

financial arrangements have been made to carry out at the Rothamsted Experimental Station, an investigation of foul brood diseases of bees, which have hitherto caused considerable trouble and loss. Dr. H. L. A. Tarr has been appointed investigator. Dr. Tarr is a graduate of the University of British Columbia and McGill University, and since 1931 he has been working at bacteriological problems in the Biochemical School at the University of Cambridge. Foul brood diseases were investigated in England nearly fifty years ago by Cheshire and Cheyne, and in more recent years by workers in the United States, Canada and on the Continent, but in spite of all that has been done, little is known about the cause of the diseases and still less as to how to avoid or cure them. The bee keepers, through the British Bee Keepers Association, have now agreed to raise half the money necessary for the investigations, and the Agricultural Research Council has undertaken to contribute the other half. As a result, a sum of £500 a year is now available for the study of foul brood. It is hoped that the work will continue for a period of at least three years, starting early in March 1934 under the general direction of Dr. C. B. Williams, head of the Department of Entomology at Rothamsted, with the co-operation of Mr. D. M. T. Morland, apiarist. Some of the more purely bacteriological side of the work will be carried out at the Lister Institute in London. Rothamsted Experimental Station will be advised on the practical side of the work by a small expert committee of bee keepers. Further contributions towards the cost of the investigations will be welcome.

#### National Importance of Scientific Research

REVIEWING the organisation of industrial research in Great Britain and other countries in an article in the *Draughtsman* of December entitled "Research and Industry", Mr. G. Windred concludes that we are at present by no means in a leading position, due perhaps to the curtailment of research expenditure in almost every direction, consequent upon the reduction of Government expenditure and the unwillingness of commercial organisations to spend capital. Mr. Windred states that industry, as a whole, is not prepared to apply scientific research methods until their possibilities have been clearly demonstrated. "Such demonstration can be effected only with the aid of research experience which must involve considerable expenditure, such as other countries have in general been willing to provide". The author reminds us that in the various departments of pure science, Great Britain holds a premier position which must prove of great assistance in the work of applying scientific principles to industrial improvement, and pleads for increased opportunities for industrial research. Assuredly, in this era of world-wide industrial progress, we can no longer afford to suffer the accusation that, however important are our fundamental discoveries in pure science, we yield pride of place to others in their application.

PUBLIC interest in the national importance of scientific research has recently been stimulated

in Germany by a series of publications which are intended to awaken all classes to a realisation of the material benefits involved, and to counteract the tendency for too stringent economy in scientific work. These publications, which are written in non-technical language, are sponsored by scientific and educational associations of high standing. In the United States there are said to be more than 1,500 well-established research organisations, and the expenditure of American industry in support of these research laboratories has been assessed for the year 1931 at no less than 235 million dollars. The activities of the Mellon Institute of Industrial Research of the University of Pittsburgh are too well known and appreciated in Great Britain to require more than a passing reference. As regards Russia, Mr. Windred has no doubt that the plans for scientific reconstruction in that country have the strongest scientific arguments in their favour. He devotes considerable attention to the work of the British Science Guild, which was founded in 1905 by Sir Norman Lockyer. The following statement, which the Guild has included in the announcement of its aims, objects and activities, is so manifestly pertinent to the conditions of to-day that it deserves the widest possible publicity: "The most urgent practical need to-day is the promotion of the spirit of unity among all classes through the alliance of Science, Invention and Labour, working as a single force for national development and common welfare. Science discovers; Invention applies; Industry produces. No nation can occupy a place in the van of modern civilisation unless the three legs of this tripod form strong and secure supports for all its constructive activities".

#### Recent Advances in Microscopy

MR. CONRAD BECK, in his presidential address to the Royal Microscopical Society on January 17, pointed out that the resolution of the microscope had reached at least 100,000 lines to the inch in the middle of last century, and this limit was extended by steady advances to nearly 140,000 by the end of the century, but the limit is now placed at a figure that is less than 1/300,000 in. In referring to dark ground illumination, he stated that while it was used with low and moderate powers almost from the time achromatic microscopes were first made, it is only in recent years that the refined apparatus required to use it with high power lenses has been produced. He remarked that this technique does not render differential staining less important and expressed his satisfaction that the Council of the Society has appointed a committee to study the stains and reagents used for microscopic research, and he suggested that, in addition to other matters, consideration should be given to the introduction of differential stains, particularly designed for dark ground illumination. As an example, he cited the anthrax bacillus which, stained with methylene blue, appears blood-red by dark ground, and hence there might be stains which would differentiate structure viewed by this means to a greater extent than can be done with transmitted light.