for the time at least, some of the difficulties: contacts with other institutes and advisory officers are increasing, and an informal network of co-operative field experiments (and demonstrations) is developing. For the first time there emerges a possibility of joint work on some important agricultural problems not included within the interests of official and private organizations.

The freedom of development that characterized the second stage of agricultural research has not only produced the third stage as a logical outcome: it has also provided the technical machinery that makes the next stage possible. The statistical design of experiments to secure comparable results of an ascertainable degree of accuracy enables the maximum of information to be obtained from a given amount of experimental effort, by combining several related questions in one design. Thus, problems concerning two or more research institutes could be dealt with in the same experiment. Such a scheme of field experiments would need co-operative control by the interests concerned through a committee which might work under the aegis of the Agricultural Research Council. The committee would be responsible for selecting the programme from the various proposals put forward and for combining the selected problems in the most economical manner. Each experimental site would be typical of an important soil and farming system.

It is certain that a system of well-distributed replicated experiments will be of the utmost value to the research institutes. It is equally certain that it will enable rapid answers to be given to many urgent post-war agricultural problems of a practical and economic nature, for, as already stated, it is growing up even now under the compelling pressure of immediate war-time problems.

Wars and their aftermaths are conducive to centralized control of many activities. The majority of research workers regard such controls as temporary necessities which have an unfortunate tendency to persist after the need for them has vanished. Lest it should be thought that the scheme outlined above is merely another fashionable war-time centralization, it is desirable to stress the following points: the need for it was apparent before the War; it is a natural development from a second to a third stage of agricultural research. Finally, it does not call for any significant changes in the control and administration of the research institutes. Their record during the twenty-five years of the second stage of agricultural research, and the fundamental work now in hand and projected, are enough to show that they are still efficient instruments in the furtherance of agricultural science.

As stated at the outset, this article deals only with the organization and administration of research in arable agriculture. Contacts with colleagues in various other branches lead me to believe that among agricultural research workers there is general agreement on the situation briefly discussed here and on the best method of dealing with it. But agricultural science ranges so widely that workers in other branches will have their own proposals to offer for the general plan of research organization. One purpose of this article is to promote discussion in these columns and elsewhere, in the belief that a common ground of agreement will emerge; there is no doubt that, especially at the present time, such discussions and expressions of opinion will be very opportune.

OBITUARIES

Dr. Arnold Berliner

The death occurred, on March 23, of Dr. Arnold Berliner, well known to the scientific world as the founder and editor of *Die Naturwissenschaften*.

Berliner belonged to the first generation of 'technical physicists' and worked in close connexion with Emil Rathenau as head of the physics laboratories of the A.E.G. during the period of rapid expansion of this firm. The development of the incandescent carbon lamp and of X-ray bulbs owes much to him—he introduced the first 'getter', phosphorus, in the manufacture of lamps, and the large scars on his arms bore testimony of the early stages of experimenting with X-rays when their dangers were not yet realized. Among other technical problems advanced by Berliner was that of the phonograph: he was the first to introduce the disk form for records (1889).

As an author Berliner was successful with a textbook on physics which appeared in several editions. It is conspicuous for stressing the application of physical knowledge to technical problems, many years in advance of a recognized 'technical physics'. In "Physikalisches Handwörterbuch", edited by Berliner and Scheel, many of the articles defining concepts or describing methods used in physics are from Berliner's pen.

These and other literary products, sound as they are, have not attained the importance of Berliner's creation of *Die Naturwissenschaften* in 1912. Framed on the model of NATURE, for the achievements of which Berliner had the greatest admiration, this journal for general science was to draw closer together the physical and the biological, the experimental and the descriptive sciences. Berliner addressed himself mainly to the then young generation of men of science. Much of the success of the journal was due to Berliner's vivid personality, his close contact with the majority of young physicists and mathematicians and his initiative in formulating the subject of articles he wanted written for his journal. Thus *Die Naturwissenschaften* became a mirror reflecting the development of science during 1913–30. To what extent the success of the journal depended on its editor became apparent when his work became limited by a serious eye trouble which made reading nearly impossible to him for many years. His field of vision was filled with a misty haze; after having vainly consulted many oculists, Berliner found the physicists' solution of eliminating much of the light diffusely scattered in his eye by filtering away the short-wave part of the spectrum and reading by red light only.

Berliner's desire was to complete the twenty-fifth volume of *Die Naturwissenschaften*, his very own creation. In the "Aryanization" of the publishing firm of Julius Springer, the old man was turned out of his office in 1935. He had since lived a life of reminiscence of his many friends—artists, men of science and politicians. Various attempts to find a new home outside Germany were unsuccessful. Now his friends deplore in his tragic escape from life the loss of one who represented much of the best cultural traditions of a bygone Germany, and of a warm-hearted and helpful friend. P. F. EWALD.

DURING the years following the War of 1914–18. Arnold Berliner was a prominent figure in German