

process. The paper presents an exceptionally interesting and valuable piece of work along lines that have not received the attention they deserve.

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*An Experimental Study of Writing Movements.* CHARLES H. JUDD. *Philos. Studien*, XIX. (Wundt's Festschrift, I.,) pp. 243-259.

This study aims to discover the relation of consciousness to the acquirement of the writing movements, and how this relation changes as the movements become automatic. The apparatus used was a brass spring clasped tightly around the fifth metacarpal bone just behind the little finger, and to which was attached a short aluminum rod carrying at its outer extremity a glass tube held in a vertical position. A writing stylus passed through the tube was allowed to write through the pressure of its own weight. The same hand of the subject wrote with a pen held in the usual way. As the stylus wrote with only the movements of the hand, and the pen with the combined movements of the hand and fingers, a comparison between the two writings shows how much is done with the hand and how much with the fingers.

It was found that the fingers do the work of constructing the letters, while the hand participates only in the forward movements, and the arm acts in the intervals of the words to carry the hand forward. In learning to write one is unconscious of the kind of movements he makes, but gropes about until an easy and effective set of movements is acquired which makes the result conform to the visual pattern. If this pattern is tenaciously held to, the writer may come to produce a perfect copy, but in so doing he sacrifices mental content to form, since attention to form crowds out attention to content. Herein lies the key to individuality in handwriting. If the visual pattern is relinquished early, individual variation is more pronounced, because attention is relieved from its control.

While the study makes an interesting beginning, one regrets that it could not have been carried farther and embodied more results. A real science of chirography is perhaps attainable in this direction.

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