

**BODILY CHANGES IN PAIN,
HUNGER, FEAR AND RAGE: AN
ACCOUNT OF RECENT
RESEARCHES INTO THE FUNCTIONS
OF EMOTIONAL EXCITEMENT**

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Bodily Changes in Pain, Hunger, Fear and Rage: An Account of Recent Researches into the Functions of Emotional Excitement by Walter B. Cannon

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WALTER B. CANNON

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AN ACCOUNT OF RECENT RE-
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OF EMOTIONAL EXCITEMENT

BY
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GEORGE HIGGINSON, PROFESSOR OF PHYSIOLOGY IN
HARVARD UNIVERSITY



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TO MY COLLABORATORS IN THESE RESEARCHES

DANIEL DE LA PAZ
ALFRED T. SHOHL
WADE S. WRIGHT
ARTHUR L. WASHBURN
HENRY LYMAN
LEONARD B. NICE
CHARLES M. GRUBER
HOWARD OSGOOD
HORACE GRAY
WALTER L. MENDENHALL

WITH PLEASANT MEMORIES OF OUR
WORK TOGETHER

PREFACE

Fear, rage and pain, and the pangs of hunger are all primitive experiences which human beings share with the lower animals. These experiences are properly classed as among the most powerful that determine the action of men and beasts. A knowledge of the conditions which attend these experiences, therefore, is of general and fundamental importance in the interpretation of behavior.

During the past four years there has been conducted, in the Harvard Physiological Laboratory, a series of investigations concerned with the bodily changes which occur in conjunction with pain, hunger and the major emotions. A group of remarkable alterations in the bodily economy have been discovered, all of which can reasonably be regarded as responses that are nicely adapted to the individual's welfare and preservation. Because these physiological adaptations are interesting both in themselves and in their interpretation, not only to physiologists and psychologists, but to others as well, it has seemed worth while to gather together in convenient form the original accounts of the experiments, which have been published in various American medical and physiological journals. I have, however, attempted to arrange the results and discussions in an orderly and consecutive manner, and I have tried also to elim-

inate or incidentally to explain the technical terms, so that the exposition will be easily understood by any intelligent reader even though not trained in the medical sciences.

My first interest in the conditions attending pain, hunger and strong emotional states was stimulated during the course of a previous series of researches on the motor activities of the alimentary canal. A summary of these researches appeared in 1911, under the title, "The Mechanical Factors of Digestion." The studies recorded in the present volume may be regarded as a natural sequence of observations on the influence of emotional states on the digestive process, which were reported in that volume.

W. B. CANNON.

Boston, Mass.

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