
30%	July 1st, 1956	$6,500
40%	July 1st, 1957	$7,000

While the bonuses granted are actually from year to year, it is expected that a continuance of a favourable experience will maintain the present satisfactory level of protection. It should be remembered that your Group plan is convertible to any of the Company's regular Whole Life or Endowment plans without further evidence of health at any time up to age 65."