JOINT COLLOQUIA

25 May 1961

The Restriction of Evaporation by Means of Surface Film

by W. W. Mansfield

Mr. Mansfield of the Division of Physical Chemistry, C. S. I. R. O, Melbourne, described how many substances spontaneously spread to form monomolecular surface films. If the molecules of the substance are of appropriate shape and size, the surface film is compact, coherent and capable of reducing evaporation in the laboratory. Many such films can reduce natural evaporation also. For practical use, a substance should form a liquid surface film of high intrinsic resistance to evaporation and should be cheap, readily available and non-toxic. At the present time the most suitable materials are hexadecanol and octadecanol mixtures.

The major losses of film, he continued, are due to retraction downwind and to evaporation of the film itself – the first is controlling for small dams and the second for large reservoirs. Estimates of these losses can be made. From experiments on rates of spreading, the amount of solid needed to replace continuously the film losses can be determined. Thus one can draw up tables giving dosages required for a given type of application, for a given storage size and shape, and for a given wind velocity.

The present major methods of application include the raft process for small areas, and the dusting and solution techniques for large areas; all give reductions in evaporation of about 30 per cent in most instances. In conclusion he mentioned that a number of reasons for occasional failure have been found, and improvements are being attempted.

29 June 1961

The Mountain Lee Wave Problem

by C. K. Rider

Mr. C. K. Rider of the Meteorology Department, University of Melbourne, discussed mountain lee waves. The mathematical theory of the problem was traced from Scorer's model to Wurtele's model. The latter, which assumes a troposphere with constant stability and wind shear, and constant wind in the stratosphere, was used to evaluate the wave length of the Warburton wave on June 4th, 1958. The value of $14\frac{1}{2}$ mile agreed tolerably with observation. A new model was described wherein the wind increases from the ground to some height then decreases to a constant value at very great height. The model gave good agreement with observations at Hobart on 31. 1. 55.