on account of the earlier advent of their pubertal acceleration, begin to grow more rapidly than boys, and for the next two or three years are actually taller. Accelerated growth in boys begins at 12 to 14, and is usually completed in the 16th year. The average weight at birth is 7.3 pounds for boys and 7.1 pounds for girls. Development in weight follows nearly the same laws as development in stature. Autumn is the best season of the year for growth in weight, spring and summer for stature. Children in comfortable circumstances grow larger than those reared in poverty, but it is by no means certain that mental growth corresponds with physical, and it is an open question whether the period of most rapid physical growth is also the time most appropriate for close mental application. The age of puberty is found to be the time of greatest resistance to disease. All growth is rhythmical, not only in the ordinary sense, but also in the sense that some parts of the body forge ahead at certain times, other parts at other times; a fact which suggests to the writer the idea of a principle of compensation in physical development.

The article suggests not only the extent of what has been done in the field of anthropometry, but the far greater extent of what remains to be done, as well as the complicated nature of many of the problems involved. In the case of some of these problems it is exceedingly doubtful whether any result applicable to pedagogy is likely to be attained.

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Psychology and Physiology. HERBERT NICHOLS. *American Journal of Insanity*, October, 1897. Pp. 183-200.

This article is a lecture delivered at Johns Hopkins University in March, 1896, one of six on 'Modern Psychology and its Bearings.' Dr. Nichols states that it is his present purpose to point out that although psychology and physiology are close together and even overlapping in some ways, *e. g.*, in subject-matter, yet in other respects the two sciences are too widely apart—"in points of view, in practical touch and in working support." He suggests his notion how intimately connected the two sciences are by noting that out of the 1,556 pages of the last edition of 'Foster's Physiology' 772 pages are devoted to the muscles, nerves, and sense organs, and by the opinion that "every word of this must now be considered the indispensable property alike of both sciences." None have been in the past more active than physiologists in removing from their science the false notions of scholasticism and of mysticism, but there seems to be danger now that

they will improperly refuse to admit the doctrines of modern psychology, as if they were still on the old and now outworn basis. The harm which may come from attempting to tie down modern physiology to the crude notions of the old psychology may be seen from the hindrance and confusion which such conservatism has already caused in the scientific study of such related subjects, for example, as visceral sensations, emotions, instincts, subconscious processes, and personality. Dr. Nichols then elaborates somewhat these examples in the line of his theory of pain sensation, and according to the prevalent doctrines as to cœnesthesia, subconsciousness, and instinct.

These subjects, and especially personality, physiology seems to dread to investigate, lest it be thought to lay itself liable to the once more reasonable reproach that it is metaphysically speculative. In closing, Dr. Nichols expresses the following very pertinent opinion: "There is as much need that physiology shall unite now, heartily and generously, with psychology to purge the realm of the latter from primitive scholasticism, as it was, at an earlier date, for her to drive out from her own realm the false notions of physiology derived in the same manner from the same sources."

GEORGE V. DEARBORN.

Animal Intelligence: An Experimental Study of the Associative Processes in Animals. By E. L. THORNDIKE. Monograph Supplement No. 8 of the PSYCHOLOGICAL REVIEW.

In this monograph are presented the results of some experiments which I have been carrying on during two years, and some theories which these results seem to support. The subjects of the experiments were dogs, cats and chicks, and the method was to put them, when hungry, in boxes from which they could escape and so get food by manipulating some simple mechanism (*e. g.*, by pulling down a loop of wire, depressing a lever, turning a button). On the first occasion that a young animal is put into such a box, it reacts instinctively with attempts to squeeze through holes, to claw down bars, to bite through the confining walls, to claw at things outside the box as if to pull itself through. If the animal does not, in the course of such activity, hit upon the proper act by chance, it, of course, never forms the association between the sight of the interior of that box and a certain act. But if it does hit upon the proper act, the resulting pleasure stamps in that fragment of its mass of instinctive impulses and renders it more likely to come up in connection with the sense-impression of that box. The failure of all the other acts to win pleasure stamps them out.