

## Spectroscopy and Its Applications

Proceedings of the Sixth Summer Conference on Spectroscopy and Its Applications, 1938. Edited by G. R. Harrison. (Massachusetts Institute of Technology Press; Chapman & Hall, Ltd., London), 1939. Pp. vii + 172 (10" × 7.5"). Price 15sh.

APPLIED Spectroscopy is in a period of active growth. Astronomers, biologists, chemists, geologists, metallurgists, physicians, physicists, and industrialists of many kinds find the techniques of spectroscopy of great advantage, and are taking to it at an increasingly rapid rate. Thus H. R. Kreider of the American Medical Association Laboratory (p. 53) says: "We have practically omitted the chemical qualitative analysis except as a test: . . . exact qualitative analysis of from 10 to 15 materials may be made in an hour, and a permanent record of the analysis obtained. This permanency of records is extremely important in the event of law suits, which play a rather important role in the work". Further, notwithstanding certain limitations, spectral analysis has already displaced gravimetric analysis in many instances of routine or control work, opened new fields in science and industry, and gives promise of going still further. It is interesting to recall in this connection that much of this confidence and spread in practical applications is largely due to our theoretical understanding of the principles of spectral emission, based on the work of Bohr and a host of other physicists. One has got only to add to these techniques those of the molecular spectra of the Raman type, which are now equally accessible in an analytical

laboratory, to realise the future possibilities.

Under the ægis of the Massachusetts Institute of Technology, annual Summer Conferences have been held on spectroscopy and its applications, commencing from 1932. The volume under review contains, though in an abbreviated form, the 31 papers presented during the Sixth Conference held in July 1938. The subjects covered comprise a very wide range, from descriptions of specific applications as in the investigations of vitamins, enzymes, rare earths in plants, minerals, criminal investigations, etc, to discussions of the methods of exciting spectra, e.g., 'characteristics of spectroscopic light sources' (p. 54), their recording, e.g., use of grating spectroscopes (pp. 71, 80) and their evaluation, e.g., 'a high speed method of absorption spectrophotometry' (p. 91). This last paper describes an apparatus, developed at the M.I.T., which permits density measurements to be made at the rate of 10 or more per second, using a combination of concave grating monochromator, amplification of photo-electric currents with an electron multiplier, and recording with a cathode-ray oscillograph and motion-picture film. There is also the desirable leaven of papers of theoretical interest, e.g., 'photo-chemistry of visual spectrum' (p. 134), and 'the photographic latent image from the standpoint of the modern theory of solids' (p. 157).

Though the papers are presented in an abbreviated form, they are clearly illustrated and include references to original papers. The get-up of the volume leaves nothing to be desired.

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## Evolution of the Human Brain

THE size of the Primate brain ranges from about 3 gms. in *Tarsius* to as much as 2,000 gms. in Man. Its basal structural pattern, however, remains the same throughout the Order and in Old World Primates the interrelation of surface to weight of the cerebral hemisphere and of its parts is more or less constant. The difference in brain-size between an Old World monkey (e.g., a rhesus monkey) and a gorilla is far greater relatively than the difference in size between the gorilla and Man. Yet few, if any, significant and measurable difference exist between the intelligence of the monkey and gorilla, whereas an enormous gap exists be-

tween the intelligence of Man and that of any other Primate. The anatomical evolution of the brain thus hardly parallels the evolution of intelligent behaviour. Experimental study has also indicated that there is relatively little difference in the level of learning ability between an ape and an animal as far removed as a goldfish. Significant advances in the evolution of human intelligence would seem therefore to be related to the development of speech and to the elaboration of a symbolic process.—(S. ZUCKERMAN—British Association for the Advancement of Science, Dundee, 1939—*Journal*, p. 118.)