Introduction

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Nineteen hundred and seventy-eight marked the twenty-fifth anniversary of the publication of Homer Smith's stimulating monograph, *From Fish to Philosopher*. That book contained both the essence of Smith's ideas on the evolution of the vertebrate kidney and an overview of the comparative physiology of osmoregulation. It served as a starting point for anyone interested in learning about and doing research on comparative renal and electrolyte physiology. Not only has a great deal of work been done on the comparative physiology of osmoregulation since the publication of Smith's monograph, but whole new areas of investigation have opened up in the past twenty-five years. Studies on cell-volume regulation, salt-secreting glands, electrophysiology of the renal tubules, and urinary concentrating mechanisms were either just getting started or not even conceived in 1953. So, we have come a long way in the past twenty-five years.

The papers contained in this volume emanated from talks presented at a Symposium on the Comparative Physiology of Osmoregulation held at the Annual Meeting of the Northeast Physiologists on November 4, 1978, at Brown University. I asked the speakers—Drs. Roy P. Forster, Franklin H. Epstein, Gerhard Giebisch, Bodil Schmidt-Nielsen, and Peter J. Bentley—to each discuss one of the “new areas” listed above to which he or she has contributed so much. We hope that publication of these papers will encourage continued interest and stimulate new investigation into the comparative physiology of osmoregulation.