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Duodenal and Gastric Ulcer*

NORMAN H. GOSSE, M. D.

Department of Surgery, Victoria General Hospital, Halifax, N. S.

WE start from the premise that Duodenal Ulcer is primarily a medical rather than a surgical condition, and that it becomes surgical by virtue of its taking on extra or unusual characteristics.

We believe that the great majority of duodenal ulcers can be made to heal by proper medical management, and that strict medical treatment should be continued until evidence of ulceration has disappeared or until the ulcer is deemed intractable. In the latter event it has almost certainly become surgical. Or again, the ulcer having disappeared and the patient discharged from the hospital, when he returns with a recrudescence of his symptoms and a recurrence of his ulcer, as is so often true in ulcers on the posterior wall, he is also surgical.

The close co-operation between the medical and surgical divisions of this hospital in this field makes for a very happy working arrangement, and the benefit to the patient is frequently demonstrated in the results. Our tendency in this part of the world, however, is towards conservatism, and if we can be criticized in our decisions, it is likely to be in the direction of carrying our conservatism a bit too far and withholding too long the benefits of surgical treatment. There is, however, much less of that as the results of surgery become apparent.

In the other complications of duodenal ulcer we come more readily into the realm of surgery:

1. Haemorrhage:

This is a common complication and one in which medicine and surgery come into most intimate contact. It is recognized that in persons before middle life, the best results in general, are from medical treatment, while in persons beyond middle life surgical treatment is much more likely to be necessary. It does not follow that one must resort to surgery in every case of bleeding ulcer in a person beyond middle life, but because it has to be considered in so many cases, we have a rule in this hospital that all persons beyond forty coming into the hospital with a history of haematemesis shall be admitted to surgery.

The greatest indication for surgery in haemorrhage in this hospital, however, would seem to be less in the acutely bleeding cases and more in the cases of recurrent haemorrhage. The following case is an example of this:

W. S., carpenter, 33, gave a history of "stomach trouble" for the past 10 years. His first positive diagnosis of chronic duodenal ulcer had been made after X-ray investigation July, 1946. He was then treated medically in a hospital but there is no record of the condition of the ulcer on discharge. After hospital he was continued on a modified diet. His history further shows that he was re-checked 2 months later and that X-ray still indicated active duodenal ulcer. Two months later he was again X-rayed and was said to have shown healing of the ulcer. He was symptom free. Re-checked in March this year, the findings were again good—symptom free and no ulcer

*Requested as part of a clinic given at the Dalhousie Refresher Course, October, 1947, and revised for this number of the BULLETIN. Several case reports have been omitted, and discussion increased.

shown; but on August 15th, 5 months later, he was admitted to V.G.H. with a history of having had two severe attacks of haematemesis, and a return of his ulcer symptoms.

Seen in consultation and because of his history—recurrence of the ulcer after treatment, repeated haemorrhage and high acidity—I advised operation. This was accepted.

There was a large mass in the duodenum with extension into the pancreas and considerable inflammatory reaction in the adjacent omentum. A resection of about $\frac{3}{5}$ of the stomach and a retro-colic isoperistaltic anastomosis of the Polya type was done. The post-operative course was uneventful and he was discharged in two weeks.

This man has twice returned for post-operative check-up. He has gained weight, is symptom free, and X-ray reports a normally functioning stomach.

In the cases of uncontrolled acute haemorrhage, gastro-duodenal resection is the treatment of choice, but occasionally conditions within the abdomen render this difficult; then, exposure of the ulcer and control of the bleeding by suture is definitely preferable.

2. Obstruction:

We attempt first to determine whether the obstruction is the result of organic stricture (sclerosing ulcer) or whether it is the result only of oedema and spasm. Here with the usual medical care and regular aspiration and lavage, improvement may be remarkable over a few days; or, one may fail to see any reduction at all in the degree of obstruction. The relief of obstruction in the former case also may not be complete or may be short lived. It may enable the X-ray to give a finer estimate of the lesion, but should not be regarded as necessarily obviating the necessity for surgery.

In the case of organic obstruction surgical relief becomes a necessity. How is that to be accomplished? By gastro-enterostomy or by gastric resection?

What is our position to-day with respect to gastro-enterostomy? We were born into medicine when gastro-enterostomy seemed to be the main method of treating duodenal ulcer. My old chief told me that Lord Moynihan in a personal conversation had recommended it to be done at the time of closing all perforated duodenal ulcers. Our tendency since then has been to limit this operation to persons requiring relief from obstruction, *in whom conditions do not admit of the more extensive procedure*. We admit that where acidity is definitely low, it may at times be employed in persons beyond 60 who might well stand partial gastrectomy, but it is not our practice in general to do so.

That gastro-enterostomy should not be employed as a method of choice in the average adult will be indicated by part of the case report given below under "Perforation." The danger is that of marginal ulcer. When for any reason gastro-enterostomy is done, we prefer to employ the posterior route, but we find that the anterior method functions just about as well when properly placed, and that without entero-enterostomy.

3. Perforation:

There is no doubt here as to the indication for surgery. The Levine or Harris tube is passed at once and the stomach kept empty while the patient is otherwise prepared for the operating room. Where it is possible, we still

use sutures to close the perforation and then cover it with omentum because we have always done so without observable ill effect. We have no hesitation, however, in trusting to an omental plug properly sutured in place where closure is difficult or impossible. Generally speaking our surgical troubles are over with that, but not always, as the following case will show:

H. R., farmer, 43, was referred October, 1944, as a case of perforated ulcer from a point about 40 miles away. He had suffered from dyspepsia for a year or more, lately with some vomiting. He was quite thin.

At operation perforated duodenal ulcer was found and closed. There was a great amount of scar surrounding the ulcer encroaching on the pylorus so as to produce a considerable degree of obstruction. The stomach was somewhat dilated. It was apparent that relief of the obstruction was also necessary and though we believe that in general no other operative measure should be undertaken in the presence of a perforation, there was here no choice. In view of the conditions that obtained, a gastro-enterostomy was performed—an anterior one. Three months of strict to modified medical treatment, and X-ray showed a good functioning stoma in the most dependent portion of the stomach, no evidence of ulcer, and a closed pylorus. He was symptom free. For a further two months he remained on his diet and felt well with considerable gain in weight (20 lbs.) His acidity was slightly above average. Then he began to eat practically everything and in due course developed symptoms, with tenderness now below the *left* costal margin. Return to a bland diet did not relieve him. He still had distress, eased by a small meal.

In this way with some remissions he went on for 15 months when, after a period of feeling pretty well, he perforated again. This time it was not the old but a new ulcer which had blown out and this time it was at the margin of the gastro-enterostomy. This new ulcer was simply closed, and recovery was without incident. He went home on the usual ulcer regime.

Here obviously is a man for whom gastro-jejunosomy was not a good operation—unless it were regarded as of temporary value only.

It was necessary now to consider the matter of his further treatment, and he was advised to return for gastrectomy in January, 1947. In the meantime I had met Doctor Dragstedt, the father of gastric neurectomy, in U. S. A. He told me that this was the type of case in which vagotomy did its best work—in spite of its contra-indication in *gastric* ulcers. On January 16, 1947 instead of the gastrectomy I resected his vagus nerves through the abdominal route. Following this there was a slowing up of gastric motility; later he had some diarrhoea but not severe nor prolonged. Three months after the neurectomy there was a normally functioning stoma, and gastric acidity was about $\frac{1}{4}$ its earlier concentration. Checked every three months he remains free of symptoms on a good diet, is working steadily and has gained a further 5 lbs.

This opens up the whole question of gastric neurectomy, and there have been few procedures devised that have seen at once so much enthusiastic support and so much hesitancy in accepting it as good. That it may have some good features no one doubts, but its more undesirable features are so serious as to make one hesitate to employ it as a procedure of choice in duodenal ulcer. (It is definitely contraindicated in gastric ulcer.)

An interesting estimate of the procedure has just been given by Dr. Walters of the Mayo Clinic in their "Proceedings" (Vol. 23, No. 2, January,

1948). His report shows that "of 50 cases of vagotomy—with or without other gastric operations there has been recurring proved ulceration in 6%, and that 12% of these patients have had persisting troublesome disturbances of motility lasting at least nine months." From this he suggests that "vagotomy has a very limited field, especially if we are going to confine it to the 14% of duodenal ulcer patients whom we now advise to undergo operation."

Perhaps as we go along we shall find that gastric neurectomy will have a real place in our armamentarium. It is doubtful, however, if it will fit into the high niche which its great enthusiasts have carved and are carving for it. One possible place for it might be found: in association with gastroenterostomy or otherwise for inoperable gastric cancer, for the relief of pain. I have no experience with it in that connection but one may speculate upon its possibilities.

Gastric Lesions:

Almost everything in connection with gastric ulceration is conditioned by the terrific mortality of gastric cancer, and our first effort to do something about it should be to stop, at once and for always, including both duodenal and gastric ulcers under the one generic name of "peptic ulcer." They are "a different breed of cats entirely," no matter how similar some of their features may be, and they must be completely dissociated if we are to improve the mortality figures in gastric cancer.

It is not so long since we were taught a great many differentiating features as between gastric ulcer and gastric cancer. How good are they?

1. *Take the age factor:* It may be true as pointed out by Roscoe Graham that ulcer symptoms are invariably present in patients under 60 who have ulcers of the stomach and that ulcers appearing after 60 are ulcerating cancers, but what about the young persons who get intractable ulcers of the stomach but die of gastric cancer? One such, a young woman, 33, a few days ago with symptoms of over a year's standing had far advanced gastric cancer.

2. *Then the factor of acidity:* The old teaching that there is loss of acidity in cancer while it tends to be high in ulcer is only true enough to make it dangerous. It is no longer a valid differentiating point.

3. *The size of the ulcer:* Again the generality that is expressed with respect to this finds so many exceptions that it has ceased to be valuable. Last week only, we explored a stomach in which there was a flat hard lesion the size of a nickel, 3" from the pylorus, on the anterior wall nearer the lesser curvature. The ulcer on the mucosal side was very tiny but, the liver was studded with secondary deposits. Biopsy showed adeno-carcinoma.

4. *The position of the ulcer:* It is said that lesions about the greater curvature are more likely to prove malignant and the same may be said for those in the region of the pylorus, but if in stating that it is suggested that, in contrast, lesions of the lesser curvature and other parts of the stomach are more likely to be benign, then the burden of proof is on the person who says such lesions are not malignant. We are meeting ulcers in such positions that are

malignant, and not infrequently. One person had such a lesion three and a half years ago. At that time she was in with marked hypertension and cardiac embarrassment. Her gastric symptoms were out of line with the circulatory condition and investigation showed an ulcer high on the lesser curvature. Something surgical was indicated and in view of her bad heart and very considerable fatness, we were disposed to be very conservative. A wide wedge containing the lesion was excised and microscopic examination showed it to be cancer. She still has her periods of cardiac decompensation, but as yet there is no evidence of recurrence of the cancer despite such "inadequate" treatment.

5. *Response to Medical Treatment*: Surely this should be the perfect criterion in clinical diagnosis! If the person conducting the case is sufficiently diligent perhaps it can be. If the patient is very closely watched, not only to see that he improves on medical care—that is almost sure to happen, even in cancer cases at first—but to see that *improvement is consistently maintained*. Here again, complete disappearance on X-ray is not enough. It is easy to produce cases in which the ulcer was said to have disappeared, the patient reporting great improvement; and upon which he is more or less dismissed; then a month, or several months later he is back, with his symptoms and a large crater which is found to be gastric cancer.

Our position then with regard to gastric lesions is to be as radical here as we are conservative in simple duodenal ulcer. In other words we are disposed to resect the stomach in practically all cases of gastric ulceration.

This, of course, represents a change in our earlier thinking and is a position which quite properly you may want to question. It is certainly not one to be taken without full appreciation of its significance. Let us then ask and answer some of the questions that are pertinent and see if the position can be justified.

The first is: What percentage of gastric ulcers become malignant. On this there has been a good bit of controversy and high figures have been given but the answer is: *certainly not less than 10%*.

(2) What is the mortality of gastric resection? An article by Dr. Gardner in the February number of the C.M.A.J. written from a Montreal hospital gives it as "5% in the hands of the very best surgeons rising to 20% with those less skilled." If that figure were at all correct, then our position would be much less tenable, and if we were not one of "the very best surgeons," quite unsupportable. It is a real surprise, however, that "the very best surgeons" of Montreal have a mortality of 5%, while to suggest that 20% is anywhere accepted, is to countenance malpractice! For this and for many other parts of the world such figures are very wide of the mark. The Mayo Clinic figures for 1946 and published January this year show:

Hospital Deaths all operations for Duodenal Ulcer	1.6%
" " " " " Gastric Ulcer	1.7%
" " " " " Gastric Cancer including a 14.3	
in total Gastrectomy	6.5%

Now while the total number of our cases is not as great as that of the Mayo Clinic our mortality figures are quite as good. Whether this is because

we are dealing with a younger age-group in the ulcer cases, or whether we are dealing with people of greater stamina in Nova Scotia has not yet been determined. The fact, however, is very clear to us that the risk inherent in partial gastrectomy—death as a result of surgery—as against the risk of the development of gastric cancer and its mortality is probably about 1:10; and that, therefore, our duty lies in the direction of more resections in gastric ulcer—certainly in those cases in which (a) X-ray evidence of ulcer persists or (b) symptoms persist in spite of negative X-ray.

The next question which presents itself is, what about those gastrectomized persons from one to ten years afterwards? Our follow-up here is not as nearly perfect as it could be, but we are not doing too badly. To-day we have presented to you five men who have had partial gastrectomy done at different times for various indications. One of these was almost a total gastrectomy. Our experience in general is that which you have seen and heard from them to-day. They eat well with few restrictions; they have gained weight; they feel well, and, remembering their pre-operative life are most appreciative of the change. Contrary to the old teaching, intractable anaemia is not a sequel—not, at least, in those whose protein intake is maintained at anything like a normal level.

One of the interesting things to us about these cases is their smooth post-operative course—indeed we have come to expect as smooth a course with them as we do in the average appendix, and often find it more so. I wish, however, to make the point that that is no accident. I mentioned early the co-operation with medicine in the selecting of cases for surgery but from that point to the end of post-operative care the team-work widens greatly. First come our residents and interns under whose activity the constitutional ravages of the disease are repaired—fluid and electrolyte and vitamin balance restored, the blood quality raised to and maintained at the proper level both before and after operation, and, pre-eminently, the protein level raised. Nor should too much reliance be placed on the serum-protein level as reported by the laboratory. If, as obtains in many of these persons, they have been living on a diet very low in protein, it will assist materially if that is recognized early and, where possible, excess of protein be supplied, regardless of blood-serum figures.

The great improvement in anaesthesia in recent years has made a further definite contribution to the smoothness of the immediate post-operative course, and the co-operation of the nursing and dietitians' services, to its satisfactory continuance.

As to the place of the surgeon in these cases, there is little to be said. The mechanical business of taking out a large part of the stomach and doing the odd bit of sewing around it adds nothing to this story that is new. Hofmeister modified Polya and that modification is widely used. We have followed consistently the Polya procedure and do not meet any of the sequellae said by some clinics to ensue from its use, though we have looked diligently for them. The results are good. Perhaps by now it should be assumed that in Nova Scotia we have better material to work upon!

It will be seen then that the place the surgeon occupies as a co-ordinator of all those other activities—surrounding the pre-operative preparation and the post-operative care—is certainly not subordinate to that which he

occupies in the operating room; for assuming reasonable technical skill his mortality and morbidity figures will reduce in direct ratio as he succeeds in restoring the body to normal physiological equilibrium both before and after the operation.

Summary

The indications for surgery in duodenal ulcer are reiterated.

The difference between duodenal and gastric ulcer is stressed and a plea made for earlier resort to surgery in the stomach cases. Justification for this plea is established by the results of the practice, and measures contributing to the low mortality are indicated.

NOTICE

The annual meeting of The Medical Society of Nova Scotia will be held at Keltic Lodge on September 14th, 15th and 16th. Members are advised to secure accommodation early through the President, Doctor Eric W. Macdonald of Reserve, as accommodation is limited.

H. G. GRANT, Secretary.

Cancer Research

R. W. BEGG, M.Sc., M.D.

Cancer Research Laboratory, Department of Biochemistry
Dalhousie University

Introduction

CANCER research has become a distinct discipline with its own literature, techniques peculiar to the subject and men and laboratories devoted entirely to its problems. It has made fundamental discoveries which now give us an embarrassing number of the "causes" of cancer as it is found in the laboratory.

It is the purpose of this article to review briefly the history of cancer research and to consider some of the problems with which it is concerned at the present.

Historical

The observation of Potts that chimney sweeps were prone to cancer of the scrotum was more of a contribution to industrial cancer than to cancer research. This is not to belittle Potts acuity, nor to deny that the suggested correlation between cancer and soot was one of the stimuli that eventually led to the discovery of the chemical carcinogens. But cancer research is concerned with the study of cancer under controlled conditions, usually requiring observation and experimentation on cancer in laboratory animals. Distinction should be made between a clinical observation, which may be the starting point of fundamental research, and the conduct of the research itself.

In the nineteenth century attempts were made to transplant human cancers to animals, but met with inevitable failure. With the exception of the ocular transplants of certain tumors the species barrier cannot be overcome. It was known that animals had cancer and studies of these tumors showed that they behaved in all respects like cancer in the human. Here then was material which could be investigated in the laboratory and would permit the study of malignant cells.

To await the appearance of tumors in a rat colony was a tedious process and severely limited the supply of material for investigations. Attempts were made to transplant tumors within a species, and finally certain rat tumors "took" in the hosts. Only a small number of the attempts were successful, and it is now realized that this work was hindered by a lack of knowledge of genetics. Comparatively few tumors are capable of growing in other animals for any great number of transfers unless the strain of animals being used is genetically homogenous. To-day there are available strains of mice and rats which have been inbred for many generations, and in which transplants of normal tissue as well as tumors will survive.

During this period of struggle against genetic difficulties many of the experimental observations attributed to factors which were causing a regression of tumors actually were due to genetic incompatibility. Much of the

cancer research prior to 1929, when Woglom published his classic review on transplantable tumors, is useless to-day for this reason. It is a disturbing thought to consider that perhaps to-day some other factor is being overlooked, a factor as important and as invalidating as was the genetic factor to the workers of the early part of this century.

Despite these limitations many fundamental observations were made in the early years of this century. Bashford and Murray working in the Imperial Cancer Research Laboratory in London made extensive observations on the appearance and invasive growth of rat tumors. That they did not succeed in discovering the factors which delineated a normal cell from a cancer cell is not remarkable. No such difference, apart from biological behaviour, which can consistently differentiate a normal from a malignant cell has been found to this day.

Malignant tumors had been observed in species other than mammals. Sarcoma were known to occur in fowl, and in 1910 Peyton Rous demonstrated that these tumors could be transferred to other fowl by the injection of a cell-free filtrate. Thus began the controversy as to whether or not all tumors can be attributed to a filterable virus. Though the work of Rous has been confirmed in other fowl tumors, to date no malignant tumor has been found in mammals that can be transferred to other animals by a cell-free filtrate. Benign skin tumors in rabbits of virus causation are known, but these require application of a chemical carcinogen before they exhibit malignant tendencies, and then, oddly enough, the virus cannot be recovered.

Prior to 1915 cancer workers had tumor material available but had to await the appearance of spontaneous tumors in their colonies, or to work with the transplantable tumor. The latter have limitations, and work with transplantable tumors should be checked with spontaneous or chemically induced tumors.

From the beginning of laboratory work on cancer attempts had been made to cause the appearance of tumors in animals. The transplantation of a tumor is merely the continued growth of the original tumor cells in the new host. It was not until 1915 that the Japanese workers Yamagiwa and Ichikawa succeeded in producing a skin cancer in rabbits by the continued application of coal tar over a long period of time. In 1922 Passey produced malignant growths of the skin of mice by applying an extract of soot—final proof of Potts' postulation in 1755. From this work arose a method of assaying materials for chemical substances that would produce cancer in animals, that is painting the material on the skin of the mouse and seeing if it would produce a cancer.

Coal tar is a mixture of chemicals. It was natural that an attempt should be made to ascertain the chemical nature of the material in tar that was responsible for the production of cancer. The problem was difficult. Not only was there the chemical problem of separating the tar fractions, (and the active substance might be present in very small amounts), but also the only method of assay for the cancer-producing chemical was by painting the substance on the skin of mice and waiting to see if a cancer would develop. Before one could say that the particular substance had no activity the application had to be continued for periods in excess of a year.

The observation of Hieger that the more active constituents of tar fluoresced under ultraviolet light, i.e. gave off certain colors when exposed to

ultraviolet, greatly simplified the problem. Finally Kennaway's group in London, of which Hieger was a member, isolated the carcinogen 3:4 benzopyrene from coal tar. This is one of the many pure chemical substances which will cause the appearance of a malignant tumor when painted on or injected into an animal.

These chemical carcinogens are most useful tools in the laboratory to permit the induction of tumors at will, and to study the carcinogenic process from beginning to end. But caution must be used in transferring these studies to human cancer. The types of animals that are susceptible to chemical carcinogens are limited, and different species show different responses. The mouse is very susceptible, the rat and rabbit less so, and the guinea pig relatively resistant to chemical carcinogenesis. Even among mice different strains show different degrees of response to carcinogens. Though some industrial chemicals are known to cause malignancy it would be wrong to assume that because a substance causes cancer in an animal the same substance will cause a cancer in man.

The work of Maud Slye in Chicago is well known, and frequently quoted in support of genetic influence in cancer. Slye maintained a large colony of mice under ideal conditions so that as many as possible would live to the cancer age. All deaths were autopsied and careful records kept of the incidence and type of tumors in the mice. An attempt was made to breed for high and low cancer incidence and, though Slye's conclusions are not completely acceptable to-day, there was no doubt that genetic factors were playing a part in the development of cancer in the mice.

Slye's work has been objected to on the grounds that she was not dealing with pure line mice, and thus the genetic picture was confused. The conception of pure line mice has arisen from the work of the geneticists who bred mice by brother to sister mating over many generations, selecting the mice for certain characters as the breeding continued. They were able to confirm many of Slye's findings, but in all these experiments there was difficulty in interpreting the results of crossing a mouse from a high cancer strain to one from a low cancer strain. This will be considered in the discussion of current research.

Various strains of mice that have been inbred for many generations are now available and in these the incidence of various tumors is known. Such mice are of value to those interested in the genetics of mouse tumors and also to the cancer worker in general. Experiments can be conducted with strains of mice which will respond as a group with predictable actions, e.g. in the use of mice for skin testing of carcinogens a strain which has a very low incidence of spontaneous tumors can be used. Thus the appearance of tumors in the group is strongly suggestive that the tumors arose from the action of the chemical, and were not of a "spontaneous" origin.

For those who wish to transpose the results of genetic work in mice to the clinical field consideration should be given to the degree of inbreeding necessary to produce consistent response. To produce a "pure strain" of mice brother to sister mating, or son to mother or daughter to father mating must be maintained for some twenty to thirty generations before the strain may be regarded as moderately homogenous. Where in medicine can one find inbreeding to this extent? It should be remembered that this work is done, not to transfer the results to the clinic immediately, but in an attempt

to isolate the various factors leading to the development of a tumor in animals. When the complete story is known then the real benefit to human cancer should be realized.

The modern phase of cancer research might be regarded as dating from the time when pure line mice and chemical carcinogens became available in quantity—approximately within the last fifteen years. Not only were these tools inherited from the early workers but also much of the ground work as to the characteristics of animal tumors and many of the ideas that are the stimuli for present day experimental work. Those concerned with cancer research are ever conscious of the debt they owe to the men who gave so much time and patient effort towards the initial attack on the problem. It is not a reflection on their ability, but rather a comment on the complexity of the problem, that many of their experimental results have raised more questions than they have answered.

Current Research

Milk Factor. Mention has been made of the work of Slye. Gradually a suspicion was entertained that something more than an hereditary factor was involved in the explanation of mice of high and low mammary tumor incidence.

Loeb had shown that if female mice were ovariectomized in the early months of their life they did not develop breast cancer. This was confirmed and is not surprising in that the breast in this circumstance does not develop. Lacassagne in Paris subsequently proved that mammary carcinoma could be induced in the males of high mammary tumor strains by the continued injection of estrogens in large doses.

Thus there was evidence in animals that both hormonal and hereditary factors were involved in the genesis of mammary tumors in mice but the influence of their combined effects failed to explain the observations on the transmission of the breast tumors.

Pure strains of mice were at hand exhibiting both high and low incidence of the mammary tumors. What would happen if mice of high and low strains were crossed—what would be the incidence of breast tumors in the offspring? It was observed that the young followed the tumor incidence of the mother. That is, there was evidence that an extra-chromosomal factor was at work, and that the inheritance of susceptibility to mammary tumors did not follow Mendelian patterns.

Workers in both the United States and in Holland conceived the idea that possibly some factor might be ingested by the young with the milk of the mother, since the susceptibility to breast cancer seemed to be passed along through her. To test this thesis young from a low cancer strain mother were weaned to a female of a high cancer strain. Observation of their subsequent development confirmed the theory that something was present in the milk—most of the mice developed breast cancer.

Here then was a highly important observation. Instead of breast cancer in mice being completely controlled by an hereditary factor associated with the chromosomes it was influenced by some unknown factor in milk. It must be emphasized that the hereditary factor is necessary. One of the parents of the mice must come from a high cancer strain, and the hormonal factor

is still required. Cancer of the breast in mice requires three known factors for its "spontaneous" occurrence—an hereditary factor, an hormonal factor, and this third substance which has been called the "milk factor" or "mammary tumor inciter."

Much work is presently being done to ascertain the nature of this factor. It is known to occur in the blood and tissues, as well as the milk, of certain mice. Only a small amount is necessary to decide whether or not a test mouse will develop a mammary cancer. Though not proven there is an accumulation of evidence which suggests that the factor is a virus.

The suggestion that a virus is involved in the aetiology of mammary tumors gave a resurgence to the theory of the virus causation of cancer. But though careful search has been made no similar factor can be associated with the development of other spontaneous tumors, nor can it be shown to be involved in chemically induced tumors.

The only method presently available to detect the milk factor in mice is the subsequent development of breast cancer in test mice. This is a tremendous drawback to experimentation for it takes a year or longer to be able to interpret the experiments set up to-day.

The conception of a mammary tumor inciter passed on in the milk of the mother has naturally raised the question of the advisability of stopping the breast feeding of babies, particularly when there is a history of breast cancer in the mother's family.

It would appear that the present evidence is not strong enough to advocate this serious change in paediatric routine. In the laboratory attempts to demonstrate evidence of this factor in species other than mice have failed. Competent judges feel that an observation confined to highly inbred members of one species of laboratory animals cannot be directly applied to the heterozygous human race.

In certain centres large scale experiments have been set up to determine the subsequent fate of the breast and bottle fed babies of mothers who do and do not develop cancer of the breast. This, of course, is a long term experiment as the evidence cannot be accumulated until the offspring have passed the breast cancer age.

Carcinogens. Following the isolation of the active chemical constituents from coal tar hundreds of naturally occurring and synthetic chemicals were examined for their activity as carcinogens. The search was for some common group or structure which would explain the action of these chemicals. Despite the fact that over a hundred pure chemical substances are known to possess carcinogenic activity no factor common to all has been found.

This has turned attention to the fate of the chemicals in the body. Is the explanation of their action the way in which the body metabolises the substances? Though much is being learned as to the metabolism of the carcinogens again no direct answer is available. The multiplicity of the carcinogens and their variation in chemical structure suggest that all may act through some final common path which induces the carcinogenic change. Some of the theoretical possibilities are combination with tissue enzymes, production of mutations of normal cells and the unmasking of cell viruses.

Initially it appeared that the carcinogens produced their effects locally. If painted on the skin carcinoma were produced, if injected subcutaneously

sarcoma resulted. It is now known that some of the carcinogens produce their effects at a distance. Azo dyes can be fed that produce tumors of the liver; skin painting of carcinogens at different sites, to avoid the occurrence of a carcinoma, may lead to the induction of leukemia in certain strains of mice. One of the newer carcinogens can produce malignant change of several distant tissues if injected subcutaneously. The explanation of this selective action of the carcinogens is one of the current problems of cancer research.

Hormones. The relation of mammary cancer to hormones in mice has been mentioned. Tumors of the pituitary gland, uterus, cervix and testicle as well as leukemia have been produced in mice by the administration of hormones. It is well established that certain tumors are induced by relatively large doses of hormones, chiefly the estrogens. But here the hereditary factor is also at play, in that these tumors cannot be produced in all strains of mice.

The place of orchidectomy and the administration of estrogens in the control of carcinoma of the prostate does not require discussion. Though only a palliative measure it is welcome for the relief it brings to patients, and is a stimulus to the researcher in that at least some measure of control can be maintained over a tumor for a short time. This gives hope that eventually a more permanent control may be achieved.

There is a fundamental lesson to be learned from this work which ranks with its application in the clinic. That is, all malignant tumors are not autonomous. The regression of the prostatic cancer cells when denied the androgenic hormones shows that they are in a measure at least dependent upon a normal control mechanism. Work in the laboratory with a malignant testicular tumor and the influence of diet on the development of tumors in laboratory animals had given indication that the "autonomy" of tumors was a relative matter. But Huggins work was the first clear-cut indication in the human that a malignant tumor would regress when denied normal hormonal support. The eventual reactivation of the tumor does not contradict this dependence. It is well within the bounds of reason to suppose that the tumor is reactivated by a new supply of androgens supplied by the adrenal gland. In the opinion of Rous: "The significance of this discovery far transcends its practical application; for it means that thought and endeavor in cancer research have been misdirected in consequence of the belief that tumor cells are anarchic."

Though not as well established as the estrogenic therapy of carcinoma of the prostate there are indications that in women the exhibition of testosterone can give some control over bony metastases of cancer of the breast, and estrogens cause temporary regression of the primary tumor and the soft tissue metastases.

The proven use of the estrogens in the treatment of prostatic cancer and the suggestion of the use of the estrogens and androgens in breast cancer are perhaps not so startling. These tissues have a normal dependence on hormones, and the only surprise has been the observation that certain malignant derivatives of them retained this dependence. But what of the future of hormonal therapy? Will it be confirmed to those tissues normally dependent on hormones for special functions? It has been shown that the incidence of leukemia in mice can be increased by the exhibition of estrogens, and there has been a suggestion from the clinic that certain tumors such as the inoperable carcinoma of the larynx may give some response to hormones. It would be

unwise to say that the future of the hormonal therapy of cancer was "full of promise." But the results of both fundamental and clinical investigation of the influence of hormones on the malignant process can be anticipated with interest.

Diagnosis and Chemotherapy. These two aspects of cancer research can be grouped because in both progress is limited by the lack of the fundamental knowledge of the difference between the normal and the malignant cell. Since the biological behaviour of the cancer cell is the only factor on which the cell can be differentiated from the normal it is not surprising that, with the possible exception of the microscopic diagnosis of cervical cancer, no reliable cancer test is available. Immunological tests have been attempted, but their failure is not surprising when it is realized that no difference has ever been found between the proteins of normal and cancerous cells. Enzyme concentrations in the blood and urine have been the basis of other tests and here again failure is accepted when it is understood that no invariable difference between the enzyme concentrations of normal and malignant cells has been noted. Certain empirical tests are under investigation and may be of use; but the finding of a diagnostic test for cancer, comparable to the scope and usefulness of the Kahn test, will remain at the unpredictable will of empiricism until our ignorance of the properties of the malignant cell is lessened by fundamental investigations in the laboratory. Only when we know some property, apart from biological behaviour, by which the cancer cell is at variance from the normal will we have a rational basis for a cancer test.

Unfortunately the same situation holds in the field of treatment. In rational chemotherapy an attempt is made to find some factor in which the cell to be destroyed differs from the normal cell, and use is made of this knowledge to kill the foreign cell, leaving the normal cell unharmed. It is the lack of the knowledge of this difference which makes the pursuit of a chemical efficacious against cancer so difficult and laborious. Instead of being able to suggest that a certain group of chemicals should have a powerful effect on the malignant cell the chemotherapist is confined to attempting the use of all possible drugs and many improbable ones.

It is possible that at any time someone may stumble upon a reliable test for or successful treatment of cancer—and it is to be hoped that this will be the case. But time and lives have been lost waiting for the results of an inspired "hunch" to circumvent our ignorance. Even if a practical method were produced by empirical means it could not be used intelligently and to the full unless the clinician were possessed of an understanding of the mode of action of the drug.

In addition to the hormones certain other chemotherapeutic substances have been shown to have some effect on the malignant process—urethane, the nitrogen mustards and radio-active compounds have controlled certain cancers to a degree but the effectiveness has not been in excess of more established means such as radiation therapy. The value of such research to date has been the fact that a measure of control was obtained. This has been grounds for the hope that with persistent research the degree of control will be extended until at last medicine will be possessed of an agent which will destroy the cancer cell wherever it may be found.

Summary

The above had been an attempt to present the background of current cancer research and some of the problems with which it is concerned.

It will be appreciated throughout the terrible ignorance under which cancer research is conducted. This is a legacy of the time when it was assumed that anyone with a mouse and a syringe was capable of conducting such research—an attitude that has given current research the burden of a literature full of nonsense, and the task of refuting theories grounded on poor experiments.

It is now realized that such methods are inadequate and current research is being conducted in a large measure by men trained in the techniques of modern research, working singly or in groups, and well supported with assistants and equipment. It is to these men that we must look for fundamental information concerning the development, growth and properties of the malignant cell, and for the means of applying this information not only to the control of the established cancer, but also to the prevention of cancer in mankind.

The National Gastroenterological Association will hold its Thirteenth Scientific Session at the Hotel Pennsylvania in New York City on June 7-10, 1948.

In response to popular request the program this year will again for the most part consist of Symposia and there will be one Panel Discussion.

The program for the first three days will be at the Hotel Pennsylvania and will consist of Symposia on Gastroduodenal Ulcer; Ulcerative Colitis; Jaundice and Metabolism, Nutrition and Allergy. The Panel Discussion which will be followed by a "question and answer" period will cover the topics of Diabetic, Tubercular, Psychosomatic and Cardiac Manifestations in Gastrointestinal Diseases.

The fourth day of the session will be devoted to a clinical day at cooperating hospitals in New York City.

At the Annual Banquet to be held on Tuesday evening, June 8, 1948, the winner of the National Gastroenterological Association's 1948 Cash Prize Award Contest for the best unpublished contribution on Gastroenterology or an allied subject, will receive the prize of \$100.00 and a Certificate of Merit.

Further details and a copy of the program may be obtained by writing to the Secretary, National Gastroenterological Association, 1819 Broadway, New York 23, New York.

The Relief of Pain in Terminal Cancer

M. G. WHILLANS, M.D.*

THE problem of relieving pain for more than a few weeks is one that is usually appreciated fully only by those who have been directly concerned. It is common to say that in a case of hopeless cancer, we don't have to worry about addiction,—the main thing is to make the patient comfortable. Unfortunately, the development of addiction to a drug and the increasing difficulty in relieving pain with that drug are parallel problems which apparently cannot be separated. We may not be concerned whether the patient becomes addicted, but if at the same time the side actions and toxic effects of the drug are becoming serious, and if large doses of the drug are not giving relief, the problem of withdrawing the drug is indeed difficult. By careful management we may be able to avoid such a dilemma, and it is the purpose of this paper to indicate a suitable plan by which pain-relieving drugs may be employed to the best advantage.

Are Drugs Necessary?

It is wise to consider other methods of relieving pain, and to postpone the use of drugs until other methods fail.

Occupational Therapy. Most patients are happier and less dependent on drugs if they are kept busy with some useful work. If possible, a long-term project of practical nature should be kept on the go with skilful encouragement. The need for drugs and extra nursing attention may thereby be much reduced. Cheerful surroundings assist in diversion, and a fresh coat of paint and an airy room should be advised. The room should be near a bathroom, and if there is a choice, on the ground floor.

During the terminal stages, when extra nursing care and special procedures are necessary, the patient should be in hospital.

X-ray Therapy. Consultation with a competent radiologist may prove invaluable. Much pain relief of long lasting character can often be secured with X-rays, even though the progress of the tumor may remain unaffected.

Surgery. Permanent relief can sometimes be secured as a result of the judicious sectioning or injection of sensory nerves to the area involved. Relief obtained by this procedure is much superior to that given by drugs, and where a prolonged siege is anticipated, it is probably the method of choice.

Selection of Drugs

Four classes of drugs can be considered:

- (a) *local anaesthetics*;
- (b) *analgesics*, which simply relieve pain, usually of mild character only;
- (c) *hypnotics*, to induce sleep, and sedatives (which are usually just hypnotics in smaller doses), to calm and relax;

*Department of Pharmacology, Dalhousie University.

(d) *narcotics* which combine analgesia with the ability to induce sleep.

There are other drugs which often play an important role. *Procaine* (Novocaine) injected slowly intravenously in weak solution (0.1 to 0.2%) has a pronounced analgesic effect which may last for many hours. *Alcohol*, of course, has well-known analgesic powers. Its ability to relieve pain and to induce a feeling of well-being has not been exploited sufficiently in therapeutics. For the patient who is habituated to it, alcohol may be needed during the more difficult phases of his downhill course. *Cobra venom* has been advocated but the proof of its value is not yet forthcoming.

(a) *Topical applications of local anaesthetics* may give considerable relief and often obviate the necessity for giving other medication for pain. The liberal use of 7% *benzocaine* (ethylaminobenzoate) ointment to painful, ulcerated lesions is safe and not associated with problems of addiction or tolerance. *Nupercaine* also is effective, though not as safe when used extensively on denuded surfaces. The prescribing of ointments containing opiates is irrational, as the opium alkaloids have no appreciable local anaesthetic action.

(b) *Analgesics*. We have no analgesic drug which will relieve severe pain, which is non-addicting and to which the patient will not acquire tolerance. Sooner or later then, if the patient has much pain, we have to use drugs which have these disadvantages. While we cannot expect much from the *salicylates* and *coal tar compounds*, they are worth a trial as occasionally they are surprisingly effective. Tolerance generally does not develop with these drugs, and if the patient is not getting relief from full doses, we can conclude that the pain has become too severe to be relieved by them. Various combinations of acetylsalicylic acid with and without codeine may be tried, though there is no proof that there is summation or synergism between analgesic drugs. Combinations of analgesics with small doses of hypnotics (sedative doses), however, are of known value. (It is worth a reminder here that a good night's rest does much to improve the patient's ability to withstand discomfort. We should not neglect the means to ensure sleep every night.) These analgesics, and codeine, cannot be expected to relieve anxiety or calm the patient, and the needed sedation can be supplied by phenobarbital gr. 1/4 three times daily, with a larger dose at night to promote sleep.

Codeine is decidedly more powerful than the salicylates and coal tar compounds, and can be relied on to relieve most pain of moderate severity. It has disagreeable side effects indicative of its derivation from morphine (codeine is methyl morphine), and it should cause no surprise that constipation, bad taste in the mouth, nausea and a "loggy" feeling may trouble the patient who is being dosed frequently with this drug. While codeine can cause addiction, the dangers of this are slight, and we can usually withdraw the drug without creating a turmoil in the patient. If codeine fails to relieve the pain, more potent and more definitely addicting drugs are then necessary. *Meperidine hydrochloride* or "*Demerol*", is likely to be the next drug chosen, and though it has very little more analgesic action than codeine, it is a much more effective drug. This is because it makes the patient more indifferent to his pain and often increases his sense of well-being. By comparison with the opium alkaloids (meperidine is a synthetic related to atropine) this drug is less likely to cause respiratory depression, constipation or nausea and vomit-

ing. Because of its antispasmodic action it is particularly useful where smooth muscle spasm is a factor in causing pain. Alone, or in combination with one of the hypnotic drugs, meperidine has proven valuable and safe. The problems of addiction, tolerance and withdrawal may be less serious than with the opiates. For severe pain, however, it is generally inadequate.

The decision to use *morphine* or one of the other opium narcotics on a patient, should be taken only after other methods and drugs have been shown inadequate. Though these drugs are the most powerful we have and are a great boon when used properly, their disadvantages are serious, and once administration has fairly begun, withdrawal may be too much to impose on the patient.

Morphine's well known undesirable side-effects require no elaboration here. The nausea, vomiting, respiratory depression and abnormal sensations in the skin, are not easily obviated, but the constipation may be minimized by the regular administration of a suitable cathartic, such as sodium sulphate or cascara.

In spite of the most judicious use of these drugs, larger and larger doses are required as tolerance develops. When this becomes apparent, it is wise to notify the R.C.M.P.* that you have such a case on your hands and that you anticipate the need for larger amounts as tolerance increases. A complete record should be kept of the drugs used, with pertinent details. (Copies of all prescriptions serve the purpose well.)

The hypnotic drugs go well with opiates, and frequently allow the patient to get along on much smaller doses of them.

Tolerance develops hand in hand with **addiction**, and about two weeks of regular dosage usually shows the need for larger doses to control the pain. This process is speeded up by regular "by the clock" dosing, and especially by short-interval schedules. If the pain is not being controlled, it is better to increase the amount in each dose rather than to shorten the interval between doses. By stopping the drug for a few days at a time it is possible to prevent or at least to slow up the development of tolerance. In any event, the degree of pain should be the guide to the time and amount of drug required. Pain in cancer varies greatly from hour to hour and from week to week, and it may be possible to stop all drugs for hours or days. It is sound practice to give the patient a "blank" (placebo) dose once in a while, in order to study the amount and character of pain the patient is having, and the degree of dependence established. The early symptoms of addiction will appear within 8 hours after withdrawal;—yawning, restlessness, malaise, anorexia, followed by the rest of the withdrawal syndrome.

Remove all timepieces from the patient's vision and for as long as possible give all drugs by mouth or by rectum, as the hypodermic needle is associated in the lay mind with narcotic drugs. It is just as well to keep the patient ignorant of the drug he is receiving, and also the person administering it, too, if possible.

There is considerable *cross-tolerance* among the opium alkaloids, so that we cannot count on gaining anything by switching from one drug to another.

New Drugs

What promise do the new analgesic drugs give us? As yet, no drug meets all of the basic requirements, and none have an overall superiority

* or write direct to Narcotics Division, Dept. National Health and Welfare, Ottawa.

The Department of Veterans' Affairs

Requires

Junior Internes

Senior Internes

Assistant Residents

Residents

The Department of Veterans' Affairs now offers excellent opportunities to graduates in Medicine for postgraduate training and experience in its hospitals. Graduate interne training programmes have been organized in D.V.A. Hospitals with the cooperation and assistance of the Medical Schools of Canada, and adequate facilities exist for clinical, laboratory and radiological examinations. Although D.V.A. Hospitals do not maintain Services in Obstetrics, Gynaecology and Paediatrics, a high standard of graduate interne training in Medicine and Surgery is available. In the larger hospitals training in special branches of Medicine or Surgery may be obtained.

Since the end of the war interne appointments in D.V.A. Hospitals have been reserved for veterans desiring further training before entering general practice or to qualify them for admission to the Examinations of the Royal College of Physicians and Surgeons of Canada. Interne appointments are now open to recent graduates in Medicine. Preference will be given to those who have served a rotating internship. At the present time D.V.A. Hospitals have an adequate number of patients and a sufficient variety of clinical material to provide a high standard of training in Medicine and Surgery and in certain specialties for the greater part of the five-year course of training required for admission to the Examinations of the Royal College of Physicians and Surgeons of Canada.

Interne appointments in D.V.A. Hospitals are available in the following classifications to those graduates of approved Medical Schools who have the minimum requirements indicated:

Classification	Remuneration (Per annum)	Qualifications
Junior Interne	\$1,080	Graduation from an approved Medical School
Senior Interne	\$1,800	Completion of a minimum of one year's approved postgraduate training
Assistant Resident	\$2,700	Completion of a minimum of two years' approved postgraduate training
Resident	\$3,300	Completion of a minimum of three years' approved postgraduate training

Note

1. Appointments will in all instances be effected at the minimum salary of the classification, subject to concurrence by Head Office. In exceptional instances a higher rate of remuneration may be considered where prevailing local conditions warrant such action.

2. Internes and residents will be required to "live in" where quarters are available through the Department and a maximum deduction of \$15.00 per month will be made for the quarters provided. All internes and residents

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will be required to pay for meals obtained at the hospital at a nominal charge per meal. Uniforms and laundry will be supplied by the Department.

3. Departmental hospitals offer appointments as indicated in the attached Schedule.

4. Graduates in Medicine wishing to apply for an interne appointment in a D.V.A. Hospital for the year July, 1948, to July, 1949, should apply directly to the Superintendent of the D.V.A. Hospital in their District or to the District Medical Officer of the District in which the hospital is located. Where applicants have equivalent qualifications the veteran with overseas service will be given prior consideration for appointment.

5. Application Forms are available through the Departmental representatives listed below and should be forwarded for approval not later than April 15, 1948. If all appointments are not filled through applications received by this date late applications will be accepted.

Local Representatives

District Medical Officer, Camp Hill Hospital, Halifax, N. S.

Dr. C. MacLeod, Superintendent, Camp Hill Hospital, Halifax, N. S.

Dr. J. A. Noble, Director of Surgery, Camp Hill Hospital, Halifax, N. S.

Dr. K. A. MacKenzie, Assistant Director of Medicine, Camp Hill Hospital, Halifax, N. S.

Dr. E. A. Fergusson, Superintendent, Veterans' Hospital, Cornwallis, N. S.

Dr. J. F. Bates, Medical Officer, Cape Breton Sub District, Sydney, N. S.

District Medical Officers

Dr. C. J. MacDonald,
Camp Hill Hospital, Halifax, N. S.

Dr. Jules Mercier,
15 Blvd. des Capucins, Quebec, P. Q.

Dr. W. H. Pedley,
Aylmer Bldg., Slater St., Ottawa.

Dr. A. C. Norwich,
55 York Street, Toronto, Ont.

Dr. J. L. Lamont,
Commercial Building
169 Notre Dame Ave. E., Winnipeg.

Dr. R. M. Scott,
London Building, Saskatoon, Sask.

Dr. J. G. Wright,
New Regina Trading Co. Bldg.,
Scarth Street at 12th Avenue,
Regina, Sask.

Dr. R. J. Dolan,
56 St. Germain St., Saint John, N. B.

Dr. T. E. Kirk,
379 Common Street, Montreal, P. Q.

Dr. F. L. Reid,
Richardson Bldg., Kingston, Ont.

Dr. S. O. Rogers,
201 King Street, London, Ont.

Dr. D. R. Easton,
Veterans and Mewburn Pavilion,
University Hospital, Edmonton, Alta.

Dr. J. L. Mulloy,
Colonel Belcher Hospital, Calgary.

Dr. D. W. Johnstone,
1231 Haro Street,
Vancouver, B. C.

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Appointments Available

*Camp Hill Hospital, Halifax, N. S. (600 Beds)	General Medicine General Surgery Urology E.E.N.T.	Junior or Senior Internes Assistant Resident or Resident Junior or Senior Internes Assistant Resident or Resident Assistant Resident Assistant Resident
Lancaster Hospital, Saint John, N. B. (400 Beds)	General Medicine General Surgery Urology	Assistant Resident Junior or Senior Internes Assistant Resident Junior or Senior Internes Assistant Resident
*Quebec Veterans' Hospital, Quebec, P. Q. (300 Beds)	General Medicine General Surgery E.E.N.T.	Junior or Senior Internes Junior or Senior Internes Assistant Resident or Resident Senior Interne or Assistant Resident
Veterans' Pavilion, Ottawa Civic Hospital, Ottawa, Ont. (200 Beds)	General Medicine General Surgery	Junior or Senior Internes Junior or Senior Internes
Kingston Veterans' Hospital, (250 Beds) Hotel Dieu, (50 Beds) Kingston General Hospital, (100 Beds) Kingston, Ontario.	T.B. Medicine General Medicine General Surgery	Assistant Resident Senior Interne Senior Interne
*Deer Lodge Hospital, Winnipeg, Man. (800 Beds)	General Medicine General Surgery	Junior or Senior Internes Junior or Senior Internes
Veterans' Wing, Regina General Hospital, Regina, Sask. (186 Beds)	General Medicine General Surgery	Junior or Senior Internes Junior or Senior Internes

*Hospitals so indicated are "Approved" by the Canadian Medical Association.

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Saskatoon Veterans' Hospital Saskatoon, Sask. (175 Beds)	General Medicine General Surgery	Junior or Senior Internes Junior or Senior Internes
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*Colonel Belcher Hospital, Calgary, Alta. (250 Beds)	General Medicine General Surgery	Junior or Senior Internes Junior or Senior Internes
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*Shaughnessy Hospital, Vancouver, B. C. (1,100 Beds)	General Medicine T. B. Medicine	Assistant Residents Junior or Senior Internes Assistant Resident Junior or Senior Internes
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Victoria Veterans' Hospital, Victoria, B. C. (200 Beds)	General Medicine General Surgery	Junior or Senior Internes Junior or Senior Internes
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*Hospitals so indicated are "Approved" by the Canadian Medical Association.

over morphine for severe pain. Some special improvements have been made in a few cases, exemplified notably in metopon.

Metopon (methyldihydromorphinone) is about twice as potent as morphine and has a more prolonged action with fewer side effects. It is addicting, but tolerance develops more slowly and is apparently broken more easily (in about 3 days) than with morphine. It may cause marked respiratory depression. At present all supplies are earmarked for cases of terminal cancer only. Physicians desiring supplies can write to Parke, Davis Company or to Sharpe and Dohme Company. To assist in further studying the drug the physician is required to give a summary of the case history and to file a report on how the drug did its job. *Metopon*, judging by reports to date, seems to be a most useful drug, and further reports on it will be followed closely. *Dolophine* (Methadon) is inferior to morphine for these cases, because it has no sedative effect and leaves the patient apprehensive. It often appears useful in pain arising in kidney and bladder when other drugs, including morphine have failed. *AN 148*, like *Dolophine*, is a powerful analgesic but it has no sedative action.

Other drugs are being studied, and some appear of great interest though not yet released from the laboratory. (For instance, Dodds in England has described a compound of such great specificity that it will relieve pain due to pressure on nerves though it is of little value for pain due to other causes.)

Summary

1. A skeleton plan of a rational method of using drugs in terminal cancer is as follows:
 - (a) Explore the possibilities of X-ray, nerve block or nerve section, and occupational therapy before, or in conjunction with the use of drugs.
 - (b) Give the weaker analgesics a trial. Start with the *salicylates* and the *coal tar analgesics*, using sedative doses of hypnotic drugs to reinforce their action. Combinations of these with *codeine*, and codeine alone and codeine with sedation, offer greater analgesic action.
 - (c) *Meperidine* (demerol) may then be given alone or in combination with some hypnotic drug.
 - (d) The opium alkaloids, typified by *morphine*, should be resorted to only when other drugs and methods have failed.
 - (e) *Metopon*, a new drug, appears to offer definite advantages in this type of case.
 - (f) *Procaine* intravenously may afford relief when other drugs have failed.
 - (g) The liberal use of a *local anaesthetic ointment* is recommended for ulcerated lesions.
2. Measures useful in delaying the development of drug tolerance and addiction are suggested.

Acknowledgment: The author is indebted to Dr. D. M. MacRae for suggesting this subject for discussion in an article.

The Control of Cancer^{*†}

A. W. OUGHTERSON, M.D.

New York, N. Y.

INTRODUCTION

THE death toll from cancer has been steadily rising, chiefly due to the older average age of the population, and last year there were 181,000 dead. Since cancer is not a reportable disease, there are no accurate figures on incidence, but surveys¹ indicate there are approximately 310,000 new cancer cases each year. It is estimated that there are 700,000² persons in this country who are under treatment for cancer at any one time. There is evidence of increasing public interest in the control of cancer as shown by a recent Gallup survey, which indicated that 72 per cent of the people were willing to pay more taxes in order to have better control of cancer.

The control of cancer requires research, education, and service to the cancer patient. All this involves the medical profession, the hospitals, the public health service, nursing service, schools, universities, and other groups. Obviously, no one agency, governmental or private, has sufficient resources to cope with a problem of this magnitude. The necessity for seeking the assistance of all groups is apparent. The keynote of effective cancer control must be the cooperation and coordination of all groups dedicated to this task. Since the voluntary health agency exists for the purpose of assisting the people to meet a health menace not controlled by other organizations, its most important function may be as a coordinating agency.

The American Cancer Society may best serve the people and the medical profession by remaining a dynamic force, so flexible that it may render assistance wherever the need is greatest, rather than to become static by assuming a permanent maintenance responsibility. Its most valued service may be to show the need, point the way to better cancer control, and demonstrate the method by which this may be achieved. The ultimate goal of the voluntary health agency is to bring disease under control, and so to eliminate itself by removing the reason for its existence.

OVERALL PLANNING

The need for a more intensive effort to control cancer is apparent. The scope of the various activities involved in the control of cancer is so great that no one group, the medical profession, the United States Public Health Service, the American Cancer Society, or the private foundations can accomplish the goal unaided. For this reason there is a need for a cooperative, coordinated effort within the framework of an overall plan of attack. This is necessary if the most effective use is to be made of our limited resources, men, and material.

Funds available for the support of cancer research in the past have been inadequate, but even if adequate financial support were available, overall

^{*}Reprinted from the *Annals of Surgery*, October, 1947, by kind permission of the author and the editors.

[†]Read before the American Surgical Association, March 25, 1947, Hot Springs, Va.

planning is needed in the interest of economy and efficiency. During the year 1946 the funds available for cancer research were as follows:

American Cancer Society	\$2,500,000
United States Public Health Service.....	1,772,000
All private foundation funds	650,000
Total.....	\$4,922,000

Thus our national expenditure for cancer research was at the low rate of \$27.19 per death caused by cancer. At the same time we live in an economy where more than this amount was spent to advertise one brand of cigarettes and four times this amount was spent for hair tonic. Plainly, as a nation we have not given due consideration to the facts and the resources needed for an overall attack to control a major health menace.

There is also a shortage of trained personnel and facilities for both research and the care of the cancer patient. Since time will be required to build laboratories and hospitals and even more time to train personnel, the need for a coordinated overall plan rather than competition between interested groups is apparent.

The control of cancer may be accomplished by two major lines of attack:

1. The maximum use of the present methods of prevention, diagnosis, and treatment.
2. Research for new methods.

The only methods at present available for the treatment of cancer are surgery, X-ray and radium. The importance of surgery in the treatment of cancer, the importance of cancer to the surgeon, and the public interest in this problem warrant a discussion of the role of surgery.

In order to make the maximum use of surgery in the prevention, diagnosis, and treatment of cancer there are four objectives to be achieved:

1. Early recognition of the signs and symptoms of cancer is necessary so as to cause the potential patient to seek the advice of a physician early in the course of the disease. While this is a problem of lay health education, the content of knowledge is medical. Further, while this problem more properly lies within the field of activity of the lay educator, the general practitioner, and the internist, the surgeon because of his wider experience in the treatment of cancer has a responsibility in promoting such education. Unfortunately, all cancers do not give early signs and symptoms, or they exist in a part of the body where they cannot be seen or felt by the patient. For some time, regular semi-annual physical examinations have been advocated to meet this problem. Cancer detection centres or prevention clinics have been set up in New York, Philadelphia, Chicago, and other cities. These clinics have reported finding approximately 1.5 per cent of cancer in supposedly well persons. This is more cancer than has been estimated to exist in our population. Statistics as to the incidence of cancer, however, are so inadequate that these figures may be more nearly correct than the previous estimates. Macfarlane³ found 10 cancers in 10,325 examinations in 550 female volunteers, an incidence of 2 per cent or 0.1 per cent of the examinations. In addition, numerous other abnormalities requiring medical attention were detected. *There is no doubt that regular physical examinations will detect many unsuspected cancers in an*

early curable stage of the disease. It appears that the value of the semi-annual physical examination should be measured in terms of the general health problem and its educational value, rather than in terms of cancer alone. If a semi-annual physical examination is to become part of our national health program, a re-evaluation of the number of physicians required for the nation is indicated. Approximately 95 per cent of all cancers are found in the 59,000,000² people who are over 35 years of age. Assuming one-half hour per examination, a biannual physical checkup would require 59,000,000 physician hours, or the full time of approximately 30,000 physicians. It should not be assumed that this is an impossible task because of the number of physicians required, nor that cancer detection or health maintenance centres could be put into operation immediately for the entire nation. Rather it emphasizes the need for planning; because if such a national program is to be realized within a ten-year period, we must plan now to train the necessary personnel and provide the required facilities. In the meantime, the need for cancer detection* in supposedly well persons is established, and every effort should be made to extend its application. There is need for data to determine the type of history and physical and laboratory examination which may yield the maximum result with the greatest economy.

There is an urgent need for medical schools and hospitals to establish pilot cancer detection or health maintenance centres to study these problems and to establish techniques for screening large groups of the population. Such pilot clinics may also provide an invaluable service as postgraduate teaching centres. Medicine as a social science must face this problem, the scope and importance of which demands an experimental approach to insure acquisition of basic information.

Surgery cannot yield a high degree of success unless cancer is treated before the disease has spread to distant parts. It is, therefore, apparent that the public must know what potential cancer symptoms are so that it may seek aid early in the course of the disease. It is also well established that many cancers do not give early symptoms but can be detected on physical examination. While the relative value of lay health education and the regular physical examination has not been determined, it is apparent that both are necessary steps in effective cancer control. Finally, for those cancers which do not give early symptoms and which cannot be detected on physical examination, research is needed to establish more effective screening technics.

2. The second important objective is early diagnosis, which is primarily a responsibility of the medical profession. The physician is directly liable for the delay in 25 per cent of cases and shares the responsibility with the patient in another 15 per cent.^{4,5,6} While the patient is culpable for most of the delay in superficial cancer, the physician assumes the major responsibility as the cancer becomes more inaccessible, requiring special laboratory, X-ray, or endoscopic examination. This points the need for better professional education in the diagnosis of cancer, since wrong advice is frequently given. It also suggests that lack of availability of proper diagnostic facilities may be an important factor. There is too frequently a tendency to treat cancer of the internal organs as a benign or functional lesion until proven to be other-

* The term detection is here used to indicate the detection of cancer in supposedly well people who have no complaints. It is suggested that the word prevention should be limited to the eradication of supposedly precancerous lesions.

wise. This does not imply a knife diagnosis, but earlier and more adequate study if the cause of the complaint is unknown.

It behooves those of us who are teachers of medicine and surgery to inquire as to why this situation should exist. Are our textbooks so written as to make clear that cancer of the internal organs, such as the lungs and gastro-intestinal tract, cannot be diagnosed by the history and physical examination? Do we spend too much time demonstrating advanced cancer and too little emphasis on the steps necessary to diagnose early cancer? Is the training of specialists on a sufficiently broad basis to make clear the danger of inadequate general physical examinations? Does the instruction in physical examination make clear its limitations as well as its potentialities?

As lay health education becomes more effective, causing an alert public to seek earlier diagnosis, the diagnostic problem for the physician will become more difficult. Has the time come to re-evaluate some of the criteria we have used in teaching the diagnosis of cancer in the past? In an already overcrowded curriculum, is adequate time and skill devoted to the second most common cause of death?

It is clear that the average physician is increasingly in need of help in the diagnosis of early cancer. More studies are needed to indicate what type of assistance, in what age groups, and where it is most needed. Are facilities for diagnosis available to the average physician adequate to meet the need? Have we devoted sufficient attention to postgraduate education for the doctor who is not privileged to work in a hospital or medical school? The American Cancer Society, believing that there is a need for postgraduate cancer education, proposes to publish a concise professional journal dedicated to this purpose. Until such time as research makes available better and simpler methods of diagnosis, we have no choice but to make the maximum use of the methods we now have.

3. The third requirement is prompt treatment. Early detection and diagnosis may be of little value unless treatment is rendered promptly. Procrastination by either the doctor or the patient may be fatal. The "shopping" habit of patients going from one doctor to another seeking a favorable opinion and general lack of health education contributes to delay. Also in recent years the shortage of hospital beds, with delays in admission because of long waiting lists, is a contributing factor.

4. The fourth objective is adequate treatment. Until research reveals new and better methods of treatment, the chief hope of the cancer patient lies in surgery. The developments in surgery have been great and show promise of keeping pace with the increased demands of cancer patients if treated in time. There is, however, a lag between the potentialities of treatment as demonstrated in the best clinics and the average result found in the average hospital available to the average patient. This is of especial significance, because the average physician is more likely to be influenced by the results he has experienced in his own patients rather than those reported in some far away clinic. There is a great need to study the results of treatment in larger and unselected groups of the population, and to find ways and means of making better treatment available to more people.

The Tumor Committee of the Connecticut State Medical Society in collaboration with the State Department of Health in 1934 developed a

system for the study of cancer in 27 general hospitals. This offered the first opportunity to determine the effectiveness of present methods in treating cancer in a large section of the population. The first study was done on 1,610 cancers of the rectum admitted to hospitals between 1935-45⁷. During 1935-40 the radical operability was 32 per cent, and during the second five-year period it rose to 44 per cent. For the same period the largest clinic in New England reported an operability of 83.5 per cent.⁸ During the first five-year period, the operative mortality in the 27 general hospitals was 25 per cent, and during the second five-year period it dropped to 18 per cent. At the same time, the operative mortality for the largest clinic in New England was under 5 per cent. The five-year cure rate for the 735 patients in Connecticut was 7.9 per cent in contrast to approximately 50 per cent for those patients entering the larger clinics.

These comparisons are not made to show that one clinic is better or worse than another, or selective, but to call attention to the fact that the average effectiveness of our present methods of treating cancer in a large group of the population is vastly different from those ordinarily reported in medical literature. The larger clinics have pointed the way and demonstrated what may be accomplished. It is the responsibility of those interested in cancer as a health menace to obtain the facts and point the way to better treatment.

The statement has been made that 30-50 per cent of those now dying of cancer could be saved by the maximum use of the present methods. It is estimated that there are 14,000 new cancers of the rectum in this country each year. If we assume the present five-year cure rate is 10 per cent, there would be 1,400 cured patients each year, leaving 12,600 who die within five years. To save 50 per cent, would require a curability approximately 5 per cent under the cure rate reported by one of the larger clinics to-day. It would, therefore, appear that an attempt to save 50 per cent of those now dying from cancer of the rectum is not an unreasonable goal.

Cancer Research

The second major line of attack on the cancer problem is research for new and better methods of prevention, diagnosis, and treatment. While there is no longer a question of the need for cancer research, there are, however, differences of opinion as to how funds may be most wisely expended, and what methods and disciplines are most urgently needed. This appears to be a natural consequence of the rudimentary state of our knowledge of cancer and diversity of interest in the problem. There is, however, a consensus of the need for more fundamental knowledge of normal growth so as to better understand the abnormal growth of cancer.

The present high development of surgery well exemplifies the wisdom of the flank attack versus the frontal assault. Discoveries in supposedly unrelated fields have made modern surgery possible. From Pasteur and wine fermentation to bacteriology and asepsis, the chemistry of ether and laughing gas to anesthesia, the chemistry of aniline dyes to chemotherapy, the physiology of moulds to penicillin, these are all examples of the potential benefits of the prepared mind on a broad research front. At the same time, the rapid development under war-time pressure of penicillin and blood substitutes are effective examples of the frontal assault by planned developmental techniques.

The Scope of Cancer Research

The complexities of the problems and the varied disciplines required all suggest the need for coordinated and integrated effort. For these reasons the American Cancer Society turned to the National Research Council's Committee on Growth for advice and guidance in planning its research program. The Committee on Growth is composed of 19 members with an executive committee, the members of which are chairmen of the divisions of physics, chemistry, biology, clinical investigation, chemotherapy, and fellowships. Each division is composed of a number of panels made up of specialists in their respective field of research. The Committee on Growth, together with the panels, numbers 120 scientists representing 48 different universities and laboratories. Requests for grants-in-aid are received by the secretary of the Committee on Growth at the National Academy of Sciences in Washington, D. C., where they are channeled through the various divisions and referred to the panels best qualified to advise on the research for which funds are requested.

Thus requests for grants-in-aid receive careful study by experts in each panel, and the chairman of each division presents his recommendations to the executive committee for final consideration, so that funds may be allocated according to the overall need. It is hoped this plan will insure that the most promising research receives adequate support, that duplication of effort may be avoided, and that eventually a better coordinated and integrated attack on cancer may be developed.

It is recognized that grants-in-aid may not provide sufficient latitude for the development of cancer research. It is expected that grants may be initiated to stimulate research in responsible institutions with established reputations and that such funds may be used within a limited but less restricted field than the grants-in-aid.

Finally, as the need arises, it may be necessary to provide funds for developmental research, using more intensive or compartmentalized methods within institutions especially equipped and staffed for this purpose.

There is a shortage of personnel trained in the disciplines needed in cancer research. In order to fulfill this need the American Cancer Society has made funds available for research fellowships up to a maximum of \$6,000 per year for senior fellowships. Beyond this, it is hoped that more permanent posts will become available in the various universities and laboratories. It appears that one of the reasons for the scarcity of qualified personnel may be that in the past cancer research has been so frequently a dead-end street academically. It is essential that opportunity be provided for adequate careers in this difficult field of investigation.

There has been much discussion as to the place of cancer research in medical schools and whether departments of oncology are justified. It is frequently observed that no one individual can be competent in the whole field of cancer. The same reasoning could be applied equally well to a professor of medicine or surgery, and in fact, this is acknowledged by the subdivision of these departments. It appears that a serious approach to the study of cancer cannot long remain an avocation, and it is likely that tradition will make a place for new ideas within the old framework.

The study of cancer began at the bedside of the patient. It moved to the mortuary and the laboratory, but finally it must return to the patient.

Clinicians are the custodians of the care of patients, and hence have a grave responsibility in cancer research. Theirs is the task of promoting research in this difficult field at the bedside. The study of cancer in the clinic has yielded the only effective modes of therapy yet available, and among these is surgery. The surgeon must now assume his obligation by participating in the teamwork needed to bring together the varied disciplines required in the new and highly specialized technics of clinical investigation.

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Discussion.—Dr. E. P. Lehman, Charlottesville, Va.: You have heard presented in very brief form the program of the American Cancer Society. The surgeon comes closer to the cancer patient, if only because of the need for biopsy, than does any other group in medicine. For that reason the American Cancer Society, and especially its Medical and Scientific Committee, recognizes the importance of having its program presented to and understood by this most representative group of surgeons of the country. I know and Dr. Oughterson knows that there are members of this Association who have in the past expressed disagreement with the aims and policies of the American Cancer Society. There may be good reasons for such disagreement. The Society in growing in two years from a corporation spending \$800,000 a year to one spending \$10,000,000 a year has made mistakes. It needs the wholehearted support of the surgical profession. The Medical and Scientific Committee will, therefore, welcome constructive criticism from any member of this body transmitted through Dr. Oughterson. Cancer is the leading problem of the surgeon to-day. The American Cancer Society is in a sense your instrument in a program of cancer control in which we are all so vitally interested.

Dr. A. W. Oughterson, New York (closing): I can only second what Dr. Lehman has said. Ours is a common effort against a common enemy, devoted to the common purpose of trying to find a common solution. It is our earnest desire to promote the control of cancer in the best interests of the medical profession and the nation, and we welcome your assistance and advice at all times.

Editorial

APRIL is Cancer Month in Canada. The American Cancer Society has its annual campaign for funds at this time, and in order to benefit by the intensive magazine and radio publicity, the Canadian Cancer Society arranges its drive for membership and financial support to coincide. In tune with the times this is a Cancer Number of the BULLETIN. Each of the four scientific articles deals with a different aspect of the Cancer problem. An aspect that is not dealt with at any length is the psychological one. A steadily growing effort is being made to educate the people about cancer, its early recognition, diagnosis and treatment. Yet, although here and there are found encouraging signs that the struggle is not in vain, there remains a widespread general resistance to any or all attacks on ignorance, fear or superstition. It would be most enlightening to know the reasons for this resistance. Some, of course, seem obvious, others are far from it. Here and there an over-enthusiastic effort to further the work of the Cancer Society goads from some unwilling lips a bitter reply and light falls for a moment into a dark corner of a mind. If more were known about these dark corners the task of those concerned in the work of education would be easier and more productive, and the goal of early recognition and treatment might be brought within reach. No one will deny the desirability of the achievement, as soon as possible, of such an end. The question which should be the concern of all is: By what means and with what tools should the job be done?

* * * * *

From time to time we mark in our pages the passing of members of the medical profession in our own province. Rarely do we note such sad events taking place elsewhere in the country. And yet it must often happen that many hearts are saddened when death puts an end to the career of one closely associated with the growth and progress of the medical life of the land. Sometimes these blows seem to fall in rapid succession. So it is that since the New Year three men have passed from the scene whose names had special significance, both in their own fields, and as outstanding personalities in the medical world.

Two of these men were surgeons, and each, as no doubt would have been his desire, died suddenly. Dr. Roscoe Graham of Toronto was struck down in January, and ironically, while enjoying what must have been one of his rare moments of recreation. At 57 years he was the youngest of the three, and his gifts as an inspiring teacher, able executive and skilful surgeon were widely recognized and appreciated. He had already contributed much and his early death has robbed the current scene of some of its lustre.

Dr. Fraser Gurd of Montreal died in his 65th year, suddenly, while on his way home from meetings of two of the many associations of which he was a member. Dr. Gurd will be remembered by all who knew him as an enthusiastic and untiring worker. He was also a man of great patience and a large ability to wait for the reward of his patience. It was 25 years from the time he first joined the teaching staff of McGill as lecturer until he became assistant professor of surgery in 1936. He was raised to full professorship in 1947—after 36 years! Verily a long apprenticeship! In addition to his professional qualities Dr. Gurd had the virtues of loyalty, kindness and thoughtfulness which made him the valued friend of all who had the privilege of knowing him well.

Dr. W. F. Hamilton of Montreal died after a long period of delicate health. He was in his 83rd year and had been retired from active participation in medical affairs for some years. He will be well remembered by McGill graduates who were in Medical School at any time between the years of 1895 and 1933. He was a teacher in the Osler tradition and was an incomparable bedside instructor, leading the student by carefully phrased questions, to observe, to think, and then to ask his own questions, less carefully phrased perhaps, but always satisfactorily answered. He was himself a "gentleman of the old school" in the best sense, and by his assumption that all students were like himself, he inevitably led them to be so, at least in his presence. Frequent exposure to his benign influence undoubtedly produced a lasting effect.

We are prone to say "We shall not look upon their like again." But perhaps we shall. As long as there are those to say with pride, "I was his interne" or "I was one of his students" something has been passed on to them. There must be many in Canada to say that of each of these three men, and something of the essential quality of each has been perpetuated.

M. E. B. G.

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To Conquer Cancer

Minutes of the Semi-Annual Meeting of The Medical Society of Nova Scotia, 1948

THE semi-annual meeting of the Executive of The Medical Society of Nova Scotia was held at the Dalhousie Public Health Clinic, Halifax, N. S., on Thursday, January 22, 1948, at 2.30 p.m.

Doctor Eric W. Macdonald of Reserve presided. The following representatives of the Executive and members of Council of the Canadian Medical Association attended: Doctors Hugh A. Fraser, J. J. Carroll, H. G. Grant, R. O. Jones, D. F. Macdonald, A. W. Ormiston, J. S. Munro, G. A. Dunn, A. E. Blackett, D. K. Murray, S. Marcus, A. Ernest Doull, H. D. O'Brien, C. L. Gosse, V. O. Mader, C. M. Bethune, F. F. P. Malcolm, J. G. B. Lynch, P. E. Belliveau, J. S. Brean, J. W. Reid, N. H. Gosse and E. I. Glenister.

The first item on the agenda was the date and place of our annual meeting.

President Eric Macdonald stated he had interviewed the manager of Keltic Lodge and that the dates of the meeting would have to be in September during the week of the 13th. He said the only place to hold the meeting in Cape Breton was at Keltic Lodge at Ingonish although there would be some difficulties there. He was sure that a successful meeting could be held there and that everybody would be accommodated. He mentioned Sydney as the only alternative, but felt that too many members would have to go to private homes.

Doctor J. G. B. Lynch mentioned the fact that at the last annual meeting the invitation of the Cape Breton Medical Society had been accepted. Doctor H. G. Grant felt that it would be a popular meeting but doubted whether everyone would be taken care of. He also said the dates, i.e. the week of September 13th would not be convenient to the members of the Faculty of Dalhousie as the Medical School would start classes during that week.

It was agreed that all arrangements, dates, etc., be left with the Cape Breton Medical Society.

There was some discussion about displays and also about rates. President Eric Macdonald said that he has asked for special rates, but that there was no assurance from the manager that there would be any reduction.

There followed a brief discussion about the regulations defining honorary membership in The Medical Society of Nova Scotia.

The next matter dealt with was a report from Doctor R. O. Jones, one of our representatives to the Provincial Medical Board on the letter of Doctor W. M. Phinney of Yarmouth regarding the advertising of a Doctor Shane who represents himself as a specialist in diseases of the eye. Doctor Jones said the Provincial Medical Board had instructed their solicitor to investigate and take action depending on his findings.

President Eric Macdonald asked that Doctor Jones give a final report when the matter had been disposed of.

Doctor R. O. Jones, the Treasurer, gave a brief financial report in which he expressed the opinion that our present rate of expenditures is slightly

over our income. He said that he could not give any definite statement until about six months time. He also thought that some of the increased expenditures would probably result in increased revenue.

Doctor H. G. Grant read a letter from Mr. R. W. McColough, Executive Assistant to the Minister of Highways for Nova Scotia, expressing the opinion that it would be difficult for the department to issue special plates to the medical profession.

Doctor C. M. Bethune moved and it was seconded that the Society obtain a special emblem for use on their automobiles. This was carried. Doctor Bethune was appointed a committee of one to prepare this emblem.

The Secretary read a letter from Doctor T. C. Routley in which a request was made from The Maritime Hospital Association for better records and case histories.

President Eric Macdonald then brought up the matter of the Society's nomination for President of the Canadian Medical Association for the year 1950. It was agreed that this matter be held over until the annual meeting.

The Canadian Red Cross National Blood Transfusion Service was next considered. The Dominion wide plan of the Red Cross was explained to the members by President Macdonald. He also read a letter from Doctor F. R. Davis, Minister of Health, which defined the attitude of the Government of Nova Scotia toward the Red Cross plan and stated that the Government had made a grant of \$100,000 toward the Canadian Red Cross National Blood Transfusion Service for Nova Scotia. There was doubt expressed by several members about the response of the general public for donors. A motion was passed expressing the appreciation of the executive to the Government of Nova Scotia for the generous support given the Red Cross.

The interim report of the Committee on Economics was presented by the Chairman, Doctor N. H. Gosse, and was thoroughly discussed. Doctor J. G. B. Lynch described two schemes at present operating in Ontario—the Windsor plan and the Physicians' Services Incorporated of Ontario. He was favourably impressed with the Windsor plan, but said that the profession in Ontario were very enthusiastic about the Physicians' Services Incorporated. Doctor Lynch also told the meeting of the plan of the Canadian Medical Association to apply for a charter for a dominion wide prepaid plan.

Doctor D. F. Macdonald of Yarmouth asked why mileage was not included in the Ontario plan. Doctor N. H. Gosse said that most of the schemes did not include mileage, and he felt that at present they were afraid to include it, but that it must be included when the rural areas were included.

It was then moved by Doctor J. G. B. Lynch, seconded by Doctor D. F. Macdonald, and carried, that the executive approve the action of the nucleus committee with respect to the Blue Cross; that on account of its inadequacy and that since the medical profession would not have control, the committee was unable to recommend the Blue Cross plan to The Medical Society of Nova Scotia.

Doctor J. W. Reid of Halifax moved, and it was seconded by Doctor J. J. Carroll of Antigonish, that the Ontario plan be taken as a basis on which the Committee on Economics would prepare a plan for Nova Scotia. This was carried.

Following considerable discussion it was moved by Doctor J. G. B. Lynch seconded by Doctor J. S. Brean and carried that the Committee on Economics be given authority to deal with a plan for the Maritime Provinces.

Doctor N. H. Gosse spoke of his conference with Doctor A. F. VanWart of Fredericton, who expressed the personal opinion that New Brunswick would like to join with Nova Scotia in having one plan of prepaid medical care to cover the two provinces.

Doctor A. E. Blackett then spoke on the urgency of the matter. He referred to the unhappy plight of the British Medical Association beginning in 1911 and progressing until the present unsatisfactory status has been reached. He urged that the Society prepare a plan as soon as possible, and that in the interim the public be notified that we are preparing a plan of prepaid medical care.

The Secretary suggested that a release be given the press immediately following the meeting. Doctor J. G. B. Lynch suggested that Doctor T. C. Routley be consulted before the article was released, so that our plans would more or less fit in with those of the Canadian Medical Association. Doctor A. E. Blackett and Doctor H. D. O'Brien expressed the opinions that this was unnecessary as the matter so far was purely provincial.

It was agreed that Doctor N. H. Gosse and Doctor H. G. Grant issue a release in the name of the Society immediately following the meeting.

Doctor H. D. O'Brien asked the question whether the final plan would represent The Medical Society of Nova Scotia or the medical profession of Nova Scotia?

The question was then raised as to what proportion of the profession were members of The Medical Society of Nova Scotia. The Secretary answered about 75%. Doctor N. H. Gosse felt that the proportion should be higher.

Item 5, namely, that the decision of the executive with respect to prepaid medical care be referred to the Branch Societies for their consideration and approval was then passed.

The executive then passed Item No. 6, "That this Committee regards this matter as being not only important but urgent, and recommends that the Society take prompt action to implement these recommendations or to adopt similar measures looking to the instituting at an early date of a plan of prepaid medical care for this Province."

The matter of securing letters patent was next considered. After considerable discussion in which Doctor Eric Macdonald, Doctor N. H. Gosse, Doctor A. E. Blackett and Doctor J. G. B. Lynch joined it was moved by Doctor Victor O. Mader, seconded by Doctor R. O. Jones, that letters patent for prepaid medical services be taken up by a Provisional Board recommended by the Committee on Economics at an opportune time. President Eric Macdonald suggested the name "The Nova Scotia Medical Services Limited" for the company to sell prepaid medical care. His suggestion met with the approval of the meeting.

Doctor A. E. Blackett suggested the Committee on Economics would need more money. Doctor H. G. Grant felt that some of the members of the Committee on Economics should visit other places where schemes had been in effect for some time so that we could profit by their experience. Doctor

J. G. B. Lynch felt that we should invite some of the executives to visit us; he mentioned Doctor Brockenshire and Doctor Boyd.

Doctor H. G. Grant suggested that the Committee on Economics be given authority to spend an additional \$1,000 or \$1,500. Doctor N. H. Gosse said that he had an invitation from Mr. W. S. Major, the General Manager of Physicians' Services Incorporated, to visit them, and also they would place all their literature at our disposal.

It was moved by Doctor J. G. B. Lynch, seconded by Doctor G. A. Dunn, that Five Hundred Dollars (\$500) additional be placed at the disposal of the Committee on Economics. This was carried.

It was moved by Doctor C. L. Gosse, seconded by Doctor J. J. Carroll, and carried, that the Committee on Economics provide speakers who would explain to the Branch Societies the non-profit prepaid medical services plan.

The Secretary next read the following letter regarding membership at large from Doctor A. D. Kelly, Assistant Secretary, Canadian Medical Association.

November 5, 1947

To The Secretaries of Divisions

Dear Doctor Grant:

Approximately one year ago the Minister of National Defence was approached with the proposal that membership in the Canadian Medical Association be provided for all serving medical officers of the Permanent Forces and paid for out of public funds. Negotiations have been inconclusive and it is felt that our inability to quote a uniform membership fee, applicable to medical officers no matter where they may be stationed, has been to a large extent responsible for our lack of progress.

It is a fact that very few serving medical officers have availed themselves of the opportunity of joining the C.M.A., and the Division in which they reside by paying their own membership fees. This is considered to be a loss to organized medicine, to the individual officers and to the medical services which they represent.

At a recent meeting of the Executive Committee, this matter was fully discussed and the suggestion was made that those medical officers be accepted as members-at-large in the Canadian Medical Association. If this proposal is concurred in by the Divisions, it will be possible to reopen negotiations with the Department of National Defence on the basis of a single membership fee which will enhance our prospect of success.

The provisions of Chapter 2, Section 2, of the By-laws of the Canadian Medical Association make it necessary that the national body obtain the approval of the Division concerned before accepting as a member-at-large any doctor who resides within the area of that Division.

In view of the foregoing, it is requested that consideration be given to granting permission to the Canadian Medical Association to accept as members-at-large the medical officers serving in His Majesty's Canadian Forces who are resident in your Division.

In replying to this request, it is hoped that the proposal will be treated in its merits and that considerations such as provincial licensure be not introduced. As the season for the enrollment of members is approaching, may we be favoured with a reply at the earliest possible date.

Yours faithfully

(Sgd.) A. D. Kelly

Assistant Secretary

This matter was taken up at the Executive Committee as the members at large wanted a reduced fee. It was Doctor J. G. B. Lynch's impression that no reduction was made. This matter also came before the Provincial Medical Board for the privilege of licensing in provinces to which they are transferred. It was agreed that this matter be brought up at the next meeting.

A letter was then read from Mr. Sollows of the North American Life Assurance Company in which they offered group insurance to The Medical Society of Nova Scotia. It was decided that further information be obtained by the Secretary from four or five companies before any decision be made.

The following letter from The British Columbia Medical Association was read.

203 Medical-Dental Building
Vancouver, B. C.
October 1, 1947

Dr. John E. Plunkett
The Honourary Secretary
Royal College of Physicians and Surgeons of Canada
150 Metcalfe Street
Ottawa, Ontario

Dear Sir:

At the Annual Meeting of the British Columbia Medical Association, held in Vancouver, B. C., on Thursday, September 18, 1947, the question of the expense involved and time lost in taking the oral examinations of the Royal College of Physicians and Surgeons of Canada, with particular regard to those candidates who have to travel from as far afield as British Columbia, was discussed:

The question was raised in a letter to us, signed by thirteen prospective candidates for various examinations by your body.

It was finally resolved that:

"Be it resolved that strong representation be made to the Royal College of Physicians and Surgeons of Canada, to change the oral examining procedure of the candidates for certification in the medical specialties or Fellowship in the Royal College of Physicians and Surgeons of Canada, to enable these examinations to be conducted at distributed centres across Canada in the same manner that the written examinations are now taken."

After further discussion it was also resolved that;

"Be it further resolved that the above resolution with an explanatory letter be brought to the attention of the provincial medical associations of the western and Maritime Provinces."

A copy of this letter is being forwarded to the provincial medical associations, as noted in the resolution above.

Would you please give this matter your earnest consideration and inform me whether there is any likelihood, in the near future, of the Royal College of Physicians and Surgeons of Canada being able to institute the holding of oral examinations at more widely scattered centres throughout Canada.

Yours very truly,

(Sgd.) F. I. Whitehead, M.D.
Executive Secretary

It was approved that a similar letter be sent from The Medical Society of Nova Scotia to the Royal College of Physicians and Surgeons of Canada.

It was duly passed that members of the Executive be paid the usual travel and out of pocket expenses.

It was moved by Doctor H. G. Grant, seconded by Doctor V. O. Mader, and carried that the Committee on Economics be given authority to spend money for clerical help and also for travel as they deem it necessary.

A letter was next presented in which the complaint of over-charging was made against one member of the Society. It was agreed that Doctor N. H. Gosse reply to this letter.

It was moved by Doctor N. H. Gosse, seconded by Doctor J. S. Munro, and carried, that a committee be appointed to bring in a revised scale of fees at the next executive meeting.

Doctor E. I. Glenister of Halifax informed the meeting that the Eye, Ear, Nose and Throat specialists had formed a group. He asked the executive whether they should constitute a section of the Medical Society or a separate organization. President Eric Macdonald felt they should remain within The Medical Society of Nova Scotia. Doctor Ernest Doull spoke on the subject; so also did Doctor J. W. Reid and Doctor H. G. Grant. President Eric Macdonald suggested to Doctor Glenister that the group apply to The Medical Society of Nova Scotia for permission to establish a division.

The President thanked the members who attended the meeting.

The meeting adjourned at 5.55 p.m.

FELLOWSHIPS IN MEDICINE FOR TRAINING IN THE FIELD OF RHEUMATIC FEVER

Four fellowships are open to citizens of the United States and Canada who possess M.D. or Ph.D. degrees. The fellowships provide opportunities for training and research in the various aspects of Rheumatic Fever.

The annual stipends are from \$1500 to \$3500 per annum depending on the training and qualifications of the applicant. The fellowships are granted for one year, but may be renewed. Appointments may begin on any date. Opportunity will be available for basic research in the laboratories of one of the four Chicago Medical Schools, or clinical research at the La Rabida Jackson Park Sanatorium, depending upon the qualifications, training and research interests of the candidate.

Complete information concerning these fellowships may be obtained on request.

Address Communications to

JESSE W. HOFER, Ph.D., M.D.

Medical Director

La Rabida Jackson Park Sanitarium
Chicago, Illinois

Correspondence

March 12, 1948

Dear Doctor:

Re: Confusion from Poorly Named Drugs

The confusion caused by the present, largely haphazard method of naming drugs is deepening, and some of us feel it is high time we did something about it.

Though it is a live issue in the Departments and Committees concerned with the control and standardization of drugs, their work would be greatly strengthened, and given direction, if they had an accurate knowledge of the problem as it affects those who are doing the prescribing and dispensing.

It would be most helpful to know of as many incidents of confusion arising from poorly chosen drug names as possible,—confusion to the physician or confusion to the pharmacist. Such difficulty may result in either hazard to the patient's health, or in extra, unnecessary cost. The experiences you have had in this regard will be particularly valuable if you record them by answering the questions which follow. Any suggestions you have will be welcomed.

Yours sincerely

M. G. Whillans, M.D.

Professor of Pharmacology

Dalhousie University

Questionnaire re Confusion in Drug Terminology

1. Name (you may remain anonymous if you wish).
2. Address.
3. Years in practice.
4. Do you consider that something should be done to clear up the matter of terminology of drugs?

yes..... no..... undecided.....

5. Please give instances of difficulty or confusion in prescribing or administering drugs, which can be blamed partially or wholly on the name of the drug.
6. Remarks. (Suggestions will be welcomed).

Please send your answers to M. G. Whillans, M.D., Department of Pharmacology, Medical Sciences Building, Halifax, N. S., before April 15, 1948.

DOCTORS NEEDED

The community of Port Hood and surrounding district require a resident doctor. For further particulars apply to C. J. Holder, Port Hood.

The community of Kennetcook in Hants County and surrounding district require a resident doctor. For further particulars apply to Mrs. Marsden G. Anthony, Secretary, Home and School Association, Kennetcook.

There is an opening for a resident doctor at Mulgrave. For further particulars apply to Mr. F. W. Digdon, Mulgrave.

PHYSICIAN NEEDED

Doctor J. S. Munro of North Sydney is in need of an assistant. Anyone interested will kindly communicate directly with him.

POSITIONS VACANT

The Dartmouth Medical Centre, 180 Portland Street, Dartmouth, Nova Scotia, invite applications for the following positions: (1) Eye, Ear, Nose and Throat Specialist. (2) General Practitioner. To work in association with established group.

PHYSICIAN NEEDED.

A physician is wanted to take over the practice at Upper Stewiacke which will be vacated the end of May. For further information apply to Doctor R. G. MacKenzie.

Doctors are also needed at the following places—

Port Elgin, N. B.

Port Hood, N. S.

New Waterford, N. S.

Shubenacadie, N. S.

Doctor C. L. Gass, Sackville, N. B.

Winnipeg Clinic, Winnipeg, Manitoba.

House Surgeon for 70-Bed Hospital, Modern facilities. Apply stating age, qualifications, experience, and salary expected, to THE SUPERINTENDENT, NEW WATERFORD GENERAL HOSPITAL.