SCIENCE

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WILL THE READER please cast his eye upon the following questions: 1. How can it be proved that nicotine is a poison? 2. Why are cigarettes especially harmful? 3. Is alcohol a food? 4. What is the effect of disuse upon a muscle? 5. Under what names is opium sold? 6. Under what names is alcohol drunk? 7. What is the difference between a food and a poison? 8. Is any thing gained by changing from one narcotic to another? 9. What is the effect of beer as a drink? 10. How does cheerfulness help the muscle? These are the questions given as a test in physiology in the public schools of a prominent Eastern city. They are not addressed to young men about to leave school. No, they are asked of little boys and girls of from eight to ten years of age. This is the examination-paper at the end of the first year's elementary instruction in physiology. Of ten questions, eight relate to drinking and smoking: the physiology is a mere side issue. These children, who ought to have about as much knowledge of such matters as they should of the methods in vogue at the stock exchange, are actually forced to learn by rote the details of human vice; and that, too, under the name of 'physiology,' the only science which they learn. Unconsciousness, *naïveté*, is the symbol of childhood. The fact that physiology, even if well taught, tends to destroy this trait, is the chief objection to its early study. Instruction such as the above implies crushes the most valuable trait in the child, directs its curiosity to what is morbid, and forces into precocious development all its dangerous elements. Not enough that the newspaper and the dime novel proclaim in glaring colors the story of crime and sin: some notion of the perversity of human nature must be mixed with the food of babes. That the result of this teaching is to excite in the children a morbid curiosity to experiment for themselves in such matters; or (with the boys) to regard the whole thing as a lesson in 'goody-goodyness,' to which they forthwith decide to show themselves superior; or to regard their father, who takes his glass of wine at dinner, as an incipient criminal, — this could easily have been foreseen, and goes without saying. If there is one method better than all others to produce a race of drunkards, this has good claims to that distinction. If there is a degree of wrong in such superlatively perverse methods, then it is still worse that the fair name of science should be outraged in this cause. Not only that this kind of teaching necessarily depends upon catechism methods (that the answer to the second question, for example, is to read that the especial perniciousness of cigarettes is due to the fact that they are usually made of decayed cigar-stumps), but that the entire idea of science thus implanted is as wrong as it well can be. Better far revert to the old days when there was no science on the curriculum than have science thus taught. The crowning educational virtue of science is that it leads to the use of scientific methods of teaching: this usurper chokes up all possibility of an interest in the scientific. The 'temperance' question is doubtless one of the most important with which our age has to deal; sufficiently important, perhaps, to make some consideration of it in the public schools a legitimate proceeding, but it must be done at the right time and in the proper way. Nothing can excuse the conversion of a text-book on physiology into a 'temperance' tract: nothing can excuse the sacrilege of presenting this story of disgusting vice under the name of 'science.'

THE STATEMENTS by Mr. W. Glenn in *Science* of July 15, as to the freedom from disease of men employed in the Baltimore sewers, are of greater interest in view of the report of Professor Carnelley, D.Sc., and Mr. Haldane, of University College, Dundee, referred to in *Engineering* lately. These gentlemen have been investigating the impurities of sewer-air, and find that the organic acid in the sewers examined was about twice, and the organic matter three times, that of the outside air, whereas the number of micro-organisms was less. As regards the quantity of these three impurities, the air of the sewers was better than the air of naturally ventilated schools, while even mechanically ventilated schools were more polluted with organic matter. The sewer-air contained a much smaller number of micro-organisms than the air of any class of house, and the carbonic acid was rather greater than the air of houses of four rooms and upwards, but less than in two and one roomed houses. As regards organic matter, however, the sewer-air was only slightly better than the air of one-roomed houses, and much worse than that of other classes of houses. The amount of carbonic acid found by the observers shows that the sewers observed were better ventilated than those investigated by previous observers. They attribute the excess of carbonic acid over that of the outside air chiefly to oxidation of organic matter in the sewage and the air of the sewer. The excess of organic matter is probably chiefly gaseous, and derived from the sewage itself. The micro-organisms in sewer-air come entirely, or nearly so, from outside, and are not derived, or only so in relatively small numbers, from the sewer itself. This important conclusion is proved by the facts that the average number of micro-organisms in sewer-air was less than in the outside air, namely, as 9 to 16; that the number increased with the efficacy of the ventilation; that the average proportion of moulds to bacteria in sewer-air was almost exactly the same as in outside air at the same time, whereas one would expect the proportion to be very different were the outside air not the source from which they were derived, seeing that such a difference has been proved to exist in the air of houses and schools. Another consideration is that the filthiness of a sewer seems to have no influence on the number of micro-organisms. Further experiments in the laboratory showed that the number of micro-organisms in sewer-air is diminished nearly a half in passing along a moist tube 5 feet long and 1¾ inches in diameter, at a rate of nearly 1 foot per second. There was, however, distinct evidence of the occasional dissemination of micro-organisms from the sewage itself; especially in splashing, owing to drains entering the sewers at points high up in the roofs. It is therefore important that drains should be arranged to avoid splashing.

TOPOGRAPHICAL SURVEY OF THE UNITED STATES.

IT is some eight years since the passage of the law creating the U. S. Geological Survey. This survey is charged, among other things, with making a geological map of the United States. For this purpose, it is desirable to have good maps for the use of the geologist in the field, and for the exhibition of results. No map of the whole country, suitable for the purpose, exists, and, of many and extensive portions, rude and imperfect diagrams constitute the only maps. The Geological Survey, therefore, first sought to have inaugurated a general topographical survey of the whole country.

The superintendent of the Coast and Geodetic Survey was conferred with and solicited to undertake the work, and a little work was actually undertaken, but none upon a general or comprehensive plan. The Geological Survey, therefore, finding that no satisfactory progress in geological work was possible without suitable maps, set about organizing topographic work on a systematic and comprehensive plan.