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CONTENTS

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

HEREDITY AND ENVIRONIC FORCES[1]

THAT the qualities and forms of living things are the final and net result of the action of environic conditions upon ancestral protoplasm is almost universally agreed upon. Unanimous as may be the acceptance of this all-inclusive generalization, yet when the attempt is made to establish the causal connection between organisms and the forces concerned in their development, an accumulation of facts is encountered which lends itself to widely divergent theoretical explanations.

No gain would result from a citation of these countless theories or from a rehearsal of the evidence claimed for the support of each of them. A proper approach to some of the results to be presented, however, makes necessary a preliminary consideration of some of the basal and recognized relations of the cell, or of the organism to the developing complex of external forces. Foremost among the problems that present themselves in such a review is that of the nature of the so-called adaptations. Underlying the practise and extension of botanical science is the untested assumption that, for example, when a mesophyte is grown as a xerophyte, the modifications of structure which ensue are adaptive and fit the organism for dealing with arid conditions. The size and form of leaves de-

[1] Address of the vice-president and chairman of the Section of Botany, American Association for the Advancement of Science, Chicago meeting, 1907–8.