Studies on Gastric Cancer

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IT is my intention to present as an essay some of the intricacies of gastric cancer, the surgical pathology of which disease has held my interest for many years. It is in no manner meant to be a factual scientific presentation of the results of my own or other morbid-anatomical researches into this subject; such an academic thesis would occasion publication in like academic manner, and dissertation sacrificed thereby. This is then a dissertation and is illustrative only of the manner in which my own thoughts upon this disease have been influenced by some of my studies and my findings, and of the manner in which my further efforts are being directed as a consequence.

My material has been cumulative and has included many hundreds of gastrectomy specimens of benign chronic ulcers and early ulcer-cancers, and very numerous surgical and post-mortem specimens of primary gastric cancer. The two large English teaching hospitals at which these collections were studied had available for me the clinical histories and detailed follow-up records with every specimen saved.

I once heard the possibilities and scope of research into gastric malignant disease raised at a University Pathology Staff research conference and the subject received from the Professor a verdict which was to me as astonishing and as incorrect as it was unconsidered. Simply, it was, "No, that has all been very fully worked up!"

Perhaps his view is shared by many and perhaps nothing more remains for the pathologist to do which can affect our knowledge of gastric malignant disease. This is not my view, nor is it that of my old teacher and chief, famous for his studies upon the pathological behaviour of the stomach, to whom I am most indebted for teaching me the uncertainties and shortcomings of our knowledge as revealingly as the truths and facts he knew. Perhaps "fully worked up" really means being content with the reporting of gastric microsections, informing the surgeon of something he most probably knew before he even scrubbed up; giving added details of the type of cell and the various complexities of its nuceoplasm. Perhaps it means those microscopical studies of cancer architecture which proffer prognostic hints and aids but which in clinical practice only too often prove futile rather than in any sense accurate. It may mean a reference to those repetitive and frequently factless arguments concerning disbelief or faith in some well-established precancerous lesion of the gastric mucosa. But all this apart, there remains one outstanding major issue in gastric cancer which no single statement can dismiss, nor a whole library explain. In this commonest of all malignancies what phenomena really occur, which, despite all the excellencies of surgery, ultimately leave us with such a very unsatisfactory end result, and determine that there be about three long term survivors out of every hundred people who suffer its presence. If we exclude the great losses in gastric cancer from inoperability, unresectability, and resection mortality, why do we still have such a large number who do not reach three or five years survival? What is the explanation for the surgeon, in terms of surgical pathology, which can account for those all too frequent early deaths which appear to make a mockery of a "satisfactory" radical resection?

Here exists scope enough for work which may replace conjecture and complacency by facts. The cancer problem is being brought before the lay public with increasing forcefulness, and one of the arguments which the medical profession and the various lay organizations are using to impress the public with the curability of cancer is, that if cancer is discovered early it may be cured. This argument is true to only a certain degree with respect to cancer of the stomach. It does not take into consideration the different growth potentialities of various gastric tumours which enable some small tumours to destroy a patient rapidly even though discovered when small; nor does it explain the fact that many are large before they give rise to any kind of symptoms whatsoever. Nevertheless, a broad truth is there and certainly the resectability rate would increase with earlier cancer diagnosis even if the five year curability showed a less impressive rise. Yet earlier diagnosis of gastric cancer is an ideal and shows no certain evidence of coming yet. In a survey from 1935 to 1946 inclusive, the Lahey Clinic found that the resection rate had not increased and had even decreased slightly, and because the resection rate was so closely wedded to early diagnosis, it was felt that here was distinct evidence that no improvement in earlier diagnosis has been made. The different growth potentialities of various tumours, alone, can explain the indisputable fact seen time and time again that, whereas somewhere in the region of 40p.c. of patients whose tumours were non-resectable had suffered symptoms for only a matter of two or three months, another large group was amenable to radical surgery having experienced symptoms for a much longer period. It is impossible for the clinician to make an early diagnosis of cancer, and at times it is extremely difficult for the radiologist to do so. This probably is the point at which I may comment upon what is the source of some clinical underestimate. It concerns those vague changes in symptomatology which are presumed by some to herald the change-over from a simple chronic gastric ulcer to one now showing malignant changes. It is folly ever to believe that this is an early help in the diagnosis of cancer in such patients; for, if indeed malignant transformation has taken place, then those symptom changes, however vague, are manifestations of a cancer attack upon the gastric wall which is far from early. Though such a growth may be resectable, that particular patient takes his place in the same small queue for the three year cure and possesses no priority. There is surely already ample pathological evidence to support a conclusion that gastric, and more precisely pyloric, chronic ulceration arising or manifesting itself in the gastric cancer age period should be accepted as primarily a surgical disease, necessitating radical surgical treatment. By so doing there would be the assurance of a higher cure rate for cancer of the stomach in those who really have, or will have, a malignant lesion which clinically and radiologically appears benign. Ulcer size should never be used as a guide to opinionate upon the benignity of an ulcer in this age group, for the size of an ulcer is often misleading and many a highly malignant ulcer is often little more than 1 c.m. in diameter. It is better to beware also the "therapeutic test" as tending to disprove the presence of cancer, for it is a strange, but by no means an inexplicable, circumstance to see radiologically and gastroscopically such cases of ulcer-cancers, and even cancer-ulcers, respond favourably in some measure to medical therapy. This response is given only by an inflammatory subsidiary partner of a morbid combine, whilst the major complement still prefers to treat the whole stomach as open territory for its wanderings.

I have only mentioned without amplification the different propensities for growth possessed by various malignant gastric tumours. A thorough examination of such resected growths with the fingers and unaided eye, before recourse to the microscope, gives us some immediate and important information upon this problem. One type of growth comprises the diffusely infiltrative tumours where no sharp distinct limit to the cancer growth is found anywhere; sometimes the entire stomach may be infiltrated and within this infiltration may develop shallow or deep ulceration, which in addition, may be multiple. It is the latter phenomenon of multiple ulceration in this type which has, in my opinion, been responsible for some reports in literature of multiple malignancies in the one organ. There is fairly uniform agreement amongst morbid-anatomists that this infiltrative type has by far the highest incidence, and it is unfortunately a fact that about 80p.c. of gastric carcinomas fall into this category. What is much worse is that the infiltrative type may be microscopically diffusely spread even when it is recognized only as a growth of several millimetres in diameter. A cancer of one gross type never changes, however large it may become. A well-defined, well-limited growth remains so even if time allows it to expand over the larger portion of the stomach mucosa. It might be expected that the microscopic structure of a gastric tumour would determine its gross growth, but this is not so, and it is a truth that the microscopical appearances of tumours of the same gross type may vary remarkably. This is one of the many facts which makes microscopical grading of gastric tumours futile and unreliable. The diffusely infiltrative type is often a medullary or a scirrhous carcinoma, but it may equally well be a mucoid or a moderately-differentiated adenocarcinoma. What then causes the different types? The only answer to that is we do not know even one small fact to begin an explanation. We can theorize and say that there are some yet unrecognised features of the microscopical structure responsible for the type of gross growth; or that it is not the tumour itself but the reaction of the surrounding tissue which is responsible for such a gross development. From published literature and from my own review of the statistical records of the Liverpool Regional Cancer Control Organization it seems a fact that a patient having a sharply limited gastric cancer has a ten times greater chance of a three year cure when resection is performed than has a patient with an infiltrative growth. When we go on to consider the possibility of five year cures only patients with sharply limited tumours survive, and, with present day surgical therapy, in infiltrative gastric carcinoma of whatever cell type, no five year cure is possible.

Let us now for simplicity take the two obvious big surgical divisions, namely, the larger group of unresectable growths and the smaller one of resectable gastric cancers. Specimens from the former group necessarily have to be scrutinized at autopsy, when that is possible, and those from the latter examined after radical gastrectomy. Between the two groups often exists a big gap of time with a concommitant disorganization of the tissues of neighbouring Vicera by the advanced ravages of the cancer spread. But by using some little common sense and a knowledge of anatomy, plus opportunities offered by rarer gastrectomy specimens of advanced cancer acting as an intermediate link, we can approach an objective fairly closely. That objective is to try and work out completely the pathological state which exists at those times when, at operation, a surgeon experiences difficulties in deciding whether resection is possible or not, and for us to realize at the same time that when this condition exists there is for every one of his contrary visual or tactile findings many

more unseen and unknown microscopic ones. Then to proceed further backward in time is to reach a stage at which the surgeon experiences no difficulty in deciding to resect, discovering no reason for not doing so, and yet this particular patient dies of malignancy within three years. In brief, it is possible to retrace anatomically, and very completely, gastric cancer's progress, and if we do so, will our findings give us any facts to explain why the ranks of those 30p.c resectables are decimated within so short a space of time? In giving some facts which I consider to have a bearing upon this question I will mention along with them some important, directly related principles.

Perhaps lack of knowledge of, or failure to attach significant importance to the lymphatic anatomy of the stomach wall originally resulted in the introduction of many a false dogma into the teaching and practice of the pathology and surgery of gastric cancer. The early German investigators, prolific giants in their field, were, unfortunately too prone to making sweeping statements. Perhaps one of the most damaging and one of the most enduring was that made by Rokitansky that gastric carcinoma never invaded the oesophagus or the duodenum. The distribution of the lymphatic channels of the stomach wall gives a growth every facility for doing just both those things, and the lymphatic spread of gastric cancer into the former organ is now a matter of common knowledge. Cuneo in 1900 worked out the lymphatic drainage of carcinoma of the stomach, and from his results there was designed a radical gastrectomy technique which was widely practised. With his mind probably upon the construction of such an operative procedure Cuneo mapped out particular areas of the stomach from which the large valved lymphatic vessel carried their contents to discrete lymph node groups; he noted at the same time the tendency of gastric carcinoma to spread in these collecting lymphatic vessels along the lesser curvature from the pylorus. It is very important to stress that such divisions of lymphatic drainage areas of the stomach wall are purely arbitrary, and the idea of any sharp line of demarcation between such areas can be dispelled by experimental injection methods, and by observing the behaviour of cancer cells in their spread through the stomach wall. In no sense should such divisions be said to anastomose with each other, for it is much more than a question of an anastomosis, being a complete and unbroken continuity of a diffuse lymphatic network throughout the whole extent of the stomach wall. The areas represented are those which happen to be served by groups of valved collecting vessels which arise in the subserous lymphatic plexus of the stomach wall. The behaviour of cancer cells in their migration through the open network of the stomach wall long before they reach those collecting vessels is impressing me with the futility of paying too much attention to any one particular drainage area and the lymph nodes served by it to the exclusion of most of the other areas. I am finding that, especially the more common infiltrative type of cancer, malignant cells may be in many drainage areas though still confined to the stomach wall lymphatic plexuses. After gastrectomy for pyloric carcinoma, many cells are probably left intact within the walls of the remaining portion of the stomach and may appear later in those undisturbed lymph nodes serving the other areas not resected. When such malignant cells exist in the first big plexus, the submucous, their bounds are unlimited; in fact they find greater ease of spread within it than in penetrating through the muscular plexus up to the final subserous one. It may be of value to quote from Jamieson and Dobson's memorable work upon the lymphatic system of the stomach, although it will be realized that embolic

cancer-cell groups can not be expected to travel as readily and as easily as injection material; nevertheless, these experiments illustrate the avenues which are open to them.

"The needle point.....enters the submucous plexus into which the fluid passes readily; favoured by the loose texture of the submucous coat the fluid spreads widely in the plexus. As the injection is continued, injected vessels spring to the surface and fill the subserous network, not only at the curvatures, where they seem to be of the largest size but on the surface of the organ far removed from the puncture. The extent of the area which may become injected from any single puncture cannot be determined. If punctures are made into the submucous plexus at various points and the flow of injection carefully watched it soon becomes obvious to the observer that any lines of demarcation between the areas drained into different gland groups are arbitrary. Given a slight check to the outflow through one set of collectors, the injection mass will pass readily out by another set. If the subserous network is punctured no limit can be set to the area of plexus which may become filled. As a rule, only a limited area shows the injected network, as the fluid finds easy egress by way of the collecting vessels, but when these vessels are filled or obstructed the fluid passes into the areas of neighbouring collectors without any difficulty."

Cancer cells can behave likewise. In "surgically early" pyloric cancers I have repeatedly found lymphatic cancer cell islands in the stomach wall plexuses along the greater curvature as well as the anterior and posterior walls. In lesser curvature growths I have found them involving that area of the stomach the lymph drainage of which is into the vessels of the gastro-splenic ligament. These particular collecting vessels come from both surfaces of the stomach from the summit of the fundus to a point on the greater curvature below the oesophagus. The lower main vessels of this group run to the hilum of the spleen and end in the splenic nodes above and occasionally below the tail of the pancreas. In a small number of autopsies on post-gastrectomy deaths in cases of resectable pyloric and lesser curvature growths, I have found cancer cell groups within the lymphatics of this gastro-splenic ligament. But at the same time microscopic cancer was always detectable in the stomach plexuses within this drainage area even though it often necessitated a great deal of serial microsectioning to find them. Spread of cancer in a distal direction had to be studied, and my results published in 1948 suplemented and confirmed those of previous investigators that immunity of the duodenum to microscopic cancer spread was a myth. It furnished me with at least one very impressive reason as to why gastric cancer recurrence after a radical gastrectomy should occur in some cases. Several of my resected specimens were early pyloric cancers and a number were without detectable spread to lymph nodes as judged by multiple sectioning of all the lymph nodes dissected from the specimen. Yet how insecure the patient's future seemed when one saw microscopically the malignant cells within the lymphatic plexuses only a mere fraction of a millimeter distant from the resected edge of the duodenum; and in some few cases the scalpel blade had even passed through groups of them. Cuneo, with good evidence, did recommend that two inches of duodenum be resected, yet Hartmann, Moynihan and Mayo must have believed the difficulties involved in this procedure were too great to warrant its practice. However, with evidence though as yet incomplete, I am approaching the feeling that the local cancer spread which I have discussed is of as great an importance to surgical consideration as is the next stage of spread to the

regional lymph nodes. This invasion of the lymphatic nodes in gastric cancer "is of the greatest practical importance and takes place by a process of embolism from the primary growth after the latter has reached or filled the subserous" lymphatic plexus. Whether lymph node involvement by gastric cancer is ever present at any time without subserosal involvement, I strongly doubt and I fail to find help on that score from published literature.

There seems to be no doubt that the emboli are arrested at the first gland relay they reach and that they do not pass on to a more distant secondary group until growth in the former has advanced to a marked extent. It does seem that, except as a mere matter of chance, no standard operation done yet for gastric carcinoma can be considered a radical one when once malignant emboli have commenced to reach the lymph nodes. Many such lymph nodes are beyond the effective reach of the surgeon. An example of such are those nodes often termed the right supra-pancreatic, lying along the trunk of the hepatic artery, the incoming lymphatic vessels of which drain an area of the pylorus. One of these vessels often pursues a direct course behind the duodenum to a node of the biliary chain. Cancer emboli may thus reach without interruption both the nodes at the upper border of the pancreas and those of the biliary chain. It would be helpful to know the frequency of the involvement of these lymph nodes in gastric carcinoma, yet I have never been able to discover any published record of a routine examination of these nodes in this disease.

In conclusion, though I know that more academic knowledge of this disease is coming, and remains to come, from detailed studies of its pathology, it is one thing to supply such knowledge and another to be able to act upon it. Even if the presentation of that knowledge be compelling and be bristling with thrice-confirmed facts, can it be applied by surgery, or has the terminus of gastric surgery been reached? Does the statement made in 1939 by Livingston and Pack that, "Gastric surgery does not now, nor is it likely in the future to prove a satisfactory answer for more than the smallest number of patients," remain as a dismal prophecy or a challenge? My feeling upon such a statement is that back in the close of the 19th century, Kocher, as judged from his writings, very probably had the same opinion. If so he would have been led to modify it by the surgery of the subsequent few decades. Examples from the immediate past history of gastric surgery alone, whether simple or malignant lesions were under consideration, impress me with a belief, or at least a hope, that the gastric cancer surgery of the future will not be content with the comparative failure which exists today.

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*General Semantics and the Practice of Medicine

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GENERAL semantics is defined as the study and improvement of human evaluative processes with special emphasis on their relation to signs and symbols including language. Throughout the daily livesof physicians and in the practice of their profession numerous symbols arising out of established language patterns do seriously interfere with the necessary flexibility of daily social contacts and even more importantly with the advancement of special scientific knowledge and with the freedom of approach to the solution of problems in medicine.

The control of our language and its adaptation and alteration to be consonant with changes in our social structure, our philosophies and more pertinently our scientific attitudes, is a function of the people who use the language. That this function is not properly exercised and that contrarily, words, word forms and word phrases obstruct the thinking of many people, is a paradox which seriously impedes the ability of individuals and groups to think and act without undue reference to established practice or custom or precedent.

There is no more classic example of the effects of adherence to unscientific dogma than that sterile period in medicine during which Galen was the high priest. During his life and for centuries thereafter, language habits so dominated thought processes and associated actions that there was widespread blanketing of creative scientific endeavour and only the eclectic and discerning minds of Vesalius, Leonardo de Vinci, Harvey and others had the courage to break with tradition and question the authorities. How many physicians to-day are Galenical in their teaching and in their practice of medicine? Medical students, as students of science, are constantly exposed to habits of language in texts, lectures, seminars and in everyday conversations with their fellow students and with their teachers. Consciously or unconsciously these students are grooved into channels which restrict freedom of expression, leave little room or time for ruminative or creative thinking and permit a minimum of deviation from the established pattern. At the ends of these channels there are rewards for the comformist, for the student who can best parrot back the phrases, the Galenical elements known as syndromes. Would it not be pertinent for the student who is striving for these rewards or is the recipient of the distinctions accorded them by the apostles of Galen to inquire into the manner by which these standards were attained and whether the methods used in achieving them will serve him well as a continuing man of science?

Orientation in our culture can be accomplished in part, at least, by the application of the principles followed by the general semanticist. General

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semantics has to do with the application of scientific method not only to the study and the practice of medicine, but also to the evaluation of daily experiences with family, friends, etc. General semantics provides a means by which we can develop a philosophy of thought and action to cope with the constant changes in our profession as well as our daily lives.

It is in respect to the consciousness of changes that one can begin to obtain an awareness of one useful area of general semantics. From Wendell Johnson's book "People in Quandaries"1, it might be as well to quote a few paragraphs in clarification of the matter of change.

"Change, however, all-pervading and rapid, need not be terrifying. It does not terrify the physicist, it fascinates him. And change in the lives of nations, groups, and individuals does not terrify the social scientist; it merely determines the lines of his investigation. Change is terrifying only to those who do not expect it, only to those who, in planning their lives, leave it out of account.

"But in large measure, unfortunately, we have and still are taught to leave it out of account. Change has been suspect and has been resisted throughout the history of the race. It has been customary for fathers to pass on to their sons the creeds and customs which their own fathers passed on to them. Ancestors have been worshipped and the Old Man has been honoured from time immemorial. Education has been chiefly a matter of compelling the child to conform to the ways of his elders. The student has been taught answers, not questions. At least, when questions have been taught, the answers have been given the student, but not a method for adding to it or reviewing it—except the method of authority, of going to the book, of asking the Old Man. The chief aim of education has been to make the child another Old Man, to pour the new wines of possibility into the old bottles of tradition."

Medical students, teachers of medicine and practitioners of medicine might ask themselves the following questions. Are you functioning as a child of the Old Man? Is education to you a matter of going to the book? When presented with a problem in medicine have you developed a method so that if the book and the Old Man do not have the answer, it is still possible to work at the problem? Have your contacts in school, in the hospital, and in your office left you with many questions the answers to which are not in the back of the book? Have these unanswered questions provoked you to evolve a method by which some of them may be answered? To you is one pharmacolgic experiment the same as the next one? is one patient with appendicitis the same as the next one? and in the treatment of pneumonia is one patient the same as in the next? Have you learned that one set of signs and symptoms is pathognomonic of one disease in all patients? Have you learned that if that set of signs and symptoms is not complete that it is possible that that disease may still exist in the patient? If in your final compilation of signs, symptoms, and laboratory data on a certain patient, the diagnosis is still not made, are you depressed because it does not fit with the answer in the book or the statements of the Old Man, or are you exhilarated with the prospect of continuing the search for the answer and are you prepared with a scientific method to attempt the solution of the problem?

Do you fill that it is the duty of your teachers to provide you with all the answers and with finite knowledge? Do you want to be satisfied with "established concepts" or are you interested in being imbued with the feeling that the knowledge gained to-day is "subject to change without notice?" Are you

more comfortable when you can "make up your mind" about a patient or a laboratory problem and are you disturbed when it appears that it may be necessary to change your mind?

Throughout medical education students have been taught to believe in the consistency of things. The gastrocnemius muscle originates here and inserts there in all cadavers; atropine does this to all animals or all patients. All patients with brain tumour have elevated intracranial pressure, etc. This process of emphasizing similarities may cause the student to be distracted and annoyed and somewhat lost when the gastrocnemius does not follow the usual pattern; atropine does not produce the expected effect in your patient, or the autopsy reveals a brain tumour in the patient who did not have an elevated intracranial pressure. Perhaps it would be expedient and more productive of satisfactory results if one learned to expect dissimilarities, recognize them, investigate them and use them.

Resistance to change, the adherence to recognition of similarities, the formulation of inflexible generalizations, the retention of dogmatism and the preachings of the Old Man represent the Aristotelian or prescientific civilization. Although this prescientific civilization is still dominant in our world, we are in the process of exchanging it for the civilization of science. The static notions of the old are giving way to the realization of "tendency toward change, a high valuation of differences, a critical attitude toward establishing generalization, a conviction that traditions are to be outgrown and a profound respect for the authority of systematic observation and evaluated experience—the authority of science as method."[1]

Science, in the language of the general semanticist, refers not to the use of technical apparatus, not to "the sciences" such as biology, physics, etc., not to statements represented many times as "scientific facts," or to theories and laws. Science as a method is a device, the application of which will result in the practice of better medicine, the development of fruitful research, and better relations with and more complete understanding of our fellow men. In the practice of medicine is there any more important element in the success of that practice than the understanding of our patients, our colleagues, and all those with whom we come in contact?

The method of science consists of asking clear questions, making direct, unprejudiced, and thorough observations, using those observations to answer as well as possible the questions asked, and revising or discarding any beliefs or assumptions made prior to the observations, if those beliefs or assumptions are not valid in the light of the new observations made.

It is well to emphasize that science as a method is not utilized to its fullest extent if the process ceases with the single application of the afore-mentioned pattern. It is essential that new questions be asked, new observations made, from which new answers can be derived. Smug satisfaction with one project well done is not conducive to continuing profit to the individual or to our culture.

In the pattern for scientific method one should be aware that the questions should be well-framed. Experiments cannot be planned, observations are not apt to be pertinent, and the answers are likely to be unreliable and meaningless if the questions are not clearly stated. An example of a question not clearly stated is one you often hear asked. Will socialized medicine result in a poorer grade of patient care? A question such as this put to a general semanticist immediately prompts him to inquire, "What do you mean? What do you mean

when you ask 'will'? Do you mean in the next ten years or the next thousand? What do you mean by 'socialized' "?

There is no more perfect example of an ambiguous symbol in language than the phrase "socialized medicine." What does it mean? Bolshevism? Leninism? Marxism? or is it possible that it could be something like the AAA programme in which many farmers are now participating?

It is possible also that "socialized medicine" could be that type of medicine that is practised to the benefit of patients and to the science of medicine in general in Sweden and in medical schools, particularly those supported by state funds which have staffs which are "socialized" according to certain standards. Private schools are encountering or participating in a rather distinct trend toward distribution of available sources of income along lines which in some quarters are considered "socialistic."

This is not meant to be a discourse on "socialized medicine" nor is there advocation of the sort of practice of medicine that many people believe will be associated with their interpretation of the term "socialized medicine," but the semanticist would strongly urge that the red flag that obscures our vision when the symbol is uttered be removed so that a scientific approach to the problem can be made.

The semanticist would continue to ask, "What do you mean by 'medicine'? Do you mean the diagnosis of disease, the treatment of it, and if so by whom? What do you mean by 'poorer grade'? What standard are you using and what reference is there for that standard? What do you mean by 'patient care'?" And so on.

It becomes apparent that the question posed is not an answerable question. The answer to it will most certainly be meaningless unless the words within the question are used with reference to their adaptability to reliable and specific observations and deductions. A question such as the following might be more amenable to answer.

In the next five years, will men and women with the degree of Doctor of Medicine, who are employed by the Federal Government on a salary, cure by contemporary standards, more or less, patients with pulmonary tuberculosis than men and women with the degree of doctor of Medicine who are not employed by the Federal Government? This seems like a more complicated question, but it delineates the problem more clearly and is more adaptable to solution.

Another significant feature of general semantics is its treatment of projection. Projection is an unavoidable aspect of one's evaluation of any stimulus or situation. To put it simply, when one says, "The sky is blue," he is making a statement that is only in part about the sky; in part it is a statement about him, about the way his nervous system works in response to stimulation by light waves with particular characteristics. He is projecting his personal evaluation of the sky into the sky. His statement, "The sky is blue," would therefore be more accurate if it were changed to, "The sky, as I perceive and interpret it, appears blue," or more simply, "The sky looks blue to me." We sky looks blue to me." We cannot avoid projecting our personal perceptions and interpretations onto what we call external reality. What is crucial, therefore, is that we be highly conscious of projection, constantly aware of the degree to which the statements we make are about the things we are presumably talking about, and the degree to which they are abont us, our personal habits of perception and evaluation.

Conscious projection is an awareness on the part of the individual that statements he makes or observations he makes are a result of his own conscious or unconscious interpretations. When an individual says, "This is a fine day," he is not usually reporting solely on the weather. He means that he had a good night's sleep; he had no fight with his wife at breakfast; the youngsters seemed more angelic than usual and were ready for school on time; he likes sunshine, and many other personal influences. The scientist is careful to point out in reporting a certain experiment that the data were obtained under specific conditions, with certain equipment, and were interpreted according to specific conditions. The semanticist and the scientist are saying that "to me this is a fine day" and "to me the results of this experiment seem to indicate such and such." Projection of this nature clarifies to the listener the source of the observation or the statement but more importantly it leaves the maker of the observation or the statement with the perception that his own statement or observation is the result of many factors that are subject to change as the evidence warrants it.

This is the sort of an attitude that the medical student can well afford to cultivate. In his approach to a problem in medicine, whether it be the diagnosis of a difficult case or the solution of a biochemical investigation, the student would unconsciously work at the problem to satisfy his own interests and to answer his own questions. When the diagnosis of the case or the results of the biochemical investigation are presented to his teacher, they are presented as the result of his personal observations and scientific deductions and not as memorized answers from the book. In other words "to him" the answer seems to be as presented. If the answer does not coincide with what the teacher considers to be correct or with what is in "the book," the teacher can more profitably investigate the method by which the answer was obtained and work at improving it rather than simply provide the "correct" answer. It may be that the answer as given by "the book" or the teacher is not right.

This is the sort of attitude that the practitioner of medicine can use to advantage in his evaluation of his patients. If he has asked questions, made reliable observations, and altered beliefs and assumptions made from these observations after new data are available, he is less likely to be reluctant to seek consultation and enter into profitable discussion concerning his practice. "To him", according to the methods he has applied, there is evidence to support his interpretations; and he becomes unconsciously aware that to others other observations and interpretations may result. Differences of opinion "automatically" become impersonal and stimulating.

One of the standbys of prescientific culture is ventriloquizing. It is the practice of speaking or writing or even thinking as if with the voice or the pen or the mind of another. The eminent ventriloquizers of our time are the judge, the preacher, the parent and the teacher. The judge commonly speaks as if he were the *Law*, the preacher as if he were the *Divine Being*, the parent as if he knew all the answers, and the teacher as if he were the *Voice of Wisdom*.

How many teachers have presented dogma as if they were the unquestionable authority? Is is not time for you and for all of us to begin to ask these ventriloquizers, "What do you mean? and "How do you know?" It is perfectly acceptable to listen to what the teachers have to present, in fact, it is imperative to the relatively speedy advancement of learning that one listens atten-

tively. However, at the termination of the listening, it is time to start asking questions and to find methods of answering those questions.

Another significant feature of scientific practice is that of prediction. Prediction is important for two reasons. It enables us to gain a certain measure of control over the processes of nature and our own personal and social development. Furthermore, it provides the basis for evaluation. That is, a theory or policy is good only insofar as it enables us to predict with reasonable accuracy, and thus prepare effectively for coming events. This ability to predict is sometimes referred to as foresight and makes up a good share of what is ofttimes referred to as intelligence. Predictions are reliable when based upon scientific endeavour; that is, the preparation of good questions, the recording of observations, the making of conclusions from accurate data, and the constant testing and revision of general conclusions.

The material presented represents but a small fraction of the whole field of general semantics. It has had to do chiefly with the presentation of some of the general principles of semantics and the manner in which they can be applied by medical students, teachers and practitioners. In these principles there are useful features that will help them in their daily associations with their fellow men, in their daily work with their colleagues, and in their endeavours to advance the art and the science of medicine.

Bibliography

1. Wendell Johnston: "People in Quandaries." Harper's, 1946.

Book Review

CORRELATIVE NEUROANATOMY. By J. J. McDonald, J. G. Chusid and J. Lange. Pp. ii+156. Fig. 60. 10″ x 7″. Ed. 4, 1948. University Medical Publishers, Palo Alto, California. $3.00 (U. S.)

This book gives, in condensed form, abundant information on the gross anatomy of the central nervous system and peripheral nerves, microscopic anatomy of the central nervous system, neurophysiology, neuropathology, the clinical features, diagnosis and treatment of neurological disorders. The presentation purports to be "correlation," but it is questionable if mere juxtaposition of information on the various topics is sufficient to justify the term. The text is typescript reduced in size and reproduced by multigraph. The illustrations are line drawings. The book creates the impression of a crowd of somewhat lifeless details, compiled from larger textbooks for the student to memorize. Some students, taking certain types of course, doubtless appreciate it. Others, attracted by its small size and low price, may find it useful as a handy reference book.

FOUR HAND BOOKS FOR INTERNES AND OTHERS

H. H. Jacobson
Victoria General Hospital Interne Staff

A review of four publications designed for internes and others associated with the work of general hospitals and practice.

In the following reviews, no attempt is made to place these efforts on a comparative basis. Many teaching units publish their own manuals designed to conform to their individual likes and dislikes, and although all four considered here follow a similar pattern and purpose, the scope of each differs from its neighbour, so that comparison would be unfair and unjustified.

Because the American Medical Association Manual devotes a section to the responsibilities of training internes and because the writer is an interne and therefore full of the grievances peculiar to that social order, considerable space is devoted to the relationships of the interne to his hospital.

A.M.A. INTERNES MANUAL. W. B. Saunders Co. $2.50.

This book is designed to provide suggestions for conduct proper to an interne on his service, basic useful data for reference, laboratory methods, emergencies and information about proven drugs.

It contains a very valuable section on General Information regarding interneships and residencies, e.g. what the hospital expects of the internes and what internes *should* obtain from hospitals. The Association stresses the importance of well conducted bedside teaching and the value of staff and departmental meetings at which the interne is expected to take an active part, and the continual encouragement of the interne. Thus hospitals training both residents and internes should recognize their responsibility to both groups and not curtail too sharply the opportunities ordinarily given to

Diet and Nutrition form a valuable addition containing information to aid in prescribing foods for either normal or special diets.

The Course of Physical Medicine includes a section on Heat (including infra-red, paraffin baths, diathermy) massage, remedial exercises, radiant energy, hydrotherapy, fever therapy and low frequency and constant current.

PHARMACOPOEIA AND CLINICAL METHODS MCGILL UNIVERSITY. Publishers. McGill Univezsity Press. $1.50.

This soft covered, extremely portable little book easily fits the back pocket, is brief, concise and beautifully organized. It contains an easily referred to table of doses, a Formulary with sections devoted to General Medicine, Paediatrics, Dermatology, Opthalmology and Oto-Laryngology. The Prescriptions are written in entirely with Metric and Imperial systems, and a valuable table of standard capsules, tablets and ampules is included.

The clinical methods section follow a similar pattern, a chapter for methods in the Departments of Medicine, Paediatrics, Surgery, Gynecology and Obstetrics. Metabolism data and food tables, special diets and recipes are brief, adequate, quickly and easily read. Organ extracts, insulin and hormones are similarly treated, while the section on Infectious Diseases, prevention and treatment contains valuable paragraphs devoted to chemotherapy, incubation and isolation periods and disinfection in private practice.

Preparation of the patient before the operation discusses sedatives in relation to various anaesthetics, and skin and instrument preparation. There is a useful paragraph on post-operative care and intravenous solutions as well as formulae of special surgical preparations and dressings. Gynecological and Obstetrical routines are presented in the usual manner.

Special dental procedures offer a page of extremely useful information. There is a section on laboratory methods with complete simplified procedures for diagnostic tests, and on procedures related to the X-ray department plus treatment of radiation sickness and burns.

The organization, type setting and information contained in this manual make it one of the best of its kind.

MEDICAL MANUAL. W. A. Feasby, B.A.,M.D. University of Toronto Press. $2.25.

Prepared for use of senior students and internes in hospital practice, this pocket-fitting little reference book follows the usual effort to include infomation required for every day investigation and treatment of common cases. Its diet section is especially interesting, containing dietary instructions presented in a form suitable for patients, with lists of foods not allowed, and a very useful table of 100 caloric portions of commonly used foods.

The sections on clinical methods departs somewhat from the usual presentation in that it offers outlines of suggestions as a guide to special investigation required after routine physical and laboratory examinations. Treatment of common medical emergencies is more comprehensive than usual.

A most valuable contribution are the pages devoted to technique for procedures such as thora-centesis, sternal punctures, etc., and the set-ups for individual sterile trays.

internes by an excess of solicitude for the residents or students. Too often the interne finds himself a whipping boy for the numerous hospital routines which give useful information but leave him little time for critical thought and study.

The A.M.A. believes it necessary for hospital regulations to be developed locally in keeping with various requirements, but each interne may properly expect to receive an explicit statement on his relation to the hospital as a whole and to administrative, nursing and other personnel; his relation to the Staff Interne Committee, especially the nature of disciplinary action for misconduct, and opportunity for a fair hearing on the part of such a committee.

A statement of his relationship to the House Staff and Visiting Staff, what are his responsibilities with regard to prescribing and written orders on both public and private services, his responsibilities during emergencies, and his relationship to the resident staff, should all be included.

Finally the interne should know what the hospital requires in his personal conduct, his attitude to and restrictions in examining patients, post mortem requests, admission and discharge routines, and nature and quality of records.

Since the press forms an important and sensitive part of the community, internes should know what the hospital-press attitude is with regard to information to newspapers and outside agencies such as Insurance Companies Compensation Boards and Welfare Agencies.

To avoid misunderstanding, it is desirable that each interne and resident at the time of his appointment should enter into a formal agreement with the hospital defining mutual obligations. Such agreement should be honourably fulfilled by both parties.

The Manual gives information of the choice of internes and includes a useful table containing the details of licensure by states and territories of the United States.

So that internes will not overemphasize special or unusual techniques a table is given of situations which general practitioners have reported that they are required to meet in list order of frequency both in home calls and office calls. Thus it is hoped that interns will concentrate on proficiency in these respects, rather than on the highly specialized investigative problems so frequently seen in public wards.

The requirements for specialty candidates are given and residents are acquainted with certain important relationships regarding teaching and conduct. Aside from daily contact with patients and attending staff, the manual stresses a point some hospitals are inclined to forget—the assumption of responsibility is a most valuable aspect of residency training.

The section on Clinical and Laboratory data deals with the common emergencies, techniques, interpretations of laboratory tests, and tables of normal values for blood, urine, gastric analysis and C.S.F. examination.

Drug Administration is a useful and interesting chapter. The sections on dosage and methods of administration are especially useful to the interne. Tables of weights, measures and equivalents are included as well as a long list of solubilities.

The Materia Medica contains 246 drugs of established effectiveness with uses and dosage, and the section on acute poisoning contains symptoms, antidotes and treatment of the common poisonings as well as a concise section on general principles in treatment of poisoning.

The section on Obstetrics, Gynecology and care of new-born contains a treatise on pre-natal care and initial steps in serious ante natal emergencies as well as excellent pre-and post-operative gynecological case. Anaesthesia is presented in more detail than usual, and the suggested investigative outline is continued through Opthalmology, and Oto-Laryngology.

There is a chapter on legal considerations in Canada and a chapter of common diagnosis according to the standard nomenclature.

This Book is a well conceived and well constructed little mine of information and deserves a wide acquaintance. Its suggestions for investigation of cases, though never intended to be all inclusive, are a welcome addition.

PHYSICIAN'S HANDBOOK. John Workentin, Ph.D.,M.D. and Jack D. Large, M.S.,M.D. University Medical Publishers. Palo Alta., California. $2.00.

The purpose of this $2.00 handbook has been to summarize tersely, clearly and comprehensively diagnostic procedures and factual data which a physician must have quickly available. At the same time the scope of the book has been extended so as to make it a serviceable pocket reference library for many types of medical practice. Included in it is a relatively complete laboratory manual, the common clinical tests and such other factual information hard to remember but often needed. Considerable space is devoted to the significance of abnormal laboratory findings.

A more complete work than this pocket-sized, loose-leaf, 270 pages effort would be difficult to imagine. The book is a popular one among senior students and internes at Dalhousie Medical School and is especially appreciated because of the clear interpretations of laboratory results and the summaries of normal physiology and normal constitutents and findings of different systems. Techniques are described and explained, comparative tables and diagnosis included.

Hardly a clinical procedure is omitted and the bonanza of clinical facts ranges from history outlines for different specialties, innervation and referred pain, fluid balance, tables of height and weight, autopsy procedures, stages of anaesthesia, to a score of other subjects.

The text is roughly divided in half, the first part devoted to an extensive coverage of laboratory diagnosis, the second half comprising a similarly detailed account of clinically important procedures and facts. No space is wasted, even the covers are devoted to tables of normal values and equivalents. No practitioner should be without this amazingly helpful and informative, inexpensive handbook.

Personal Interest Notes

DOCTOR V. D. Schaffner, F.A.C.S., surgeon to the Nova Scotia Sanatorium at Kentville, recently attended the annual meeting of the American Association for Thoracic Surgeons, held in New Orleans, Louisiana.

Doctor and Mrs. L. M. Morton of Yarmouth have returned after an absence of several months in Florida. They motored from Yarmouth last December, and visited in West Palm Beach and other Florida areas.

Doctor R. S. Shlossberg of New Glasgow left the end of March to take a post graduate course of three weeks at the Gill Memorial Eye, Ear, Nose and Throat Hospital in Roanoke, Virginia.

Doctor J. E. Hiltz, Medical Superintendent of the Nova Scotia Sanatorium at Kentville, attended the Refresher Course promoted by the American College of Chest Physicians in Philadelphia from February 28th to March 4th. The work covered all phases of diseases of the chest. Enrolment was restricted to sixty, and there was only one other Canadian beside Doctor Hiltz in attendance.

Doctor Duncan MacMillan of Sheet Harbour left the first of April for a six weeks post graduate course in Chicago.

Doctor C. J. W. Beckwith, Medical Superintendent of the City Tuberculosis Hospital at Halifax, attended a two-day session of the executive of the Canadian Tuberculosis Association in Ottawa in March. One of the main concerns of the session was discussion of detailed arrangements for the annual convention to be held in Halifax in June. Doctor Beckwith, who is president-elect of the Association, reports that a hundred or more persons are expected to be in attendance at the annual meeting. The executive will meet on June 22nd, and the scientific programme will last from June 23rd to the 25th, at the Nova Scotian Hotel.

The *Bulletin* extends congratulations to Doctor and Mrs. H. R. McKean of Truro on the birth of a daughter on April 4th, and to Doctor and Mrs. C. A. Gordon of Halifax (Marian Tregunno) on the birth of a son, James Stewart, on April 7th.

Obituary

The death occurred at his home in Halifax after a brief illness of Doctor Albert Arthur Schaffner on April first, at the age of eighty-two. Doctor Schaffner was born in Williamston, Annapolis County, and received his early education in the Valley and graduated from Baltimore Medical College in 1894. After graduation he did post graduate work at the Johns Hopkins Hospital and in hospitals in Dublin and London, and practised medicine in Halifax for approximately fifty years. During the first world war he served for four years in the Medical Corps with the rank of Lieutenant Colonel. For a time during that war he was in charge of the Cogswell Street Military Hospital. Doctor Schaffner maintained a keen interest in civic and political affairs and was a member of the Halifax City Council during the early 1920's. He was a member of the Baptist Church. Surviving are his wife, Gertrude, one daughter, Eleanor, and one son, Warren, both of Halifax.

The Bulletin extends sympathy to Doctor C. K. Fuller of Yarmouth on the death of his mother, Mrs. Bessie Lent Fuller, which occurred on March 26th, at the age of eighty-eight.

THE VICTORIA GENERAL HOSPITAL HALIFAX, NOVA SCOTIA

Post-Graduate Course in Surgery Designed to Assist Those Who Desire to Write Certification or Fellowship Examinations in General Surgery for the Royal College of Surgeons of Canada

A Post-Graduate Course in Surgery will be given by The Victoria General Hospital, with the assistance of Doctor Richard Saunders of Dalhousie University, designed to assist those who desire to write Certification Examinations in General Surgery for the Royal College of Surgeons of Canada. Those qualified to write examinations for Fellowship in the Royal College of Surgeons of Canada are also invited to take this course.

The correspondence part of the course will begin in May, and continue through to August, 1949. The Didactic Lectures will be given from 12 September, 1949, to 8 October, 1949, for the four week period.

The course will include lectures in Biochemistry, Physiology, Anatomy, Pathology, and General Surgery.

The fee for the course is fifty dollars.

Applications for the course, stating qualifications, should be sent to the Chairman, Post-Graduate Course Committee, The Victoria General Hospital, Halifax, Nova Scotia.

Reservations for Annual Meeting

As accommodation at White Point Beach Lodge will be limited, Mr. Howard B. Elliot, the manager, has asked that when writing in for reservations he be given the following information.

The date and time of arrival and departure.

The number in the party.

Will delegate be accompanied by his wife and or other members of his family?

Is there any preference as to whom they would like to room with?

The annual meeting of The Medical Society of Nova Scotia will beheld at White Point Beach Lodge, White Point Beach, from Wednesday, September 7th to Friday noon, the 9th, with the executive on the afternoon of Tuesday, September 6th.

WANTED: LOCUMS TENENS

Wanted by a recent graduate locums tenens for the month of June. Interested parties please contact the Secretary.

NOTICE

We feel that our readers would like to know that the reason the April number of the Nova Scotia Medical Bulletin is late is due to the fact that our printers have been in the process of moving their plant.

War on Rats

Each year millions of dollars worth of damage is caused in Canada by rats. These creatures destroy food and property on a vast scale. Responsible for some of the most dreadful epidemics in history, the rat is stilldangerous as a carrier of disease. Every means should be employed to destroy this menace.

The First Rule

All children ask questions about sex and the parents' answers should never be untrue or evasive. The cardinal rule is: Tell your child the truth, giving him enough information to answer his immediate question. Use language he can understand and tell him that such matters are best talked about only in the family circle.

Safe Water

Improper wells may be the cause of serious disease in rural districts. Wells should be placed an adequate distance from homes or outhouses and should be protected from surface drainage. The importance of a safe well cannot be overstressed. The location of a well depends on the nature of the surrounding areas.

Breakfast Menu

On chilly November mornings a dish of hot cooked cereal helps start the day on the right foot. Oatmeal or other whole-grain cereals are not only appetizing but they provide warmth and energy while supplying minerals and the B vitamins. A good breakfast means energy to spare.

Dental Decay

Scientists are conducting exhaustive studies to determine the effect of fluorine in combatting dental decay. But it will be some years before these studies are completed. Parents can do much to protect their children's teeth now, however, by providing nourishing foods, cutting down on sweets and seeing to it that teeth are brushed carefully after each meal.

Distance Does It

Glasses that are fine for reading may not always be so suitable for work. Reading glasses are designed for use at distances of 14 to 16 inches and, if used at longer range, they may cause stooping and fatigue as well as eyestrain. Workers who need glasses for their work should have them ground to fit their working distance.