afternoon session Dr. R. Ramanna (Bombay) gave a brief survey of the technique of neutron diffraction and their applications to the study of solid and liquid states. Neutron diffraction in vanadium and germanium and the information obtained therefrom regarding the vibrations and thermodynamic properties of a harmonic crystal were presented by Dr. P. K. Iyengar (Bombay). Prof. W. Koch (Madras) spoke on the structure of metal semiconductor contacts. Dr. K. Vedam reviewed the current developments in the field of Ferroelectricity and the properties of newly developed ferroelectric crystals.

The second day of the symposium commenced with an address by Dr. S. Bhagavantam on "Non-linear Elasticity" in the course of which he sought to explain several geophysical features of great practical importance, on the basis of the theory of finite deformation elasticity. In the session devoted to Magnetic Resonance Phenomena, Drs. S. S. Dharmatti and B. Venkataraman presented the work on NMR and EPR which were being pursued at T.I.F.R. and A.E.E.T., Bombay. A group of young workers from the Nuclear Physics Institute, Calcutta, discussed some theoretical aspects of atomic and nuclear magnetic problems.

The third day of the Conference opened with a talk on the "Fourier and Vector Shift Methods in X-ray Crystal Structure Analysis" by Prof. G. N. Ramachandran (Madras). Dr. S. Ramaseshan (Bangalore) presented an account of the results on organic and inorganic structures under investigation at the Institute, their importance from the point of view of valency, chemical binding and steric hindrance, and also of techniques developed in the laboratory for low temperature crystallography. This was followed by papers on structure problems, study of crystallinity and orientation of crystallites in fibres, thermodynamics of structural changes, etc. The last session of the Conference was devoted to papers on geophysics, oceanography, micrometeorology and micro-seismology.

Dr. Vikram Sarabhai, Chairman of the Physical Research Committee, in his concluding remarks expressed the hope that a symposium of this kind would become an annual feature and lead to a better understanding and coordination of research in Solid State Physics in India. The full proceedings of the Conference are expected to be published shortly.

DIFFERENCE METHOD FOR RAMAN SPECTRA INVESTIGATIONS

DIFFERENCE methods although widely employed in Infra-red spectroscopy have not so far been used in the study of Raman spectra. The successful application of this method and its possibilities to molecular analysis by Raman spectra are indicated by Zubov *et al.*, in a note in *Optics and Spectroscopy*, June 1959, p. 541.

A grating spectrograph with photoelectric accessories (consisting of photomultiplier tube FEU-17, preamplifier, selective amplifier and recorder) for the registration of spectra is used in the investigation.

In the difference method light is directed on to the entrance slit of the spectrograph alternately from two sources by means of a rotating mirror. The light energy after dispersion is received on the photomultiplier placed immediately after the exit slit. When the two light beams are equal in intensity the resulting photocurrent in the multiplier tube is unmodulated and is not passed by the selective amplifier which is tuned to the modulation frequency. When one light beam has a higher intensity, the resulting photocurrent contains an alternating component which is amplified and activates the recorder. In this way the difference of the signals is recorded.

In the application of the method to Raman spectra investigations, the two sources are the two Raman tubes, one of which will give the full spectrum under investigation and the other will give the spectrum which it is desired to be "subtracted".

The following possible uses of the difference method in Raman investigations might be indicated: (1) Elimination of background interference in the region close to the exciting line. In this case the Rayleigh line of a substance with a structure similar to that of the scattering substance is "subtracted" from the Raman spectrum of the latter. This permits, for example, the study of low frequency lines which are difficult to investigate by other methods. (2) The investigation of mixtures in which Raman lines of interest in analytical work are covered up by lines of another component of the mixture. Here the spectrum of the interfering component with matching intensity is "subtracted" from the spectrum of the mixture. (3) The study of small changes in the width and in the intensity of lines in the investigation of solvent influence and temperature effects.