

to instruct soldiers in camp cooking with economy. Colonial troopers from Australia and Canada were among the keenest students. The men were billeted in the schools. At first sundry people were sceptical of the wisdom of this plan, but the men's behaviour was beyond all praise, and their appreciation of the teaching was very great.

## A LIGHT TO KILL GERMS

*Many Marvellous New Aids to War, by Scientists of Europe*

ACCORDING to Frederick Talbot, the achievements recorded by the scientists during this world war would fill many volumes. A few are given in the following article in the Scientific American:

The longer the war drags its weary way, the more apparent it becomes that the ultimate decision will be vitally influenced by the scientist. In its opening days everything appeared to turn upon the preponderance of brute force represented by trained men. Then came the revelation that artillery, relatively speaking, is more important than men. Now we are discovering that, behind all the varied forces in the field, and in the munition shops, rises another more powerful, more penetrating and more influential force—science!

The scientist will have the last word. At the moment all belligerents are feverishly organizing their scientific resources. Experts in every field of research and experiment are mobilized and urged to redouble their efforts in the common cause.

Many years ago the late Professor Milne devised an ingenious instrument, whereby he was able to obtain a graphic record of an earthquake, and by simple deduction could locate the geographical situation of the centre of the disturbance. But how many people would conceive it possible to adapt the seismograph to the peculiar and exacting requirements of detecting the distance of hostile artillery? Yet this has been achieved.

The new apparatus, which is small and compact, so that it may be carried about readily from place to place, is extremely sensitive. Indeed, it will record a hammer blow upon the ground, and the wave is so distinctive as to enable the cause of the vibration through the earth to be identified. The instrument is set up at a suitable point, and one which is preferably in telephonic communication with the battery, so that, in constant touch with the artillery, information can be received when the Austrian guns are fired.

Nor is this all. Each gun and exploding projectile produces its distinctive record, which is as easy to identify as individual hand-writing. By the possession of a record of the Austrian guns and their projectiles it is possible to distinguish them from those of the enemy.

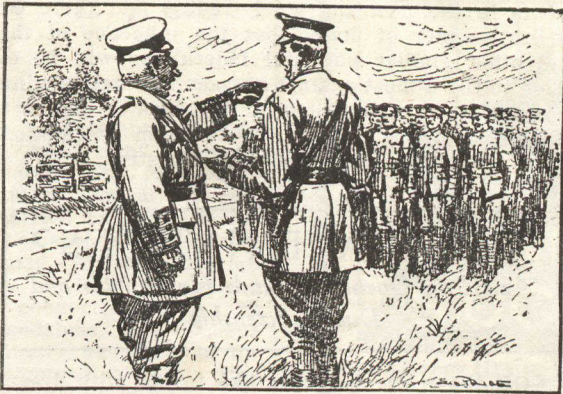
One of the greatest problems confronting the Central Powers at the moment is the discovery of ways and means to remedy the deficiency in their cotton supply, as a result of the British blockade. The first step was to reduce the supply of cotton for the production of textiles. But this became possible only by the presentation of more or less efficient substitutes, in the perfection of which the aid of the scientist was in urgent demand.

In this manner certain forms of paper pulp, lignin and other materials were introduced as a substitute, and their utilization enforced by compulsory methods. Thus lignin has come to be regarded as an efficient substitute for cotton-wool for surgical purposes. Sphagnum moss is another vegetable product which has entered into this field, vast quantities being readily available in Germany.

This moss has established its value as an absorbent for surgical operations and is now being extensively employed. The moss is gathered and exposed to the sun, which not only deprives it of its water content, but also acts as a bleaching agent. Then the latter is cleaned, sterilized, and passed through a certain manufacturing process, emerging from which it is declared to represent an effective substitute for cotton-wool.

But the assiduity of the scientist is not confined to any one of the belligerents. Fertility of thought and inventive ingenuity are not the prerogative of many, which, in the past, have devoted so much attention to scientific education and the application of the fruits of discovery in the laboratory to commerce, necessarily occupy a more favourable position. This is where Germany has been able to score up to the present, although her large and industrious scientific army has discovered to its cost that bricks cannot be made without straw.

Both in this country and in France the world of science has been mobilized and has already been suc-



"There's a man talking; give him three days' C.B."

"Can't, sir, he's a Corporal."

"Then give it to the next man; give it to somebody."

—Drawn by Sid Pride.

cessful in evolving many practical ideas to improve our position.

Striking evidences of the far-reaching work of the scientist are apparent in the fighting zone. Despite the fact that the present constitutes the greatest war in the history of the world, involving such numbers of men as almost baffles comprehension, disease has failed to make any ravages. Yet in every previous campaign more victims have fallen to disease than before the weapons.

Drinking-water is no longer drawn haphazard from surface sources and consumed in its raw condition. It is first subjected to some sterilizing process which ensures the destruction of all noxious germs, while simple yet effective precautions are adopted in connection with its transportation.

When conditions permit, electric light is brought into action, the water intended for consumption being passed in a thin sheet before a lamp of special design shedding a light rich in the ultra-violet rays. Such a light spells death to the germs invariably lurking in water. Consequently the water even when drawn from a river exposed to pollution may be drunk with as much impunity as that tapped 2,000 feet below the earth's surface.

One of the most remarkable conversions to be recorded in the world of medical science is the adoption of the practice of hypnosis. If one had dared to suggest a decade since that this science should have embraced hypnotism for the treatment of certain phases of disease, one would have been laughed to scorn. Hypnotism and quackery were once held to be synonymous in the medical world. But complete conversion is largely attributable to the war.

One of the most perplexing injuries incidental to modern warfare is shell blindness, caused by shock. Two of our leading optical scientists were attracted to the strange situation, and, although neither believed in hypnosis, both considered the field promising for its practice. Forthwith the patient was hypnotized, and he was induced to imagine that he was only temporarily blind and that he could see if he strove to do so. Strange to say, the treatment invariably had the desired effect. When the man awoke from his sleep he was able to see as well as ever. Indeed, in the cases handled by the two above-mentioned scientists the hypnosis treatment has never failed.

It is difficult to realize how medical science would be able to record so many striking and complete triumphs but for the assistance extended by X-rays. Not only have they expedited the work of the surgeons in the hospitals, enabling an injury to be diagnosed speedily and accurately, but time has been saved by enabling the surgeons to attack the injury straightaway.

To-day France is not only meeting her needs in this special field, but is able to supply all the de-



STINGING HIMSELF.

The scorpion is said to sting itself to death when it cannot get through a ring of fire.

—From London Opinion.

mands of her Allies, and that without undue effort. At the moment the requirements of the services are being more than fulfilled, and adequate quantities are produced for public and private hospitals.

No matter from what point of view the subject may be regarded, the part played by the scientist is becoming more and more prominent with each succeeding day. The science forces of the Allies have been completely mobilized, and at the moment are working in complete harmony. The ability to attack a problem from half-a-dozen sides at once is a decided advantage in our favour, for the simple reason that the greater the number, and the more diverse the brilliant minds which can be brought to bear upon an issue, the more likelihood is there of the requisite solution being found in quick time, and advanced to such a stage of perfection as to justify its commercial utilization.

## CONSCRIPTING TRADE

*Permanent State Control of All Industry in England Discussed*

WILL England be able to do without State regulated industry after this war? Mr. J. H. Harley gives his opinion in the Contemporary Review:

Labour has given of its best, in ungrudging and voluntary service, to bring about the speedy termination of the war. Out of the three million and more workers who comprise the great army of organized Trade Unionists, it has been calculated that nearly half are in the fighting forces, while another extra million are engaged in the making of munitions. Trade Union leaders, whose whole talk before the conflict had been of an industrial union of the workers of every land and nationality, have now recognized the paramount claims of their own country's need, and have not hesitated to appeal from the recruiting platform to the young men of Great Britain to take up arms in defence of their country's liberties.

It is this splendid voluntary enthusiasm of the organized workers that gives all the more significance to the stand which was made before the passing of the Military Service Act against the acme of compulsion involved in what has been called the conscription of industry. There may have been many people who supposed that the suspicions involved in such an attitude were entirely unfounded. Who could imagine or opine that the efforts of the Government of the United Kingdom of Great Britain and Ireland, in the throes of a serious and costly war, could be directed to the sole task of stealing a march on the drawn up forces of the great army of Labour?

It was just before the epoch-making war of 1870 and largely owing to the propaganda of the German workers that the Socialist programme of Labour first became connected with a large and authoritative extension of the administrative competencies of the State.

It was in Germany that these authoritative ideas took the deepest root, and then they produced what the Syndicalist theorists have since called the "decomposition of Marxism." They had free scope, and were glorified in the Fatherland because they agreed with all the patriotic movements which were a characteristic of the years following the war.

The first undoubted right and duty of such an authoritative State is to enrol its available manhood for the call of battle. Military necessity familiarizes all men with the thought that the most efficiently organized activities of society can all be directed from above. But what is involved in this paramount military necessity? The railways, for example, are needed for the effective transport of troops. How can the State refrain from laying its hand on the railways?

As a matter of fact, this evident conscription of industry has already been admitted to a very marked degree in both Germany and Austria. The workers employed in the State railways, posts, telegraphs, and telephones, as well as the men employed in municipal water, gas, and similar undertakings, have no right to think of a strike or of federation with any of their fellow workmen in private industries. They must regard themselves as industrial conscripts belonging to a class apart. When a worker rises to a permanent position, he has to take an official oath which immediately separates him from the hole of the pit whence he was dug.

At every stage of his career, the State railway worker of Germany is reminded that he is an industrial conscript. He has to send the bye-laws of any union he may form to be examined by his official superior.

France, Belgium, and Italy are all three conscript