

practical experience in metallurgical work he will, whether by intention or no, be bound to pay more attention to that kind of work to the inevitable detriment of other lines in which he has but an ex-officio interest. If he be an organic chemist he will probably have little more than a perfunctory interest in the physical problems of, say, aviation.

Another drawback to the scheme is that the co-operation and interest of manufacturers would not be fully enlisted. A laboratory of this description must needs be National in scope and be controlled and financed by the nation. Experience has shown that although the nation has in the past maintained some excellent scientific branches, the work of these branches has not been made use of by manufacturers as it should. It is the old story of the thing which costs nothing not being appreciated. Reports published by the government have either a nominal cost or none at all, and as a consequence, only too often soon find their way to the waste paper basket. If a research laboratory is to have the co-operation and appreciation of the industry, then the industry must be financially interested in the first place. When the money of the industry is involved there will be a very definite incentive to scrutinize the value of the returns. After all, when the industries are to reap the direct benefits of at least the more strictly industrial research they should be required to pay for it.

#### THE SOLUTION OF THE PROBLEM.

From what has been said, we may take it that one central institution, other things being equal, is a better scheme than any which will involve the establishment of a number of small units. This being granted, the first thing to do is to commence the gathering together of a comprehensive technical library. This is, in itself, a work of very considerable magnitude and should be organized and supervised by an official of some considerable experience in research work. As this department is to be rather more than a mere library, let us call it the Intelligence Department, borrowing the name from the army organization. The duty of the department is to have available all possible information regarding the technical work which is being done, or which has been done, anywhere in the world, and to keep this information so thoroughly classified and cross-referenced that complete information on any subject can be obtained on short notice. An incidental part of this duty will be the compiling and publishing of reviews covering the work done on subjects of particular interest, such reviews generally consisting of complete bibliographies with abstracts of the principal articles on the subject. All current technical literature will be thoroughly examined and abstracted in a way similar to that in which chemical literature is now covered by the American Chemical Society in "Chemical Abstracts." These current abstracts will be classified into suitable groups and published periodically and sold at cost to those interested as will also the more specialized reviews on particular subjects. The department will hold itself ready to supply either gratis or at a low cost complete bibliographies on any technical subject. It will as rapidly as possible accumulate in its files originals of all technical publications, holding them available for reference and will supply copies of these (photostat or similar reproduction) at cost on application.

The cost of operation of this department should be borne entirely by the government as it is of nation wide value. For the first few years this will probably amount to a considerable sum, but the returns from publications sent out will eventually cut this down to a very considerable extent if charges are made so as to produce a small profit on those going to foreign countries.

If we go no farther than this first step of the Intelligence Department, much will have been achieved, but it is really only a preliminary to the establishment of the laboratory proper. To establish this we should first take all the existing government laboratories and combine them into one large laboratory. This has been suggested before now, but the suggestion has met with opposition from the departments concerned. The opposition is based chiefly on the rather intense jealousy which exists between some of the departments, particularly those whose work is liable to overlap. They reason that if all laboratories are combined, the work of some will be credited to others, and that there will be a danger of more money being granted for some work than is given for other equally important work. If the laboratory be established under, say, the Mines Branch, then other branches like the Forestry Branch feel that their work might not receive adequate support, and vice versa. This difficulty will be avoided if the decision as to the extent of any investigation and

the money expended for it be left as it is at present under the supervision of the Department concerned. In short, the National Laboratory will follow the example of the Mellon Institute on a large scale. Each government branch or department which feels that research should be conducted on some subject under its jurisdiction will allot a suitable sum for the work. This will be expended by the Laboratory to the best advantage, and the results will be the property of the department or branch to be used as it thinks fit. Progress reports will go to the department at frequent intervals, so that it may keep in touch with the work. The personnel employed will be under the sole supervision of the laboratory, and will to this extent be removed from political patronage. As their employment on a particular research depends on the funds available for that work, however, they may be dismissed or transferred to other work if the department providing the funds should decide to discontinue the research, or the investigation is completed.

The Mellon Institute was founded particularly for the purpose of providing research facilities for manufacturers, but there is no reason why it or any similar institution should not be utilized for government research; in fact, the Mellon Institute itself has already handled investigations for one Canadian Government Branch.

The organization of the laboratory should be accomplished with fair ease if the government laboratories are first brought in. It would simply require that the director and overhead staff be appointed, and the site chosen as a first step. The next would be the placing of the existing laboratories under this body. As opportunity presented (buildings erected, etc.) the various laboratories could be moved to the central institution which would establish at the same time laboratories and workshops to perform such work as might be common to all, such as chemical analysis laboratories, physical laboratories, photographic laboratories, shops for the repair and construction of apparatus, etc. Instead of the various branches making appropriations to cover the work of

their own laboratories, they would make appropriations to the central laboratory for specific researches. In this way the National Laboratory would come into being as a going concern, and there would be no possibility of question as to whether each department was getting its share of attention.

With this step accomplished, the next would be the extension of the facilities to the industries or to trade association. These should be allowed and encouraged to subsidize research at the National Laboratory on problems of interest to them on the same footing as the government departments, regardless of the degree of national importance of the problem presented. One rule should be insisted on, viz., that the results obtained belong to the party paying for the work, but that the workers employed should share in the benefits arising therefrom and that after a definite period of two or three years the results should be made public. This rule is simply copying that of the Mellon Institute and experience has demonstrated its fairness and workability.

This scheme has the advantage of making for a large central laboratory without losing the advantages of the other suggestions. Any kind of research, for which funds are provided, may be conducted from the most involved work in pure science to the most empirical problem of the smallest manufacturer, and all will be conducted in the most efficient and economical manner. There will be no loss through the discontinuance of existing laboratories for both their apparatus and their work can be merged into the larger one with only slight temporary delay. The cost of the investigations will fall where they belong, the individual paying for what is of use to him as an individual, the association of manufacturers paying for what is of value to their particular industry, and the country paying for the research in pure science, and any other work of value to the country as a whole. No jealousy will arise between different government branches or different manufacturers, for each will get returns in exact proportion as it is willing and able to pay for them.

## Mentioned in Despatches

**MR. G. F. BENSON**, who had charge of the Khaki League Club House Fund is a former president of the Montreal Board of Trade, president of the Edwardsburg Starch Company and one of our best known business men. Since the outbreak of the war Mr. Benson has been particularly active in relief work among the soldiers.

**WILL THORNE, M.P.**, one of the leaders of the Labor Party in Great Britain, has been foremost in the welcome tendered to Samuel Gompers by British labor men. Thorne who has represented West Ham since 1906 began his business career as a barber, later taking a keen interest in labor movements, he founded the National Union of General Workers, and became their general secretary. He has given his wholehearted support to the Government in their conduct of the war.

**MR. FERNAND RINFRET** who addressed the Montreal Reform Club a few days ago on his experience overseas is editor of "Le Canada," and one of the ablest of the younger journalists in this Province. Mr. Rinfret was one of the twenty odd Canadian journalists who visited England and the battlefields of France at the invitation of the British Government. This young journalist not only wields a trenchant pen, but is also a very able speaker. At the banquet tendered the visiting journalists in Paris Rinfret replied for the Canadians and created a most favorable impression.

**GENERAL PERSHING.**—The recent American offensive which is the first major operation carried on by the Americans calls fresh attention to General Pershing. Like the President of the United States Pershing was originally a school master, but evidently the training he received in the little Red School House has not unfitted him to command a huge body of men and to strike a telling blow. Pershing has seen service in various minor wars, particularly in Mexico, and was appointed to command the American overseas army when Uncle Sam declared war on the Huns. Pershing has been in France for nearly a year and a half and has now over a million and a half men under his command. He is regarded as a particularly efficient officer and under his leadership the Americans will undoubtedly give a good account of themselves.

**LIEUT. G. A. MCGIFFEN**, who has made the supreme sacrifice was a well known Toronto newspaper man before the war commenced. Lieut. McGiffen was a graduate from the University of Toronto of the year 1903, then immediately took up newspaper work in which he made a big name for himself. He went overseas with one of the first contingents, was wounded some months ago but returned to the front as soon as possible.

**LIEUT.-COL. CLARENCE F. SMITH**, who heads the Knights of Columbus Campaign was formerly the active head of the Red Cross activities in this city. At the outbreak of the war he took a prominent part in the organization and activities of the Home Guard and has continued his interest in welfare work among the soldiers. Col. Smith was formerly Managing Director of the Ames-Holden McCready Shoe Company and is now a Director of the Canada Forgings Company, and of various other financial and industrial institutions.

**EUGENE DEBS** who has been arrested in Cleveland and is on trial for seditious utterances was, on four occasions, a candidate for the Presidency of the United States. He seems, however, to be an irreconcilable individual and has come out so strongly in favor of the I. W. W. and the Bolsheviks that the United States Government arrested him and are now having him tried. Debs is head of the socialists in the United States and, while sound in some respects, preaches a lot of seditious doctrines. The probabilities are that he will receive a sentence somewhat in line to those handed out to I. W. W. leaders.

**FREDERICK G. KELLAWAY.**—Another newspaper man has attained a prominent post in Great Britain, namely, Frederick G. Kellaway, Parliamentary Secretary to the British Ministry of Munitions. Kellaway has just come out with the statement that "Germany must receive a 'knock-out' blow before she can be admitted to any league of the nations or even permitted to discuss peace terms." Kellaway has been in Parliament for the past seven years. Previous to that time he edited a series of local newspapers at Lewisham. He attained his present post two years ago.