can be taken. It is a common experience that suspicious physical signs upon the first examination may at a subsequent examination at an interval of a few days be found to have entirely disappeared.

VI. When sputum is obtainable in a suspected case it should, of course, be examined, and for this purpose a clinical laboratory should be at hand as well as for other bacteriological examinations.

VII. All cases with any developmental defects of the chest, such as rachitis, or with defective musculature, should receive especial attention in the examination.

VIII. In suspicious cases, particularly with a pulse above the normal, the temperature should be taken at stated periods for several days.

IX. All acute respiratory infections, such as bronchitis, influenza, laryngitis, etc., should be kept under observation in the hospital.

Elliot advises that each man should be reexamined once in three months as a routine measure. And "a most thorough medical examination is essential," he says, "when he is warned for departure overseas." While this may not be necessary or possible with a large army, and when departures are uncertain and often unexpected, at least all cases which for any reason aroused suspicion in the former examination should be re-examined, at intervals, as well as those suffering from any "bronchial trouble." It "eternal vigilance is the price of liberty," it is equally the price of keeping tuberculosis out of the army.

REFERENCES.

6 The British Journal of Tuberculosis (Tuberculosis among Combatants and War Workers), Vol. 1, No. 2, April, 1917.
7 The American Review of Tuberculosis, Vol. 1, No. 6, p. 248.
10 Same as above.

THE AFTER-CARE OF THE WAR CRIPPLE.

BY E. A. McCARTHY, M.D., FALL RIVER, MASS.

The privilege of addressing you I consider not only an honor but a patriotic duty to discuss with you such an important and timely subject as "The After-Care of the War Cripple." The preceding speaker has told you what is to be done with the soldier maimed and scarred, from an industrial standpoint. Allow me, if you will, to tell you a few things about the status and purpose of the orthopedic surgeon in this conflict.

In order that there should not be any misunderstanding, it perhaps would be the proper thing to define the word, "Orthopedic," for we have been called, by the laity, many beautiful and sacred names. We have been called the bone doctor, the foot doctor, the toe doctor; and one woman, who called at my office, eagerly inquired if I was the toe-nail doctor. According to Col. Sir Robert Jones, who, in the opinion of orthopedic surgeons, is probably one of the greatest in the world, the misspelling of the word, "Orthopedic" is probably responsible for the wrong understanding of its service. The fact that in America the word is spelled o-r-t-h-o-p-e-d-i-c has many to believe that the p-e-d is derived from the Latin word, pes, meaning foot, and therefore it is a common error that this specialty deals with disorders of the feet. The word "Orthopedic," properly spelled, is as follows: o-r-t-h-o-p-e-d-i-c, and it is derived from the two Greek words, ὀρθός meaning "straight," and παιδόν, meaning "a little child." It was originally intended to indicate that orthopedic surgery has to deal with the straightening of deformed children.

In the last three years' war, the experience of our Allies has shown that we must consider the soldier, wounded in battle, from a different aspect than ever before. In past wars, it was the practice, if a man was totally or partially unfit for further service to his country, to give him a pension and allow him to shift for himself, the nation believing it had done its part when this questionable form of charity had been provided. The enormity and extent of the present conflict has shown that such an attitude by any nation toward the disabled soldier would lead to an economic catastrophe and almost to the destruction of the nation.

Just think for a moment what the condition of Great Britain, with 600,000 crippled soldiers for whom no special preparation had been made at the beginning of the war, would be today, and in the days to come, if she had not inaugurated those marvelous curative workshops for the rehabilitation of her disabled soldiers by the aid of orthopedic surgery.

Probably the greatest leader of this particular phase of the war has been Col. Sir Robert Jones of Liverpool, and through him has grown up the system in vogue in the British empire by which cripples are taught, as soon as possible, some form of training whereby they may earn either more than they earned before the war or very nearly as much. Of course, this depends upon the amount and character of the disability with which the soldier is afflicted. In his very interesting book, under the very modest title of "Notes on Military Orthopedics," Col. Sir Robert Jones tells how, when preliminary stages of operative and surgical treatment are over, the orthopedic hospital affords a steady gradation through massage, exercise, and stim-
ulbus to productive work which is commenced
as an integral part of the treatment as soon as
the man can begin to use his limbs at all. In-
dolent and often discontented patients are thus
converted into happy men who soon begin to
feel that they are becoming useful members of
society and not mere derelicts.

The men are given employment in the tools
they understand or an occupation suitable to
their disability. For instance, if a man is put
on a machine his mind turns to the work that
he is doing and he very soon forgets his disabil-
ity. Those of us who have any imagination at
all, and particularly the orthopedic surgeons
who have been confronted with the various
propositions arising out of industrial accidents,
cannot fail to appreciate that it is far better
to keep a man busy at regular, useful and pro-
ductive work, rather than at card-playing,
smoking, or doing other trivialities in a hospital
ward.

About a week or so ago, at a meeting of the
Boston Orthopedic Club I listened with a great
deal of interest to Maj. E. G. Brackett, who is
the director of orthopedic surgery in the Med-
ical Department of the United States Army in
this country; and he outlined the purpose of
the United States Government in the present
crisis as regards the treatment of crippled sol-
diers. To a great extent, the system in vogue
in England is, with a few exceptions, to be
adopted by this country. It is known that the
English and our Allies made some very bad
mistakes in the beginning, but it is believed by
the government medical authorities that they
are now handling the cripple situation with a
great deal of skill. It is the purpose of the
government to establish in France about 35,000
orthopedic beds, divided into units or hospitals
of about 2500 beds each; also to construct in
this country several reconstruction or reliabil-
ating hospitals in different centers of the coun-
try. These hospitals are to be mainly ortho-
opedic in their nature, but will include other
specialties as well as general medicine and gen-
eral surgery. It has always been the conten-
tion of the orthopedic surgeon, understanding
deformity as he does and its final result, and
understanding joints, muscles, and nerves in
their various functions and abnormalities, that
he can forestall some of the terrible deforma-
ties resulting from injury, provided he is on the
ground or near the place where the injury takes
place, to direct the methods of treatment which
will be conducive to either a very good result or
to the best obtainable result under the condi-
tions; hence the establishment of orthopedic
beds in France.

The purpose of the reconstruction hospital on
this side of the water is to take care of those
cases which can be transported to this side with-
out danger to the patients who need further
surgical treatment and training along industrial
lines for their further service in life. Of course
those who come across the water will be the
soldiers who are unfit for further military ser-
vice on account of their disabilities, the ortho-
pedic hospitals in France sending back to the
front as many as can go back after treatment.
It is also intended in these reconstruction hos-
pitals on this side of the water to have them
very completely equipped. They will have
orthopedic surgeons especially trained in their
line, general surgeons, internists, and all the
different specialists. They will also have a de-
partment of massage, electricity, and what is
known as the curative workshop, about which I
have already spoken.

In order to conduct properly these hospitals
it will be absolutely necessary that the com-
munities in which they are established shall
have the strict co-operation and interest of all
industrial establishments situated near or at the
place where the hospital is located. The prob-
lem of handling these cripples is one requiring
ingenuity and skill, because on reading many
of the journals of England on this particular
line of work, we find that many of the soldiers
do not seem anxious to pursue an industrial
line, preferring a pension and a life of ease and
laziness, rather than work. On account of this
it has been deemed wise by the United States
Medical Department to state that, until a sol-
dier is entirely cured and educated or trained
along industrial lines, he is to be kept under
army discipline and is not to be discharged
from the army until he is ready to perform
usefully such service in civil life as his recon-
structed crippled condition will permit. This
precaution upon the part of the Government is
undoubtedly a very wise provision. Today in
civil life we are confronted with this very pro-
blem, and especially in industrial accidents
where there is no law to compel a man, crippled
through an industrial accident, to train and to
be educated as far as possible for some other
form of work. Of course I recognize that the
State, in making laws of this kind, can go only
so far before we get to a line where it may be
said that the man’s individual freedom is re-
stricted; and it is not for me to suggest that in-
dividual freedom, as a general proposition
which we prize so highly and regard so sacred
in this grand democracy of the United States,
shall be substituted by methods which have
made the German Empire of today the greatest
autocracy in the world.

I am not here to argue the pro and con of the
advisability of adopting such compelling force
in our civil accidents. I think, however, that
we all agree that if this war continues for any
long period of time, that the knowledge gained
in the treatment of war cripples will greatly
change our present methods of caring for the
industrial cripple. I might go on here and cite
many instances and defects under the Industrial
Compensation law on account of which a great
many of our industrial cripples are not pursu-
ing a proper line of work or making even
enough money to support themselves—which less supporting their families.

There are many cases, as I say, that might be cited as bad examples of the workings of the present industrial laws. Just by way of illustration, let me cite one in which the individual might have been willing to take up training and education for his betterment, but there was no way or no law which compelled either insurance companies or anybody else to follow this case. This man(103,39),(877,990) was an alien in this country, with a wife and seven children, who injured his foot in one of our neighboring cities—not Fall River,—by the falling of an elevator. He was treated by two practitioners for about four weeks during the acute stage of his injury, since when he has been compelled to shift for himself. This accident happened last January and since that time the man has been going around with this bad foot with no treatment at all, and with no facilities to help him by proper training. He was sent to me the other day by an attorney in Fall River for examination, and I found that he was suffering from a permanent injury to the foot, due to a fracture of what is called the os calcis, better known to the laity as the heel-bone. The x-ray demonstrated that he had several bony spurs coming out from the bone, making it absolutely difficult for that man to walk at all without severe pain.

How this man and his wife and seven children subsisted on $7.00 a week and what the outlook for him is, I am unable to say. This would be easy to determine, however, had we some system, such as is being instituted for the war cripple, and would make a gratifying change in our industrial cases of the future.

Let us now consider, for a moment, the idea of the Government in relation to reconstruction hospitals. If I understand Dr. Brackett rightly, it is the purpose of the Medical Department of the Army to establish in different parts of the United States these various reconstruction hospitals, the purpose of which it is to rehabilitate, re-educate, and retrain the crippled soldier for further service in civil life. Of course, the greatest factor in the line of treatment will be orthopedics, supplemented and aided by various specialists, such as brain men, eye men, nose and throat men, x-ray men, general surgeons, and internists. It is computed that at least seventy per cent. of the returning war cripples need some form of orthopedic treatment for their rehabilitation. There can be no doubt and there should be, in the minds of medical men, that with a properly organized system such as this, great good will result. There can be no question in the minds of those who have studied and thought, to any extent, of these reconstruction hospitals, that in the form devised by the Government exceptional opportunities for treatment are given to the crippled soldier.

The question now arises whether this method, as outlined by the Department of Medicine in the United States, is to work to the best interest of the country as a whole. I wish, in discussing this question, to make my position clearly understood; I do not propose to offer adverse criticism on the splendid work that is being done, because I greatly admire the present administration and the remarkable results obtained by them in such a remarkably short time. We, living at home, can have no idea of the enormity and multiplicity of details that must be carried out to prepare a nation for war, especially when that nation is a democracy, does not believe in militarism and its people are peace-loving in their general make-up. I only desire, in my humble way, to offer some constructive criticism concerning some of the problems which confront us in this great struggle and the attending ills that are sure to follow.

These hospitals are to be created as separate Government units, operating apart from the civil institutions. Now the thought I wish to suggest to you in relation to these hospitals is this: Let me say that it is a very, very serious question, and it concerns you as members of this great electorate of our country. At the present time we have, in this country, in most of our large cities of 30,000 or over, finely equipped general hospitals. Is it wise to deplete these already existing institutions of some of their staffs, or, instead of the reconstruction hospitals, should we expand the general hospitals, as at present constituted, to carry on the work intended by the Government in these reconstruction hospitals?

You know, and I know, that the number of doctors in this country, as compared with the amount of population, is not very large, and conservation should be practised here just as well as in other departments of life.

The purpose of the selective draft, inaugurated by President Wilson, was one of the greatest war measures, in my opinion, ever instituted by any nation in time of war; and that principle applies to the medical profession just as well as to the layman. Selection and organization are great factors in organizing any army for the proper welfare of the nation. I realize the army takes precedence to everything, but the President has often told us that the man working at home is just as essential to the success of the army as the soldier himself.

This question of the establishment of the reconstruction hospitals and the desirability of such, as opposed to the further expansion of the civil hospitals, we ought to consider most seriously. The American Hospital Association, I understand, is opposed to this plan of separate reconstruction hospitals; and in talking this over with a trustee of that association recently, he said they would present reasons this week to the Surgeon-General, why, in their opinion, this plan was not of the best. Of course, the trustees of civil hospitals are very much concerned with this proposition because they realize that it is their obligation and duty to care for the
civil population, and if their staffs are depleted, the problem, to them, becomes one difficult to handle.

The question also arises whether the civil hospitals, caring, as they do today, for the many industrial cases, may not profit, to a great extent, in knowledge and education, by taking care of the war cripple; and thereby become a greater benefit to the civil community in the future after the scars of this great world conflict have healed. The soldier has made a great sacrifice for his country; it is your duty and my duty to see to it that he gets the best possible service that can be had on his return from the front. The Government, establishing these new hospitals has this in view, but the scarcity of doctors and the care of the community itself are to be considered. I am not here to criticize, and I am glad to say that the criticism that was rampant and undeserved a few months ago, attendant the preparation of the Army and Navy, is now fast disappearing, and that we, as a nation, are beginning to appreciate that the men in Washington, and those who are planning and directing the preparation for our defensive operations, are bringing this nation to a state of proficiency which the German autocracy failed to estimate when, by persistently carrying on an inhuman war, they forced this peace-loving nation into a world conflict for the purpose of making the world safe for democracy.

PAROXYSMAL TACHYCARDIA OF VENTRICULAR ORIGIN.*
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During the last two years an interesting group of tachycardias has been observed in the Mayo Clinic, and the infrequent occurrence and the importance of recognition merits this report. The literature contains a wealth of material dealing with tachycardia of sinus and nodal origin, but few articles could be found relative to tachycardia having its origin in the ventricles. The rhythmic cardiac impulse takes its origin in the sino-auricular node* or "pacemaker," a collection of specialized tissue lying in the sulcus terminalis at the juncture of the superior vena cava and the right auricular appendage. This has been established by the experimental work of Lewis,1 Oppenheim and Oppenheim,2 Eyster and Meek,3 who found this structure to become electro-negative before the rest of the sinus region. The function of "pacemaker" may be assumed by other portions of the heart, either within or outside of the conduction system, with the establishment of an ectopic rhythm.

Lewis7 has classified these abnormal rhythms as homogenetic and heterogenetic. The former is characterized by a relatively slow rate, the onset of the rhythm is gradual, the seat of impulse production is probably always within the system of specialized tissue (conduction system) and the heart is under control of its extrinsic nerves. He believes this type to be due to exaggerated physiologic processes.

In contradistinction to this, the heterogenetic type presents a rapid pulse and rapid onset; the seat of impulse production may be within the system of specialized tissue or without, and the heart is not under control of its extrinsic innervation. This type is believed to result only from pathologic processes.

Paroxysmal ventricular tachycardia is heterogenetic and, as far as we know, is the result of myocardial disease. The recognition of this condition is of the utmost importance and can be made with certainty only by means of electrographic records. The introduction of the electrocardiograph has made possible the identification of obscure tachycardias.

Experimental studies have not only clarified the mechanism of this disorder but have suggested etiologic processes. When a single induction shock is applied to any portion of the ventricle during its resting period a single premature contraction occurs.6 The contraction evoked is not proportionate to the stimulus applied but always maximal,1 constituting the well-known "all or none" law of Bowditch, and does not occur when the muscle is in the state of contraction8 (refractory phase).

Regular series of suitably arranged induction shocks produce series of premature ventricular contractions simulating the graphic records of ventricular tachycardia. Lewis9 produced premature ventricular contractions by ligation of the coronary arteries constantly, by tying off the left descending branch and in most instances by impairing the circulation in the right vessel. As the nutrition of the ventricle became progressively impaired, series of heterogenetic contractions occurred, the sequence becoming longer as the nutritional changes became more marked.

By the intravenous injection of salts, Rothberger and Winterberg10 produced this tachycardia in dogs. They found that combined stimulation of the vagi and accelerators caused cessation of the heart beat, but after injection of 5-10 mg. of barium chloride in 1% aqueous solution, premature ventricular contractions occurred. With doses of 25 to 50 mg., minus accelerator stimulation, ventricular tachycardia was produced, and at times a transient arrhythmia.

Calcium chloride 100 to 200 mg. in 10% aqueous solution, produced similar results. They concluded that these salts increase the ventricular irritability, but stated that the nodal tissues are not appreciably influenced. The electrocardiogram exhibits series of premature ventricular contractions, the complex forms varying with the point of origin in the ventricles. Iden-