

AMERICAN SURGERY IN A CHANGING WORLD

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IN the slow, painful progress of human culture and advancement there have been frequent interludes in which this movement has been stopped temporarily by the catastrophe of war. For a thousand years, however, no threat of an extinction of culture and of the finer qualities of our civilization has arisen equal to that which exists now in the appalling possibility of a victory of Hitler and of his Nazi barbarians. It seems fitting, therefore, that at the meeting this year of this great body of surgeons we should consider soberly some of the consequences upon our profession which the war may have, particularly in order that by thinking of them now we may perhaps be better prepared to prevent their occurrence.

It is almost incredible that the Germany of only fifty years ago in which there originated much of the groundwork of modern science, including many of the important developments of surgery, should have degenerated into its present position of practical denial of the true values of intellectual enterprise.

The Nazi philosophy of the supremacy of brute force can hardly be reconciled with the fundamental ethical principle of attempting to help the weak and the underprivileged patient which has always been the basis, and, may I say the glory, of medical practice at least

during the Christian era. Shirer,¹ in his *Berlin Diary* states that on May 6, 1940, Bernhard Rust, Nazi minister of education, said in a radio broadcast, "God created the world as a place for work and battle. Whoever doesn't understand the laws of life's battles will be counted out, as in the boxing ring. All the good things on this earth are trophy cups. The strong win them. The weak lose them." This authoritative statement from the man in charge of education in the Germany of today and possibly of continental Europe tomorrow, if taken at its face value, can mean only that in his opinion the purpose of education is to enable the strong to become stronger in order better to rob the weak. Surely that cannot be, some will say. It is unthinkable that anyone in a responsible position of authority could subscribe to so bestial a philosophy. But is not a sufficient answer to that complacent doubt to be found in what has already happened in the countries reduced to slavery—Poland, Czechoslovakia, Denmark, France, Norway?

Let anyone picture to himself the consequences if this conception of the ideals of education should dominate the world. In medicine no more humanitarian principles! Gone the charity hospitals! No more bother about crippled children! It is their own misfortune if the poor are sick and the children are crippled.

Presidential address of the retiring president, presented before the Clinical Congress of the American College of Surgeons, Boston, November 3-7, 1941.

¹Shirer, William L. *Berlin Diary*, p. 328. New York: Alfred A. Knopf.

They are the weaklings. They "will be counted out, as in the boxing ring." What of the effect of the glorification of such brutality upon the doctor himself and especially upon the surgeon? Is such a philosophy compatible with the kind of surgical practice with which you and I are familiar? Certainly not. Why carry out all the troublesome details to make an operation as safe as possible? If the patient is strong he will recover anyway, and why worry if the weak does not survive? Doubtless the extreme results on the practice of surgery which I have just mentioned would not occur quickly but in the long run the corroding influence of a philosophy of brute force accepted by the dominant people of the European continent would be bound to degrade the present high standards which have been set up.

If then at the conclusion of this war Nazi influence should dominate the world a recurrence of the Dark Ages would seem to be inevitable so far as education and the progress of science is concerned. The spirit of the Spanish Inquisition would rear its ugly head again. Has it not already done so in those regions which have come under Hitler's control? The atmosphere of freedom necessary for the growth of science and the spread of education would not exist. German surgery since Hitler came to power has been practically sterile.

Those in America who, because of the wide expanse of the Atlantic Ocean feel secure against the possibility of a successful Nazi military invasion may think that it is of little concern to us here whether or not Europe adopts the Nazi ideology. But I cannot agree with that opinion. It is admitted probably by everybody that if Hitler is victorious in the European conflict it will be necessary for the United States to remain on a war footing indefinitely. This will mean not only a large army and navy but large taxes also. We have become accustomed to depend on private benefactions for much of the support of our universities and hospitals. It is common knowledge, frequently expressed, that already the reduction of private contributions has seriously handicapped many of our institutions. If those contributions become still less because of higher and higher taxes for the support of a huge preparedness program, radical changes

in the whole scheme of higher education and of the support of scientific research will probably be necessary. It seems hardly possible that either education or research would be supported on the same generous scale if that support were dependent largely on government grants. Certainly much of the freedom to which we have long been accustomed in the privately supported institution would be curtailed with all the restraints, delays, and red tape necessitated by dealing with government clerks.

More important though might be the spread of the demoralizing Nazi theories of education to this side of the Atlantic which might be accepted under the impulse of necessity in competition even if they were considered undesirable. As long as three years ago reports from Germany indicated that the medical course had been shortened by a year and a half because of the demand for more medical officers in the Army. Is it inconceivable that such pressure might be made in this country for a shorter and "more practical" training if we are forced to stay indefinitely on a war basis? The close integration of the world which has been brought about by modern transportation and communication has made it difficult even for an educational system of one country to be uninfluenced by that of another strong and dominating nation.

That science knows no political boundaries is a common remark. An idea expressed in one country is elaborated in a second and built upon in a third to emerge as something practical and perhaps utilitarian. Great accomplishments are necessarily the products of many minds and hands. Surgical science in its development has been no exception to this rule. The evolution of modern surgery has been the work of all the enlightened peoples of the world, and the chief contributions to it have been made by those who have lived in atmospheres of the greatest intellectual freedom. If Europe continues to live in slavery and the rest of the world becomes an armed camp there will be little prospect of any notable advance in any of the sciences or cultural activities even on this side of the Atlantic.

At a time like this when international hatreds are strongly aroused it is well to recall some of the epoch-making contributions which

have served to create our modern surgery. Although it is difficult, if not impossible, to date the beginning of any great movement, to say who actually started it, it seems reasonable to state that the birth of the modern scientific spirit of surgery can be traced more definitely to the immortal Englishman, John Hunter, than to any other individual. Before his time, and for that matter during his life (1729-1793), there was no experimental approach to surgical problems and no accurate knowledge of the pathological conditions present. Surgical operations for the most part consisted of amputations, the opening of abscesses, and the removal of superficial tumors. Hunter, however, by his resort to the experimental method, his careful study of pathological specimens, his observations on comparative anatomy and on embryology established a scientific basis without which the surgery of the present day could not have developed. While Hunter was inaugurating the new sciences of experimental pathology and experimental surgery in England the army surgeon in Germany, according to Garrison, was still being called *Feldscherer*, because it was his duty to shave the officers.

To Great Britain, of course, also must go the credit of creating the antiseptic principle in surgery, carried to a revolutionary success by Lister, but later modified by the German, von Bergmann, into the technique of the present day asepsis. Lister's discovery, as everyone knows, made it possible for the first time to perform an operation on a patient without the previous fear of wound infection. The tremendous practical value of that work is likely to overshadow its other aspects. To me, however, some of those other aspects are of the greatest importance. Lister was a man of the same mental stripe as John Hunter. He was both a logical thinker and an experimentalist. From experiments which ran over a period of about twelve years he reached certain tantalizing conclusions about the nature of wound infection but he was unable to go further on his own knowledge. For example he had concluded that: (1) putrefaction caused suppuration, and wound infection did not occur without suppuration; (2) suppuration (decomposition) was in some manner caused by the presence of air; (3) the gases in the air

were not responsible. What could it be in the air that was responsible, if not the gases? In 1865 his colleague at the University of Glasgow, Dr. Thomas Anderson, the professor of chemistry, called his attention to the papers of Pasteur on fermentation and putrefaction. Now he found the answer to his question. This to my mind is a splendid example not only of the interdependence of one nation upon another in science but of the interdependence of one science upon another. Was it not a revolutionary idea in itself at the time that a surgeon could receive help from a chemist on a "practical" problem like the healing of a wound?

Another major British contribution to the development of modern surgery has been the part played by the trained nurse. It seems doubtful to me that the art of surgery could have reached its present high plane without the sympathetic devotion to the patient and the careful attention to details which can be given only by intelligent women. The fact that Florence Nightingale and Joseph Lister were contemporaries has been of the greatest importance to us.

Germany through the influence of its great universities on medicine during especially the latter half of the nineteenth century and in the present century until the World War did much to extend the development of the scientific spirit in surgery. The older members of this audience will recall how eagerly the German surgical journals were read before the World War to learn of the latest developments in both the art and science of our profession and with what authority we at least in this country considered the German masters to speak. In looking back now, however, to the period nearly thirty years ago when German surgery was at its peak it would seem that what inspired us and fascinated us most was the spirit of scientific inquiry which was developed in that country to a greater degree than in any other up to that time. The best German university surgical clinics were centers of experimental investigation and were influenced by, at the same time as they themselves were influencing, other medical sciences, notably physiology and pathology. With the advent of antiseptic and aseptic surgery the German and

Austrian surgeons seized eagerly upon the opportunity to extend the occasional previous attempts to explore the possibilities of abdominal surgery. As a result particularly of the work of Billroth and his distinguished pupils, notably Mikulicz, Czerny, Woelfler, Gersuny, and von Eiselsberg, visceral surgery was added to the field of the surgery of the extremities. Billroth, however, made another important contribution, namely, a plan to educate young men to be surgeons comparable to or even to excel the "chief." It seems strange to us that the idea was so late in being proposed. Yet outside of the German and Austrian universities it was slow to take root. Even the great Lister had no disciples of the sort who were trained and developed in the well known surgical clinics of Germany and Austria.

In spite of the development of the science of surgery to a high degree in Germany, no individual giants arose comparable in stature to John Hunter or Lister. Contributions of others who were not surgeons, however, did greatly influence the science and art of surgery perhaps as profoundly as those of Hunter and Lister. I refer especially to the contribution of the x-ray by Roentgen and to the development of the new bacteriology by Robert Koch.

The United States has had an important share in the development of modern surgery. It is customary to say that our greatest contribution has been surgical anesthesia. There can be no question that this was of the first magnitude, ranking with Lister's antiseptics as one of the principal foundations upon which modern surgery was erected. Yet it seems to me there have been other American contributions almost, if not quite, as noteworthy, although less dramatic.

The elaboration of the nature of and the present treatment of surgical shock has been largely accomplished by Americans, although no single name in this connection stands out so prominently as with each of the other epochal discoveries previously mentioned. Until the beginning of this century only the haziest of ideas existed among the surgeons of the world as to the nature of this serious and frequent complication of severe injuries and of major

operations. Crile's researches published in 1899, although not the first, and although later shown to be partly wrong in their conclusion, nevertheless focused the attention of surgeons on this subject and had great influence in arousing their interest. The more recent work of the American surgeons, Blacklock, Phemister, Scudder, and others has added greatly to our knowledge of the fundamental mechanism of the production of shock. The contribution of Lewisohn of the harmlessness of the transfusion of citrated blood furnished a practical method for the better treatment of shock. The most recent development of using dried plasma instead of whole blood has been chiefly made by workers on this side of the Atlantic. The first experimental use of it for this purpose was by Bond and Wright of the University of Pennsylvania in 1938. As a result largely of the American contributions to this subject, a danger ever present in serious operations which is scarcely less important than that of infection has been practically banished from modern operating rooms.

As a sort of corollary to both the principles of the prevention of wound infection and the protection of the patient against surgical shock there stands the necessity of the gentle handling of tissues in order to accomplish a healing of the wound as nearly perfect as possible. To Halsted of Baltimore no less than to his Swiss contemporary, Kocher, belongs the credit of the passing of the rough and ready slapdash surgery which was prevalent a generation ago. Americans who had come under the influence of the careful, painstaking, deliberate, and almost bloodless operating technique of Halsted were usually amazed when visiting the well known German surgical clinics of the time to see the surgeons wearing rubber boots, the disregard of hemorrhage, the rough handling of the tissues, the careless closure of the wounds, and the shocking anesthesia. These sights usually made an indelible impression that the German surgeons, although perhaps greatly interested in the science of surgery, had failed to cultivate its art.

In order that the public may profit by developments in any science it is necessary of course that those developments should be

placed at the disposal of a large number of people. The important surgical advances which were rapidly developed after the advent of Listerism would have been of very little use to the general public if there had not been a considerable body of surgeons trained to make use of them. The system of training young surgeons put into effect by Halsted at the Johns Hopkins Hospital, the so called graded resident system, appeals to us Americans as being in principle the best method yet proposed. The fact that it is being used extensively in this country and elsewhere has been of incalculable value in raising the general level of surgical practice.

There must not only be well trained surgeons to carry the new developments of our profession to the public but there must also be facilities for the use of those developments. The United States and Canada have been leaders in the creation of a sort of hospital which until very recent years was unknown in those countries which followed European customs. The idea that the hospital is an institution for only the poor has been prevalent for centuries in Europe. As modern medicine developed, necessitating complicated apparatus and equipment for diagnosis and treatment, the remark was frequently made by our European colleagues that the middle class and the rich, who were taken care of either in their own homes or in the institutions known as nursing homes, were denied the medical care received by the poor. The North American idea, however, fortunately for us and for our patients, has been that a hospital could serve all classes in the community. Long ago surgeons here stopped performing major operations in the patient's homes except in isolated instances. There is no country in the world in which good hospital care is so readily available for all classes of patients as it is in the United States and Canada. But it was not always so. Some hospitals would like to cut corners by all sorts of economies which might make them unsafe for the surgical care of unsuspecting patients by even well trained surgeons. It is necessary to compel such institutions to live up to certain standards if they wish to maintain their good reputation with the public. The hospital standardization program carried out

by the American College of Surgeons for nearly twenty-five years under the very able leadership of Dr. Malcolm MacEachern has been unique. No other organization in the world has performed the same function. Its influence in maintaining a high standard of surgical practice in North America has been incalculable. Perhaps it would be no exaggeration to say that the hospital standardization program has been no less powerful than the trained nurse in carrying the benefits of modern surgery to the general public.

My purpose in mentioning some of the outstanding developments which have created what we know as modern surgery has been to emphasize its internationality, rather than to attempt to give a brief historical review. I have, therefore, omitted many important discoveries and contributions which others might think deserve to be mentioned in a discussion of the parts which the leading countries of the world have had in establishing the science and art of our profession.

It is unthinkable that this structure so laboriously created should be destroyed, but to preserve it will almost certainly be the responsibility and obligation of those of us who live on this side of the Atlantic at least until such time as the world has recovered from the exhaustion which will follow the struggle for the crushing of Hitlerism. From force of circumstances the surgical world will surely look to America for leadership. We must be prepared to accept that responsibility.

Although surgery is international in its scope, its development in different countries has been characterized by differences of emphasis and by differences in point of view which have resulted in a more or less distinctive and characteristic quality of the surgery in the principal nations. Thus, for example, British surgery in many respects differs from our own and the German surgery. Likewise American surgery differs from the German. There is, of course, nothing surprising in this fact. Each of the three nations mentioned has a different culture and different traditions, and distinguishing features can be recognized in many intellectual activities, as in their methods of general education, in their music, their art, their architecture and so on.

Our own surgery more closely resembles that of the British than any other. The differences are somewhat intangible and difficult to describe; yet they are apparent. They can perhaps best be summarized by stating that we are more theoretical and less practically minded. We are a younger nation and, therefore, less conservative. The British surgeon is a master clinician in the application of the older art of physical examination to diagnosis and he is unexcelled in technical operative skill. He has carried on splendidly the tradition of anatomy as the foundation stone of surgery. We Americans, on the other hand, as a result of the changes in our undergraduate medical curriculum, have almost forsaken the gods of our fathers, anatomy and pathology. We have been seduced by the newer and more alluring gods of physiology and biochemistry. We have become more interested in function than in structure. It has been an amazing revelation to the American Board of Surgery to find that a generation of young surgeons has grown up whose ignorance of the anatomy and of the pathology of the structures with which they are dealing is abysmal. The wonder is that such men can be doing as good surgery as they undoubtedly are doing. Although the revelation shakes one's faith somewhat in the necessity of a sound knowledge of anatomy and pathology, nevertheless, it is difficult to believe that these same men would not be doing much better surgery if they did have sounder knowledge of those subjects.

It is probably an inevitable characteristic of a young rapidly developing nation to become ambitious to equal or to excel the accomplishments of older nations. The spirit of inquiry and of experimental research prevalent in the better German clinics before the First World War found favorable soil on this continent when it was transplanted here by many young men who saw in the rapidly developing sciences of physiology and chemistry many applications to clinical problems. It is not surprising, therefore, that the stream of publications appearing in the German journals had a profound influence on American surgeons. Moreover this influence came at a time when we in this country were most able to take advantage of it. From the beginning of

this century on, more and more opportunities were presented to young men to undertake original experimental work. After the great awakening and the revolution in medical education which followed the publication of the Flexner report in 1910, together with the work of the Council on Medical Education of the American Medical Association, these opportunities were greatly multiplied. Experimental investigation and the spirit of scientific inquiry became glorified. The older, more drab and less fertile disciplines of anatomy and pathology became seemingly of less importance to the ambitious young surgeon. His desire was to startle the world with a new and important discovery. Not much chance of doing that in the intensively cultivated and exhausted soils of anatomy and pathology. The urge to get into print to make his name known obsessed every young surgeon who was ambitious to get along. Positions of prestige and influence were often filled on a basis of the candidate's publications more than on any other qualification. Sometimes the list would be regarded as more imposing if the number of the published articles exceeded those of the rival candidate, without a sufficient regard for their quality. Is it any wonder then that this urge for recognition resulted in a dimming of the lights of anatomy, pathology, and the old established methods of physical examination of the patient?

One of the American characteristics most frequently noted by foreigners is our tendency to undertake a new project or to accept a new idea with the utmost vigor and enthusiasm. Our acceptance of the value of the spirit of research in medicine was no exception. The movement in this country developed into a veritable surge, and large numbers of young men crowded into the research laboratories to find out something new. The printing presses were overworked to publish the volumes of work produced and scores of new medical journals appeared. There was little excuse for any Milton to be mute and inglorious. It was to be expected that most of the ambitious young investigators would be unfitted by nature to startle the world with any epoch-making discovery. On the other hand some, yes even some of the young surgeons, have

made very important fundamental contributions to our knowledge not only of physiology, both normal and abnormal, but even of pathology and of the forsaken subject anatomy, especially the anatomy of the nervous system. Others have added smaller stones to the building of our edifice. The spirit of research overflowed from this country into neighboring countries and back to Europe. With the benefactions of the Rockefeller Foundation distributed throughout the world there was scarcely a civilized country in which the spark of original investigation was not kindled into flame if it existed at all. Never before in the history of the world has there been anything remotely approaching the flood of scientific discoveries which has occurred in the last twenty years. Perhaps there will never be another period like it. In any case there is bound to be a recession of the wave. Almost certainly this recession has already begun. In all those parts of the world touched by the withering hand of Nazism research activities are impossible. England and Russia are handicapped by their struggle for existence. Only the nations of North and South America are so far free to carry on the spirit of research, and one wonders how long can this go on. Historians often have pointed out the wave-like character of the great cultural advances. During a relatively short period of time enormous progress is made, to be followed by a long period of relative inactivity or actual recession. Notable examples are the so-called Age of Pericles, the Alexandrian Period, and the Elizabethan Era. In view of the present chaotic conditions of the world, it would seem to require much optimism to assume that the period of unprecedented scientific advance through which we have just passed will continue with undiminished tempo.

Along with the recent period of enormous research activity there has been an immense improvement in the quality not only of the best but also of the average surgery practiced in this country. Better medical schools, more and better facilities for a long term specialized education of the young surgeon, more widely distributed well equipped hospitals have all had an incalculable effect in making good surgery available for the mass of the popula-

tion. The high standards set for certification by the specialty boards have been a very stimulating influence in keeping the practice of the various surgical specialties on a high level. The development of group practice brought to a remarkable state of efficiency by the Mayo Clinic and emulated by many other clinics has also been a factor in improving surgical practice.

The influence of the American College of Surgeons has carried much weight in improving the average surgical practice throughout the country. Its splendid work in improving the hospitals of the United States and Canada has already been mentioned. Also important have been its recently increased standards of admission to fellowship, the work of its recently appointed committee on graduate education, its official journal, and its annual meetings where the surgeon out of touch with the medical centers of the country can come to learn of the new developments in surgery.

At the meeting this year an innovation in the program was made. The Forum on Fundamental Surgical Problems was created. This symposium of ninety short presentations of experimental work on surgical problems was arranged largely by the efforts of Dr. Owen H. Wangensteen. It can almost certainly be said without fear of denial that never before at any surgical meeting in any country has there been a program presenting so much original work, mostly by younger investigators. It constitutes, therefore, a unique event. Moreover, it represents, it seems to me, one of the chief characteristics of modern American surgery, the spirit of inquiry and the utilization of all the sciences for the solution of surgical problems. It is a characteristic of which we American surgeons can justifiably be proud. It removes surgery from the realm of mere craftsmanship and translates it into a science. It is this experimental attack which constitutes the front line of surgery. Does not this program show that the spirit of the immortal John Hunter still survives? His memorable words to Jenner should be recalled, "I think your solution is just; but why think? Why not try the experiment?"

In the foregoing remarks an attempt has been made to emphasize the fact that the de-

velopment of modern surgery has been due to important contributions from several nations but yet that the practice of surgery has certain national characteristics which make it different in different countries. Reasons have been advanced for assuming that the recent unprecedented period of scientific progress is certain to be checked, if it has not already been, regardless of the outcome of the war. A Nazi victory, however, will mean almost certainly for a time a more or less complete destruction of the scientific spirit throughout the world. It has been emphasized that attempts to preserve our present high standards and to carry forward the light of progress will fall most heavily on those of us who live in the Americas, South as well as North.

Let us now briefly consider some of the ways by which these standards can be preserved. I should say that it is of the utmost importance that the surgeons of North America and of Latin America come to know each other better and to develop a spirit of more sympathetic mutual understanding. The surgery that is being practiced in the centers of Latin America is not excelled anywhere, and an increasing volume of original work of very high order is being produced. The knowledge of this work has been only slowly diffused in North America because of difficulties in language. Likewise, for the same reason, our surgery has not been so well known to our southern neighbors as the continental surgery. Would not a regularly meeting Pan-American surgical congress with the cooperation of the American College of Surgeons provide a stimulating and helpful influence in preserving and fostering the spirit of surgical progress at least on this side of the Atlantic while Europe is recovering from the disaster of war? By meeting in different countries and at stated times, either annually or less often, there would certainly arise an inspiration from personal contact and from developing friendships and respects among those most actively engaged in the advance and practice of our profession. More of us North Americans would come to possess a knowledge of Spanish and Portuguese, and more of the South Americans, English. There would be a freer interchange of medical literature, of ideas, and of students. The American College of

Surgeons already has a membership of 225 from Latin America. It could well be more nearly representative of all the Americas, both in membership and in its governing bodies, so that truly it would be an all embracing American College of Surgeons, thoroughly international in its point of view and administration. This suggestion may seem too radical, but we must be prepared to make radical moves if we wish to counteract the results of the swiftly moving tragedy in Europe.

In a discussion of the preservation of our highly developed modern surgery, it is necessary to touch upon our duties and obligations to the armed forces of our country in a program of preparedness for war. The Army particularly, and to a less extent the Navy, need more medical officers. We must do all in our power to provide them during the acute emergency. In striving to preserve our programs of training young surgeons we must not hamper the agencies of our government whose defeat would mean the destruction of our national independence. On the other hand, the armed forces should not unnecessarily and ruthlessly interfere with our laboriously developed system of training. Enough of it must be safeguarded to prevent too great a recession from our present standards. I am pleased to say here, to the credit of the wisdom of Surgeon General Magee of the Army and of Surgeon General McIntire of the Navy, that every effort has been made to interfere as little as possible with the training programs. Possibly a plan may be worked out whereby the young medical officers, after a limited service, can be released to finish their periods of training in the civilian hospitals.

Possibly greater dangers to the safety of our resident system will come from the governing bodies of our civilian hospitals when the specter of hard times leers at them. We must, however, hold fast to the principle of the system, even if some modifications become necessary. We must not forget that surgery is a science as well as an art and must constantly advance. Above all, to be true to our profession, we must remember that the practice of surgery is based on humanitarian principles. Come what may, we shall not subscribe to the philosophy of the supremacy of brute force.