

whole story, still it is a very convenient and useful way of indicating the alkali condition of the treatment that is under investigation.

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THE RÔLE OF PSYCHOLOGICAL FACTORS IN DIGESTION

AN experimental report on the relative digestibility of palatable and unpalatable food in a recent number of *SCIENCE* by Messrs. Holder, Smith and Hawk,¹ raises the important problem of the place of the mental factors in such activities of the human being as the partaking of food. In a general way this is the problem of the unified and complete versus the partial functioning of the organism. Now the title of the report in question, namely, "Is Unpalatable Food Properly Digested," clearly indicates that the question of the partial or incomplete functioning of the organism is in point here. For the question of palatableness is one which concerns not merely the comparatively simple, metabolic chemical reaction, but always involves a highly integrated conscious organism such as a human individual.

When we study isolated phases of an organism rather than observe the responses of the organism as a whole, we naturally arrive at different results, and so the report based upon isolated physiological data reads as follows: "If the stomach and intestine can be cajoled into making the proper effort, the unsavory concoction can be digested just about as satisfactorily as can the food mixture which makes a stronger appeal." This conclusion is reached by the observation that there is only one per cent. difference in the utilization of nitrogen when taking palatable and unpalatable food.

At this point appear some questions of extreme importance. For example, has there been sufficient time in the two days in which the unpalatable food has been administered for any change to take place in the functioning of the organism? Would not a protracted

period of subjection to unpalatable food conditions show marked metabolic deterioration? It is decidedly an open question how long the stomach and intestine can be cajoled into making the proper effort for digestion when the organism (person) perceives and objects to the disagreeableness of the food. Indeed the writers declare that this experiment "shows how insulting we can be to the normal stomach and get away with it, but this does not necessarily prove this to be the wisest policy." Why should there be any question of policy? The answer is clear; the student of psychopathology knows full well what are the dangers of being compelled to respond to food or other situations under unfavorable circumstances. The record of broken-down organisms with incapacitating digestive symptoms is too large to leave any room for doubt as to what hygienic policy should prevail with respect to the palatableness as well as other conditions of the food-taking responses. Further, aside from the too brief period employed in the experiment, one must not lose sight of the fact that the subject was fully cognizant of responding to an experimental situation, a fact which greatly influences the stimulus-response complex.

When we consider the digestive functions as isolated activities of the organism it is beyond dispute that the absorption and utilization of the materials will depend essentially upon the chemical constitution or the food value of the materials eaten, but can we so consider human digestion? To consider digestion or any other organic process as an abstract activity is to overlook entirely the unitary character of a biological organism. Of course, no one can possibly fail to observe the value of the hypothesis that the complex activities of organisms are rather simple chemical reactions, for upon no other basis could progress be made in the investigation of such phenomena. But, this in no wise implies that in order really to understand the organism we must overlook the functioning of it as a whole. And when we do study the organism as a unit we not only find that "psychic stimuli" promote or retard the secretion of

¹ LI., p. 299.

digestive juices, but that all actions of the individual are affected by the particular surrounding conditions of such actions.

That unfortunate effects result from the failure to appreciate the fact that in dealing with the human organism we are not dealing with isolated elements is a common observation in medical practise. All too frequently an individual, who is clearly in the process of preventable disintegration, is caused to break down completely because the elemental theory actuates the psychiatrist to pronounce that there is nothing wrong with a person having no apparent organic or functional lesion. The writer wishes to suggest, that at least from a medical standpoint, we have placed too great emphasis upon the chemical factors in the process of human digestion and too little stress upon the psychological factors.

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A SIDEWALK MIRAGE

TO THE EDITOR OF SCIENCE: It seems the phenomenon here described must have been noticed by many others, but it caught my attention for the first time about two weeks since, and nowhere have I seen it described.

On several occasions, lately, I have observed a mirage under the conditions hereafter stated which are those of a typical case. I was walking eastward on a cement sidewalk on a street running nearly east and west, and moving up a moderate grade which joins a nearly level stretch of walk. On reaching a point which brought my eye slightly above the level portion, and at which normally the level stretch would have been seen in its entire length, but much foreshortened, I observed instead what appeared to be a stretch of clear dark water covering the entire width of the walk, and brilliantly reflecting moving persons and other objects in sight beyond it.

The sky was clear, the air cool, the sun high. It was about three o'clock p.m., local time. There was a moderate breeze. The angle of observation was very small, probably not above three degrees. A step or two either east or west, and the water was gone,

but within the proper limits, the illusion was definite and continuing. The Weather Bureau report for the day indicates that approximately 30 feet above the spot where the mirage was observed the air temperature was about 63° F. and the humidity about 63°.

The resemblance between conditions here described and those which produce the mirage on the plains is obvious.

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SCIENTIFIC BOOKS

Helmets and Body Armor in Modern Warfare.

By BASHFORD DEAN. New Haven, Yale University Press.

To most of us armor belongs to the romantic past. We hardly think of it as a practical, up-to-date accessory of modern warfare. But in a book which has recently appeared, it is clearly demonstrated that armor has still a distinct value. We are of course familiar with the various steel helmets used by all the nations in the Great War, but it is not generally known that all the countries were hard at work experimenting with and developing body armor of every sort for their fighting men. General Pershing recognized its value and in the title page of Dr. Bashford Dean's "Helmets and Body Armor in Modern Warfare" he is quoted as saying that "effort should be continued towards a satisfactory form of body armor."

Dr. Dean is the foremost authority on armor in this country and curator of arms at the Metropolitan Museum of Art. When we entered the war he was placed in charge of the armor problem and his tireless energy and enthusiasm, together with the generous cooperation of the Metropolitan Museum, led to the development of many types of armor for our combat troops. It is unfortunate that too little of this armor was used during the final drive of 1918.

Dr. Dean views the subject from many angles. The introduction is devoted to the evolution of modern armor from early times and enables one to contrast the old with the new. The medical viewpoint is considered