

MEMORY AND THE LEARNING PROCESS

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By

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D. H. M.

IN MEMORY OF BAR HARBOR DAYS

PREFACE.*

The present work is the outgrowth of experiments on memory that I have been conducting since the year 1906. The first experiments performed were somewhat limited in character, being made solely with the view of ascertaining the relation existing between facility of learning and tenacity of impression. Whenever publishing brief abstracts of the work as it progressed, the title chosen as being the most appropriate was "The Relation of Quickness of Learning to Retentiveness." As the experimental work progressed, the method used became more elaborate, with the result that, though the relationship in question was never lost sight of, the data obtained were so extensive as to make the old title seem almost inappropriate. In a somewhat condensed form the results of these experiments, where they refer to the problem in question, are placed in Chapter IV. In a more complete form they constitute No. 34 of the Columbia University *Archives of Psychology*, Vol. V.

In 1908 experiments were started on *The Relation of Length of Material to Time Taken for Learning*. Two methods, or distributions of time were used and thus there was added an extra problem—a problem that we might call the *Optimum Distribution of Time*. The results of these experiments have been published in *The Journal of Educational Psychology*, Vol. V, Nos. 1, 2, and 3. In a slightly more condensed form they constitute Chapter III of the present volume.

The larger parts of Chapters III and IV are confined to the examination of data obtained by experiment, and can be of but little interest to any but the student in experimental psychology. Chapters I and II are also somewhat technical in character, so that, apart from Chapter V, this book can be of but little interest to the ordinary public.

*This work was announced in 1914, shortly before the war, but its publication delayed until now because of the loss, in Germany, of the original manuscript.

Generally speaking, Education has use for Psychology only in so far as the latter may be of assistance in laying down rules for study. Education demands of Psychology that it show us how our various mental activities may best be developed, how to recognize and use our dominant form of imagery, what form of imagery to select under certain conditions and depending upon the object in view, how good habits of study may best be acquired, and how labor-saving devices—in so far as the mind is concerned—may best be disclosed and developed.

We do not presume to say that this book is an answer to such questions as these. Psychology is as yet unable to formulate definite rules on problems so complex. We merely pretend to discuss the learning process from an educational point of view, and trust, at the same time, that the conclusions we have drawn from the various experimental data may be of some practical use to the teacher.

Acknowledgments are due to Professors Cattell, Woodworth, and Meumann for the numerous suggestions given me in the treatment of the results.

Many of the experiments were performed on pathological subjects for purposes of comparison with the normal. In this connection I gratefully acknowledge thanks to the following for permissions and privileges granted:—Joseph F. Scott, Superintendent of New York State Reformatories and Prisons; Hon. John J. Barry, Commissioner of Correction of the City of New York; Dr. C. Macfie Campbell of Bloomingdale Hospital, White Plains; Dr. Frederick L. Wells of McLean Hospital, Waverley, Mass.; Dr. August Hoch, Director of the Psychiatric Institute on Wards Island.

INTRODUCTION.

The ever-increasing appearance of popular articles on topics supposedly relegated to the psychologist testifies probably more than anything else to the general interest taken in psychological matters wherever it is thought that any practical advantage may result therefrom. This is especially true of MEMORY, and the interest with which the layman reads articles on this subject is but proof of the fact that it is still felt some royal road to knowledge may still be found—some mysterious method by which a thing once heard shall be forever remembered. It might be supposed that in the field of memory—a field so admirably open to experimental research—the psychologist would hold full sway, but that this is far from being the case is evidenced by the large following that the authors of the numerous memory “systems” have been able to acquire from a public that ought to know better. The success that these men have gained is, however, not alone due to the practical advantages that their students hoped may follow the adoption of their master’s rules, but also to the fact that the experimental psychologist himself has thus far been unable to lay down rules that, to an impatient public, seem of any great importance. It is possible that this inability of the psychologist to here give any positive aid is due to the relatively small amount of experimental work that has been done on such problems as memory-improvement, economy in learning, mnemonic systems, etc., but the reason more probably lies in the hard fact that—as will be explained later—memory, as a faculty of the mind, is unimprovable.

Though within the past decade the progress that has been made in Experimental Psychology has completely changed the general aspect of this science, and although an unprecedented amount of attention has been devoted to an experimental study of the various educational problems, relatively little has been done with memory, notwithstanding its great importance to psychology, pedagogy, and education in gen-

eral. Many psychologists have devoted the best part of their life to problems less important, but with the exception of Ebbinghaus, Meumann, and perhaps half a dozen others, no one has devoted himself for any lengthy period to the exclusive study of retention, recollection, and kindred problems. This is the more surprising when we consider its great importance. What can the psychologist tell us that is more important than how best to remember? The experimental study of memory for logical trains of thought has received but little attention, while an experimental study of the various systems of mnemonics seems to have received practically no attention at all. No experimental psychologist has as yet told us the most economical method of memorizing a passage of prose—or what method will give the greatest retention. Hosts of articles are found on other aspects of the memory problem, but as yet no one seems to have made these problems the subject of serious research.

Probably the main reason that there has been but little advancement in this field is due to the difficulties encountered when one undertakes to investigate this so-called "faculty" of memory. The reasons for this are twofold—that is, not only do the difficulties exist as a matter of fact, but they are increased by the erroneous conceptions held concerning this mental function. Memory is not a separate and distinct faculty of the mind, as is generally considered to be the case, but a gross, unanalyzable term, having no claim to represent an elementary function of mental life. Having been taught to consider memory as a natural, specific, and distinct property of the mind by which it acts uniformly and machine-like in a specific way, experimenters naturally supposed they could investigate it in much the same way as they could reaction time, sensation, rhythm, etc. This view is still the prevalent one, even among the more educated classes, and the average layman still looks upon memory as an elementary, separate, and distinct function of mental life. The error is an enormous one. To see this it is necessary to get rid of the wrong connotations that the word "memory" has acquired, and to use instead the term intellect. Memory properly interpreted is co-extensive with intellect, and in one sense of the word is part