

Studies in Pure and Applied
Surface Physics and Chemistry

by William Walladge Mansfield B.Sc. (Hons).,
being a collection of published papers submitted in
support of his candidature for the Degree of Doctor of
Science of the University of Adelaide.

Dated . . 28 . . June . . 1972

TABLE OF PUBLICATIONS

1. Low Temperature Scouring of Greasy Wool - Aust. J. Appl. Sci. 1, 330 (1950).
2. The Removal of Oil from Wool Fibres - Aust. J. Appl. Sci. 3, 193 (1952).
3. Quantitative Determination of Sodium Cetyl Sulphate - Analyst 77, 205 (1952) - with G.R. Edwards and W.E. Ewens.
4. The Determination of Woolwax, Soap and Insoluble Matter in Wool Scour Liquors - Aust. J. Appl. Sci. 4, 579 (1953) - with G.R. Edwards and A.G. Pagels.
5. Spontaneous Emulsification of Mixtures of Oleic Acid and Paraffin Oil - Aust. J. Sci. Res. A5, 331 (1952).
6. Effect of Surface Films on Evaporation of Water - Nature 172, 1101 (1953).
7. Influence of Monolayers on the Natural Rate of Evaporation of Water - Nature 175, 247 (1955).
8. The Use of Hexadecanol for Reservoir Evaporation Control - Proc. First International Symposium on Evaporation Control, p.3. (Southwest Research Institute, U.S.A. 1956).

- 9a. Summary of Field Trials on the Use of Cetyl Alcohol - C.S.I.R.O. Serial Report No.75 (Melbourne, 1955).
- 9b. Reduction of Evaporation from Reservoirs - Comment in Proc. Second International Congress of Surface Activity, vol.1, p.279 (Butterworth, London, 1957).
10. The Potential Performance of Monolayers of Cetyl Alcohol - Aust. J. Appl. Sci. 9, 245 (1958).
11. Reduction of Evaporation of Stored Water - "Climatology and Microclimatology", p.61 (UNESCO, Paris, 1958).
12. Evaporation and Seepage from Water Storages - Aust. J. Appl. Sci. 10, 65 (1959).
13. The Action of Wind, Wave and Dust upon Monolayers - Aust. J. Appl. Sci. 10, 73 (1959).
14. The Spreading of Monolayers - Aust. J. Chem. 12, 382 (1959).
15. Aspects of Evaporation Control - "Retardation of Evaporation by Monolayers," p.133 (Academic Press, New York, 1962).
16. Spreading from Solid Hexadecanol - Aust. J. Chem. 16, 76 (1963).

17. Control of Evaporation - "Water Resources, Use and Management," p.112 (Melbourne University Press, Melbourne 1964).
18. Influence of Gases on the Rate of Evaporation of Water - Nature 205, 278 (1965).
19. Response of Closed Channels to Wind Stresses - Aust. J. Phys. 18, 219 (1965) - with L.M. Fitzgerald.
20. Influence of Ambient Gases on the Rate of Evaporation of Water - Nature 205, 1148 (1965).
21. Evaporation Control in Australia - Proc. International Congress, "Water for Peace," p.121 (Washington, U.S.A. 1967).
22. Influence of Capillarity on a Density Gradient Column - Trans. Faraday Soc. 66, 341 (1970).
23. A History of Anomalous Water - Search 1, 332 (1970).
24. The Physical Properties of Anomalous Water - Aust. J. Chem. 24, 675 (1971).
25. The Spectra of Polywater - Aust. J. Chem. 24, 681 (1971) - with R.G. Gardiner and R.I. Willing.

26. Lactates and Polywater - Search 2, 205 (1971).

SUMMARY

The earlier papers discuss surface phenomena encountered in studies of detergency, emulsification and evaporation control. The interplay between surface flows and surrounding fluid flows, a feature common to many of these studies, is examined also in such processes as the evaporation of quiescent liquids, the transfer of momentum through a liquid surface, and level-seeking in a density-gradient column.

The final papers relate the process of surface spreading to the alleged formation of anomalous water.