

division on isotony and other osmotic phenomena of the cell, and there is another subdivision in physiological chemistry on 'semi-permeability and physiological properties of colloids,' but I am at a loss to find where experiments on the osmotic properties of muscles or connective tissues, etc., could be properly catalogued. It seems to me that fuller provision should be made for the whole realm of the application of physical chemistry to physiology.

3. It seems to me, further, that provision should be made for the facts of physiological morphology. By physiological morphology I mean the energetics of the phenomena of organization. Physiology has thus far chiefly been a study of the phenomena of irritability. But there can be no doubt that phenomena of growth, irritability and metabolism are so thoroughly interwoven that neither metabolism nor irritability can be fully understood without taking into consideration the phenomena of growth. For instance, only the active muscle is able to undergo hypertrophia. The resting muscle atrophies. It is evident that contractility and growth are in some way connected. In plants the heliotropic and other curvatures are connected with the phenomena of growth. It is even possible that our inability to explain contractility is due to the fact that we have not yet taken into consideration the phenomena of growth. Furthermore, I do not quite see where in the present catalogue such experiments on physiological morphology as those on heteromorphosis (the experimental substitution of one organ for another) could be mentioned. Physiological morphology includes also the physiological analysis of heredity. The field of physiological morphology is wider and certainly more fundamental than the present physiology of nerves and muscles.

JACQUES LOEB.

UNIVERSITY OF CHICAGO.

SCIENTIFIC BOOKS.

Talks to Teachers on Psychology, and to Students on some of Life's Ideals. By WILLIAM JAMES. New York, Henry Holt & Co. 1899.

In his first chapter Professor James discusses the relation of psychology to the teaching art. We have so many statements from non-psychologists concerning what psychology may do for teaching that it is pleasant to hear what a psychologist himself has to say on the subject. In the first place, it is pointed out that sciences do not directly generate arts. The study of logic does not make a thinker, nor that of grammar a correct speaker; so the study, even the mastery, of psychology does not insure success in teaching. A science and its corresponding art can be brought together only by means of a mediator; that is, a mind full of tact and invention for the application of the rules of the science to the practice of the art. Given a skilful mediator, psychology can be of the greatest aid to teaching. This is especially true in this country, where the system is so elastic that it becomes a vast laboratory for educational experiment. To this advantage we have the concomitant circumstance of a body of psychologists anxious to instruct another body of teachers eager to learn.

Incidentally, in this chapter, Professor James attempts to allay the pangs of bad conscience in those teachers who have been made to feel that they must contribute to child psychology or be unworthy their calling. He heartily agrees with Professor Münsterberg that the psychologist's attitude toward mind must be abstract and analytical, whereas the teacher's should be concrete and ethical. Haunted by Emerson's lines—

"When duty whispers lo, thou must,
The youth replies, I can,"

the conscientious teacher is pained that she does not. But Professor James eases this pain by intimating gently that obligation is obviated by inability.

The second chapter contains an abridgement of Professor James's well-known description of the Stream of Consciousness, while the third and fourth chapters are devoted to conduct as the outcome of education.

Chapters five, six and seven show the nature and need of spontaneous and acquired reactions. This discussion is new, forceful and illuminating. Not all of these things can be said of the succeeding chapter on the laws of habit. This is taken almost bodily from the author's 'Psychology.' That it is brilliant and sound will be attested by many. Yet what shall we say of the man who *can* produce new books, but who simply copies his old ones verbatim in the most important parts? Professor Patten, in his 'Development of English Thought,' declares that geniuses are always lazy. Professor James can bear this double imputation, yet one can hardly excuse him when he says he needs to offer no apology for copying his own books. The apology is needless only because it is useless. An author should treat himself as well as he treats other authors. He would not incorporate their matter without transforming it by the force of his own thinking; no more should he repeat himself without subjecting his older thought to the transforming influence of a new point of view. Who wants to buy the same book twice?

The chapters on Interest and Attention are among the best and most typical in the book. The treatment is eminently popular and general, yet none the less helpful on that account. If it is much less rigid than that of Dr. Dewey, it is perhaps as useful to the ordinary teacher. The difference is that which exists between a diagram and a demonstration; the one is æsthetic, the other intellectual.

Apperception is described at some length in chapter fourteen, the discussion making no pretension to scientific exactness. Indeed, Professor James has always given the topic a step-motherly treatment, viewing the word *apperception* as a blanket term in psychology, and following the older traditional division into sensation, perception, memory, etc. Yet even from the standpoint of psychology itself, the researches of Wundt and others have shown that there are distinct advantages in treating apperception as an elemental process in psychic life; when we come to education the advantages of this procedure are great and unquestionable. It is to be hoped that Professor James will some day give his mind to a thoroughgoing scientific

exposition of the subject. If one may be permitted to cut out work for his neighbor, one may perhaps suggest to Professor James that a monograph upon apperception in its educative bearings would be gratefully received by American teachers.

Of the significance and value of this volume as a contribution to the cause of education there can be no question. Like everything that Professor James writes, it is at once lucid and interesting. If the treatment is popular and general, it is, at all events, founded on scientific insight, and, so far as it goes, may be confidently trusted as sound. If it ridicules 'brass instrument' study of children, it yet tends to awaken sympathy with childhood. If it disappoints the seeker after 'scientific' study of education, it, at least, satisfies the heart of the earnest teacher.

Finally, this book is to be welcomed because it shows that in educational theory, as in treatises upon subject-matter, the writing of books is passing from the hands of professional book-makers into those of the real leaders of thought. In this fact we find the brightest hope of our educational progress.

CHARLES DEGARMO.

CORNELL UNIVERSITY.

Wetterprognosen und Wetterberichte des XV. und XVI. Jahrhunderts. No. 12, Neudrucke von Schriften und Karten über Meteorologie und Erdmagnetismus herausgegeben von PROFESSOR DR. G. HELLMANN. Berlin, A. Asher & Co. 1899.

In this volume, which is the latest and largest of the series, Dr. Hellmann explains the origin and growth of weather predictions in almanacs, etc., and the practice in the different countries of describing remarkable meteorological phenomena, illustrating both subjects by *facsimile* reproductions of printed documents of the fifteenth and sixteenth centuries. As Dr. Hellmann remarks, the art of foretelling the weather has always been the object of meteorological research, but it has been practiced in various ways according to the theoretical knowledge that existed of the occurrences in the atmosphere. Among the Greeks, at the time of Meton, public placards announced the past and expected weather. Later, astrology controlled