

MODERN PSYCHOLOGY.—(VII.)

We have now been introduced to the real activities out of which knowledge, thought, emotions, and choices result.

The effect upon the nerve fibers and upon the ganglionic cells is known to be greatly influenced by the quality of the stimuli, by their intensity, by emotional emphasis (tone of feelings), by localization, by duration.

It requires no discussion to show that the quality of the stimuli affects the results, as all the explanation thus far shows that certain stimuli affect some nerve terminals while others affect quite different terminals, and it is apparent that certain stimuli produce one color, or taste, or odor, while others have quite a different effect. A slight change in quality of stimuli will tint or shade a color in the sensation. The influence of intensity requires a more careful study. Can we know the relation between the increase of intensity and the increase in the sensation? Is there a constant ratio? If so, what is it? Is it the same with all nerve terminals? If the stimuli is doubled in intensity, has the sensation doubled in effectiveness? When we consider that in the case of seeing, tasting and smelling, the nerve terminal effect is chemical change; that the effect is modified by transmission along the nerve path to the ganglion cells in the cerebral cortex it would certainly be strange if the sensations should vary as does the intensity of the stimuli.

This much is clearly known, that in the case of any stimuli there is an intensity so slight as to produce no effect upon the nerve terminals; that the sensation is then increased as the intensity of the stimuli increases up to a given height; that beyond a given point the increase of intensity does not in the least affect the sensation.

Three things then are desirable to know: The intensity of the stimuli of which we can be cognizant; the height of the intensity (maximum of stimulation) beyond which we are not affected by the increase; the ratio between the increase of stimulation and of sensation. I am not at all sure that the following law is based upon a sufficient number of experiments to prove its universality, but it certainly has been sufficiently tested to prove its probability and its certainty with some kinds of stimuli, and within certain ranges:—The stimuli increase by geometrical progression, and the sensation by arithmetical progression. Two sensations then are in the same ratio as the logarithms of their stimuli. Hence, any sensation is proportional to the logarithm of its stimulus.

The explanation of the experiments by which this has been reached is too complicated for our purpose. In a word it is based upon the fact that if a pound weight be held in the extended hand and an ounce weight be added we should not know by the feeling that anything had been added, nor with two ounces, but when a third of a pound had been added, we should feel it instantly. If we hold two pounds in the hand and add a third of a pound we should not know that aught had been added, nor if we added half a pound, but the moment it was two-thirds of a pound we should know it. With three pounds, if we could hold it easily, we should not notice any increase less than another pound, *i. e.*, it requires a third additional stimulus to be appreciated as a sensation. The intensity of the stimuli must be four-thirds the original for the increase to be appreciable in sensation. Out of this and similar experiments with other qualities of stimuli the law comes that *the sensation is proportional to the logarithm of the stimulus.*

CONFERENCE WITH TEACHERS.

335. *How can we best test the efficiency of our pupils?*
M., Missouri.

That depends upon the subject, upon whether you seek to know the strength of the best or the weakness of the poorest, whether you are to test them for promotion or for your knowledge of what to do with them for the remainder of the year.

In the case of process studies, test them as a rule by written work; *i. e.*, arithmetic, spelling, language (except for conversational power), drawing, should be tested by the doing on paper of what they are directed to do.

In the case of knowledge subjects, such as geography, physiology, history, and natural science, the test should be largely in writing. In the case of thought studies,

like some phases of science, history, and mathematics, the test can hardly be given in writing, but must come largely through oral discussions or experimentation.

In the case of culture studies, like literature and art, the work may be best done by writing and a subsequent open discussion of what has been written.

If your aim is at the best end of the class, writing is very successful, but it is often unfair to the dull end of the class who write slowly, spell poorly, express themselves awkwardly, and never write when they can help it.

Promotions should rarely be based upon written examinations. I should have written examinations for promotions for the stimulus it is to study, but it ought not to weigh more than a third in the estimate.

Each scholar should have his efficiency tested where he can work at best advantage. It is hard enough to do one's best when told to do anything at a given time without being placed at a disadvantage by the way we have to do it.

Remember, the aim is to test the efficiency and not the inefficiency of pupils.

336. *Had Judge Draper been connected with the schools of New York prior to his appointment as state superintendent? If not, what was his occupation? Please state what he accomplished for the schools of New York.*

Judge Draper was not connected with the schools of New York prior to his election as state superintendent. He was formerly a lawyer and a judge in one of the courts. There was much excitement among educational men when he was elected; but he at once won universal confidence rarely paralleled in this country by the business-like way in which he set about securing definite improvements and accomplishing specific reforms in the matter of school buildings, school sanitation, examination of teachers, toning up of institutes, etc. In no one thing, perhaps, was his administration more notably successful than in the prompt, impartial way in which he decided all school appeals that came to him.

THE PSYCHOLOGY OF IMITATION.

BY PROFESSOR JOSIAH ROYCE.
[Reported for the JOURNAL.]

HARVARD LECTURES ON TOPICS OF PSYCHOLOGY OF INTEREST TO TEACHERS.—(V.)

Imitation is not the end in itself. By imitating the good teacher, the pupil learns to think something for himself. The effective authority is that which asserts itself, but makes the least possible parade of itself as an opposing force. It wins by appealing to the imitative function. We love to imitate the interesting personality. Conflicts have also a part to play. Authority often appeals to a natural love. But it need not announce itself as such to make the greatest impression. "Let us sing unto the Lord" is a most effective, authoritative invitation. The most convincing authority is that which speaks with the assurance that the thing is going to happen. The irresistible leaders of men are not those who put the yoke upon them, but who announce their confidence that their followers will do what is proposed. If a topic is dry, there is the greater need of authority. Mankind loves the control of command, so long as the individual weaknesses and caprices are not aroused.

Imitation has an important biological relation to the whole evolution of intelligence. Consciousness accompanies the relative increase of leisure. Opportunity is given for the watchful attentiveness to the acts of companions, and to the memory of past successes and failures.

There are three possible explanations of the origin of the imitative function, all possibly true. The Ideo-Motor Factor accounts for the more or less vague responses to environment, which grow into habits. This gives spontaneous, reflex responses. Pleasurable combinations are repeated while the painful are repressed. This is as true of the caprices of the Ideo-Motor Factor. A suggestion of a given act leads to the persistence in a precisely opposed act. There is often a stronger suggestion of a forbidden deed than of the objection to it. A smile inevitably follows the "Please do not laugh." Make all the suggestions personality demands, but beware of the reaction.

The deepest imitations, as laughter and weeping, are often claimed as immediate and underived, true instincts. Apart from the Ideo-Motor Factor, there are still a number of very obscure, instructive reactions, in advance of all experience. We seem to get by suggestion experiences we have not ourselves been through. We are not confined to the expression of our own past griefs when we sympathize with others. There are fundamental imitative tendencies which precede the observation of our own reactionary experiences.

There is also, it seems, a predominantly ideal factor in our imitation. There are personally interesting models whom we wish to imitate before we know how we are to do so. The child tries to produce combinations it has seen others produce. It persists, stim-

ulated by half success, in the hope of sometime doing better. In the end he gains the knowledge of his own powers, and of the nature of the processes by which he grew. Thus he learns about his calling and the universe, the nature of external things.

The ideas that precede imitation are as nothing to those that come after. External things are to us those that can be imitated. When the infant has been taught by its desire to imitate, it first learns what the external world is.

In addition to the literature cited in the notes to Lecture IV., mention is made in the present lecture of the discussions of Bain (*Senses and Intellect, in the division on "the Intellect" § 52*), Sully (*The Human Mind, Vol. II, Chap. XVII, § 23*). The essay by Tarde in the *Revue Philosophique* for November 1884, entitled "What is a Society?" contains one of the earliest formal comparisons between the hypnotic and the social consciousness.

EDITORIAL MENTION.

The Brooklyn Teachers' Fair has realized not far from \$25,000.

Scientific temperance instruction is now given in all the public schools of Sweden.

Pres. Irwin Shepard of the State Normal School, Winona, Minn., has entered upon his duties as secretary of the N. E. A. in place of R. L. Stevenson, deceased.

Among the distinguished visitors in this city during the past week was Miss Hulda Lundin, the Swedish inspectress, a sketch and portrait of whom is given in this issue.

The pupils of the English High School of Fall River are to present the school with a fine bust of their late master, William H. Lambert, which is being executed by Mr. Cyrus Cobb.

Professors D. G. Lyon, C. R. Lanman, C. H. Toy, J. H. White of Harvard and Rev. Dr. W. C. Winslow of Boston have been appointed on the Advisory Council in the Department of Philology in the World's Congress Auxiliary at Chicago.

Miss Sarah A. Burstall, a graduate of Girton College, England, is now in this country inspecting the public school system. She is one of the five "traveling scholars" appointed by the Gilchrist trustees of England to inspect American schools.

The Department Congress of the International Kindergarten Union will be held in Chicago on May 17th. Among the speakers will be Sarah B. Cooper, Lillah B. Pingree, Sarah A. Stewart, Ada Marean Hughes, Alice H. Putnam, Eudora L. Hailmann, Emma Marwadel, Emilie Poulsson, Mrs. Louis H. Allen. A reading will be given by Mrs. Kate Douglass Wiggin.

It is said that Phillips Brooks first came to notice in Boston in connection with a service held at Harvard College, celebrating the end of the war. Col. Henry Lee, the Harvard marshal for that day, said that the services for that occasion were not equal to what men felt. Lowell's "Commemoration Ode" was great, and so was General Devens' speech, but everything fell short, and words seemed to be too weak until Phillips Brooks offered the prayer. The inquiry was, "Who is Phillips Brooks?" and from that moment the growing thought at Trinity Church was to call the young minister to the rectorship.

The Harvard summer school is one of the courageous institutions that proposes to have a larger and better school this summer, despite the World's Fair, than ever before. There is no mental reservation or equivocation whatever in the fullest endorsement of this school; indeed, to hesitate in the endorsement of a school presided over by Prof. N. S. Shaler, with the special departments in charge of Prof. A. S. Hill, Prof. D. G. Lyon, Prof. Paul H. Hanus, and Dr. T. H. Richards would simply discount oneself rather than the school. The special features will be rhetoric and composition, Anglo-Saxon, French and German, history, geometry, trigonometry, engineering, physics, chemistry, botany, geology, and physical training. More than twenty of the Harvard experts will do the teaching with all of the resources of this greatest of American universities at their command. The school opens July 5, and any information desired may be obtained by writing to Prof. N. S. Shaler, Harvard University, Cambridge, Mass.

The New York City Teachers' Mutual Benefit Association has a permanent fund of \$125,121, with an annuity fund of \$2,295, making assets amounting to \$127,417, of which \$123,800 is in mortgages and the balance in banks that pay interest on deposits. The income from investments now amounts to \$6,003. From one concert last year the Association netted \$1,309. The sum total of all salaries paid to those who do all the business necessitated by the various interests of the Association is \$550, which is less than one half of one per cent for handling the money, to say nothing of all the business necessitated in the paying out of \$22,654 in annuities, etc. Seventy-six teachers have been retired since the formation of the organization. Of these, eleven have died and two have withdrawn, leaving sixty-three on the list Jan. 1, and two have since been added. Forty-one retired from disability and thirty-five for length of service. The present membership is 2,017.

TO THE WORLD'S FAIR.

On the present basis, the rates to the World's Fair at Chicago, round trip tickets, will be as follows:—

Trains taking more than thirty-five hours between Boston and Chicago:

Fitchburg & West Shore,	\$32.00
Fitchburg (Erie & Boston Line),	30.40
Fitchburg via Montreal,	29.60

Trains making the run in thirty-five hours or less:

Fitchburg & West Shore,	40.00
Fitchburg (Erie & Boston Line),	38.00
Fitchburg via Montreal,	37.00