Kilo-Curies to Kill Cancer

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THE installation of a radioactive Cobalt Teletherapy unit in the Radiotherapy Department at the Victoria General Hospital this year will be a major addition to the aramentarium for the treatment of malignant disease. Development of the Cobalt Teletherapy unit is a saga of Canadian vision and enterprise. A dinner conversation between a British Physicist and a Doctor from the prairies—a man passionately dedicated to the more efficient treatment of cancer—sparked the development of the first unit.

Successful planning of the Manhattan Project in the United States during the war had culminated in the explosion of three atomic bombs—one over the sands of New Mexico, the others over Hiroshimo and Nagasaki—and the sudden collapse of the war with Japan. In the construction of the nuclear reactor to produce material for the bombs, carbon blocks had been used to slow down the neutrons produced within the pile. Theoretically, heavy water was a more efficient moderator than carbon but the difficulties involved in constructing a practical reactor were such that it was thought that as much as twenty-five years of development and research might be needed before such a reactor became a reality. The problem was turned over to Canadian scientists while those in America got on with the less formidable task of building the carbon reactor which, it was known, would work. To the astonishment of the remainder of the atomic physicists the heavy water pile at Chalk River was constructed by Canadian scientists in almost jig-time and Canada was for a time the proud possessor of the most powerful pile in the world.

After the war the British scientists who had worked in Canada were given a farewell dinner. Dr. Allan Blair of Regina sat next to Professor Maynard, Physicist to the Royal Cancer Hospital in London and their talk was the real beginning of the cobalt bomb. Speaking of production of radioactive substances possibly useful in Medicine, Maynard mentioned there was an isotope of Cobalt, Cobalt ^{60}, which produced radiation of more than a million volts in energy and easier to handle than radium. Now, continued Maynard, the Chalk River pile was capable of producing the isotope in reasonably large quantity; if enough was obtained—say 1000 Curies—and a suitable container designed, it might be possible to use it in place of a supervoltage X-ray machine and the advantages would be enormous. Radiation would be produced 24 hours a day, there would be no risk of tube failure, (the plague of supervoltage machines); no engineer would be necessary to keep the apparatus working and maintenance cost would be negligible.

Dr. Blair went back to Regina with the conviction that a Cobalt Teletherapy unit should be and would be translated from dream to reality as quickly as possible. As Director of Cancer Services he retold his conversation with Maynard to the Saskatchewan Government and immediately the funds necessary to plan and develop the unit were set aside. The Physicist to the Saskatchewan Cancer Commission, Professor Harold Johns, was asked to calculate the optimum size and thickness of the Cobalt discs which would be-

come radioactive after being baked in the atomic pile and, further, was asked to design the container for the radioactive cobalt.

By now, however, the idea of a cancer treating unit using radioactive cobalt had caught the imagination of many radiotherapists and physicists. Atomic energy of Canada, a Crown company formed to sell and distribute radioactive products set to work to develop an independent design of unit; the M. D. Anderson Hospital in Houston, Texas, held a competition for the best designed unit, which was won by Dr. Grimmett who had recently come to Texas from England to take charge of the Physics Dept. at the M. D. Anderson Hospital. Grimmett died of a heart attack shortly after his design was accepted. Allan Blair also had died of a heart attack after instituting the planning stage for the Saskatchewan unit.

When Professor Johns came to transfer his design from paper to metal he had the good luck to have the McKay Engineering Works almost at his back door. McKay was a self taught metal craftsman whose native ability, uncanny intuition and dogged pursuit of perfection had made him a master of his craft. Together they formed a slim, smooth-working unit which was installed in the then uncompleted University Hospital in Saskatoon. In 1952 the radioactive cobalt wafers were received from Chalk River and the treatment of cancer cases begun a few weeks before the Canadian Atomic Energy designed unit was placed in operation at London, Ontario.

Since then other types of Cobalt unit have been designed—notably by the Argonne Laboratory in Chicago for the University of Chicago Radiotherapy Department. This utilizes the smallest, most powerful source yet made. It was irradiated in a new heavy water pile built in the U. S., which has at present the greatest neutron flux of all reactors. The McKay-Johns unit, however, has been taken up by the Picker Company, the world's largest manufacturer of X-ray equipment, is being produced on a mass production basis and is now installed in several Canadian and American radiotherapy departments.

The successful development of the Cobalt ^{60} unit has not caused a dramatic rise in the number of survivors from cancer. No one—apart from writers of the popular press—believed that it would! After all, the treatment of cancer with high energy X-ray beams began as early as 1932 with the development of a million volt X-ray machine. There is no special virtue inherent in the rays produced from the radioactive cobalt atom: they are indistinguishable from those produced say from a Van de Graaf generator or a linear accelerator operating at about three million volts. Indeed, they are not as energetic as radiation produced by a Betatron or a Synchotron. The virtue of the cobalt unit is its freedom from the temperament shown by electronic machines and the fact that the radiation produced is all high energy. There are no low energy radiations present to be absorbed easily in the skin such as is the case with X-ray machines or the rays from radium. The cost of the cobalt unit is undoubtedly less than the cost of an equivelant X-ray machine over a period of say five years if the maintenance costs of the latter are taken into account.

In the treatment of malignant disease it is generally agreed that radiotherapy is of no value in the treatment of sarcoma, melonoma, carcinoma of the

stomach, intestine, colon or rectum. The use of supervoltage or cobalt therapy in these conditions has simply served to strengthen this opinion. It is in the treatment of deep seated tumours such as cancer of the cervix, cancer of the bladder, cancer of the oesophagus that supervoltage or cobalt therapy has earned a special niche for itself. The reasons are many.

In the first place it must be said that the supervoltage beams penetrate the tissues more easily than corresponding beams from conventional X-ray machines operating at 250,000 volts. With the latter machines, the amount of radiation reaching a point say ten centimeters below the surface depends on the surface area of the field used. The larger the field used, the greater the dose obtainable. With the use of small fields, just big enough to cover the tumour it often happens that the amount of radiation reaching the tumour in comparison with the amount delivered to the skin is small: the skin, happening to be very sensitive to radiation limits the amount of radiation that can be delivered at a depth. Increasing the size of the field increases the amount of radiation at a depth but only at risk of provoking symptoms of radiation sickness and general malaise.

Supervoltage radiation suffers hardly at all from the disadvantage that the smaller the field, the smaller the dose at a depth. The skin reaction provoked by identical doses of supervoltage and conventional X-ray radiation is much less in the case of the former. The dose delivered to the first few millimeters of the skin—the sensitive region responsible for the erythematous reaction—is quite small because of the different behaviour of the high speed electrons produced. Thus, with supervoltage radiation there is no nook or cranny within the body that cannot be irradiated to any desirable dose—with far more comfort to the patient than was formerly thought possible.

Unfortunately, the treatment of cancer by radiotherapy is not as simple as mapping out the area of the tumour and delivering a specified dose of roentgens. If it were, there would be a clamour for the cobalt unit reputed to be under development at Oak Ridge, Tennessee. With this machine, it is rumoured, all that the radiotherapist has to do is push the patient underneath the machine so that the tumour is directly below a fixed point, feed the necessary data to the machine (depth of tumour below skin, height of tumour, width of tumour, etc.) and then it will perform the necessary movements to deliver the maximum dose to the tumour for a minimum dose to the skin.

Such automation would at first sight seem to make the presence of a physicist or physician in the radiotherapy department unnecessary. However, first class radiotherapy can never be performed without the close collaboration of surgeon, pathologist, medical physicist and radiotherapist. Take the treatment of carcinoma of the bladder as an example.

The cure of a small transitional-cell carcinoma not palpable on bi-manual examination is perhaps best achieved by cystotomy and implantation of radon seeds or radioactive gold particles or flexible radioactive tantalum wire; the surgical procedure of total cystectomy is held in reserve in case of failure of radiotherapy. If there is widespread papillomatosis which has escaped beyond management of endoscopic diathermy, then perhaps the treatment in-

dicated is by liquid radioactive bromine held in the bladder by a latex balloon introduced per urethram. Advanced cases of bladder cancer, palpable bimanually, are perhaps best treated by supervoltage or cobalt teletherapy. The treatment of any individual case therefore needs first of all careful assessment of the stage of the disease, choice of the appropriate treatment method; planning of the proposed treatment in association with the Physicist; and finally meticulous checking by the Physicist that in fact the planned treatment has actually been delivered.

There are cases when tumours occur in situations, usually in the head and neck, where the deep penetrations of the teletherapy unit is an actual disadvantage in that a large amount of delicate tissue deep to the tumour is unavoidably irradiated. Such is the case with carcinoma of the larynx. To treat this cancer with a bean designed for use on deep seated tumours has been likened to cracking a nut with a steam hammer. Consequently, smaller cobalt therapy units are now being designed especially to treat the more superficial lesions which will utilise the source from the larger unit when its output has fallen below a reasonable level due to the natural decay of the radioactive element. Usually the effective useful life of a radioactive cobalt source in a large teletherapy unit is about five years; at this time however its strength is still sufficient to power a smaller unit for a further ten years. In this way the cost of radioactive cobalt therapy will be substantially reduced.

It must be remembered that radioactive cobalt is but one of the hundreds of radioactive substances produced by the neuclear reactor, about a dozen of which are being used routinely in the leading radiotherapy centres for diagnosis and treatment. Employing them successfully also calls for substantial special facilities and equipment with an adequate trained staff including nurses and technicians. It may reasonably be expected that following the installation of the Cobalt ^{60} Teletherapy unit at Halifax the facilities of the Radiotherapy Department will be still further augmented by the establishment of a modern isotope laboratory which will operate in conjunction with the existing medical, surgical, biochemical and pathological services of the hospital.

"Histamine Tolerance In A Schizophrenic"

(Report of a case with discussion.)

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INTRODUCTION

The fact that schizophrenics are able to tolerate astonishingly large doses of various pharmacodynamic agents has been, for a long time, noted by clinicians and studied by biologists. (1) Insensitivity of schizophrenic patients to adrenaline has been reported by many researchers; (2, 3, 4,) they have been found to be less than normally sensitive to thyroxin; (5) they react much less promptly than normal persons to carbon dioxide tension. The enormous doses of insulin required to produce coma in some schizophrenic patients are well known to all who use insulin shock therapy. (6, 7). An analogous phenomenon occurs in the *non-convulsive histamine biochemotherapy*, a form of shock treatment first suggested by Gildea et al. (8) in 1935, advocated by Hill (9, 10 11) since 1938, and later elaborated by the Sacklers and their associates. (12, 13, 14, 15,) An observation (made during a clinical trial of this form of treatment at the Saskatchewan Hospital, Weyburn) that the histamine resistance correlates with the length of the schizophrenic illness, led Lucy (16, 17,) to devise his *histamine tolerance test.* This test has been used by the present writer as one of a series of preliminary investigations of a pair of schizophrenic twins. The dose of histamine which one of the twins was able to tolerate with minimal side-effects reached the astounding quantity of 40 mgms. (*histamine base given subcutaneously*), which is considerably more than the highest dose given in Lucy's series (28 mgms.); the maximal therapeutic dose used in the treatment of schizophrenia, recently quoted by Rouleau et al. (18) is in the region of 14 mgms. This fact, illustrating a gross dis-equilibrium of biochemical function, appears therefore to be worthy of detailed description and discussion as it probably has some relationship to the physiologic substratum of schizophrenia.

CASE REPORT

1. Material.

The patient is a twenty-six year old white male of healthy German immigrant stock, whose schizophrenic illness started very insidiously, probably some three years prior to his admission to the hospital in 1950, when he was found to be correctly oriented but auditorily and visually hallucinating, emotionally flat, withdrawn and manneristic. He was incoherent or monosyllabic in speech. Having failed to respond to the usual methods of treatment, (E.C.T., Insulin,) he now presents a picture of heboid regression (schizoid withdrawal), characterized by mutism, inane giggling, inactivity, overt masturbatory activity, a complete emotional blunting and passivity in attitude. He no longer shows evidence of hallucinations or delusional ideation. Physical examination is essentially negative. He is a 5ft. $8\frac{1}{2}''$ tall, weighs 142 lbs., and his resting average TPR and BP is 98-74-20 and 114/82 respectively.

2. Procedure.

(a) *Lucy's Histamine Tolerance Test.*

The test consists of giving histamine in progressively higher doses until the limit of tolerance expressed by a fall of the systolic blood pressure to 60 mm Hg is reached.

2.765 mgms. histamine diphosphate (i. e. 1.0 mgm. histamine base) given subcutaneously produced no change in the patient's blood pressure which was recorded every five minutes. Double this dose produced a fall from 112 to 102 mm Hg.

The amount of histamine was stepped up gradually: two injections were given every day, the first one at 9 a. m., and the second one, one half hour or forty-five minutes later. In the fifth day a dose of 20 mgms. (histamine base) was reached and it produced a fall of the systolic blood pressure from 112 to 70 mm. Hg in 20 minutes with a prompt return to the initial threshold. In the ninth and last day of the test, the first dose was 38 mgms. of histamine base, (7.6 cc. of a solution containing 13.82 mgms. of histamine diphosphate per c. c., i. e. 5 mgms. of histamine base per cc.). This dose brought his systolic pressure to 68 mm Hg in ten minutes. At the fifteenth minute it started to pick up again. The last dose, given 35 minutes after the first injection contained 40 mgms. of histamine base and it produced a fall to the aimed at limit, i. e., 60 mm Hg. Thus the patient tolerated a total of 78 mgms. of histamine base given during the hour of the test, without developing untoward side effects other than the initial flush, sneezing, a short dry cough and pruritus.

(b) *A Modified Histamine Tolerance Test*, (devised by the present writer)*, in which the intravenous route is used, was administered a week later, and the results were equally unusual.

This test consists of two procedures: in the first one, histamine solution (0.1 mgm, of base per cc.) is given by slow (5 cc. per minute) intravenous injection until the systolic pressure, which is recorded every 30 seconds, falls to one-half of its initial threshold. In the case of our patient, whose blood pressure was 108 mm Hg at the beginning of the test, the whole 20 cc.-syringe was emptied at the end of the fourth minute, yet his systolic pressure was still 68 mm Hg; i. e., 14 mm Hg above the aimed at limit (54 mm Hg). After the injection was stopped, the blood pressure fell a further 4 mm Hg in the next minute (i. e. to 64 mm Hg). It returned to its initial height at the end of the ninth minute (counting from the start of the injection). There were no side-effects except flushing.

In the second part of the test, which consists of a rapid (8 to 10 seconds) intravenous injection of a standard dose of histamine (0.4 mgms. histamine base; i. e., 4 cc. of the same solution), the response of the blood pressure was equally rigid. Usually there is a sharp but fleeting fall of about 35 mm Hg followed by variable compensatory rise. In our patient's case, his blood pressure fell from 114 to only 100 mm Hg in thirty seconds. It then rose to 130 mm Hg

*To be published at a later date.

(i. e., 16 mm Hg above the resting, initial level) but returned to the original height at the end of the fifth minute and remained at that level until the end of the test (15 minutes).

There were no unpleasant side effects whatsoever and the initial transient flushing was not very intense.

The batch of histamine solution used in these tests was found to be of correct strength. The tests were repeated, using a different batch of histamine and similar results were obtained.

The graphs on page 215, 216 illustrate the behaviour of the blood pressure curves in both intravenous tests. A test chart of another schizophrenic patient who tolerated 10 mgms. histamine in the Lucy's subcutaneous test is included for comparison.

DISCUSSION

The enormity of the dose of histamine tolerated by this patient can be better visualized when compared with the usual doses used in various diagnostic tests and therapeutic procedures.

In the *gastric HCl secretion test*, a dose of 0.5 to 0.75 mgms. of histamine diphosphate is given subcutaneously, and in normal subjects it not infrequently causes unpleasant side effects, (flushing of face, pounding of the heart, headache, vomiting and diarrhoea). Smaller doses (0.25) have been recommended, (Bodansky & Bodansky) (19),. Wright, (20) in his textbook on physiology warns that the histamine test of gastric secretion may be dangerous if the initial blood pressure is under 110 mm Hg. Selye (21) states that one gamma of histamine given intravenously to normal human subjects produces severe hypotension. In the diagnosis of *pheochromocytoma* (Calkins et al.) (22) histamine base is given by rapid intravenous injection in doses of 0.0125 to 0.05 mgms. and in some cases it causes a severe headache. Buchler and von Sarudy, (23) investigating the *vasomotor stability in dementia paralytica*, used intravenous histamine in doses of 0.01 to 0.015 mgms. Friedman (24) and Friedman & Thale (25) were giving 0.1 mgm. histamine phosphate subcutaneously in their investigations of the *effects of autonomic drugs on the CSF pressure in psychotics.*

Therapeutic administration of histamine (intraven.) has been used in the treatment of *migraine*, (Thomas & Butler) (26) *acute ischaemia of brain*, (Furmanski & V. Nuys) (27) *Meniere's disease* (Grinker & Bucy) (28) and *multiple sclerosis*, (Schumacher) (29). The usual dosage in these therapies was 1 mgm. of histamine base in 250 to 500 cc. of fluid given over a period of about 2 hours. Similar dosage (2.75 mgm. histamne acid phosphate in 500 cc., 2 to 5 drops entering the circulaton during each diastole) was used in intra-arterial administration of histamine, introduced by Swann, Cook and Yates, (30) for the treament of *occlusive peripheral arterial disease.* Niver

and Claire (31) advocated the use of histamine (0.05 hist. base in 2.5 cc. of fluid given intravenously, over a period of one minute), as an adjunct to *psychotherapy.*

These doses are dwarfed by the amounts of histamine employed in the *non-convulsive histamine biochemotherapy of schizophrenia* Rouleau etal. (18) report in a recent paper that they were giving to some schizophrenic patients 14 mgms. of histamine base (42 mgms. of histamine phosphate); the same amount was given 45 minutes after the first injection, i. e. a total of 28 mgms. histamine base (84 mgms. of hist. phosphate), was given in the space of two hours. One of the patients in Lucy's series tolerated the same dose (28 mgms. histamine base), in a single injection. It appeared to be enormous if compared with doses described as poisonous, i. e. 2 to 8 mgms. (Hill).

Tolerance The possibility of production of an acquired tolerance must not be overlooked. Thomas and Butler (26) state that in almost all cases of migraine treated by histamine, there was a definite increase of tolerance. On beginning treatment, their patients were given histamine (1 mgm. of base in 500 cc. fluid) at the rate of 5 drops per minute. Later, the rate of 30 to 40 drops per minute could be tolerated. On the other hand, animal experiments (Clark & MacKay) (32) (Wells & al.) (33) indicate that the repeated administration of histamine does not increase tolerance. Our own experience shows that there is a certain degree of tolerance built up during the several days necessary to complete the test using Lucy's (subcutaneous) method.

Historical Note. That a histamine-like substance plays a part in the schizophrenic process was first suggested by Jahn and Greving (34) in 1926. Buscaino (in 1930) actually claimed that histamine intoxication played an important role in the causation of this psychosis. Marshall & Tarwater (35) put forward the hypothesis (1938) that various psychological conditions may be produced by allergic factors which cause abnormal cerebral reactions, possibly resulting from liberation of a histamine-like substance. Friedman & Thale (25) in 1934, studying the effects of histamine on the CSF pressure, concluded that "schizophrenia may be characterized by a relatively limited cerebrovascular reactivity to administration of histamine". Strengers & Goozen (36) in 1947, using Code's modified technique, found that schizophrenic patients have very high histamine levels in the blood. Instead of jumping to the conclusion that histamine intoxication causes schizophrenia, they confine themselves to a cautious statement that "histamine may be one link in the chain of causation".

The importance of histamine in relation to psychosomatic disorders is further emphasized by the findings published in 1949 by von Euler (37) who postulates the existence of a special histaminergic system anatomically associated with the sympathetic system. The body of information indicating that the function of the autonomous nervous system is abnormal in schizophrenics was recently increased by the contribution of Hoffer (38).

CONCLUSION AND SUMMARY

Whatever its causation, histamine tolerance of schizophrenics is another example of the autonomic rigidity and of the general tissue insensitivity or

"resistance to change" noted by a number of clinicians and researchers. The diminished responsitivity to histamine in schizophrenic patients has some relationship to the duration of their illness or their hospitalization as shown by Lucy (1953, 1954) who first used this phenomenon as a basis of a test.

A case is reported of a schizophrenic patient, ill for at least six years and hospitalized for four years, who tolerated, without untoward effects, 40 mgm. of histamine base, as the diphosphate, given subcutaneously 35 minutes after administration of a similarly high dose (38 mgm.).

First description of an intravenous histamine response test is also given, in which the same patient has shown very little reaction to 2 mgms. of histamine base injected slowly (over a period of 4 minutes) and to 0.4 mgms. injected rapidly (in 10 seconds).

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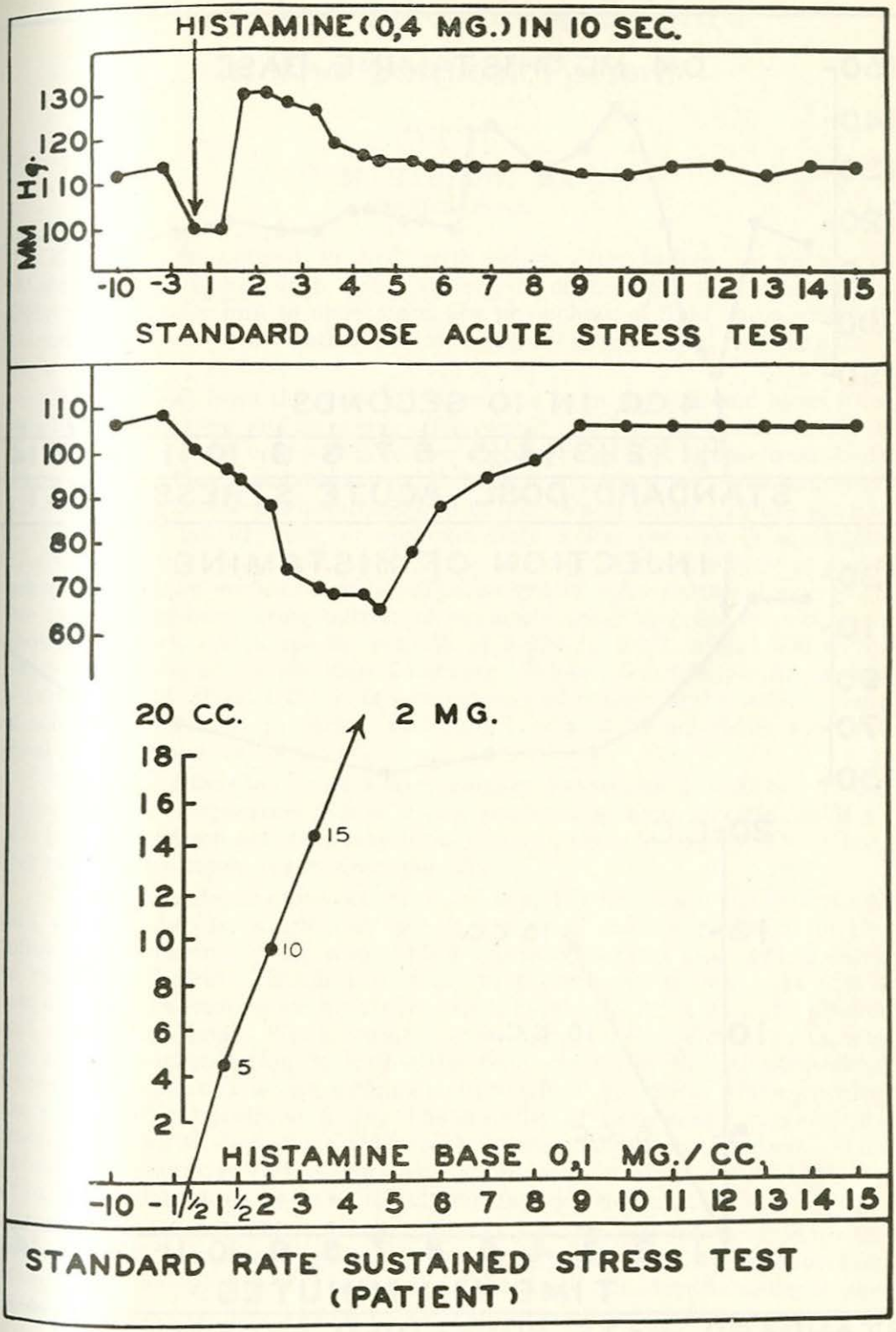
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STANDARD DOSE ACUTE STRESS TEST
110
100
90
80
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20 CC.
2 MG.
18
16
14
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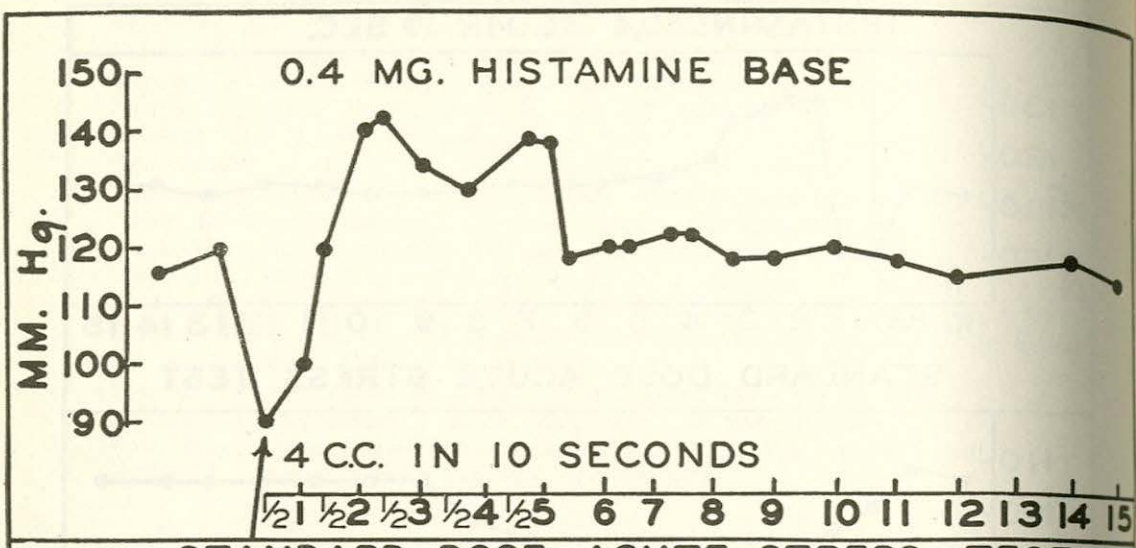
-10 -1½ 1½ 2 3 4 5 6 7 8 9 10 11 12 13 14 15
STANDARD RATE SUSTAINED STRESS TEST
(PATIENT)



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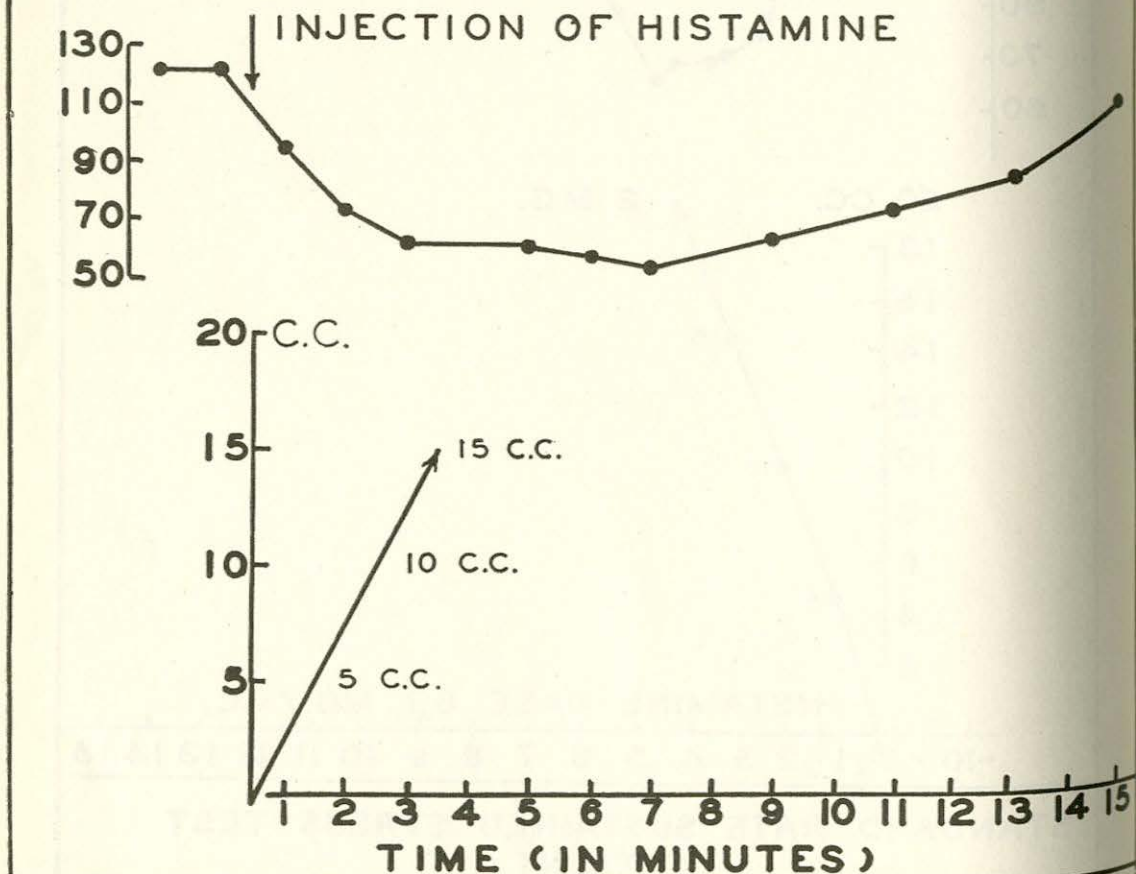

STANDARD RATE SUSTAINED STRESS TEST
(CONTROL)

Fluid And Electrolyte Balance In The Surgical Patient

PART I.

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THE surgeon is obliged to deal with acute disturbances in water and electrolyte balance in a wide variety of circumstances. It is accordingly necessary for him to understand the physiology of fluid and electrolyte balance and the correct methods of avoiding imbalance or of dealing with it when present.

Water is lost from the body by vaporation from the skin and lungs ("insensible" water loss) and as urine. The water loss by vaporation assists in the dispersal of body heat and is related to metabolic rate, surface area, body temperature, skin circulation, environmental temperature and humidity. Th s water loss proceeds without relation to body water stores. In this climate it averages 0.5 gm/kg/hour, or approximately a liter per day in the adult. The water of the urine is required for the excretion of end products of metabolism other than carbon dioxide. The weight of solid matter dissolved in the twenty-four-hour urine output of an adult under average conditions is about 35 grams. At a specific gravity of 1.029 to 1.032, about 500 cc. of water is required to excrete these 35 grams. When the urine specific gravity is 1.010 to 1.014, about 1500 cc. of water is needed to excrete the same amount of solid. Water loss in the urine, therefore, is related to metabolic activity, renal function and water stores.

The twenty-four-hour loss under ordinary conditions is 2500 cc. If the environmental temperature is high or the patient has fever, sweating adds to this loss. Loss from sweating may be as much as three liters and in very hot, wet climates as much as ten liters per day.

When water deprivation occurs, the demand is first upon the interstitial and vascular depots, which may be considered as one compartment in the following discussion. When water shifts, electrolytes must also shift in order to sustain the normal chemical anatomy of the interstitial fluid. At first a loss of water is accompanied by a loss of sodium into the urine from the plasma and interstitial fluid. When water loss continues, the need for sustaining the sodium concentration in interstitial fluid results in the withdrawal of water from cells. It is the sodium concentration therefore, which governs the volume of extracellular fluid. The stability of the osmotic value of extracellular fluid is dependent upon renal control of sodium content. The kidney undertakes to restore normal sodium concentration by withholding or excreting sodium or water as the circumstances require.

Proper therapy of conditions involving water and electrolyte losses depends upon accurate diagnosis. The history and physical examination stand in the most important position. Historically one should inquire in the greatest detail into the volume of losses sustained. However, in spite of

recent rapid advances in information regarding the clinical behaviour of fluid and electrolyte in ill patients, deaths still frequently occur which might have been prevented by correct prompt correction with the proper repair solutions. Perhaps this is because clinical application of the knowledge to patients is slow or because the early symptoms and signs of abnormal shifts in fluid and electrolyte are not impressive and go unrecognized. The clinical manifestations in early stages such as lassitude, apathy, weakness, vertigo, or headache are ascribed to the primary surgical disease and go too often unrecognized as representing early and quite simply reversible disturbances consequent to the illness rather than an intrinsic part of the illness.

In order to recognize and treat electrolyte and fluid abnormality we must have a working knowledge of the basic physiology and chemical pathology of extracellular and intracellular fluid. The consistent correlation of clinical symptoms and signs with laboratory studies is becoming progressively more possible. Recognition of the particular abnormality is most important because these states differ from one another in aetiology, clinical symptoms, blood and urinary chemical findings and in therapy. Treatment that may be life saving in one type of altered body water and electrolyte changes may be fatal in another.

The various electrolyte components of extracellular water are best expressed in terms of milliequivalents per liter of plasma. Total base of extracellular fluid is equal to 155 milliequivalents (mEq) ler liter. Sodium makes up about 90 per cent of total base, or 137 to 147 mEq per liter. The principal anion is chloride, which is normally 96 to 105 mEq per liter. Potassium is normally 4.1 to 5.6 mEq per liter; calcium is 5 mEq per liter. Magnesium is 3 mEq per liter. Acid constituents are HCO_3^-, 27 mEq per liter; Chlorides (Cl^-) 103 mEq per liter; $HPO4^=$, 2 mEq per liter; $SO4^=$ 1 mEq per liter; organic acid 6 mEq per liter; and protein 16 mEq per liter. (See Figure 1).

One every now and then hears resentment on the part of surgeons to the use of the term milliequivalent. This is peculiar inasmuch as it makes clear otherwise difficult water and electrolyte problems and affords a thinking pattern and a means of plotting graphically the patient's condition in regard to acid-base balance. Diagrammatic visualization of disturbances in base cation and acid-anion renders fairly simple the true picture of the pathologic physiology involved. Units of weight such as milligrams or grams per cent and volume per cent are quite unrelated and make comparative thinking difficult.

Reference to figure one again demonstrates the blood fluid compartment. It is described as a double column, the basic cation column being on the left and the acid or anion column on the right. Each constituent of the double column occupies a space in the column equal to its milliequivalents per liter. What is an equivalent, and next what is a milliequivalent? The molecular weight of NaOH in grams is one gram molecule. The molecular weight of NaOH is Na^+, 23.0, plus OH^-, 17.0 equalling 40.0. If one molecular weight in grams is weighed out or put in one liter (1000 c.c.) of water the solution will contain 1 gram molecule of NaOH (gm.40.0) and will be termed a 1 molar solution because it contains one mole of NaOH.

If one gram molecule of HCl or H, gm. 1.0, plus choloride, gms. 36.0, is weighed out and placed in one liter (1000 c.c.) of water, it will have a one molar solution of HCl. Now if one c.c. of the one molar NaOH solution is placed with one c.c. of the HCl solution, they will neutralize each other although the weights of the substances involved per unit volume are different. Each solution, however, contains the same number of active particles in unit volume. If one mole of NaOH will combine with one mole of HCl and make a neutral solution, they are *equivalent* mole for mole of the substances. Because we are concerned with quite small amounts of chemical substances, it helps to express it in terms of *milliequivalents* or one thousandth of one equivalent.

Units of chemical equivalence are used in expressing electrolyte concentration in body fluids. The body fluid compartments demand electroneutrality and the sum of the electro-positive cations in the base column and the sum of the electronegative anions in the acid column must be equal, and constant work is being done to preserve this equality or electro-neutrality. The use of the term milliequivalents per liter of solution or per liter of body fluids permits visualization of anion-cation disturbances and is perfectly applicable to clinical usage. It might be pointed out that the reporting of serum chloride as m.g. per 100 c.c as sodium chloride is fallacious inasmuch as the serum concentration of Na and Cl are unequal. Physiological saline solution contains 150 mEq per liter of each sodium and chloride (see Figure 2), while by referring to Figure 1 again you see that blood serum contains 145 and 103 milliequivalents respectively. The chloride concentration of isotonic saline then is appreciably higher than that of serum. Then the administration of isotonic saline tends to raise the Cl^- level and the HCO_3^- falls to maintain equality of the anion and cation columns. An elevation of 10 mEq per liter of Cl^- produces a fall of 10 mEq per liter of HCO_3^-. The HCO_3^- concentration is normally 27 mEq per liter and it is obvious that a decrease of 10 mEq tends towards acidosis, a compensated acidosis, to be sure. We can now clearly see that if a healthy person is given physiological saline the normal kidneys are able to select the ions needed and excrete the surplus. This works well in many instances but at present more thought is given to the individual need for either more acid or basic ions and a solution is now selected to more nearly fit that need. The kidneys are thus saved from having to make all the selection and do extra work when function may be poor because of the disease condition plus variable amounts of surgical shock.

The criteria by which surgeons make estimates for parenteral fluid requirements of the preoperative and postoperative patient are frequently based on traditional and theoretic considerations. One sometimes hears internes instructed to give 2 liters of glucose and saline or 2 liters of glucose and water. Too often such orders are written only because of established policy and traditional use of parenteral fluid and electrolyte without much thought to actual needs of the particular patient at the particular time in question. In the treatment of fluid and electrolyte abnormalities in surgical patients, each case is quite an individual problem and routine administration is dangerous if one is to remain within relatively safe limits.

The more depleted the patient, the more applicable is this dictum and hence the more likely is he to succumb to electrolyte abnormalities rather than his primary disease. Rule of the thumb procedures are extremely undesirable.

In evaluating and planning fluid therapy in the surgical patient, the problem revolves itself into three periods, the preoperative, operative and postoperative periods. The estimation of needs for fluid and electrolyte is individualized and the pathological physiology of each patient should be determined. In general, one should concern himself with three categories of parenteral fluid need and hence three general types of fluid, these being (a) water and electrolyte (b) nutritional fluids and (c) fluids to combat or prevent the development of shock, e. g. plasma whole blood, etc.

There are a number of helpful laboratory examinations that one should be aware of, but under no circumstances can the physician successfully substitute the findings of laboratory tests for clinical acumen and a trained mind. This is an extremely important point in parenteral fluid therapy. Laboratory studies clearly sharpen and enchance clinical judgment, but can never serve as a substitute or replacement for the clinician's evaluation. The following are some of the more important laboratory tests used in evaluating and following surgical cases with water, electrolyte and nutritional unbalance.

1. Serial determinations of body weight are a reliable guide to therapeutic progress.

2. Complete blood count, sedimentation rate and haematocrit to aid in detecting haemoconcentration as the plasma volume is dimished in hypotonic dehydration. Also the presence or absence of anaemia is of the utmost importance, for the oxygen carrying power of the blood should be at optimum.

3. Urinalysis, 6-hourly urine volumes, urine concentration test, quantitative urine chloride and pH of urine each 6 hours, all should be done.

4. Blood nonprotein nitrogen to determine the presence or absence of retention of end products of protein metabolism, or to detect intraluminal gastro-intestinal bleeding.

5. Serum sodium, potassium and chloride to evaluate the presence of extracellular deficit. It must be kept in mind that extracellular volumes and concentrations may not reflect deficits in the intracellular compartment. If the values are low, an intracellular deficit certainly exists.

6. Total carbon dioxide content of the serum and blood pH for the evaluation of change in the hydrogenion concentration and possible presence of acid-base unbalance.

7. Plasma protein with albumin globulin fraction is particularly important, especially in the aged.

The above tests are the most important ones available; however, there are numerous other ones that will be of assistance when complications arise or problems arise in diagnosis.

Part II of this paper will follow in the next issue.

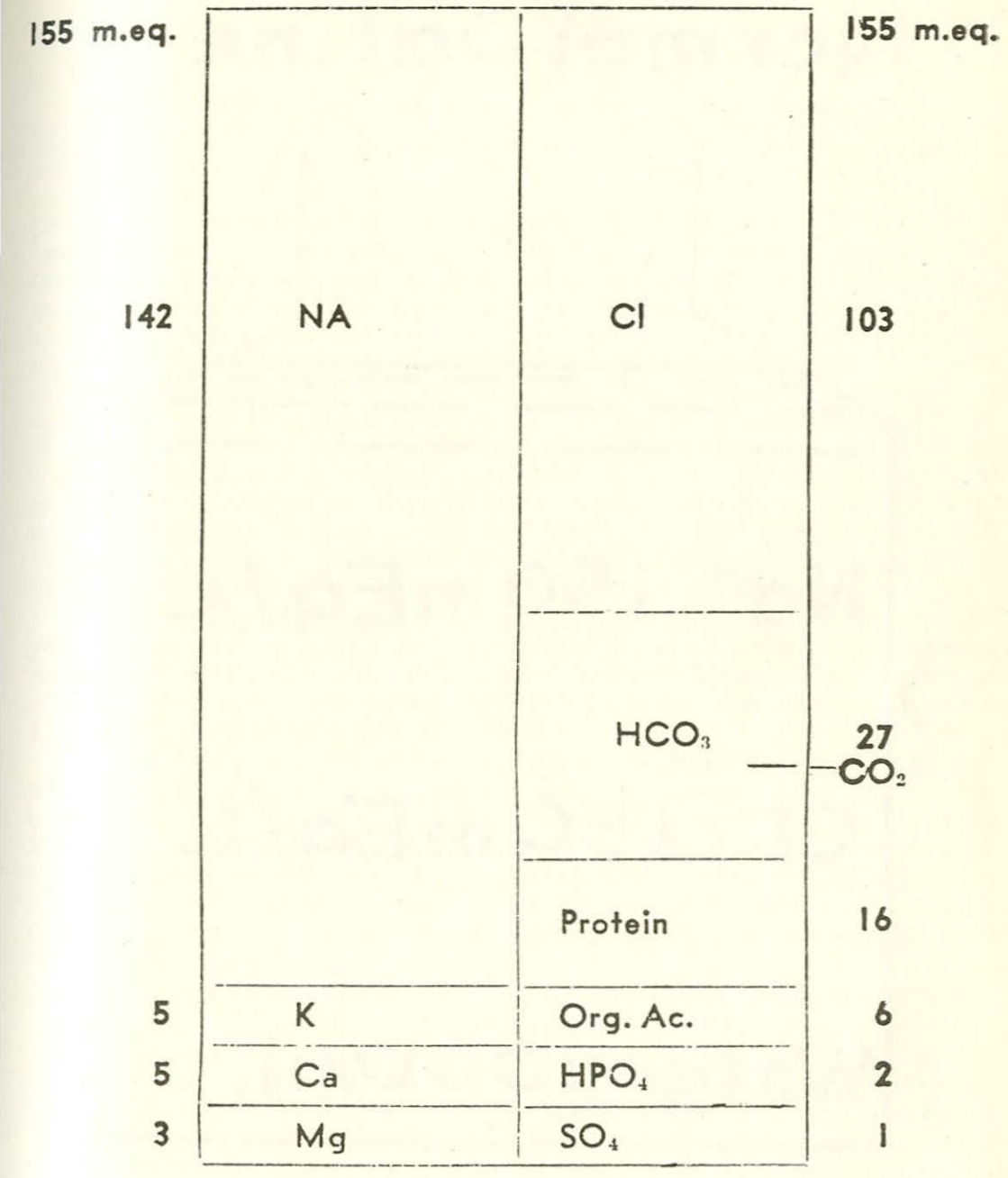

FIG. 1 PLASMA ELECTROLYTES

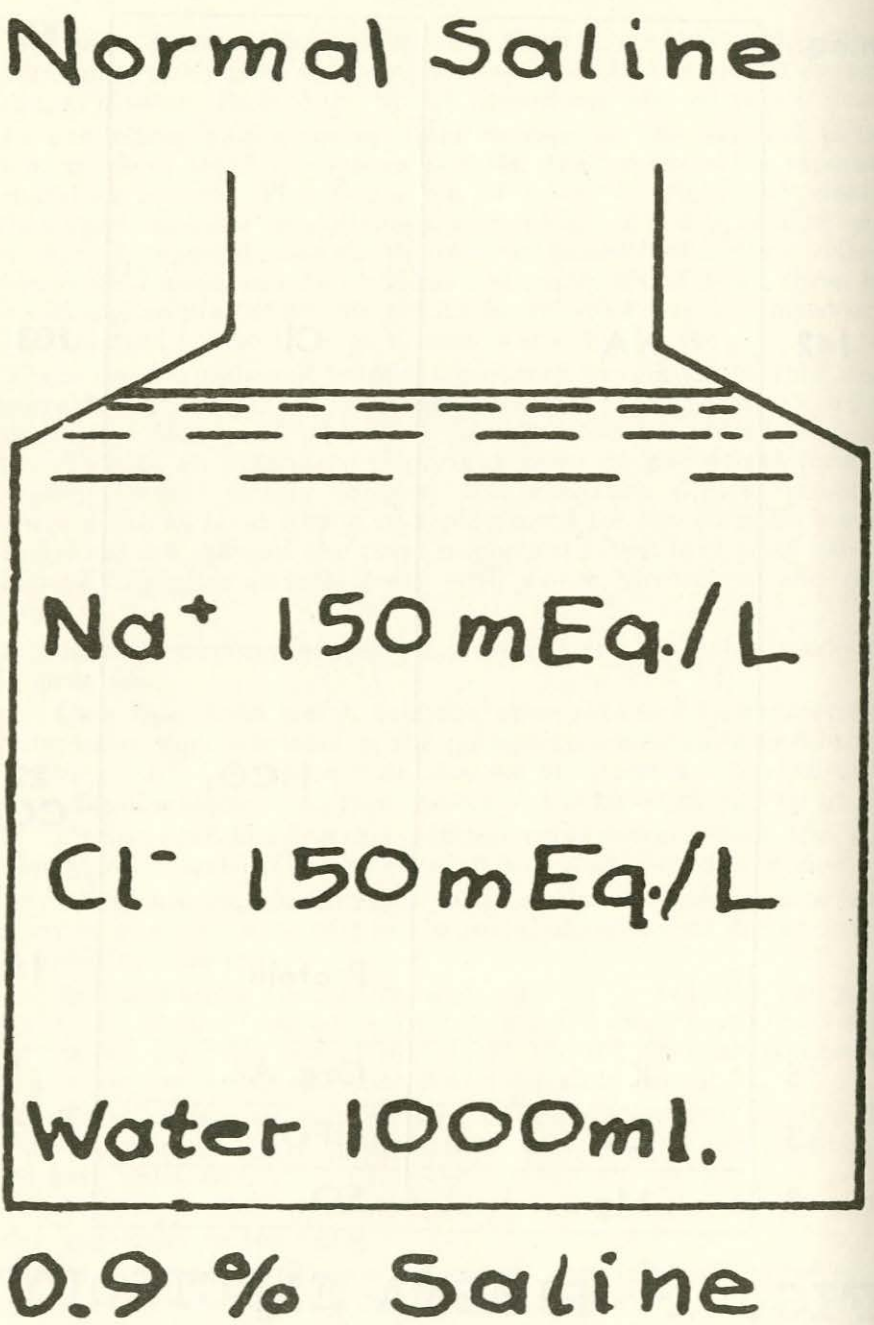

FIGURE 2

Proverbs XXV., 18*

G. W. T. Farish, M. D.,
Yarmouth, N. S.

The Bulletin reprints this article from the Maritime Medical News of 1907, not only for its intrinsic worth as the product of the mind of a well known and highly regarded Nova Scotian physician, but as an incentive to readers of the Bulletin to put their thoughts in writing on matters akin to the Art as well as to the Science of the Profession.

IN the 25th chapter of Proverbs, and the 16th verse, you will find these words: "Hast thou found honey? Eat so much as is sufficient for thee, else thou be filled therewith, and vomit it." Having taken this mode of beginning these my feeble efforts, I do not wish you to think that I have left you all, and gone into theology, although there are occasions which present themselves, when that would be an excellent adjunct to the medical profession, as is shown by the good work done by the medical missionaries in the East. But in this country it is as much as one can do to attend to and exist with one of them at a time. Also, I do not think that, until that time when the universal church is established, it would be conducive to the well-being of the general practitioner to combine theology with his general work. as he would be compelled at times at least, to divulge his "ism." And this would in turn lead to discussion and it is well known that it is next to impossible to convince a man but what his "ism" is the one paramount above all others.

However, having been invited to read a paper before the Society this year, and having refused so many times that I feel ashamed to do so again, partly for fear that I might not be invited to have that opportunity when it offered itself to my convenience, I began to look about for a subject with which I might fill in the allotted fifteen minutes to advantage.

I know that we are all here for the purpose of mutual fraternization, and interchange of any and all ideas which might emenate from the gray matter of many of the collossal brains of my medical colleagues of the Maritime Provinces, and to that end I felt it was my bounden duty this time to look over my case book, as a person does his barrel, and see what I could find which would be of sufficient interest to place before you. I did find some, and I think quite interesting cases at that, but is it absolutely necessary, I thought, that all papers should be:-

Mrs. A. B., age 52, married, house-wife, 25 children and no miscarriages?

After some thought I came to the conclusion that I would omit the stereotyped "case report," and speak of something which rather appealed to me, but whether or not it will do the same to you remains to be proven. Whether or not it is instructive matters not this time. On some other occasion I hope to be able to give you something more in that line, so if you will bear with me, Mr. President and brethren, for the few minutes which are at my disposal, I will proceed. And first I will just relate how it was this paper was evolved.

Last summer there was sojourning at Yarmouth a dear aunt of mine.

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*Read at meeting of Maritime Medical Association, Saint John, N. B., July, 1907.

During her stay she was seized with an attack of so-called biliary colic, arising from a condition of cholelithiasis from which she had been suffering for a period.

As convalescence was becoming established my better half invited her to dine with us one evening, and during the course of the meal, I was referred to frequently, as to the dietetic possibilities.

In a jocular way I appealed to her not to be seized with a pain during the night and at 2 a. m. disturb my peaceful slumbers. So she and her husband returned home at an early hour, she apparently none the worse for her meal.

At 2 a. m. precisely the door bell pealed forth, and to my surprise the husband stood before me to acquaint me with the fact that my patient had had a return of the pain in her stomach.

I naturally felt very guilty, and my wife ditto, for it is not a pleasant feeling to have a person go from your hospitality and then be compelled to send for you a sufficient length of time after which would unmistakably identify the meal with the pain or vice-versa. It savours of graft. However, fortunately, a few days sufficed for her to recover her equilibrum. And then she, feeling that we were sensitive on the matter, wished to tell my wife that it was not her dinner which caused the pain, but to quote to her this proverb: "Hast thou found honey: Eat so much as is sufficient for thee, else thou be filled therewith, and vomit it".

This appealed to me as being so apropos, that I asked her to repeat it until I could carry it home with me, and when I returned I took up my Bible and began to peruse the book of Proverbs in search of this particular one. In so doing, I encountered so many which applied so directly to one's every day life and especially, I thought, to that of a practitioner of medicine, that it struck me they seemed to be applicable to that more especially and hence what follows:

Let us, for instance for a few miuutes, run through some of the features of a physician's life, and see how many of the proverbs of Solomon, in the short while at my disposal, can be made to dove-tail into it in one way or another.

He begins his career at college where he is supposed to get "wisdom and understanding, and to receive the instruction of justice, wisdom and equity;" "to the young man knowledge and understanding;" "wisdom is the principal thing, therefore get wisdom, and with all thy getting, get understanding."

He graduates, and enters upon the practice of his profession, and frames his course according to his liking, and naturally he feels ambitious to acquire practice and fame.

Now he meets with opposition, and it behooves him to know how to act. so that he will always hold the respect of his fellows and colleagues.

He must bear in mind that he must not be too "greedy for gain," lest this should be conducive to his failing to be courteous to his brother practitioners, and here Solomon admonishes that "so are the ways of every one who is greedy of gain."

As he progresses he will probably feel that he has a particular fitness for some one or other of the different specialties; it may be surgery, or medicine or any one of the numerous ones which are now rampant amongst the profession, one of the latest of these to come under my observation being that of a back specialist.

However, suppose he takes up that of surgery for instance, he may become over-zealous, as Elbert Hubbard in the *Philistine* in speaking of trusts mentions that of the medical trust in which he remarks:

"If the medical trust has committed murder, as possibly it has, its victims have been the crippled and diseased. If it has killed, it has been thus: indiscretion, inadvertence and an excess of scientific zeal, and so is entitled to leniency." So in this position he should be careful not to be over zealous as to get to that point of removing healthy organs such as appendices, ovaries, etc., which might as well be sacrificed when the opportunity offers for fear that they might become diseased and become sources of trouble hereafter, for from the book of Proverbs he will find that Solomon cautions such to beware, in that he says "If they say, come with us, let us lay wait for blood, let us lurk privily for the innocent without a cause," then shall such and such happen, and at the end he remarks: "So is the way of every one who is greedy of gain."

The physician to be successful should be a reader and a student, and not only acquire a general knowledge of the things of the world. but rather those relative to the advancement of his own profession, for only by these can we attain knowledge and wisdom, "and when wisdom entereth into thine heart, and knowledge is pleasant unto thy soul, discretion shall preserve thee and understanding shall keep thee."

Honesty and uprightness are two great essentials to the good physician. "For the upright shall dwell in the land and the perfect shall remain in it."

If we peruse further through this wonderful book and apply these wise sayings to other characteristics which are so essential to the well-being of a general practitioner, we will find that he speaks very strongly in the matter of diligence and method in our doings. It is essential that a practitioner to be successful should bear in mind that "he becometh poor who dealeth with a slack hand; but the hand of the diligent maketh rich." "He that gathereth in summer is a wise son; but he that sleepeth in harvest is a son that causeth shame." "The soul of the sluggard desireth and hath nothing; but the soul of the diligent shall be made fat."

Should a doctor marry? Here is a point where I know the majority of you will hold up both hands in yeas! And to those I have nothing to say, for they have already found out yea or nay. But to the younger men of the medical profession who are still occupying their virtuous couches, I will say that Solomon, who evidently knew a great deal about women, seems to have a wonderful admiration for a virtuous one, but for her whom he terms contentious or brawling, woe unto him who takes her unto himself, for says he "It is better to dwell in the corner of the housetop than with a brawling woman in a wide house." And "For three things the earth is disquieted, and for four which it cannot bear, for a servant when he reigneth, for a fool when he is filled with

meat, *for an odious woman when she is married*, and an handmaid when she is heir to her mistress." Also, "it is better to dwell in the wilderness than with a contentious and angry woman."

But listen young unmarried medicos, who are contemplating, and be guided thereby, what Solomon has to say of her who is a good woman:

"Who can find a virtuous woman, for her price is far above rubies. The heart of her husband doth safely trust in her, so that he shall have no need of spoil. She will do him good and not evil all the days of her life. She riseth also while it is yet night and giveth meat to her household. She looketh well to the ways of her household and eateth not of the bread of idleness." Again he saith, "A virtuous woman is a crown to her husband" and last but not least, "Whoso findeth a wife, findeth a good thing and obtaineth favour of the Lord."

So should it be a yea or a nay, without doubt the affirmative, but should she not only be virtuous but able to fill this saying "Whoso keepeth his mouth and tongue keepeth his soul from trouble." But why should I expatiate on the *kind* of a wife a physician should have? Love is blind, and will remain so for a time, but after its eyes are opened and sight restored, then, should she not know the necessary qualities to ensure her being the ideal wife, she should be instructed to read this section of the Proverbs of Solomon before mingling with the throng.

Now that we have the proper wife for the doctor his success ought to be assured; but still there are a great many obstacles in his path through life. He is the observed of all observers.

He must walk a straight and narrow way, else should he swerve there is always some busybody who is ready to notice it. Of such persons Solomon says "Forwardness is in their heart, he devises mischief continually; he soweth discord."

Such people as these, in a community, and they are universal, are to be feared. So that it behooves the doctor to do the best he is able, and although under the most favourable circumstances, he will be censured, still "ponder the path of thy feet, and let all the ways be established," and he will minimize the dangers arising from this source.

For the young doctor starting out in life I would like to say a word or two on a subject on which he will often be called upon to play a very important part. There are those of our female patients (God bless them), who seem to object to the furtherance of the population of the community in which they dwell. These cases may occur in otherwise repectable people, the other class occurring in the unmarried but not always uninitiated. Young physician, when you are appealed to, make a barrier between me and thee which cannot be broken down, for if not "a wound and dishonor shall he get; and his reproach shall not be wiped away." Another very important point which I would like to touch upon, viz., for the physician to keep his own counsel; not to go from house to house eulogizing himself to the apparent detriment of his colleague, for "let another man praise thee and not thine own mouth, a stranger and not thine own lips;" "for by their works shall ye know them."

As he goes through the world he has many and varied natures to deal with, the rich and the poor, the meek and the lowly, the true and deceitful, and he that has a "proud look and high stomach."

One of these, the poor, we have always with us, and of three sorts: God's poor, the devil's poor and the poor devils. The first and last deserve his kind and honest treatment, the middle class I will leave to his own discretion.

I cannot resist, at this stage, in paying a tribute to one of my colleagues, since passed to the great beyond, who by his unerring and faithful attendance on all and every one alike, laid down his life for the good of mankind. It seemed that none were too poor for his most careful care and attention, and one could hardly imagine how, even in his last days, when it must have been so irksome for him to concentrate his mind on his work, he was able to do so. Still he felt that it was his duty, and while he lived he had the respect of all, and now that he is dead is honoured by all with whom he came in contact in life. I refer to my late commented colleague, Dr. G. D. Turnbull, of Yarmouth.

Solomon admonishes in respect to the poor that "he that oppresseth the poor reproacheth his Maker, but he had honoreth him hath mercy on the poor." "He that hath mercy on the poor lendeth unto the Lord, and that which he hath given will he pay to him again.

"Withhold not thine hand from them to whom it is due when it is in the power of thine hand to do it." "Whoso stoppeth his ears at the cry of the poor, he also shall cry himself, but shall not be heard."

This, say you, sounds well theoretically, but I will leave it to each one of you to see that you are not imposed on by this individual.

Who has ever heard that "a merry heart doeth good like medicine," or that "a merry heart make a cheerful countenance?" Who has ever heard of what cheer from the physician can accomplish in the sick chamber?

You will note the wisdom of Solomon when he says that it doeth good *like* medicine, and as they are both of such inestimable value individually, what must they be in combination? Surely they are not incompatibles, and of what aid they can be in the uplifting of those who are stricken down by the different diseases which flesh is heir to!

There is still one very important question to be seriously thought of relating to a physician's career, viz: Should he use intoxicating beverages? I think the consensus of opinion is no! He gains nothing and loses woefully. It will ensnare him sooner or later. "Be not among wine bibbers; for the drunkard and glutton shall come to poverty."

"Look not upon the wine when it is red, when it giveth his color in the cup, for at the last it biteth like a serpent and stingeth like an adder."

"Wine is a mocker, strong drink is raging and whoso is deceived thereby is not wise."

The doctor who has lived up to all this is revered and honored, and justly so, by his colleagues, and by the community at large, as one who has practised faithfully, honourably and diligently the noblest profession barring none.

Then comes the time when after over half a century of hard and unremitting toil there is "a little sleep, a little slumber, a little folding of the hands to sleep," and all is over, and "the hoary head is a crown of glory, if it be found in the way of righteousness."

But his estate pans out next to nothing, and the people who worked him day and night open their eyes in wonderment to find out for a surety that the poor doctor was eking out an existence only, and his family was not provided for. And where lies the fault? I am afraid in a great many cases in the doctor himself. He has laid down his life for his fellows, but has failed woefully to lay up any treasure for those who follow him. So although sentiment is good and noble, still there are other things to be thought of, viz., strict and close business relationship between doctor and patient, for "Short payments make long friends." And then he will not be compelled to occupy the place of our friend who dreamed the following, taken from the pen of Dr. Moore, of Missouri:

Last evening I was talking
With a doctor aged and gray,
Who told me of a dream he had,
I think 'twas Christmas day.

While snoozing in his office,
The vision came to view,
For he saw an Angel enter,
Dressed in garments white and new.

Said the Angel "I'm from heaven;
The Lord just sent me down
To bring you up to glory,
To wear your golden crown.

"You've been a friend to everyone,
And worked hard night and day
You have doctored many thousands,
And from few received your pay,

"So we want you up in Glory,
For you have laboured hard,
And the good Lord is preparing
Your eternal just reward."

Then the Angel and the Doctor,
Started up toward Glory's gate,
But when passing close to Hades,
The Angel murmured: "Wait:

"I have here a place to show you:
It's the hottest place in hell,
Where those who never paid you
In torment always dwell."

And behold, the doctor saw there
His old patients by the score,
And taking up a chair and fan
He wished for nothing more,

But was bound to sit and watch them,
As they sizzle, singe and burn,
And his eyes would rest on debtors
Whichever way they'd turn.

Said the angel "Come on doctor,
There are pearly gates to see:"
But the doctor only murmured:
"This is good enough for me!"

He refused to go on further,
But preferred to sit and gaze
At the crowd of rank old dead heads,
As they lay there in the blaze.

But just then the Doctor's office clock
Cuckooed the hour of seven,
And he awoke to find himself
In neither Hell nor Heaven.

The Annual Meeting

Great preparations are being made by the members of the Cumberland Medical Society for the Annual Meeting of The Medical Society of Nova Scotia. Not since 1924 has The Medical Society met in Amherst and the Committee on Arrangements are anxious to make this meeting a big success.

The Executive Meetings will be held on Tuesday, September 6th.

The General Meetings will be held on Wednesday, Thursday and Friday, September 7th, 8th and 9th.

The Nova Scotia General Practitioners Society and The College of General Practice will hold a meeting on Thursday, September 8th at 9.00 a.m.

The Annual Dinner will be on Thursday night—the guest speaker, Doctor T. C. Routley, long time General Secretary of The Caadian Medical Association and recently installed as President of the British Medical Association and also The Canadian Medical Association.

Arrangements have been made for a Luncheon on Wednesday, September 7th and a Dance the same night.

Please make reservations early. An active Housing Committee under Doctor J. A. Langille, M.L.A., is busy with arrangements to accommodate all who wish to attend.

29th Annual Dalhousie Refresher Course

October 24th - 25th, 1955

The program schedule for the 29th Annual Dalhousie Refresher Course is assuming form and from the initial outline gives promise of being a very interesting and rewarding week. We trust that it will offer to the general practitioner the properly varied "Refresher" which has come to be the essence of these fall courses.

The John Stewart Memorial Lecturer is to be Professor E. D. G. Murray, Professor of Bacteriology at McGill University, who is also renowned as a speaker of skill and considerable wit. Professor Murray has agreed to take part in the program and we are anticipating some clinics and round table discussions of particular verve.

As guests in Medicine and Surgery we have two distinguished Canadian Medical Lecturers, Dr. R. B. Kerr, who is Professor and Head of the Department of Medicine at the University of British Columbia and Dr. W. Keith Welsh, Associate Professor of Surgery at the University of Toronto. Dr. Kerr and Dr. Welsh will be with us during the first part of the week.

It is some time since we have included Radiology amongst the specialties covered in the Refresher Course and we count ourselves fortunate in being able to wecome as our guest speaker in this subject Dr. E. B. D. Neuhauser, Radiologist-in-Chief at the Children's Hospital, Boston. Dr. Neuhauser is well known for his very wide interest in all phases of Medicine and his contribution to our program will be correspondingly varied.

Paediatrics will also be featured during the last two days of the week and another Canadian is to be our guest teacher in this subject. He is Dr. Arnold L. Johnson, Demonstrator in the Department of Paediatrics at McGill University.

Members of our own Faculty are preparing presentations to be given during the Refresher Course week which we feel sure will be of a high calibre and particularly pertinent to the problems of the general practitioner of the Atlantic Provinces.

Society Meetings

WESTERN COUNTIES MEDICAL SOCIETY

The annual meeting of the Western Counties Medical Society was held on June 23rd at Braemar Lodge, Yarmouth, N. S. Following a delicious lobster dinner in the Main Dining Room, we adjourned to the Totem Lodge for the business session and to hear the outside speakers. The president, Dr. A. M. Siddall, first introduced Dr. Lee Steeves of Halifax who spoke on the "Management of Hypertension." He was followed by Dr. Garnet Colwell whose subject was "Physical Treament Following Cerebral Vascular Accidents." Both papers were very well received and provoked an interesting discussion. Dr. J. E. LeBlanc, in his usual inimitable style moved a vote of thanks to the speakers following which election of officers took place resulting in the following.

President—Dr. Robert Belliveau of Meteghan.

Vice-President—Drs. W. H. Jeffry of Shelburne, B. J. d'Eon of Yarmouth, A. F. Weir of Hebron.

Sectretary-Treasurer—Dr. D. F. Macdonald of Yarmouth.

Representative to the Nova Scotia Medical Society Executive—Dr. D. R. Sutherland of Yarmouth.

On motion of Dr. D. S. Robb, Dr. L. P. Churchill was made an honorary member of our Society. New members introduced were Dr. Donald Campbell of Shelburne and Dr. Milton O'Brien of Lockeport. Dr. Norman MacLeod of New York City and Dr. Wilson Siddall were guests.

The following Doctors were in attendance:

H. J. Pothier of Weymouth, P. H. LeBlanc of Little Brook, Robert Belliveau of Meteghan, A. F. Weir of Hebron, W. C. O'Brien, G. V. Burton, George Burton, B. J. d'Eon, C. K. Fuller, R. M. Caldwell, W. M. Phinney, L. M. Morton, D. R. Sutherland, D. F. Macdonald of Yarmouth; E. Melanson of Eel Brook, A. M. Siddall of Pubnico, J. E. LeBlanc of West Pubnico, M. F. Taylor of Barrington, Donald Campbell, D. S. Robb, W. H. Jeffry of Shelburne, J. F. Robbins, Milton O'Brien of Lockeport.

D. F. MACDONALD,
Secretary-Treasurer.

CAPE BRETON MEDICAL SOCIETY

The annual meeting of the Cape Breton Medical Society was held at St. Rita Hospital in Sydney closing out a highly successful year under the Presidency of Doctor A. W. Ormiston, on June 2nd, and was highlighted by the presence of the former Provincial Minister of Health Hon. Harold Connolly who was heard in a highly informative talk.

Annual reports placed before the largely attended meeting showed progress in the many and varied activities of the society during the term just ended and a programme mapped out for the incoming year.

The officers elected for 1955-56 are president, Doctor John R. Macneil of Glace Bay, Vice-President, Doctor Arthur L. Sutherland of Sydney, Secretary-Treasurer, Doctor H. R. Corbett of Sydney, Executive, Doctor William A. Gardiner of Sydney Mines, Doctor S. Arthur Green of Glace Bay, Doctor H. J. Devereux of Sydney; representatives on the Executive of The Medical Society of Nova Scotia, Doctor Arthur L. Sutherland and Doctor A. W. Ormiston; representatives from the Society to the Cape Breton branch of Canadian Medical Health Association, Doctor Arthur W. Ormiston, Doctor S. Arthur Green and Doctor William A. Gardiner.

Urology Award

The American Urological Association offers an annual award of $1,000 (first prize $500, second prize $300 and third prize $200) for essays on the result of some clinical or laboratory research in Urology. Competition shall be limited to urologists who have been graduated not more than ten years, and to men in training to become urologists.

The first prize essay will appear on the programme of the forthcoming meeting of the American Urological Association, to be held at the Statler Hotel, Boston, Massachusetts, May 28-31, 1956.

For full particulars write the Executive Secretary, William P. Didusch, 1120 North Charles Street, Baltimore, Maryland. Essays must be in his hands before December 1, 1955.

The Medico-Legal Society

A meeting was held on May 11th, 1955, for the formation of a Medico-Legal Society. This meeting was attended by Dr. A. E. Murray, Dr. V. O. Mader, Dr. C. D. Vair and Dr. A. Brown Crosby representing The Halifax Medical Society and by Carl P. Bethune, Q.C., P. J. O'Hearn, Q.C., R. W. E. Mingo, L. A. Bell and Bruce M. Nickerson representing The Nova Scotia Barristers, Society.

The meeting was convened by Mr. C. P. Bethune, Q.C., Vice-President for Nova Scotia of the Canadian Bar Association, which Association has adopted the policy of encouraging the formation of Medico-Legal Societies, believing that the existence of such societies is of benefit to the professions taking part in them.

Officers were elected as follows:

President:—Dr. V. O. Mader
Vice-President:—Mr. P. J. O'Hearn, Q.C.
Secretary-Treasurer:—Mr. C. P. Bethune, Q.C.

An interim constitution was adopted, under which the annual dues were fixed at $5.00.

It is proposed to commence holding meetings in the fall of 1955.

Any members of The Nova Scotia Barristers, Society or of the Nova Scotia Division of the Canadian Medical Association desiring to become members of the Halifax Medico-Legal Society are requested to advise the 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 20% increase in the amount of insurance with no change in the schedule of premiums, will be effective the first of July, 1955.

All conditions of the policy affecting the payment of insurance shall apply to the payment of the bonus except that the Conversion Privilege shall not be applicable to such increase.

The bonus will remain in effect until the first of July, 1956, and thereafter until notice to the Society.

Personal Interest Notes

Doctor and Mrs. B. J. D'Eon of Yarmouth, left on June 6th for a vacation to Montreal, Quebec City and the United States.

Rev. Frank Lawson, Mrs. Lawson (the former Doctor Jean Macdonald), and their sons, John and Keith, left early in May for a two months visit to Ireland, Scotland and England.

Doctor Milton W. O'Brien, Dal. 1955, son of Doctor and Mrs. W. C. O'Brien of Yarmouth, has opened an office for the practice of medicine in Lockport.

The marriage took place in Halifax on May 19th of Maura Rose Jamieson daughter of the late Mr. and Mrs. Herman James Jamieson and Doctor Charles Francis Brennan, Dal. 1955, son of Mr. and Mrs. Chapman J. Brennan, Niagara Falls, Ontario.

The marriage took place in Einz-on-the Danube, Austria, of the only daughter of the Right Rev. and Mrs. Wilhelm Mensing-Braum of Linz, Bishop of Upper Austria, and Doctor Franklyn Herbert Hicks, Dal. 1951, youngest son of Mrs. Henry B. Hicks and the late Mr. Hicks of Bridgetown, N. S. The civil ceremony was at 10.15 a. m. in the Upper Austrian Provincial Building. The couple were attended by Miss Liselotte Davogg, Urfahr, Austria and Doctor N. Seymour Black, Amherst, N. S. The church ceremony was performed in the Lutheran Church of Linz at 3.30 p. m. The couple were married by the father of the bride. The impressive ceremony was witnessed by a host of friends from Austria, Germany, England, Canada, France and Italy. Guests from Canada included Hon. Henry D. Hicks, Premier of Nova Scotia; Doctor N. S. Black, Amherst; A. A. Crowell, Bridgetown and Doctor and Mrs. H. W. Soby of High River, Alberta. After a honeymoon in Jugoslavia, the couple will reside in Linz prior to returning to Canada.

Doctor W. F. Verge, Dal. 1955, has announced his association in the practice of medicine with Doctor D. S. MacKeigan of Dartmouth.

Doctor R. O. Jones of Halifax, attended the American Psychiatric convention at Atlantic City in May.

The Bulletin extends congratulations to Doctor and Mrs. V. C. Starratt of Halifax on the birth of a son, Graham Cameron, on April 17th, and to Doctor and Mrs. C. R. B. Auld of Halifax on the birth of a daughter, Marsha Lee, on May 10th.

At the closing exercises at Ste. Anne's College, Church Point, held this spring, Doctor P. E. Belliveau of Metegan was honoured with a doctorate in history, Doctor L. F. Doiron of Digby medical science and Doctor J. E. LeBlanc of West Pubnico in literature.

Doctor P. C. Gordon, Dal. 1955, is practising his profession in association with Doctor J. C. Wickwire in Liverpool.

The marriage took place in New Glasgow of Doctor Matthew H. Swan, Dal. 1955, son of Mr. and Mrs. Clarence Swan of Harvey, N. B., and Gladys Maye Dickson, daughter of Mr. and Mrs. Charles Dickson of New Glasgow.

Doctor and Mrs. Donald H. MacKay and son, Donald, of Halifax, have left for Toronto where Doctor MacKay will continue his post-graduate training in radiology at Sunnybrook Hospital.

On May 21st at Halifax Doctor Arthur William Elliot, son of Doctor and Mrs. H. C. S. Elliot was married to Joan Isabel Smith, daughter of Mrs. M. I. Mothersill and the late Lieutenant-Colonel G. S. Mothersill, M.D., C.M., D.S.O., Ottawa. Doctor Elliot is at present taking post-graduate at the Neurological Institute in Montreal.

Doctor Horace Bernard Colford and Mary Elizabeth MacDougall, daughter of Ralph MacDougall, were married at Halifax on May 27th.

Obituary

The Bulletin extends sympathy to Doctor W. J. MacDonald of Truro on the death of his mother, Mrs. Alice MacDonald on April 17th in her eighty-fourth year, following several months of ill health; to Doctor C. M. Bethune of Halifax on the death of his mother, Mrs. Mary C. Bethune, widow of Doctor John L. Bethune, on April 17th in her ninetieth year, and to Doctor Robert M. MacDonald of Halifax, on the death of his mother, Mrs. May MacL. MacDonald, widow of Doctor Edward Murray MacDonald, on May 14th, in her eighty-first year.