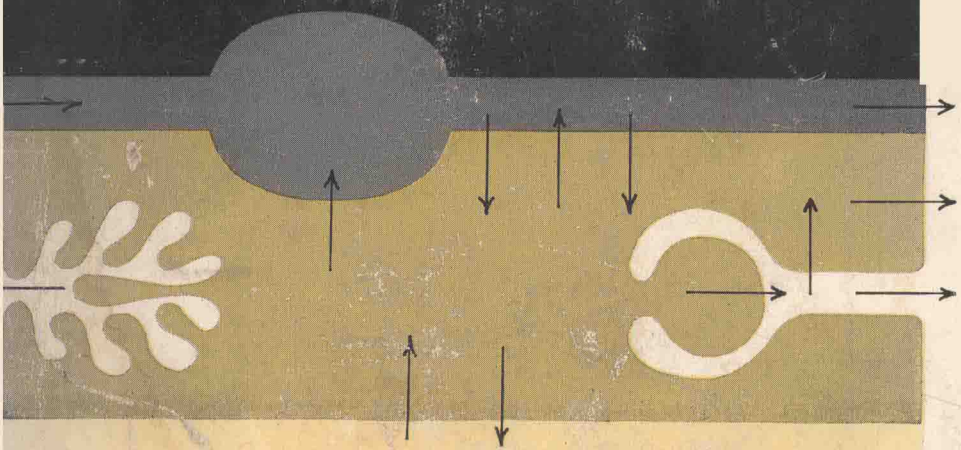
BODY WATER IN MAN

The Acquisition and Maintenance of the Body Fluids



As of today, the evidence seems clear that thirst and appetite under the regulation of the central nervous system and the kidneys under the influence of circulatory, hormonal, and possibly neurogenic factors regulate the volume of body fluids.

MAURICE B. STRAUSS, M.D.

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by

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To

JOHN PUNNETT PETERS, M.D.

1887–1955

Physician, Scientist, Citizen

"The disorders encountered in disease may be regarded as normal physiologic responses to unusual conditions produced by pathologic processes."
— JOHN PUNNETT PETERS, M.D., 1948

Preface

In the pages that follow, no attempt has been made to give an exhaustive account of any of the subjects treated. A brief recapitulation of the evolutionary events which necessitated the development of means for regulating the osmotic pressure and volume of the body fluids precedes consideration of these mechanisms *in man* — the main concern of this volume. The lack of satisfactory observations on man has frequently forced recourse to experiments on animals. "Obviously man does not behave like a dog, which fact presents us with some of our major clinical problems" (Smith, 1957). Man is an omnivore who walks erect. His highly developed brain is ordinarily much farther above his heart than is that of the dog, though to be sure not so far removed as the giraffe's. Man, too, is a creature of individual habit and social custom. The role of thirst and appetite are often subsidiary in regulating his alimentary intake of water and salt. Man's kidneys differ from those of the more carnivorous canine. Thus data obtained from animal experiments, although often applicable to man, are not necessarily so. Comparative physiology, which reveals fascinating similitudes throughout the world of living organisms, nevertheless also indicates that there may be significant differences between even closely related species.

Many experimental studies, when considered of special importance, have been outlined in considerable detail in the following pages, since no matter how earnestly the investigator desired to establish a universal law, the results may hold only for the experimental conditions established.

Progress in some aspects of the matters discussed is being made rapidly. In others we seem to have advanced not at all since the nineteenth century. It is hoped that the bringing together of the material in the chapters that follow may afford the student of this fundamental and absorbing field of physiology a background for comprehending the complex interrelationships which characterize the "companionship of water and electrolytes in the organization of the body fluids" (Gamble, 1951), and may aid the investigator to speed the advance of understanding.

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