

## JOINT COLLOQUIA

18 November 1964

### THE SIGNIFICANCE OF PICTURES OBTAINED BY TIROS AND NIMBUS SATELLITES OVER THE AUSTRALIAN REGION

by G. T. Rutherford

Mr. G. T. Rutherford of the Bureau of Meteorology discussed the interpretation from synoptic aspects of pictures taken by TIROS and NIMBUS satellites over the Australian region which were shown from slides.

The appearance of terrain from the satellite viewpoint was presented in a number of pictures and demonstrated the need for adequate knowledge of local features of physiography.

Extra-tropical and tropical cloud vortices were shown in various stages of development and attention drawn to characteristic patterns typical of these stages.

Identifying features of cold front systems were shown and meso-scale differences in the cloud formations suggested as indicating different stability and shear structure of the warm air.

The appearance and significance of convective cellular and "street" formations were discussed and reference made to the limitations of the latter in middle and high latitudes for indicating wind direction.

An elongated cloud pattern was shown in a jet stream area and discussed for its significance as a "jet stream cloud". Evidence was presented to suggest that the formation could have resulted from both the high level divergence fields of the jet maxima and the low level convergence at a frontal zone associated with the jet.

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### STATISTICAL INFERENCE

by P. A. P. Moran

Professor P. A. P. Moran of the Australian National University observed that the uses of statistics may be divided into:

- (1) the summarising of large bodies of data,
- (2) the drawing of scientific inferences from such bodies of data.

He suggested that more attention be devoted to consideration of the optimal methods of presenting meteorological data, e. g. , the giving of standard deviations of yearly rainfall data and perhaps some indications of the skewness of distributions.

Taking Canberra as an example he showed how the general theory could be applied to a single station's rainfall, and indicated that "rainfall experience" could not be expressed adequately by using one quantity such as the mean, but should include also a measure of variability such as the variance, together with an indication of the sample size.

Professor Moran stressed that in using statistical data to test meteorological hypotheses or theories the concept of the "Power" of a test is valuable and demonstrated how the effects of Type I and Type II errors should be considered in accepting or rejecting hypotheses. Estimates of such powers enable the scientist to choose optimal methods of collecting data and of analysis, and if such estimates are made at the beginning of an investigation much trouble may be saved.

