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THE CASUALTIES OF WAR AND INDUSTRY AND THEIR RELATION TO ORTHOPEDIC SURGERY *

ALBERT H. FREIBERG, M.D.

Major, M. R. C., U. S. Army
CINCINNATI

With the entrance of our country into the great war, in which we are now involved, there has come a great and new emphasis on the importance of orthopedic surgery. Before our government had placed a regiment on the shores of Europe, even before it had made known its plans for raising its great army of citizen soldiers, we were made acquainted with the fact that it would demand the service of orthopedic surgeons in numbers much greater than were known to exist in the land. It is needless to say that its plans were not based on previous military experience of our country but on the results of three years' warfare among the European nations, both those with whom we are now allied and those with whom we are at present at war. The numbers of wounded have been quite unprecedented, the character of injuries and disablement which has prevailed, distressing beyond all previous human experience.

The call to activity of the orthopedic surgeon came, however, not by reason of either of these factors; it came because it has been found that in him and his peculiar training there lay hitherto unrealized possibilities for the preservation of function in the terribly shattered human frame. It became evident that the orthopedic surgeon was proving himself to be of conspicuous usefulness with his combination of superior mechanical skill and resourcefulness, together with general mastery of the technic of operative surgery. Without such combination we have, indeed, no orthopedic surgeon but merely an orthopedist. We shall not fail to remember that only a few years ago the term "orthopedist" was applied quite as freely to the man who made and sold braces as to the medical man who ordered them; that, not infrequently, mechanical appliances were fitted without professional advice. This was not always inappropriate; frequently the artisan knew more about them and their use than the physician. Many of us, in this day, do not know how large a rôle the skilled workman played in the development of orthopedic apparatus. Hession, whose appliances have been so largely used by the Germans in times of peace, was not a graduate in medicine, but really a quack; the book published over his

name shows clearly that however marvelous his mechanical aptitude, he was never an orthopedic surgeon. He was an orthopedist, however, and one such as could never be developed by the curriculum of a medical college.

There are quite a few among us in America who have a practical acquaintance with the Hession types of apparatus as they were extensively used in Germany some years ago. We recognize that they were ingenious, exact in operation and very elegant in appearance; yet we, who are always so ready to adopt that which is mechanically attractive and purposeful, make practically no use of such appliances today. I believe that the reason for this is to be found in the fact that our professional background has become steadily more scientific and, by the measure of this, our methods more direct and simple; we are more concerned with the application of the principles of surgical pathology than with the elaboration of apparatus. It is a striking thing that our colleagues who are working in France have been able to respond to practically all of their needs in the way of mechanical appliances by means of six pieces of apparatus, as they may be modified to suit the various exigencies. Those who know the men will also know that this has not been done at the cost of efficiency. Let us take heed, therefore, and not fail to learn the lesson, for our greatest task is at hand. Let us realize that the fundamental thing about the orthopedic point of view is not that we shall possess superior knowledge in the application of mechanical methods, but rather that we shall be adept in utilizing the mechanics of physiology under conditions both normal and abnormal. From this, after all, must our mechanical methods of treatment be derived.

To my mind, there could be no greater mistake for the orthopedic surgeon than to find in the demand for large numbers of his kind the cause for self-congratulation by reason of the fact that recognition of his merit has become inevitable. On the contrary, he should be sobered by a sense of increased responsibility and should be impelled to inquire with a view to ascertaining the reasons and thus enable himself to respond most efficiently to his enlarged duties. Do we find an explanation of the need for an unusually large proportion of orthopedic surgeons in the Army in the large number of wounded, simply? Are the wounds of war so different from those of peace that we find in this the explanation? Has military practice brought forth methods of orthopedic surgery so different from those of peace that this must be considered the reason? Perhaps, with nothing but information at second hand and without any personal military experience, I am not qualified to make the inquiry and consequently surely unable to furnish the answer. I shall leave the decision open, to be finally made by

*Address of the chairman of the Section on Orthopedic Surgery, read before the joint meeting of the Section on Orthopedic Surgery and the Section on Preventive Medicine and Public Health at the Sixty-Ninth Annual Session of the American Medical Association, Chicago, June, 1918.

those whose right to form it is beyond question. At the same time it seems to me that I can forestall it. From the information at hand I believe that however different the causes of injury in combat may be from those operative in industrial life and in times of peace, the results on the human organism can differ only in degree and in the conditions under which the surgeon must do his work. I dare say that there are few injuries of war whose prototypes have not been encountered for years by the surgeons of our large industrial establishments, even though in numbers small beyond comparison in consideration of the time unit. If this be true, perhaps it would be even fair to say that, to this extent, we have always been at war.

WORK OF THE ORTHOPEDIC SURGEON

From the recorded experience of our allies it is already evident that the work of the orthopedic surgeon has accomplished certain things which have established a new value for him in the eyes of military leaders. Through his work many wounded men have been returned to active military duty within a reasonable time, who under former conditions must have been relegated to civil life with their industrial usefulness impaired; thus have been saved to the government two losses. The one is a military loss, as complete as if death had resulted, and perhaps even greater since the burden of care must fall on the military establishment. The second may be spoken of as an economic loss by as much as it means a reduction of the productive activity of the nation; in consideration of the large numbers involved in present day warfare, it constitutes a very great economic loss.

To the members of this section I need say but little concerning that which constitutes modern orthopedic surgery; they, of all persons, should understand that it does not mean a system of practice, that it is neither operative, nonoperative, manipulative nor mechanical in its methods, but that it avails itself of all of these resources as the occasion demands. That which is characteristic of orthopedic surgery today is an especial and distinctive point of view. Sir Robert Jones has expressed this in epigrammatic form by saying that "the orthopedic mind thinks in terms of function." I am unable to refrain from quoting two additional sentences from his recent address before the Hunterian Society. He said:

The pathetic side of an orthopedic center is the collection of physical disabilities which should never have been. The inspiring fact is, that in our experience, hardly a case is to be found to whom we cannot offer help.

Reflection will disclose that within these two short sentences are to be found the widest limits of our activities in cases of traumatic damage.

The justification of specialism can, however, never rest in what the specialist says he can do but in that which speaks for itself as an accomplishment. Neither is specialism in any department of human endeavor to have its *raison d'être* in the limited capacity of the specialist, if it is to mean much to humanity. Specialization in scientific fields is to be justified only as it constitutes an element of human progress. That it may do so implies that men of high ability will devote themselves to it and that they shall have the advantage of applying their talents to a field of limited extent only in order that it may be tilled with unusual care, that its problems may be studied without interference by that diffusion of interest which is necessarily

associated with a great multiplicity of questions. One is to be a specialist, therefore, not in order to fit the task to an aptitude which is restricted, but rather to apply a larger vision to the solution of difficulties in a sphere which is narrowed for the sake of a greater efficiency, and not for any other reason. The success of special endeavor depends, therefore, on the measure of its particular efficiency. Men of distinguished ability are often led astray, however, by the temptation to widen unduly the compass of their labors and at the expense of thoroughness; they fall into the error of believing that their capacities are too great to be confined. The distinctiveness of the product of such a state of mind is far more likely to be quantitative than qualitative. Let us, therefore, not say to ourselves by preference, How many more things can we do? but rather, How much better can we do them? By as much as we can do them better, shall we prevail.

FUNDAMENTAL IDENTITY OF PROBLEMS CONCERNING WAR CRIPPLES AND PEACE CRIPPLES

The burden of my message, however, may be found in the fact that the sentences which I have quoted from Sir Robert Jones are pregnant with meaning, not simply in respect of the injuries of war, but likewise in respect of those of peace. Except as a compound comminuted fracture of the femur has been produced on the battlefield by bullet, shrapnel or shell, it does not materially differ from the one produced in railroad yard or steel mill, as concerns the prevention of deformity and the preservation of function, to begin with, or the correction of deformity and the restoration of usefulness when the primary indications have failed of being met. Unfortunately, both the pathos and the inspiration of Sir Robert's words are as apposite in industrial practice of peace times as they are in military experience, notwithstanding the disparity in numbers involved. The principles are the same; once a man has lost an extremity or has had it crippled, it does not matter how it happened; the possibilities of restoration to usefulness and the means of accomplishment are the same. In some respects the war cripple is, in fact, in advantage over the industrial cripple; he has the advantage of being a part of an exigent national problem, appalling by its magnitude but attractive by its patriotic appeal. The industrial cripple, on the other hand, is very likely to be looked on as the private concern of his employer, whether corporate or individual. The pity of it is that it has required the impulse of a world catastrophe to furnish the proper stress for these facts; they should have been commonplaces in every center of industrial activity in times of peace. But this has not been the case, save in exceptional instances. Immense effort has now to be made to provide curative workshops, equipment for physical therapy in its various forms, and a skilled personnel to operate them, as if these were peculiarly the needs of war times. This is true, however, only as concerns the greatness of the needs. We are plainly guilty of having neglected the means of physical and psychic reconstruction in our days of peace, and we now see the writing on the wall. Orthopedic surgery has been held within too narrow limits, but we are now compelled to recognize the fact that this has had the effect of making the surgeon himself too contracted in his outlook.

The call is for us to meet the emergency of the appalling situation of war, first of all and by all means. We must not rest content with this, however; we must

emerge from the world conflagration as orthopedic surgeons with the broadest outlook, and we must look on the lessons learned in the reconstruction and rehabilitation of maimed soldiers as a heritage to be passed on to the coming generation of our profession and our people at large, but also to be incorporated at once into the service of those whose sacrifices have been made in the peaceful, but nevertheless relentless, combat of industrial enterprise and production. Not until this has been done shall we have responded to our duty in an adequate manner.

THE FREQUENCY OF PULMONARY COMPRESSION SIGNS IN ACUTE FIBRINOUS PERICARDITIS *

HENRY A. CHRISTIAN, M.D.

BOSTON

In books on physical diagnosis, attention frequently is called to dullness and bronchial breathing in an area of varying size in the left back just in the region of the angle of the scapula or below it as an accompaniment of pericardial effusion. For example, Musser,¹ under the heading of "Pericardial Effusion," says:

Pulmonary resonance is modified posteriorly. At the angle of the scapula is a small area of dullness, increased vocal fremitus and bronchovesicular and bronchial breathing when the patient is sitting upright, which disappears when he leans forward (Bamberger's sign). The dullness in large effusion includes the axillary region so that it may simulate pneumonia or pleural effusion.

Roberts² thus discusses these pulmonary signs in pericardial effusion:

In considerable pericardial effusion, the condition of the left lung may give rise to a definite group of signs at the back of the chest on that side; namely, a limited area of deficient resonance or actual dullness, about the size of a crown piece, generally localized in the vicinity of the angle of the scapula with increased vocal fremitus, bronchial or tubular breathing, and bronchophony or egophony. Sansom regarded these as valuable signs in children and young subjects. I have in a few instances noted them in older persons, in a pronounced degree. Dr. Ewart attaches special diagnostic importance to a patch of marked dullness at the left inner base, which he described as of square shape with abrupt boundaries, extending for a variable distance from the spine outward and upward, but limited. Over the dull patch respiratory sounds are absent and voice sounds feeble.

Robey,³ in discussing fluid in the pericardial sac, says:

In these cases almost all authors, Billings, Babcock, J. Mackenzie, Cabot, Musser, Parkinson, call attention to a small area of dullness in the left back just inside the angle of the scapula, described by Ewart and produced by mechanical atelectasis of the compressed lung.

These various authors seem to lay emphasis on the pulmonary signs described by them as indicating very considerable amounts of fluid in the pericardium. The writings indicate that the signs are found chiefly in patients who would be diagnosed as having pericar-

ditis with effusion. In my own experience I have been struck with the very great frequency of occurrence of abnormal physical signs in the left lower lobe of the lung in cases which ordinarily would be diagnosed as cases of acute or fibrinous pericarditis because of the presence of a to and fro friction rub over the precordium.

In my wards at the Peter Bent Brigham Hospital I have had opportunity to observe fifty-three patients, almost all adults and some elderly, in whom, among others, the diagnosis of acute pericarditis was made because of an audible pericardial friction rub. Of these fifty-three patients, thirty-nine, or 73.5 per cent., showed abnormal physical signs indicating some sort of a pathologic condition in the left lower back. These were not patients with signs indicating extensive pericardial effusion, but rather, so far as signs over the precordial area go, probably patients with fibrinous exudate, at least over the anterior part of the pericardial sac. Seventeen of the thirty-nine patients showing pulmonary signs had acute articular rheumatism on admission or had had an attack a very short time before admission.

As an example of the occurrence of these compression signs, Case 1 will serve:

CASE 1 (P. B. B. H. Med. No. 1159).—A woman, aged 48, was admitted to the hospital, May 5, with a history of acute rheumatism beginning one week prior to that time. On admission her heart was essentially normal and her lungs were normal. May 14, she had a recurrence of acute rheumatism. May 19, a slight pericardial friction rub was detected over the precordium. By May 25 this friction rub had become very distinct. June 2, the pulse suggested partial heart block. June 8, there was made out at the left back below the angle of the scapula moderate dullness with distinct bronchial breathing. Three days later bronchial breathing at the left base was loud and there was distinct bronchophony. By June 9 these pulmonary signs had entirely disappeared. During the period of the rheumatism, the patient's temperature fluctuated between 100 and 102 F. During the period of development of the pericarditis and of the signs at the left base, the temperature fluctuated from normal up to 100, from which point it gradually fell to normal; but the change in temperature was at no time sudden, such as might be expected from a consolidation ending by crisis.

When the physical signs are more extensive, the difficulty of making a diagnosis is increased, as is shown in Case 2:

CASE 2 (P. B. B. H. Med. No. 2201).—A man, aged 20, admitted, January 20, with a history of developing rheumatism three days before he came in, was found on admission to have normal heart and lungs. January 23, there was a suggestive pericardial friction sound, and the area of cardiac dullness was slightly increased. The pericardial friction rub became much more definite, January 26. January 28, roentgenoscopy revealed only a moderate degree of cardiac enlargement, and no pulmonary lesion. January 29, pericardial friction sounds had disappeared. February 3, dullness and bronchial breathing were noted in the left back from the spine of the scapula to the base, and in the left axilla below the fourth rib. The observer interpreted these as compression signs. Another observer on the same day interpreted the findings as consolidation in the left lower lobe. A little later, on the same day, bronchial breathing was noted in the entire distribution of the left lower lobe, including that portion of the lung that lies over the lower outer quadrant of the precordium. The finding of this very extensive consolidation coming well over the precordium indicated to this observer that there was an actual consolidation rather than simply compression. Two days later the dullness and bronchial breathing persisted over the lower back as well as over the precordium. On this day the left chest was tapped in several places to see if any fluid

* From the Medical Clinic of the Peter Bent Brigham Hospital.

* Read before the Section on Practice of Medicine at the Sixty-Ninth Annual Session of the American Medical Association, Chicago, June, 1918.

1. Musser: Practical Treatise on Medical Diagnosis for Students and Physicians, Philadelphia, Lea and Febiger, 1913, p. 615.

2. Roberts, in Allbutt and Rolleston: System of Medicine, New York, the Macmillan Company, 1909, 6, 61.

3. Robey, W. H., Jr.: Acute Pericarditis, Am. Jour. Med. Sc., 1917, 153, 529.