

Preface

I read Potts and Parry's *Osmotic and Ionic Regulation in Animals*¹³ when it was published in 1964, and I was hooked. The structured and elegant presentation made clear where the study of osmoregulation was at that time and where it needed to go. It described the classic experiments of Croghan, Forster, Lockwood, Keys, Krogh, B. and K. Schmidt-Nielsen, Shaw, Smith, Ramsay, Robertson, Ussing, Wigglesworth, and others that established the basic patterns of osmoregulation in both invertebrate and vertebrate animals. I was lucky enough to spend the summer of 1965 working with Bill Potts in Ladd Prosser's training course at Woods Hole and then secured an NIH PostDoc to continue studying with Bill at the University of Lancaster from 1967 to 1968. I was also fortunate to spend 3 months in late 1968 in Villefranche-sur-mer, France, in the lab of Jean Maetz. Jean had probably the largest and most active group working in osmoregulation at that time. His life was tragically cut short by an automobile accident in 1977.

In the intervening years, various chapters and volumes have reviewed osmoregulation in cells and specific animal groups,^{1-12,14-16} but no treatment of this depth and breadth has appeared since 1979. For the past 40 years I have thought about updating the original Potts and Parry, but I never found the time to put together a review of a field that was growing so rapidly. I had intended to spend the first few years of retirement reviewing the literature and writing the book, but it immediately became obvious that one person could not properly review osmoregulation in cells and animals—hence, this edited volume. The authors have been recruited from four continents and for their relative longevity in their respective areas of expertise, as well as their writing styles. In so doing, I hoped to generate a volume that was current, well-organized, and of interest to others in this field, as well as colleagues and students in comparative and general physiology.

REFERENCES

1. Gilles, R., *Mechanisms of Osmoregulation in Animals*, John Wiley & Sons, Chichester, 1979.
2. Gilles, R., *Animals and Environmental Fitness*, Pergamon Press, Oxford, 1980.
3. Greger, R., Ed., *Comparative and Environmental Physiology*. Vol. 1. *NaCl Transport in Epithelia*, Springer-Verlag, Berlin, 1988.
4. Gupta, B.L., Moreton, R.B., Oschman, J.L., and Wall, B.J., *Transport of Ions and Water in Animals*, Academic Press, London, 1977.
5. Hoar, W.S. and Randall, D.J., *Fish Physiology*, Vol. X, Academic Press, Orlando, FL, 1984.
6. House, C.R., *Water Transport in Cells and Tissues*, Edward Arnold, London, 1974.
7. Jorgensen, C.B. and Skadhauge, E., *Osmotic and Volume Regulation*, Munksgaard, Copenhagen, 1978.
8. Kirschner, L.B., Water and ions. In *Comparative Animal Physiology*, 4th ed., Prosser, C.L., Ed., Wiley-Liss, New York, 1991, pp. 13–107.
9. Lahlou, B., *Epithelial Transport in the Lower Vertebrates*, Cambridge University Press, Cambridge, U.K., 1980.
10. Malins, D.C. and Sargent, J.R., *Biochemical and Biophysical Perspectives in Marine Biology*, Academic Press, London, 1974.
11. Maloiy, G.M.O., *Comparative Physiology of Osmoregulation in Animals*, Academic Press, London, 1979.
12. Pequeux, A., Gilles, R., and Bolis, L., *Osmoregulation in Estuarine and Marine Animals*, Springer-Verlag, Berlin, 1984.

13. Potts, W. T. W. and Parry, G., *Osmotic and Ionic Regulation in Animals*, Macmillan, New York, 1964.
14. Rankin, C. and Davenport, J. A., *Animal Osmoregulation*, John Wiley & Sons, New York, 1981.
15. Schmidt-Nielsen, K., Bolis, L., and Maddrell, S. H. P., *Comparative Physiology: Water, Ions and Fluid Mechanics*, Cambridge University Press, Cambridge, U.K., 1978.
16. Wood, C. M. and Shuttleworth, T. J., Cellular and molecular approaches to fish ionic regulation. In *Fish Physiology*, Hoar, W. S., Randall, D., and Farrell, A. P., Eds., Academic Press, San Diego, CA, 1995.

REFERENCES

1. Gillet, R., *Physiology of Osmoregulation in Animals*, John Wiley & Sons, Chichester, 1975.
2. Gillet, R., *Animals and Environment*, 1, and *Physiology of Animals*, 1, 1981, Chapman & Hall, London.
3. Potts, W. T. W., *Comparative and Environmental Physiology*, Vol. 1, 1981, Chapman & Hall, London.
4. Potts, W. T. W., *Comparative and Environmental Physiology*, Vol. 2, 1981, Chapman & Hall, London.
5. Potts, W. T. W., *Comparative and Environmental Physiology*, Vol. 3, 1981, Chapman & Hall, London.
6. Potts, W. T. W., *Comparative and Environmental Physiology*, Vol. 4, 1981, Chapman & Hall, London.
7. Potts, W. T. W., *Comparative and Environmental Physiology*, Vol. 5, 1981, Chapman & Hall, London.
8. Potts, W. T. W., *Comparative and Environmental Physiology*, Vol. 6, 1981, Chapman & Hall, London.
9. Potts, W. T. W., *Comparative and Environmental Physiology*, Vol. 7, 1981, Chapman & Hall, London.
10. Potts, W. T. W., *Comparative and Environmental Physiology*, Vol. 8, 1981, Chapman & Hall, London.
11. Potts, W. T. W., *Comparative and Environmental Physiology*, Vol. 9, 1981, Chapman & Hall, London.
12. Potts, W. T. W., *Comparative and Environmental Physiology*, Vol. 10, 1981, Chapman & Hall, London.