

broadens the mental horizon and increases sympathy, it can not change man's nature, and men who are unfair in business affairs are to be found in our midst.

The one crying evil, which fortunately is not widespread, is the giving of commissions—in other words, the selling of the confidence which the patient has in his practitioner—to some specialist who will divide the fee in return for reference of the case. The one secretly takes money from the patient without his consent, and the other, in order to complete the bargain, charges more than he should. This is equally harmful to the one who receives and to the one who gives. Such matters can not be kept secret, and I have personal knowledge of men of good attainments and remunerative practice who have been ruined through losing the confidence of their communities by this pernicious traffic. Some attempts have been made to justify it, but the very fact that it is secret shows that both parties are ashamed to have it known and is an acknowledgment of its moral obliquity.

Our relations with the allied profession of pharmacy are not on as ethical a footing as they were twenty years ago. Then the druggist was the faithful friend of the physician. To-day, in putting up from 50 to 60 per cent. of the prescriptions sent to him, the educated pharmacist can not use his skill as a chemist, but simply acts as a distributor of copyrighted preparations which the physician calls for a few times only to take up with something new and leave the shelves of the druggist filled with the unused remnants.

Many physicians compound their own prescriptions, to the detriment of the pharmacist. The proprietary medicine people have managed this very cleverly; to the medical profession they are continuously calling out that the druggist is "substituting;" with one hand they have given the physician remedies to dispense himself, and with the other furnished the druggist with "patent medicines" with which to compete with the physician, and these two natural allies have drifted apart. The average pharmacist can not live on physicians' prescriptions alone, but he should be treated justly, and both physician and druggist would profit by mutual concessions to the great benefit of the public.

The higher grade of pharmaceutical houses already see the danger to honest pharmacy in the forced promotion of "ethical" and fake nostrums under catchy names, and it is to be hoped, in the future, will confine themselves to the open compounding of legitimate preparations; and these and these only should be found on the advertising pages of reputable medical journals.

MEDICAL PROGRESS.

Graduation from a college is merely a commencement of a life study of medicine. Therefore, young men without special training under competent teachers should not be encouraged in wanton assaults on major surgical diseases unless justified by necessity. The future will demand schools for advanced training for those who desire to do special work.

The recent graduate in medicine should begin in his county society by contributions to the newer methods which will be interesting to the older men. This should be his kindergarten; from there he will carry his papers to the district meetings; and at the end of five years he will be competent to bring useful material to the state society and later to the sections of the American Medical Association.

In the practice of medicine the student days are never over. There is so much to be learned that a long and industrious life leaves one with the feeling that he is but

a beginner. The most important habit a young physician can form is the "daily study habit." Let him put in even one hour a day with the reading of journals and books of reference and much can be accomplished. He should keep an account of the time, and if something interferes for a day he should charge himself up with it. A two weeks' vacation means fourteen hours to be made up. Most men can do more, and no man has a right to do less, no matter how busy he may be. The leaders in our profession make a daily average of five or six times this amount of study the year round, in addition to the demands of an active practice.

The practitioner must make frequent trips away for the purpose of observation. In no other way can he avoid the rut of self-satisfied content, which checks advancement and limits usefulness. No amount of diligence as a student can take the place of personal contact with men in the same line of work.

What are the rewards of so laborious a life? They can not be measured, because there is no standard of comparison. To realize that one has devoted himself to the most holy of all callings, that without thought of reward he has alleviated the sufferings of the sick and added to the length and usefulness of human life, is a source of satisfaction money can not buy. I know many a man grown gray in the profession with little of a tangible nature to show as a result of his work, but who is not only contented with his lot, but proud to have served in the ranks, and who looks back on a life of privation and hardship for the benefit of humanity as a privilege which he is thankful has been vouchsafed him.

Let us continue to strive as individuals for the honor and dignity of our profession. In this we but follow out the aims and ideals of those who have gone before and prepared the way. But the great movements of the future can not be brought about by individual action. They must be initiated and controlled by united effort, and in no other way can the epoch-making truths of preventive medicine be made to bear fruit. Unity is the spirit of the times; it marks the difference between the old and the new.

The vital need of the medical profession is a harmonious organization—an organization that will encourage right thinking and good usage among ourselves, help to secure needed medical reforms, compel redress of grievances and promote and encourage the highest interests of its individual members; and in this lies the future usefulness of our profession as a whole.

Orations

THE NATURE AND PROGRESS OF MALIGNANT DISEASE.

ORATION ON SURGERY AT THE FIFTY-SEVENTH ANNUAL SESSION OF THE AMERICAN MEDICAL ASSOCIATION, BOSTON, JUNE 5-8, 1906.

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My first words are words of thanks, profound and sincere thanks, addressed to my colleagues of the American Medical Association because of my estimation of the high honor conferred in inviting me to address you on this occasion. My first desire, the dominating desire of earnest appreciation, is that I may say something that will justify the choice of my colleagues and my presence before you. My first hope, the fond hope which I most cherish at this time, is that some one who may be influenced by what I shall say will gain in comfort and

life thereby; for, be the gain but little, even then those who are accessory to my presence may claim acquittal because of it.

Since it may not be known to all here present, I am prompted to say at once that, some time during the course of the meeting of this Association, an address, denominated "An Oration on Surgery," is a part of the scientific proceedings. In this instance it is not my intention to attempt a review of the whole field of surgery, nor even of a year's experience, but, instead, to devote the brief time given me to the consideration of a surgical topic which to-day is engrossing more of the time and energy of scientific medical endeavor than is any other subject in the entire range of surgery. Hence the topic of the evening, "The Nature and Progress of Malignant Disease."

It seems not unfitting, in a city whose early resistance to the oppressive encroachments on human liberty awakened the demand for American freedom, that an earnest warning should be voiced against the advancing encroachments on human comfort and life of a malevolent disease which obviously afflicts with dire results, all classes of vertebrate beings. The expression, malignant disease, is used here in the general sense, just as later the term cancer will be employed. It is better thus than to attempt to speak of the varieties of malignant disease, since only a general idea of its nature and progress can be considered in the comparatively short time allotted for the purpose.

Cancer is a general and not a local variety of disease. The field of its activity is quite as extensive as is the world itself. The vertebrate order of creatures is more or less afflicted with cancer throughout the entire classified series. The highest vertebrate orders of life suffer from cancer more than do all other orders combined. The civilized and the domesticated classes of higher rank suffer more from this form of infliction than do those of lower rank, or of the natural state. Mankind everywhere pays distinctive vital tribute to this disease; not, however, in equal proportions, but in accordance with the standard of the civilization of which he is a part. The higher the standard the greater is the contribution to malignant fate; the humbler and more natural the standard the less onerous is the demand. The rulers of mighty nations and the humblest human factors of savage existence, each in their respective ratios, succumb to the mysterious lethal influences of cancer. Also fish and flesh, staple articles of food of man, each in a varying measure, is the abode of malignant action, and more especially is the latter class thus afflicted. The fish of pure streams and ponds and those of salty habitations are in no small degree the subjects of cancer. The genteel trout and the beneficent cod are examples of this fact, respectively. Even the invertebrate oyster in one instance is widely reported to have yielded to malignant change.

The myriads of oysters subject to the scrutiny of hosts of gustatory and scientific observers for many years, with apparently but one reported instance of malignant disease under all of these circumstances, suggested to us the idea of reviewing the facts in this particular case. A careful examination was made, therefore, of the acknowledged record¹ of the case the recital of the chief points of which merits your indulgence at this time. It appears that the late Professor Leidy, the famous anatomist of Philadelphia, came into possession of an oyster having a large tumor of the soft parts

which he presented to the late Professor Ryder in January, 1887. In commenting on the growth at that time Professor Ryder spoke as follows: "The tumor seems to have been benign in character, as the oyster in other respects appears to be healthy." A description of the tumor of quite minute and apparently of microscopic kind is reported along with the above statement, which is now regarded by competent authority² as being congenital, thus sustaining the belief in benignity expressed by Professor Ryder at the outset.

I consider it proper to enter thus fully into the merits of this specimen, since, for some reason, it has been regarded as the first and perhaps the only proof of malignant invasion of invertebrate life. We will now return to the main channel of the discourse.

The flesh of cows and oxen is the seat of cancer in the unsuspected proportion³ of 2 per 1,000, as is revealed by the careful inspection of their slaughtered products. The young animals, however, of divers kinds, exhibit no such evidence under these circumstances.

Advanced age, both real and comparative, sets the pace of malignant progress, especially in mammals. Real age numbered by many years, and comparative age numbered by fewer, each alike invites the presence of cancer. And, too, in tissues of the human body this same age peculiarity is noted, those whose life's duty is ended, whose full years of usefulness are reached, become the frequent prey of cancer, while other contiguous tissues endowed with later function and those of the body at large remain in a healthy and useful state. In this connection it may be said that youth and youthful tissues comparatively seldom hold communion with cancer.

For a long time the solution of the problem of malignant disease has been uppermost in the minds of many of the best students of pathologic phenomena in the medical world. During the last few years the efforts directed to the solution of the mystery of malignancy, stimulated by the thought of the possible parasitic nature of the disease and the apparent increase in its extent and activity, have been markedly extended through the logical efforts of special commissions established for the purpose. Commissions organized under the patronage of crowned heads and public dignitaries of exalted station, and conducted by medical and lay minds of superlative attainment, supplemented by unlimited opportunity and ample financial support, are searching the animal world in the effort to shed light, beneficent light, on the mystery of cancer. In England and Germany especially, the resources of the governments and the sympathetic support of the King and the Emperor, respectively, are directed to the benevolent purpose of determining the origin and the true nature of malignant disease. Also in this country notable institutions of learning are patiently engaged in the efforts to accomplish the same purpose. Individuals of eminent attainment are of themselves fighting in the battle along lines of their own selection with the same object in mind. Laymen of munificent means, prompted by humane motives or perhaps by personal dread, offer bountiful endowments for the discovery of the nature and the cure of cancer. The thoughts and efforts of the civilized world, as represented in scientific medical attainment and benevolent endeavor, are to-day mainly centered on securing the control of tuberculosis and on determining the true nature and the cure of malignant disease.

1. *Proc. of the Academy of Natural Sciences of Philadelphia*, 1887, p. 25.

2. Profs. E. K. Dunham and Harlow Brooks.
3. Imperial Cancer Research Fund (Bashford).

It is proper to say, I believe, that the widely separated instances of cancerous infliction as noted between the civilized and barbarous peoples, between the dwellers in the flesh and salt media, and between the lower classes of mammals seem to indicate forcibly that the circumstances of human life in the civilized state have not given origin to cancer, although they may have added much, indeed, to its frequency.

That cancer is a distressing part of the history of the animal kingdom can not be gainsaid. And, unfortunately, the more comprehensively and critically the investigations relating to it are carried forward the more widespread it appears to be. As already expressed, mankind in the civilized and also in the undeveloped condition suffers from cancer, and it is probable that no race or condition of the human family is entirely exempted from this infliction. Also no organ or tissue of the human body is entirely free from its visitation. The dumb companions of man are similarly afflicted, but in a less degree, and it is altogether probable that as the search progresses along the various lines of animal existence malignant manifestation will appear now and again, reminding us, perhaps, that the penalty of the violation of a universal law of development of organized beings is relatively promptly enforced on the object or on the part concerned in the offense.

In this connection it is not amiss to heed the fact that experimentally and practically the transmission of cancer from man to animals or from one animal to another of different species has not yet been successfully witnessed beyond gainsay, notwithstanding the repeated attempts to attain the purpose and the results of long critical observation. On the contrary, the apparent transmission of cancer between animals of like species and its unquestionable extension by metastasis in those already afflicted is of common knowledge.

The vegetable kingdom suffers at times and in isolated places from a form of local progressive disease apparently akin in nature to the malignant characteristics of the animal economy. In fact, the realization that these peculiar vegetable afflictions were caused by a parasite in many instances prompted the renewed suggestion on the part of Hutchinson that similar appearing growths of human origin might later be found to depend on the presence of parasites. Since that time, more especially during the last fifteen years, the contention in this respect between the supporters of the parasitic and non-parasitic ideas regarding this disease has been continuous and spirited, and as yet without a generally satisfactory conclusion.

It is no part of the purpose of this address to discuss the various theories relating to the nature of the inherent cell activity characteristic of cancer, or of any other form of malignancy. To the members of the medical profession here present such a course would necessarily be inconclusive and disappointing. To those of the lay order whose feeble hold on technical expressions would present insurmountable difficulties of appreciation the result would be the same. Moreover, the chief aim of this discourse would be missing and, besides, as is expressed in a well-known play:

"The result is a very pretty quarrel as it stands;
We should only spoil it by trying to explain it."

The period at which this contention will be ended is too uncertain to merit other than hopeful anticipation, and too important to be neglected in any respect in opposing malignant advance.

The time when malignant disease first appeared in the path of human existence and added its insatiate

affliction to the burden of human suffering can not be stated except in a general way. It is fair to presume, however, that at a definite period of early recorded time malignant activity in some form was present and contributed its portion to the physical distress of the age. But it is difficult, indeed, to find ancient documentary evidence of cancer in such countries as India, China, Egypt and Greece, despite the fact that their medical literature is quite extensive, especially that of Egypt, whose medical records contain descriptions of great antiquity, comparing favorably in forms of phrase and detail with many of those of the present day. Nor can the ancient history of cancer be correctly written at this late time, as it would not be possible to distinguish between cancer and benign tumor, on the one hand, and between ulcerated cancer and other severe forms of ulcer, on the other.

The comparatively limited knowledge in diagnostic discrimination at that time, as expressed in written characters, forbids the forming of definite conclusions in diagnostic purposes. It is apparent, however, that the ancient Greeks had a very good clinical idea of cancer, as a modern Greek writer, Couzis of Athens (1903), in reviewing the past history of Greek medicine, says that the practical knowledge of the Hippocratic school was not inferior to that of his own day. The works of Hippocrates (460-370 B. C.) barely mention cancer, stating in connection with the treatment that "deep-seated forms are best untreated, for if treated the patient soon dies; otherwise he may hold on for a long time." It is not difficult for us of the present day to comprehend the full significance of this statement, as no doubt a few of us, at least, have witnessed the exemplification of this ancient expression written quite 2,300 years ago. The old Greeks described fully the various distinguishing characteristics of cancer, noted the clinical differences in its various phases, portrayed quite accurately cancerous metastases and prescribed treatment not differing, especially in the palliative sense, from that in use at the present time. Galen (131-201 A. D.), in his extended works, considered cancer quite fully in its important aspects. But from his time to that of Ambrose Paré (1517-90 A. D.) little of special significance was added thereto.

Many of the notions entertained regarding the nature of cancer since Hippocrates' time seem droll to those whose enlightenment on the subject of bacteriology is a matter of recent years. The Galenic notion—probably that of Hippocrates—attributed cancer to the local effect of "overheated and unusually acrid 'black bile' that can not be purged away." Paré ascribed cancer to the effect of improper diet influencing unfavorably the liver and spleen, followed by "a shutting into the part to be attacked of thickened acrid black bile." The emotions, anger and hate, aggravated the condition, he said. Harvey (1578-1657), the discoverer of the circulation of the blood, regarded cancer as a parasite on the body, living an independent existence at the expense of the latter.

John Hunter (1728-1793) seems to have been the first to recognize the influence of traumatism as a causative factor of cancer, aided by the consequent exudation of coagulable lymph into the interstitial tissues.

Many attempts to inoculate cancer date from the experimental period inaugurated by John Hunter. And early in the nineteenth century positive results were reported and the parasitic doctrine became prevalent. The era of pathologic anatomy, which culminated in the histologic studies of Müller and Virchow, at first fa-

vored the idea of the parasitic nature of the cancer cell, but ultimately condemned it when Virchow showed, as then appeared true, that cancer cells were derived from pre-existing normal elements.

From this period to the present day, theories regarding the nature of cancer have multiplied to a bewildering extent. The two extremes at present are the following: (1) That cancer, like many other morbid processes, is due to a micro-organism; (2) that cancer represents a morbid proliferation of certain normal cellular elements as the result of diminished inhibitory action.

A few words more relative to the parasitic theory may not be amiss at this time. The view that cancer itself is a parasite was expressed by Harvey in 1651. By Dupuytren in 1805, Laennec in 1816, Cruveilhier in 1827, and Lobstein in 1829, all adopted this view as part of their teaching of pathologic anatomy. A little later the positive results of inoculation experiments were recorded, seeming to confirm the view, and Müller's description of the histologic elements of cancer in 1842 give a remarkably clear exposition of this theory, making the cancer cell the actual parasite which, if implanted in sound tissue, caused a cancerous growth. The question of transmission of cancer, however, remained unsolved, for it was then believed that cancer cells in the natural state could live but a short time outside of the body, and that their great size seemed to preclude their being taken up by the ordinary ports of entry. Also cancer did not appear on abraded surfaces, but in the parenchyma of tissues. In the face of these facts the parasitic origin appears to have languished, and to have been superseded by the later teachings of Virchow and others which derived cancer from pre-existing normal elements.

It was quite apparent at an early period of investigation that the study of the nature and activity of this disease could not shed substantial light on the problem of its control, when based alone on the few cases falling under the notice of a small number of individual observers. The logical corollary of this situation laid the foundation for statistical inquiry and collective investigation. It was not, however, until a comparatively recent date that statistical knowledge attained sufficient rank in this regard, to arouse apprehension respecting the presence of cancer. In fact, it was not until the possibility of its being of a parasitic nature was again set forth, and the fact that perhaps it was communicable, that observers of cancer were impressed with the acute sense of a new danger.

It should be stated, although perhaps superfluous, that the deductions based on statistical estimates are not always conclusive, except perhaps to the minds of those whose contentions are encouraged or supported by the calculations. A preconceived notion relative to a disease, or a prejudiced opinion regarding it, can usually gain substantial comfort from the study of plastic statistics. The product of the data may be "very like a camel," "or a weazel," or perhaps "like a whale," accordingly as a biased statistical Polonius may fancy. One has only to keep pace with the conflicting deductions often drawn from isolated examples of statistics, whether amended or not by additional knowledge, to realize the wealth of uncertainty that frequently attend statistical conclusions. Especially is this true in the instances of afflictions with subtle natures and divers environments such as characterize cancer.

The geographic and time-of-life distribution of cancer especially concern statisticians and sanitarians. The

anatomic distribution appeals directly to practicing physicians and surgeons. The local occurrence—center-feature of the infection invites the reflections of pathologists and students of morphology. Geographically considered, cancer, as already stated, is a heritage of the human race in nearly all, if not in all, parts of the world. While it is yet unknown in some parts of South Africa (Snow) and other obscure places, it is not at all certain but that it exists, remaining hidden, however, from civilized view, because of the restraining influence of some heathen conception relating to it; especially as such conceptions have before this time thus controlled the doings of savage or superstitious peoples in other matters. Among the chief objections to the scientific value of statistical facts relating to cancer may be mentioned the inability to secure authentic complete diagnosis. The statement that a growth is malignant, when determined only by macroscopic examination, is so often fallacious as not to merit scientific confidence. Only microscopic reports of morbid growths should be given the privilege of membership in the rank of trustworthy data. I am aware that there are not a few distinguished observers who to-day seem to place quite as much confidence in the macroscopic findings of experience—their own experience—as in the conclusions of those with equal experience whose senses are fortified by the mechanism of a more exact knowledge. In any event such reports as these should be classed by themselves, unless confirmed by reliable microscopic testimony. According to the report³ of qualified authority, the frequency of error thus arising is 7 per cent. in accessible growths, and for apparent reasons is increased when the growths are deep seated.

The undoubted increase in human longevity of recent time adds many, indeed, to the list of those who from augmented years fall within the age limit of cancer attack, and thus apparently increase the spread because of a seeming greater morbid activity. And, too, it should not be forgotten that many from without seek harbor in a city for the relief which its hospitals and extended experience afford, some of whom, unfortunately, add their sad contribution to the city's death rate from cancer. On the other hand, the life-saving means now employed in defending and rescuing the young from the baneful onset of infectious disease, is increasing the number of the living, and, therefore, neutralizing proportionately the apparent increase in death from cancer.

It is not impossible that the significance of the so-called "cancer localities" may be reduced to the standard of other fields of importance, when subjected to closer analyses of circumstances that are no essential part of cancer development or propagation. It is certainly evident that the slow and continuous increase of cancer, regardless of preventive measures and of human understanding is controlled by influences of such subtle kind, as thus far to perplex beyond satisfactory solution, the minds of the most astute observers.

The relative extent of cancer invasion of the accessible,³ of the inaccessible, and of the intermediate parts of the human body in England and Wales during a three-year period affords an interesting study of this disease of great apparent significance, as will appear a little further along. Those superficial parts of the body falling readily under the scrutiny of the unaided eye and the touch of the physician are manifestly the seat of accessible cancer. Those deep and internal parts of the body, conveniently placed beyond the limits

of unaided vision or mere touch, are the sites allotted to inaccessible cancer. Those portions of the body within the reach of the finger and aided inspection are, for the most part, the sites of intermediate cancer.

The development of cancer of the parts included in each of the foregoing divisions of the body, is comparatively much less manifest in individuals under 25 years of age, than in those above that period, standing in this respect nearly as 1 to 70. The male sex suffers nearly 22 per cent. greater infliction from malignant disease than the female, during this time, which can be accounted for in part, I think, by the greater strenuousness of the male and the effect of the exposures incident thereto. The probable reasons for the greater infliction of the sexes under, than over, 25 years of age, it seems to me, have been considered sufficiently already.

The comparative difference between the frequency of occurrence of accessible and inaccessible cancer in both sexes, under and over 25 years of age is astonishing, even when proper deductions are made for the greater uncertainty of diagnosis in the latter kind. Inaccessible cancer in males of 25 years and under is 80 per cent. more frequent than the accessible kind. Inaccessible cancer in females of 25 years and under is nearly twice as frequent as accessible cancer. Inaccessible cancer in males above 25 years of age is three times more frequent than the accessible variety. Inaccessible cancer in females above 25 years of age is about $2\frac{1}{4}$ times more common than accessible cancer. Inaccessible cancer in males regardless of age, is approximately three times more frequent than the accessible variety. Inaccessible cancer in females, irrespective of age, is $2\frac{1}{5}$ times more common than the accessible. Inaccessible cancer is, without regard to age or sex, a trifle more than $2\frac{1}{2}$ times more common than cancer accessibly located.

While it is now, and has long been conceded, that external influences, traumatic and otherwise, contribute to the frequency of accessible cancer in a greater or less degree, it is also self-evident, I think, that other and more potent agencies than these must be invoked to account not only for the occurrence of inaccessible cancer, but also for its great preponderance over those accessibly located at all periods of life, more especially the dominant one, that above 25 years of age. The increase in cancer visitation, in connection with advancing years, has long been a matter of common knowledge. But that the location of cancer, at all times of life and especially in adult life, should be of inaccessible, rather than of accessible nature, is more than remarkable, it is even startling, suggesting in no common tone the idea that, directly or indirectly, subtler influences than external traumatism or infecting agents can exercise are active in the development and spread of cancer. Perhaps it may be consistently said that the traumatisms thoughtlessly inflicted on the gastrointestinal tract by the yielding to the temptations and pleasures of life—while less emphatic than those directed to the external surface—are none the less potent for evil because of the fact that their frequent and prolonged action may increase correspondingly an ill effect. However this may be, it appears quite reasonable to some that cancer organisms coming somewhere from without, implant themselves in the tissues and develop there, notwithstanding the inhibitory effect of cooking, the power of digestion, the opposition of phagocytosis, and the fickle element of chance.

It is fitting now to remark that there appears to be no good reason to believe that the food of a people influences their relation to malignant disease in an appreciable degree.

Intermediate cancer in both sexes under 25 years of age is about half as frequent as is accessible cancer in both at the same period, possibly showing thus early in life the benign effect of protection of the intermediate parts from ordinary external influences. In the male after 25 years of age, intermediate cancer shows a comparative decrease in rate from that of the accessible form of about 32 per cent., suggesting that the evil effect of external influences are superior in potency or greater in number in the male than are those causing intermediate cancer. In the female during this period (after 25 years) the rate of accessible cancer exceeds that in the male by about 37 per cent. The intermediate variety, however, at this time in the female exceeds the accessible form by more than 48 per cent., showing the rapid increase in the intermediate variety due to pelvic disease, which can not be attributed in any practical degree to infection, but mainly to the traumatisms of maternity and the age limit of certain near-by tissues. It should be stated in this connection that the liability in both sexes to cancer of the gastrointestinal tract, gradually and quite uniformly diminishes from the stomach downward toward the external opening, but not including it. This fact seems to justify the thought already stated regarding the possibility of the effect of dietary traumatism on the stomach and the upper intestinal tract.

The age limit of the tissues of the stomach in health conforms to the nutritive requirements of the life to which they are all important, consequently this feature of the causation of cancer, which so freely contributes to the total of this disease in the mammary gland and the uterus, can play no part in the causation of cancer of the stomach, making it, therefore, the more apparent that alimentary traumatisms and dietary abuses are dominant influences in the causation of gastric cancer. Another fact which seems to confirm this position is that cancer in the male in the alimentary canal is quite seven times as common as in the female, notwithstanding the further fact of the general tendency of females to suffer from cancer of the alimentary canal at an earlier age than males. Surely, if cancer of the stomach were dependent in an appreciable degree on parasitic infection of alimentary substances this great difference in the relative proportions of infliction of the sexes should not exist. Finally, in males 80 per cent.⁴ of all cancer affects the alimentary canal. In females 80 per cent. of all cancer affects the reproductive tract, including therewith the breast.

It seems that not a little that has been said in this relation is corroborative of the belief of those who regard cancer as a non-parasitic disease, which, in any circumstance, is not communicable.

A longer continuance in theoretical indulgence would necessarily deprive us of the opportunity of speaking in an emphatic manner, of an exceedingly important practical part in the contest against malignancy. This statement is prompted by the facts, that cancer appears to be on the increase in civilized countries, and also that the limit of effective operative therapy, the only agent of cure of general settled repute, has already quite reached the confines of highest efficiency, under the present established lines of action. It naturally occurs to thoughtful members of the profession, therefore, to enquire regarding what can be done by way of admonition and protective forethought, that will secure the holding of that already in hand, while the search for increased power in

4. Middlesex Hospital Reports, 1905.

curative therapy is advanced, let us hope, to a more successful issue.

As in any other field of human contention, so here the resources of every avenue of effort should be determined with care, and utilized with vigilance and pertinacity. The operative warriors in the conflict against malignancy, have striven faithfully and logically during the last years of the struggle, gaining advanced foothold by means of approved technic and prompt aggressiveness. By these masterly means in the cure of cancer of the breast, of the uterus and of the stomach, many, many years of comfort and happiness have been added to the lives of the afflicted and given to those who rejoice because of their preservation. These striking illustrations of cure in organs so profoundly concerned in the inception and preservation of life, are also an earnest of the outcome in other fields of operative endeavor in this respect. Unhappily, our fond anticipations of approaching relief, encouraged by this gain on malignant disease, are so often demolished by the ruinous delay of the afflicted, in utterance and action, as well nigh to arrest the increasing hope from operative measures. Too often, indeed, during the consideration of operative interference is heard the utterance of the sad truth, "too late," "too long deferred," and the like, on the part of all concerned. The remedy for this lamentation is prompter surgical action; and prompter surgical action requires a prompt acknowledgement of the presence of an unwelcome growth or manifestation on the part of the sufferer, supplanted by earnest co-operation in diagnosis and treatment.

It is surely not amiss to repeat, that the outcome of operative endeavor in malignant cases, has well nigh reached the highest possible success, unless aided by increased faith and lessened secretiveness on the part of the sufferers from a malignant infliction. Those who are afflicted with accessible growths are comparatively early aware of the presence of these unwelcome visitors. And when they shall have exercised the same degree of resentment because of physical intrusion on the part of a growth, as commonly distinguishes social or business intrusion on the part of a meddler, then, indeed, will much be gained for increased success in the struggle against malignancy. Since it now appears that cancer is located most often in the deep internal parts, beyond the safe limits of unaided sight and mere touch—(inaccessible cancer) $2\frac{1}{2}$ times more frequently than is accessible cancer, regardless of age or sex, then, indeed, is the fact doubly impressed, of the necessity for prompt acknowledgment of the presence of morbid manifestations and prompt determination of their nature. The handicap imposed by inaccessible cases because of their greater distance from the surface, often enables the disease to advance undiscovered to a degree forbidding operative action when their presence is finally known. In too many instances of cancer, especially the inaccessible kind, the reasonable suspicions of its presence on the part of the patient or friends, are quieted by the soothing platitudes of medical advice, until all opportunity of relief is at an end. The physician and the surgeon should join in the observation and treatment of all such cases as these, early fostering a mutual plan of action that contemplates prompt explorative investigation in doubtful instances, and forbids delay in those of undoubted character.

It is "carrying coals to Newcastle" to state in this presence, or in that of any medical gathering of the present day, that cancer invades contiguous tissues early in the course of its development. How early no one can

know. How late no one can tell. Of this, however, we are assured: Malignant activity is measured by the inherent nature of the morbid process, or by the receptive character of its host, and sometimes by both, and unfortunate indeed is the patient who is the helpless victim of both of these influences. But, on the contrary, correspondingly fortunate is one in whom each of these influences is at a minimum. A knowledge of such facts should admonish us to be charitable on the one hand, and discreetly aggressive on the other; charitable to the professional brother whose operative results may, therefore, be less fortunate than our own; discreetly aggressive so that the area of infliction may be timely removed by operative effort. Early explorative determination of the nature of disease, followed at once by operative relief in suitable cases, is to-day the potent measure of succor pending the advent of means of greater beneficence than those now at hand.

In emphasizing the pre-eminent importance of early measures of relief, one has only to point to the astonishing results which have attended the operative practice of many distinguished surgeons of this and foreign countries. And I believe that it will not be regarded by anyone as evidence of unwarranted pride or of bad taste, if in this connection and on this occasion, we should mention the name of our distinguished president.

If to these means of cure there be now added another for the sake of greater security, the picture in this respect will be complete—a means contemplating the education of the people on the great importance of overcoming reticence regarding such matters in their incipency, rather than sacrificing life by senseless delay. Patients should be taught that the evidences which they may regard as important and entitled to serious thought and decided recognition, are but a step removed from the presence of hopeless despair and final destruction. They should be told that the subtle onset of malignant disease often baffles the keenest perceptions of the most experienced, requiring for arrest and for cure the best we have, and far too often, more than we can give. The exercise of vigilance in patients already operated on by those who are profoundly concerned in the cure, should be periodically and untiringly practiced, in order that the first evidence of disease may be quickly detected and remedied by renewed operation. The stake of the contest in such cases as these is a human life, and all the comfort and happiness relating thereto. Every victory is another triumph over malignant infliction, of which there are very many in surgical experience. In the general struggle for victory against malignant disease, it should not be forgotten that all those fall who do not seek relief; and that all those who early seek relief, will surely secure added years and increased comfort, and that not a few will be finally cured. And important it is to remember that the number cured will be measured by the promptness of early diagnosis and curative action followed by untiring periodic scrutiny of the vulnerable points of return. The degree of fortitude required to sustain a patient under repeated malignant attacks, and prompt operative defense, is akin to that with which martyrs are endowed.

Finally, an emphatic warning should be given to all against the seductive influence exercised on the afflicted, by the "perversions of judgment and vain imagings" which too often allure them from the path of scientific beneficence, trodden by honest, sympathetic aid, into the wilderness of arrant quackery, infested by ghouls of heartless gain. Nor should one hasten unduly to substitute for established method in operative cases, means

which are still on trial, even though encouraged to do so by honest, yet unsettled opinion.

Rather than this one should grow in courage, stimulated by examples of successive cures from early effort, and by sentiments attuned in verse by our profession's greatest poet and our hosts' brightest ornament:

"Here stand the champions to defend
From every wound that flesh can feel;
Here science, patience, skill shall blend
To save, to calm, to help, to heal."

HOW PROGRESS COMES IN MEDICINE.

ORATION ON MEDICINE AT THE FIFTY-SEVENTH ANNUAL
SESSION OF THE AMERICAN MEDICAL ASSO-
CIATION AT BOSTON, JUNE 5-8, 1906.

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During the past year there has been no very conspicuous advance in medicine. Advance there has been, of course, but it has been all along the line rather than any one direction. I propose, therefore, to-night to attempt roughly to sketch, as far as the limitations of time and my knowledge permit, some features of the progress of medicine in the past, its irregularity, apparent lack of logical sequence, dependence on the progress of science (knowledge) as a whole, the way in which advance along a very narrow line may lead to advance along the whole front.

We may for a moment compare the whole body of scientific workers to an army determined to enter into and possess the empire of ignorance, a country of vast extent and presenting every conceivable physical difficulty to advance and occupation. This is one obstacle. Another lies in the fact that the army has not—nor can it have—an organization comparable to that of the ordinary army with its commander-in-chief, chief of staff, corps and division and brigade commanders, although it has the corps and divisions. Each has its leaders, who owe their position solely to merit. Influence, dynastic, political, family, does not count. Promotion is from the ranks. The rise to high position may be very rapid; deposition is occasionally correspondingly so. Far more than in even Napoleon's army *la carrière est ouverte aux talents*. The freest criticism is permitted, nay encouraged; government is largely by discussion based on observation and experiment. There are many scouts and skirmishers who are necessary to any advance, even of a division. There are also, alas! camp followers. As organized to-day we may distinguish six army corps—anatomy, physiology, chemistry, physics, pathology, clinical history.

Permit me now, dropping analogy, to call your attention to some of the lines of march which have been traversed, some of the territory won, some of the means by which it has been gained.

Gross anatomy was about as well, though, of course, not so widely known three hundred years ago as it is to-day. Medicine had got about as far as it could until the knowledge of a heart, of blood, bright and dark, of blood vessels, was vivified by Harvey, who, without instruments of precision, by experiments on living animals, by clear sight and straight thought, solved the mystery of the circulation of the blood. This step in physiology, in knowledge of function, threw a flood of light backward on structure and was indispensable to further progress. Harvey, a practicing physician, paved the way for Malpighi, anatomist, father of histology,

who saw what Harvey had no means of seeing—the capillary circulation. He was contemporary with Leeuwenhoek, the lens-maker, improver of the microscope, and then the microscopist making important contributions to the structure and function of the living organism. Here we see one of the first contributions of physics to medicine. It is remarkable that Leeuwenhoek could do what he did with the simple microscope. He had been in his grave more than a century before any essential advance was made in the compound microscope, gradually leading up to the instrument which has played such a vital part in the progress of modern medicine, and to which I shall again have occasion to allude.

Bichat, indeed, performed his great work and founded the anatomy of the tissues without the aid of the microscope, so imperfect in his day that he thought it more likely to promote error than to discover truth. The ultimate anatomic component of the tissues and organs alike, the cell, though seen and described by Robert Hooke long before, was first seen in its developmental relations in plants by the botanist, Schleiden. Schwann extended this knowledge into animal life. Thus was founded the physiology of the cell. Fresh impetus was given to embryology, so deeply indebted to Caspar Friederich Wolff of the previous century, and the way was smoothed for Virchow and the pathology of the cell.

In the past hundred years the anatomy of the central nervous system has not been illuminated by anatomists. The microscope showed that the grey matter is composed mainly of cells, the white of fibers. No mere anatomic study could possibly have differentiated the function of grey and white matter, the anterior and posterior nerve-roots, the motor and sensory nerves running in a common cable. Charles Bell, the surgeon, by vivisection, made a great step in physiology and thus advanced anatomy. Marshall Hall, the physician, and Johannes Mueller, the physiologist, again made a further advance in explaining reflex action and its mechanism. Waller, the physiologist, teaches us the lesson of the degeneration of nerve fibers separated from their centers. Anatomy never could have taught us the great lesson of cerebral localization, nor could animal experimentation or physiology alone. The starting point came from the clinician who, through careful comparison of the experiments of disease on the human being during life and after death, pointed out the way for physiologic experiment to follow. Critical clinical study first, pathologic anatomy second, physiology third, anatomy fourth; structure and function, function and structure; indissolubly bound together; advance in one must lead to advance in the other.

Time does not permit me to take up chemistry by itself. In other connections I shall allude to the help it has given to medicine and its progress. Chemistry looms large in the future, and we must look to the biologic chemist to solve, or aid in the solution of, some of the biggest problems which confront us to-day.

Morgagni may be regarded as the founder of pathologic anatomy, John Hunter of its greater outgrowth—pathology. Pathologic anatomy, however, remains sterile until wedded to clinical observation. Laennec is the high priest who officiated at this alliance. Borrowing percussion from Corvisart, who resurrected it from the grave of Auenbrugger, and, with the aid of physics, developing mediate auscultation, he compared the signs of thoracic disease in life in the ward with the changes wrought by it after death, and in ten years performed one of the most stupendous feats in medicine, putting