

1959 issue of the *Annals of the American Academy of Political and Social Science* devoted to that theme should be of even wider interest. It shows the perspective in which technical co-operation is seen by Americans whether from the Congress end or from within a particular mission. The characteristic approaches of the United Nations Expanded Programme and of the United States Point Four Programme are next outlined and then the less well-known bilateral approach of the Sino-Soviet Bloc technical assistance.

The bulk of the Symposium, however, is concerned with problems of administration, and these are illustrated finally by descriptions of three programmes: the United Nations programme in Brazil; the United States operations mission in Iraq; and the Ford Foundation programme in Pakistan. The problem of finance is not ignored and Dr. L. K. Caldwell deals imaginatively with the role of the technical expert, as does Mr. R. W. Jones with the problem of personnel management in this field. Constructive suggestions are to be found in the papers by P. M. Glick on the choice of instruments for technical co-operation, by H. Reining on the Government contract as an administrative device, and by G. W. Lawson on technical co-operation for administrative improvement. By and large the papers cover from an American angle ground already traversed by Political and Economic Planning, and while they do not offer much in the way of new proposals they show the extent to which there is common ground in much progressive thought in this field, some directions in which further study and creative thought are needed and the magnitude of the effort which is already being made, to which in a special field some of those papers contributed at the Geneva Conference on the Peaceful Uses of Atomic Energy also testify.

R. BRIGHTMAN

ROCHESTER CONFERENCE ON SEMICONDUCTORS

Advances in Semi-Conductor Science

Proceedings of the Third International Conference on Semi-Conductors, held at the University of Rochester, U.S.A., August 18-22, 1958. Edited by H. Brooks. (International Series of Monographs on Semiconductors.) Pp. ix+553. (London and New York: Pergamon Press, 1959.) 100s. net.

THE report of a conference can unfortunately be little more than a collection of papers which could have appeared several months earlier, distributed among a handful of journals, and can be devoid of any of the spontaneous interchange of ideas which a conference should promote. That of the Rochester conference on semiconductors does, however, include summaries of the discussions concluding each session, a review by J. Bardeen of the trends in semiconductor research emphasized by the conference, and five excellent descriptive summaries by H. Brooks, D. Polder, L. Apker, W. H. Brattain and C. Herring. Although the conference was nominally as international as those previously held at Reading, Amsterdam and Garmisch-Partenkirchen on the same subject, it was in fact dominated by American contributions and participation; but the importance which has long been attached to the subject by American defence departments, industry and universities assured an excellent array of papers, even

though none seems destined to alter profoundly the course of the subject.

The exciton was given much attention. Broser, who had, two years previously, invoked exciton diffusion to account for the propagation of photo-conductivity in some semiconductors, now considered that photon emission, scattering and reabsorption better explained the findings of further experiments. His earlier co-worker, Balkanski, on the other hand, did not reject the idea that excitons could have large diffusion lengths. Much interest was aroused by reports on clean surfaces of semiconductors (freshly cleaved or cleaned by bombardment), which require vacua of the highest order for their examination. At the same time, the practical importance of real surfaces was reflected in the continued efforts to find a model which explains the dependence of the surface electrical properties on the bulk properties, preparation and environment. Compound semiconductors, though not ignored, did not play a leading part; further physical investigations of some probably await a tenfold reduction in the content of the residual impurities. Hot carriers figured prominently in a session on transport phenomena, but the avalanche effect and tunnelling, which has more recently opened up a new field of application of degenerate semiconductors, were not mentioned.

If the report lacks a few outstanding papers, it none the less shows that further conferences can be held on this subject; the scope may have to be limited, however, if both the conferences and their reports are not to be unwieldy. J. R. TILMAN

ENGINEERING STATICS

Elements of Engineering Statics

By Prof. H. Deresiewicz. Pp. vi+124. (New York: Columbia University Press; London: Oxford University Press, 1958.) 28s. net.

STATICS has gained importance in engineering science because, together with the geometry of deformation, it forms the basis of structural analysis generally. However, owing to the apparent requirements of engineering practice over the past 100 years, a variety of set procedures for the analysis of structures has been developed, using the principles of statics and geometry and the assumption of elastic behaviour. Accordingly, text-books on theory of structures have tended to be concerned more with the details of these procedures, or so-called methods of analysis, than with general principles. This has led to some confusion and misapplication of principles as well as failure to adopt a rational and discriminating approach to structural analysis. Thus, even in published work, the so-called principle of least work, due to Castigliano (1873), has been regarded as an application of the statical principle of minimum potential energy. While the former is concerned with the compatibility of deformations within statically indeterminate structures the elasticity of which is linear, the latter is concerned with the stable equilibrium of conservative statical systems generally.

Having regard to this background, a book of the kind written by Prof. Deresiewicz, which presents the principles of statics in relation to the requirements of engineering science, is welcome indeed. It contains chapters on the elements of vector algebra, equilibrium including consideration of statical determin-