THE PHYSIOLOGICAL EFFECTS OF ALCOHOL.*

The two substantial volumes containing a study of the "Physiological Aspects of the Liquor Problem" are the fourth of a series of reports on the Liquor Problem, by the Committee of Fifty charged with the scientific investigation of that perplexed and perplexing subject. "Like its predecessors," we are told, "this report is preliminary in its nature." It has been prepared by the sub-committee on the physiological and pathological aspects of the drink problem, and is edited by Dr. J. S. Billings. The book contains altogether ten reports, or essays, dealing with different matters investigated by the sub-committee. All of these are full of valuable and interesting information, and must be carefully studied to be appreciated. There are numerous summaries of the conclusions reached, but the perusal of these leaves an impression upon the mind which is colorless compared with that produced by reading the full details. In some cases the reports seem unduly lengthened by the narration of experiments which have to be dismissed as misleading or worthless; but the sub-committee has thought it necessary to go into all these details, because there is a whole forest of current errors to fell before daylight can be let in upon the subject.

The first report in the book (after the general report of the sub-committee) is, rather to our surprise, pedagogical rather than physiological. It deals with the present instruction on the physiological action of alcohol, and is by Doctors H. P. Bowditch and C. F. Hodge. It mainly consists of a vigorous attack on what may be called the Black Bogie system of instruction, as promoted by the W. C. T. U. After detailing the history of the movement,

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and describing the character of the "authorized" text-books on physiology, the writers say:

"It is thus apparent that under the name of 'Scientific Temperance Instruction' there has been grafted upon the public school system of nearly all our states an educational scheme, relative to alcohol, which is neither scientific, nor temperate, nor instructive" (p. 44).

There are appended many letters from American and European physiologists, most of them supporting the views of Messrs. Bowditch and Hodge in general, though the diversity of opinion and the general uncertainty as to many details are conspicuous. The following statements may be selected as illustrative.

"In my *opinion*, alcohol is *not* a food, nor even a condiment."—*Dr. H. G. Beyer.*

"I believe that we have abundant evidence that alcohol has a certain food value."—*Prof. R. H. Chittenden.*

"I have also experienced the honor of an overdose [of alcohol], particularly when experimenting with whiskey in association with the late Dr. Anstie. I can think of nothing more disagreeable than the effort to make observations on one's self when half poisoned. But I quite agree with you that, notwithstanding, alcohol is *not* a poison, as well as with your definition of a poison as a thing which can only do harm and never good."—*Sir. J. Burdon Sanderson.*

"Physiology as an experimental science not only has not, but I think never will decide whether the moderate use of alcohol is good or bad."—*Prof. P. H. Pye-Smith.*

"Alcohol is a poison and not a food."—*Prof. A. Forel.*

After perusing these and many other like statements, the reader may be excused for feeling a little bewildered. The fact is, that, as in so many heated discussions, the chief things needed are common-sense and an agreement as to terms. In the second volume, Professor Atwater, after describing his numerous and elaborate investigations, concludes thus:

"If we define food as that which, taken into the body, either builds tissue or yields energy, alcohol is food, but it is a very one-sided food. If we confine the word food to materials which, like bread and meat, contain protein and build nitrogenous tissue, alcohol is not a food; neither is starch, which is the chief constituent of such food materials as wheat, corn, rice, and potatoes" (p. 314).

Practically, alcohol is not useful as a food-stuff under ordinary conditions; though in certain forms of disease it may so serve.

As to whether alcohol is a poison, the contradictory statements of Sir J. Burdon Sanderson illustrate the futility of the definition which he approves. Elsewhere in the book it is clearly pointed out that the most poisonous substances may be harmless or beneficial in certain small quantities. Hydrochloric acid is a normal constituent of the gastric juice; and yet if someone swallows a quantity of that substance, and dies in consequence, are we forbidden to say that he is poisoned? That alcohol in any other than very moderate quantities has a genuinely poisonous action is apparent from the numerous experiments detailed by Dr. J. J. Abel in the second volume. The last mentioned writer, in his long report on the Pharmacological Action of Ethyl Alcohol, raises some very interesting questions. It appears that the supposed stimulating effect of alcohol may have been quite misunderstood. Dr. Abel quotes James as saying:

"We should all be cataleptics, and never stop a contraction once begun, were it not that other processes simultaneously going on inhibit the contraction. Inhibition is, therefore, not an occasional accident; it is an essential and unremitting element of our cerebral life" (p. 131).

Now alcohol, by deadening down inhibitory influences, may give certain positive reactions a free field, and the result is an apparent stimulation. Thus:

"In speaking of a certain type of individual James says, 'It is the absence of scruples, of consequences, of considerations, the extraordinary simplification of each moment's outlook, that gives to the explosive individual such motor energy and ease.' This description aptly applies to the individual who is under the influence of a 'moderate' quantity of alcohol. It tends to turn the inhibitive type of mind into the 'hair-trigger' type" (p. 141).

Suppose a horse to be pulling a heavy load. It moves forward slowly and painfully; but all at once the tugs break, and the animal runs off, kicking up its heels. Superficially, it might seem that there had been a sudden stimulus, and that the active gyrations indicated an increase in the amount of work done. So often in the case of persons affected by alcohol.

The experiments on dogs and rabbits, illustrated by photographs, cannot be properly described here. The influence of alcohol in producing fear is most significant, as also are the effects upon the vitality of the young born to alcoholized dogs, and the increased susceptibility to disease induced by chronic alcoholism.

Dr. Billings has compiled data relating to the use of alcoholic drinks among brain-workers in the United States. It appears that of 892 cases, 18.7% were total abstainers, 64.9% occasional drinkers, and 16.3% regular moderate drinkers. The number of regular drinkers is thus quite small; the "occasional drinkers" ought, no doubt, mostly to be classed with the abstainers, as the majority of those who do not ordinarily use alcohol will drink a little on special occasions, and thus could not put themselves down as total abstainers.

A little chapter by Dr. Bowditch, on "The

Use of 'Temperance Drinks,'" is sandwiched in between discussions of the nutritive and pathological effects of alcohol, and is likely to be overlooked. It appears that practically all the tonics and bitters sold in drug-stores contain alcohol, and many of them very large quantities. So "it is clear that very large quantities of drinks containing a greater percentage of alcohol than the ordinary wines and beers are consumed among the most rigorous of total abstinence circles, and one of the foremost advocates of total abstinence has permitted her picture to be used as an advertisement of one of the most alcoholic of these drinks" (p. 345, vol. 2). The percentage of alcohol by volume in some of the drinks mentioned is as follows: Paine's Celery Compound, 21; Ayer's Sarsaparilla, 26.2; Golden's Liquid Beef Tonic, "recommended for treatment for alcohol habit," 26.5; Hostetter's Stomach Bitters, 44.3; Boker's Stomach Bitters, 42.6; and so forth!

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