cosmic ray research, and was a valuable and comprehensive contribution. The second general review was by K. Wirtz. The author was a member of a research team engaged on the German uranium project, and in his paper he surveyed the limited achievements of the Germans in this direction. The third general paper was delivered by E. Meyer, who surveyed recent developments in acoustics in a comprehensive manner.

In addition to the formal papers read, some specially arranged symposia were held, the visitors from Britain taking part respectively in those on metallic conduction and interferometry. The social programme was indifferent, which was inevitable in view of the difficult conditions in Germany to-day. In view of these quite serious difficulties, the conference must undoubtedly be considered as quite an administrative achievement and augurs well for the future of physical research in Germany, despite the very serious shortage in the current materials of research.

S. TOLANSKY

Statistical Methods

THE first meeting of mathematical statisticians ever held in Germany took place on September 3-4, 1947, in Göttingen. It was attended by British statisticians who had been invited in an endeavour to overcome the difficulties which German mathematicians have experienced by having been cut off from foreign literature for a long time. The losses suffered by libraries in Germany and the impossibility of replacing their stocks contribute to the desire of German scientific workers to resume personal relations with British (or other) contemporaries.

The first meeting was opened by Dr. H. Münzner, professor of theoretical statistics in the University of Göttingen. Prof. P. Riebesell (Hamburg) then gave a critical account of the methods of *Grosszahlforschung*, showing that this version of the statistical analysis of mass production is either trivial or false. He discussed the relation of the normal curve to empirical distributions and suggested a test of the significance of two or more observational modes based on the idea of confidence limits (*Mutungsbereich*). S. Vajda (London) gave a talk on "The Algebraic Basis of the Analysis of Variance Method" in which he derived well-known formulae for the tests of effects and interactions of any order by the use of orthogonal polynomials, and pointed out how various possible but different definitions of effects were due to different algebraic constructions (see *Nature* July 5, p. 27.)

In the afternoon, Miss M. P. Geppert (Kerckhoff Institute, Bad Nauheim) proved by examples that in estimating a parameter from a sample none of the three central measures, mode, mean, or median, of the fiducial distribution needs coincide with the maximum likelihood estimate. Prof. O. N. Anderson (late of Sofia, now at the University of Munich) gave an account of the problems of inverse probability and fiducial limits, stressing the necessity for deriving formulae pertinent to a model "without replacement"; he also discussed a formula which should take the place of the *t*-distribution in the case of relative frequencies (which are not normally distributed) for small *n* and $p \neq (1-p)$.

On September 4, H. L. Seal (London) spoke on non-parametric tests and discussed some of them from the point of view of errors of the first and

second kind. Prof. H. Münzner (Göttingen) introduced and solved an integro-difference equation which arises in the description of a 'cascade'-process where a particle multiplies *k*-fold, with probabilities dependent on *k*, at times *t*, the "intensity of multiplication" being dependent on *t*. Finally, Dr. E. Sperner (Oberwolfach) gave an account of his method of expanding meteorological functions in terms of eigenfunctions for the purpose of extrapolation.

An animated discussion took place in the afternoon at the Geophysical Institute, where the participants met by courtesy of the director, Prof. J. Bartels, whose notion of "persistence tendency" applied to time series (see *J. Amer. Stat. Assoc.*, June, 1940) gave rise to talks on a great variety of subjects, ranging from weather forecasts to the Heligoland explosion (see *Nature*, September 13, p. 350), seismic graphs of which were exhibited.

Many representatives of German statistics were, of course, unable to attend the meeting, but there was much interest in its proceedings. It was felt by all that the comparison of results obtained in ignorance of similar work done in other countries may prove stimulating, though at present Germany has scarcely anything to show which could compare with the fundamental progress achieved in Great Britain and the United States in the last twenty-five years or so. To facilitate the exchange of ideas it was decided to start work on an English-German dictionary of statistical terms, and to supplement it with proposals for a universal notation. Suggestions will be welcomed by Prof. H. Münzner (University of Göttingen, Germany, British Zone), or by the British visitors to the meeting.

S. VAJDA

Petroleum Geology

FOR the first time in the course of fifteen years, a meeting of those interested in oil geology was held in Hanover during September 9-11, about five hundred geologists and geophysicists being present. The State Secretaries of the administrative province, representatives of the Military Government, and numerous foreign guests were welcomed by Prof. Bentz, director of the Oil Department of the Reichsamt für Bodenforschung.

During the last fifteen years, several thousand wells have been drilled in north-western Germany, which have considerably increased the theoretical and practical information about the deep subsurface. The main part of the meeting consisted of reports from twenty-six German oil-fields. Their exploration by means of the most up-to-date methods has not only increased the production of the oil industry considerably but also provided much geological and geophysical material, which has helped to clarify the complicated tectonic, stratigraphic and facial conditions of the north-west German Saxonicum. Of the numerous Mesozoic rocks with oil-bearing possibilities from which the production of the north-west German oil-fields is derived, preference is still given to the Zechstein as the source rock of the oil; this hypothesis, however, was by no means placed in the foreground as the only one. The German oil industry owes its successes to this positive scientific attitude. It is only necessary to mention here the importance of the Ems district for German economic life. With regard to its reserves, this district is among the most important German oil provinces and is thus also an important political factor.