

and utilise new methods of preventive medicine for the protection of troops in the field.

Organic Chemicals, appointed in co-operation with the American Chemical Society, to secure co-operation among chemists in researches required for the manufacture of dyestuffs, synthetic medicinals, and other chemicals made scarce by the war.

Communications, appointed in co-operation with the American Physical Society and the American Institute of Electrical Engineers, to develop and apply the most effective devices for military communications, the detection of submarines, and other similar purposes.

Committees for the promotion of research in applied mathematics, astronomy, physics, chemistry, botany, zoology, and various other branches of science will also be organised by the council.

The most cordial spirit of co-operation has been shown by every individual and institution hitherto invited to take part in the work. Universities, research foundations, and industrial laboratories, in the event of war, would place every facility at the disposal of the Government. In times of peace they will co-operate with the council in the advancement of research. The Engineering Foundation, under the auspices of the United Engineering Societies, has passed resolutions commending the purposes of the council, and offering it a New York office in the Engineers' Building and the services of an executive secretary. Substantial contributions to a general expense fund have already been received. It is evident that so soon as a general request for co-operation can be issued it will meet with the widest acceptance.

Throop College of Technology, in Pasadena, Cal., has recently afforded a striking illustration of one way in which the Research Council can secure co-operation and advance scientific investigation. This institution, with its able investigators and excellent research laboratories, could be of great service in any broad scheme of co-operation. President Scherer, hearing of the formation of the council, immediately offered to take part in its work, and with this object he secured within three days an additional research endowment of 100,000 dollars. The spirit of national service and the increased appreciation of the value of science, which have resulted from the European war, should lead to many similar gifts elsewhere.

The following letter from the President shows his approval of the council's plans and his active assistance in completing its organisation:—

"Dr. William H. Welch, President of the National Academy of Sciences, 807 St. Paul Street, Baltimore, Md. :—

"My Dear Dr. Welch,—I want to tell you with what gratification I have received the preliminary report of the National Research Council, which was formed at my request under the National Academy of Sciences. The outline of work there set forth and the evidences of remarkable progress toward the accomplishment of the object of the council are indeed gratifying. May I not take this occasion to say that the departments of the Government are ready to co-operate in every way that may be required, and that the heads of the departments most immediately concerned are now, at my request, actively engaged in considering the best methods of co-operation? Representatives of Government bureaus will be appointed as members of the Research Council as the council desires.

"Cordially and sincerely yours,

"(Signed) WOODROW WILSON."

Arrangements will be made to hold a meeting of the council soon after the appointment of the representatives of Government bureaus.

GEORGE ELLERY HALE.

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THE GOVERNMENT CINCHONA PLANTATIONS IN BENGAL.

THE fifty-fourth annual report of the Government Cinchona Plantations and Factory in Bengal for the year 1915-16 is as interesting and valuable a document as that for 1914-15 noticed in these columns last year. In the previous report the scientific side of the work for the past ten years was reviewed, while in that now under notice a review of the financial side of the operations for the past sixteen years is given. Since April, 1900, to March, 1916, the total expenditure amounted to 42,65,600 rupees and total receipts to 39,30,000 rupees. The deficit of 3,35,600 rupees is, however, not a sign of financial mismanagement, but is an indication of remarkable and highly successful administrative ability. The deficit was incurred within the period 1905-14, during which time the department was being greatly improved. The explanation, which is simple, is given in the words of the report, as the excellent work which is being done by Major Gage and his staff is deserving of wider recognition.

"About the beginning of the 1905-15 period it was seen that the demand for quinine—since 1892 in excess of the yield from plantation bark—was exceeding the factory output capacity, and that as more than 90 per cent. of the world's supply of bark and quinine was in the hands respectively of Java planters and about a dozen manufacturers, the risk of the formation of a 'Trust' and the abolition of an open market was not to be taken lightly. It was foreseen that, if while there was still an open market large quantities of bark and quinine were purchased at the lowest rates ever touched, it would allow the formation of a reserve of quinine large enough to meet the increase in demand and to serve as a stand-by in case of a severe malarial epidemic, what time the plantations were being extended on a scale large enough to render the department independent of external supplies and prices.

"So during 1908-14 large sums were expended on purchase of bark and quinine at very low rates and on extra extensive plantations. Subsequent developments have thoroughly justified the then heavy expenditure. For instance, if the annual quinine yield from the plantations had remained at its 1905 figure of 9000 lb., Government would have had to pay during 1913-15 at least 7,74,000 rupees in purchase of enough bark or quinine to make up the quantity (74,000 lb.) distributed during these years, whereas it cost Government to make the quantity required above the 1905 output level less than 3,08,000 rupees. In those two years alone Government saved at least 4,66,000 rupees, which exceeds the deficit for a period of sixteen years. The deficit will speedily be replaced by a surplus yearly increasing, and meanwhile it is covered many times over by readily realisable assets."

These assets include (1) additions to factory and machinery that have quintupled its 1900 output capacity; (2) 2418 acres afforested with timber and fuel trees; (3) 2295 acres planted with cinchona 7,69,085 rupees in value; (4) a reserve of 165,000 lb. of quinine valued at 18,97,500 rupees, and other manufactured products, bark, etc., valued at 2,05,055 rupees—a total of 29,18,000 rupees. The total return for the 42,65,600 rupees expenditure is therefore in cash and assets 68,48,000 rupees. Nothing is claimed for value of factory, etc., in the estimate.

From this explanation, with conditions of presentment as stringent as few companies would think of adopting, the financial side of the department's work is seen to be as satisfactory as the scientific.