made to discover some chemical agent which shall be able to kill these organisms, without injury to the tissues in which they flourish; but with little success. It is somewhat remarkable that most success has been obtained, not, as might have been expected, with the destruction of plant organisms, but with certain protozoa which have shown themselves to be readily susceptible to the toxic action of metals in organic combination. The present report gives an account of some steps towards the solution of the general problem. The hypochlorites introduced by Dakin have been found, in the hands of Lorrain Smith and Ritchie, to be comparatively non-toxic when injected into the veins in the form of "Eusol," while having an unmistakably beneficial effect in certain infections. But, as Dakin has shown, hypochlorites enter at once into combination with the proteins of the blood and cannot be supposed to exert a direct bactericidal action therein. The effect is apparently produced by some change in the blood itself, and it is interesting to note that Dale and Dobell have been led to the conclusion that the action of alkaloids on the amœba of dysentery outside the body is not an index to their therapeutic efficiency, and that their influence on the tissues of the patient is of equal importance. On the other hand, the work of Dr. Carl Browning and his colleagues has brought forward a compound, related to the acidine series of dyes, which is apparently much more toxic to bacteria than it is to animal cells. On account of its colour, this antiseptic was originally called "flavine." It kills bacteria in concentrations in which it has but little effect on the activity of leucocytes, and is non-toxic in intravenous injection. Since the report was issued Dr. Browning has described experiments in which rabbits received intravenous injections of flavine without harm, but the serum of which was found *in vitro* to destroy bacteria. Opinions are, as yet, divided as to the value of flavine as a treatment for wounds. Some surgeons find that it prevents the normal growth of new tissue; but it is possible that the correct conditions have not yet been discovered.

In connection with the practical use of these various antiseptics, the law of distribution between phases, according to solubility, receives application in the value of the solutions of dichloroamine, acriflavine, and iodoform in fatty solvents, such as eucalyptol, paraffin, and soap.

The physiological importance of the presence in the organism of minute quantities of certain chemical substances, the constitution of which is, for the most part, unknown, becomes every day more evident. In two respects the report adds further valuable information. The "accessory factors" in food, without which growth is impossible and various diseases develop, appear to be of some variety and number. The growth factor in milk is shown by Winfield, in the laboratory of Hopkins, to be preserved in the drying process, a fact of practical bearing at the present time. The necessity of such factors for the growth of unicellular organisms themselves has been known for some time, but Miss Jordan Lloyd adds an important further contribution in her investigation of culture media for bacteria. She is of opinion that these growth factors act as catalysts. The chemical reactions, or some of them, necessary for growth proceed naturally at too slow a rate to be effective; but they can be accelerated by the presence of the factors in question. This hypothesis is in agreement with the fact that, although the substances are present in very small amount, they do not disappear from the organism for some days after the food has been deprived of them. They appear to exercise their function without themselves suffering chemical change. The second important addition to our knowledge concerns the internal secretion of the parathyroid glands. Noel Paton and his coadjutors show that the muscular tremors, which make their appearance when these glands are removed, are due to a disturbance of the metabolism of guanidine, which becomes present in excess under these conditions.

A brief reference should be made to the results of the laborious statistical work undertaken by the Committee, especially to that which shows the occurrence of two distinct types of micro-organisms producing phthisis. The comparative incidence of kidney disease in the ordinary population and in the men in the trenches also deserves mention. The value of the statistical method, under appropriate control, is well demonstrated.

A final reference may be made to the latest development of the Committee's work (see p. 78 of the report). The present writer, when visiting some casualty clearing stations in France and Flanders in August last, found so great a divergence of views as to the cause and treatment of the "shock" following injury that, on his return, a special investigation committee was formed, consisting of surgeons at the front and laboratory workers in England. Results of much physiological importance may be expected, especially as to the cause of the low blood-pressure and its indirect effects. Several memoranda are already in course of publication. W. M. BAYLISS.

SCIENCE AND INDUSTRY IN AUSTRALIA.

THE Executive Committee of the Advisory Council of Science and Industry for the Commonwealth of Australia has recently published a report covering the period from its appointment to June 30, 1917.[1] The Advisory Council was originally appointed on March 16, 1916, and was intended to be a temporary body designed to prepare the way for a permanent Institute of Science and Industry, and to exercise in a preliminary way the functions that will in future belong to the institute.

The council as a whole has met only twice, but a vast amount of work has been done through committees. The Executive Committee has previously made two reports, but the document recently issued is a survey of the work done, and represents to a large extent the completion of the task of the temporary organisation in preparing the way for the permanent institute.

[1] C. 7963. (Melbourne: Government Printer.)

The activities of the committee have been far-reaching. Attention has been given to the encouragement of researches already in progress, and it has initiated many fresh inquiries. It has got into touch with colleges and technical institutes, and collected information as to the facilities for research and the supply of research workers. But the main work of the committee has consisted in a most exhaustive survey of the problems retarding the development of existing industries, and of the research work necessary for the establishment of new industries. It would be almost tedious to enumerate the subjects which have received attention; no industry has been neglected, but perhaps special attention has been devoted to the agricultural and pastoral industries.

Some very sound principles are again and again emphasised in the course of the report. The necessity of securing a greater supply of skilled research workers is frequently referred to, and the committee has made a beginning in the way of encouraging promising students to take up such work by finding remunerative employment for some of the men at present available.

A second point which is regarded as of great importance is the improved training of artisans in technical schools. If research methods are to be more generally applied to industries, it is clear that greater skill and accuracy will be required from the general body of workers, so that it is not merely the duty of the universities and colleges to supply highly trained research workers, but the technical schools have also the important duty of educating the artisan for the new type of work required under the new conditions.

We detect here and there in the report a tendency on the part of the committee not to wait for an industry to come to them, and, indeed, not even to delay in order to secure the co-operation of the industry, but to get research work going when convinced of the necessity for it. For example, the Executive Committee decided to appoint a special committee to investigate the processes of extraction of tannin from wattle bark, and feeling that negotiations with the tanners in all the States would take too long, the investigations have been commenced without waiting for financial assistance from the industry. This method of procedure is interesting, and one would like to get further information as to whether the committee intends to publish freely the results of such investigations, or whether it is going to communicate them to firms on certain conditions.

The present report is in the main confined to a survey of the promising fields for research work, and does not deal with questions connected with the administration of public funds. Most people will probably regard it as of good omen for the success of the scheme in Australia that research, and not administration, is being given the premier place, although no doubt the authorities of the institute will find it very necessary to formulate some guiding principles. In the attempt to apply science to industry it is, however, quite clear that the result will be fatal if we take too great care to avoid a few mistakes and thus set up a system with a tendency to damp the enthusiast.

There is one respect in which the present report is rather peculiar. As we have stated, it is in the main a survey of the field for future work, but in describing the proceedings of several of the sub-committees there is included an account of the experimental results obtained in some of the researches that have been started. The effect produced is scarcely satisfactory, as the researches are only in their initial stages, and it is not possible to give definite conclusions. The public should not be encouraged to expect results of importance to industry too soon, and when given they should be stated as definitely as possible.

The Executive Committee has evidently carried out its duties with great thoroughness, and has made a very complete survey of Australian industries. In matters relating to agriculture and stock breeding the work of the Australian Institute promises to be of special interest to the mother country if we are really determined to apply science to agriculture in a systematic way in the future.

NOTES.

WE are very glad that the Government has been induced to abandon the intention to use the British Museum at Bloomsbury for the purposes of the Air Board and the Natural History Museum at South Kensington for other Government departments. Lord Sudeley directed attention to the proposed appropriation of these buildings in a question asked in the House of Lords on January 9, and, in reply, Earl Curzon said that, as regards the British Museum, he was glad to state that for the accommodation of the Air Ministry it was no longer necessary to appropriate that building. As to the Natural History Museum, it had been found, after detailed examination, that any attempt to convert the galleries into public offices would involve the closing of the building to the public, extensive internal rearrangements, and the consumption of an enormous amount of labour and material and very considerable delay. In these circumstances it had been decided that there was no necessity sufficiently urgent to warrant the use of the museum as had been contemplated.—This decision has given much satisfaction to all who cherish regard for national prestige and understand the intellectual stimulus or practical value of the collections in our national museums. What astonishes us, however, is that Sir Alfred Mond, the First Commissioner of Works, and a son of the late Dr. Ludwig Mond, should have placed himself in such an indefensible position by putting the scheme before the Government. It is difficult to comprehend also why, before deciding to requisition the building, the Government did not inquire as to whether such action was imperatively needed, and consult the trustees and other responsible authorities as to what its consequences would be. If that had been done, a storm of protest would have been saved, and Earl Curzon would not have had to confess in the House of Lords that there was no real necessity for the proposed occupation, which would, indeed, have been more like the act of an invader than of a Government entrusted with the care of national interests in every direction. The trustees of the museum, at their meeting on January 12, ex-