SCIENCE

NEW YORK, FEBRUARY 27, 1891.

SUGGESTION IN INFANCY.[1]

THE rise of hypnotism in late years has opened the way to an entirely new method of mental study. The doctrine of pure reflexes was before largely physiological, and only pathological cases could be cited in evidence of a mechanism in certain forms of consciousness as well as out of it; and even pathological cases of extreme sensitiveness to casual suggestion from the environment or from other men did not receive the interpretation which the phenomena of hypnotic suggestion are now making possible, i.e., that suggestion by idea, or through consciousness, must be recognized as as fundamental a kind of motor stimulus as the direct excitation of a sense-organ: in other words, *that nervous reflexes work directly through states of consciousness; that the latter are integral portions of these reflexes;* and, further, *that a large part of our mental life is made up of a mass of such ideo-motor reflexes, which are normally in a state of subconscious inhibition.*

Without discussing the nature of the hypnotic state, nor venturing to pass judgment in this connection upon the question whether the suggestion theory is sufficient to explain all the facts, we may yet isolate the aspect spoken of above, and discuss its general bearings. Of course, the question at once occurs, is the normal life a life to any degree of ideo-motor or suggestive re-actions, or is the hypnotic sleep in this aspect of it quite an artificial thing? Further, if such suggestion is normal or typical in the mental life, what is the nature of the inhibition by which it is kept under? Leaving this second question altogether unanswered for the present, it has occurred to me to observe my child[2] during her first year to see if light could be thrown upon the first inquiry above. If it be true that ideo-motor suggestion is a normal thing, then early child-life should present the most striking analogies to the hypnotic state in this essential respect. This is a field that has hitherto, as far as I know, been almost untouched by psychologists.

Observation of re-actions clearly due to suggestion in my child, either under natural conditions or by experiment, lead me to distinguish the following kinds of suggestion, mentioned in the order of their appearance in child-life: —

Suggestion { Physiological; Sensori-motor; Ideo-motor { Deliberative; Imitative }

I shall proceed by first describing the class of phenomena designated, and then the evidence, small or great, which my observations afford in each case.

1. *Physiological Suggestion.* — By "suggestion" ordinarily is understood ideal or ideo-motor suggestion, — the origination from without of a motor re-action by producing in consciousness the state which is ordinarily antecedent to that re-action. But observation of an infant for the first month or six weeks of its life leads to the conviction that its life is mainly physiological. The vacancy of consciousness as regards any thing not immediately given as sensation, principally pleasure and pain, precludes the possibility of ideal suggestion as such. The infant at this age has no ideas in the sense of distinct memory-images. Conscious states are affective. Accordingly, when the re-actions which are purely reflex, and certain random impulsive movements, are excluded, we seem to exhaust the contents of consciousness.

Yet even at this remarkably early stage H. was found to be in a degree receptive of suggestion — suggestion conveyed by repeated stimulation under uniform conditions. In the first place, the suggestions of sleep began to tell upon her before the end of the second month. Her nurse put her to sleep by laying her face-down and patting gently upon the end of her spine. This position soon became itself not only suggestive to the child of sleep, but sometimes necessary to sleep, even when she was laid across the nurse's lap in what seemed to be an uncomfortable position.

This illustrates what I mean by physiological suggestion. It is the law of physiological habit as it borders on the conscious. No doubt some such effect would be produced by pure habit apart from consciousness; but, consciousness being present, its nascent indefinite states may be supposed to have a quality of suggestiveness, which indicates the degree of fixedness of the habit. Yet the fact of such a coloring of consciousness in connection with the growth of physiological habit is important more as a transition to more evident suggestion.

The same kind of phenomena appear also in adult life. Positions given to the limbs of a sleeper lead to movements ordinarily associated with these positions. The sleeper defends himself, withdraws himself from cold, etc. All secondary automatic re-actions may be classed here, the sensations coming from one re-action (in, say, walking) being suggestions to the next movement unconsciously acted upon. The state of consciousness at any stage, if present at all, must be similar to the baby's in the case above, — a mere internal glimmering, whose reproduction, however brought about, re-enforces its appropriate re-action.

The most we can say of such physiological suggestion is, that, when the conscious state is present, the re-action is subsequently abbreviated and facilitated; but whether abbreviation is due entirely to habit, and the consciousness is only a result of such abbreviation, not its cause, we are unable to say.

The physiological process involved, and its relation to consciousness, may be brought out by a diagram; but, in order that it and those which follow may be easily understood, it may be well to present the *motor square*, as we

[1] For the general facts and interesting treatment of the movements of infants, see Preyer's Senses and Will, part ii.

[2] Called hereafter simply H.

as to throw their shadows on a new portion of the rod-and-cone layer. From the nature of the case, the corpuscles cannot be rendered invisible, like the capillaries.

The phenomena described above were first observed by the writer a dozen years ago; and, though it is probable that others have observed the same, consultation with persons and books that would be likely to furnish the information of such knowledge have shown that these facts are either unknown, or at least not generally known. That the facts here published may be observed by any one seems proved by the fact that they have been corroborated by almost every one who has made the attempt under the writer's direction. J. E. TODD.

Tabor College, Tabor, Io., Feb. 16.

Classification of American Languages.

IN your issue of Feb. 6 appears an article by Major J. W. Powell, chief of the Bureau of Ethnology of the Smithsonian Institution, on the study of what he calls "Indian" languages, with a list of families in the United States.

This article contains statements so much at variance with the leading authorities in linguistic science, that they should not be allowed to pass in silence.

In the first place, the term "Indian languages," applied to those spoken by the native tribes of this continent, is a misnomer based on an ancient blunder, and has been repudiated by all modern writers of weight. The so-called "Indians" are the "American race," and their languages are "American languages," by the common consent of ethnographers. Is the Bureau of Ethnology a sanctuary for the preservation of exploded errors, that it throws its influence into the scale to perpetuate this discarded blunder?

Much of the article alluded to is devoted to explaining and defending the nomenclature adopted by the bureau. In several points it requires still further defence. The arbitrary assumption of the date 1336, anterior to which the "law of priority" is decreed not to hold good, is not justified by the reasons given.

The dictum that "no family name shall be recognized if composed of more than one word," is not merely arbitrary, but has nothing in its favor and much against it. Frequently a class-name compounded of two words is particularly useful, as conveying a much wider idea than a single word. This is fully recognized by the best linguists of the day. Thus, Friedrich Müller employs the terms "Indo-Germanic," "Ural-Altaic," etc. The reasons assigned for rejecting such compounds are quite inadequate, and contrary to the practice of the highest authorities.

The adoption of the termination *an* or *ian* to denote families or stocks of languages is not original with our Bureau of Ethnology, though the article might lead the reader to suppose it a new device. Some writers adopted it long before the bureau was organized, but the plan did not meet with general approval. The cacophony of such words as "Eskimauan," "Muskhogean," etc., in Major Powell's list is apparent to every one who has not had the advantage of that training by the bureau to which he refers with pride as destroying all sense of euphony.

But the portion of the article in question which will most completely "knock the wind" out of those old-fogy linguists in Europe, and those in our own country who have been reared on Aryan and Semitic tongues, is Major Powell's declaration that "grammatic similarities are not supposed to furnish evidence of cognation;" that in his classification grammatic structure has been neglected, and lexical elements only considered.

Now, if it were said that in most instances we are obliged to depend on lexical elements because the grammatic structure has not been ascertained, the position would be sound and in accord with the recognized principles of the science of language; but to place the words of a tongue above its grammar in instituting comparisons is a feat of such daring or of such ignorance, that it requires a man long accustomed to frontier life to venture it. If there is any one principle in modern linguistics which we may look upon as thoroughly established, it is that the grammatic framework of a language is incomparably more stable than its lexicon. If there has ever been an instance where a language of agglutination has changed into one of inflection, it is not recorded "in the books." It is precisely the grammar which is the permanent part of a language, and not its vocabulary. Modern Turkish has borrowed three-fourths of its words from Arabic, Greek, Persian, etc.; but its grammar remains almost precisely that of the pure stock, the Yakut of the delta of the Lena. This principle is as true of American tongues as of others, and the evidence of it has been abundantly set forth by Friedrich Müller and Lucien Adam. D. G. BRINTON, M.D.

Philadelphia, Penn., Feb. 20.

The Food of Moles.

IT is stated in the "Encyclopædia Britannica" that moles are entirely carnivorous, are exceedingly rapacious, and will die if left longer than eight or ten hours without food. I recently kept a living mole for a time to study its habits. I shut it in a ventilated wooden box, giving it a tin lid full of water, and some grains of corn. It drank the water, refused the corn, and, while kept strictly in the dark, was quiet. After twelve hours' captivity I offered it boiled rice, which it refused. After sixteen hours' fasting, it ate bread and milk, though not freely. When I had had it twenty hours, I gave it cracked oats, soaked well in milk, but uncooked. This it ate ravenously. I then released it in the room, and it travelled about, seeking a place to burrow, and made itself troublesome tearing at the carpet and upholstery. I threw down a large thick woollen mitten, which it speedily found and entered, thrusting its head into the thumb. If undisturbed, it would hide in this way for hours, the light and warmth of the room seeming greatly to annoy it. It lived in the mitten for three days, coming out to eat oats soaked in milk, but refusing cooked oats. It was given one small meal of raw meat. At the end of four days it was killed, being apparently in a healthy condition, and not having lost any flesh.

JULIA MCNAIR WRIGHT.

Fulton, Mo., Feb. 20.

Cold and Warm Waves.

TWO rival theories have been propounded recently regarding the origin of the waves or masses of cold air which appear to traverse the country toward the east. One of these finds the source of cold in the upper regions of the atmosphere, and considers that the cold air above mixes with that below, and thus gradually approaches the earth's surface. Those supporting the other theory, however, deny that any considerable cold can be brought down in this way, because the compression to which the air would be subjected would heat it, but they claim that the cold is due to the radiation of heat through the very clear sky which is a well-nigh invariable accompaniment. Without expecting to establish the exact truth in this matter, it has yet seemed a subject of much importance; and it may be well, at this stage in the discussion, to set forth a few facts that may be of use in the final solution of the problem.

Those who have been making forecasts of the weather have recognized for more than a dozen years three great classes of temperature falls: 1. Those which come with the advance of areas of high pressure; 2. Those which follow immediately in the rear of great storms independently of any high area; 3. Those which occur under a combination of these two causes. It should be noted that the first two classes do not invariably occur even when the conditions seem favorable, and great care is needed in examining other conditions, which, though apparently remote, may yet become exceedingly important factors in the development of the cold wave. The occurrence of the cold is independent of the wind, though the extent of the wave is markedly dependent on the rapidity of its advance, and a rapid motion has a tendency to increase the wind. Some have thought that the wind brings the cold; but this cannot be the case, for often there is no wind, or at least it rarely attains fifteen miles per hour, while the cold wave advances at double that velocity. One of the essential conditions needed for a cold wave is an elimination of the moisture in the air, and this removal of moisture is oftentimes very remarkable. In one case three fourths of this moisture was removed in 110