

XVIII.—UPON THE ADULTERATION OF FOOD, DRINK AND DRUGS,
FROM THE CHEMIST'S STANDPOINT ; AND UPON THE ATTITUDE OF
CHEMISTS IN THE MATTER OF APPOINTMENT OF "GOVERNMENT
ANALYSTS."

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Abstract.

The subject of adulteration had not received that amount of attention from the chemists which its nature and amount, as at present practiced in the United States, properly demanded. And in neglecting to assume control of the investigation of the subject, and of the information and education of the public mind as to the actual facts, they had left the field in the possession of scientific demagogues and pseudo chemists who, for the past four years, had been sending out through the daily press an unlimited amount of sensational literature, either in part or altogether false. The investigations as to the facts had been mainly fragmentary and sporadic in their character, instituted from time to time by various Boards of Health, but without much outcome in the arrest and prosecution of offenders. But this period of education had now gone by, and the time had come when the various States were about to pass laws upon adulteration. Some laws had been already enacted, and grave blunders had been committed. The experience in England had shown how difficult it was to secure wise and efficient legislation, and it was very important for chemists in America to avail themselves of that experience, and to control and shape the laws now under consideration in the legislatures of the various States. Moreover, the duty of the public analyst required public training and accurate knowledge of certain topics not ordinarily studied by chemists. Finally, the analysts could not properly perform their labors without the aid of suitably qualified inspectors, and as yet these two professions did not exist in the country and would have to be in a sense created.

Dr. Leeds, who had been commissioned by the State of New Jersey to investigate the facts concerning adulteration, as a basis for future State legislation, then gave a brief resumé of the results of his labors up to date. He had analysed a very large number of samples, and without claiming that the facts were universally true for the whole country, yet the examinations of so many articles of each kind, purchased at random from dealers in various parts of New Jersey and in the City of New York, might justly be regarded as representing a reasonably close approximation to the true facts in the case.

In regard to teas, three classes of adulterated samples had been found. The smallest class contained an amount of mineral matter in excess of that which should be present from facing materials alone, or from impurities which could properly be derived from the processes of preparation for the market. The largest class consisted of teas adulterated with exhausted leaves. Finally, in some samples foreign leaves were present in such numbers as to denote intentional adulteration. But the percentage of adulterated teas was much smaller than was anticipated (10 per cent.), a majority of the teas being of inferior grade, their prices ranging from thirty to fifty cents per pound. Nearly all the coffees examined, both whole and ground, were pure; the adulterant in the other cases being chiccory. The essences of coffee sometimes contained scarcely any coffee—one sample was composed almost entirely of chiccory, caramel and liquorice.

The manufacture of mixed sugars, containing both cane sugar and glucose, is now largely carried on in the United States, the product being sold under the name of "new process" sugar by the manufacturers. This fact had given rise to a popular belief that almost all varieties of sugar were more or less adulterated. Such was not found to be the case, most of the white sugars, purchased at random, being found pure; and of the brown sugars, which were the more adulterated, certain samples furnished by dealers as in their belief adulterated, were found to contain no more inverted sugar than might properly be present in a sugar of a low grade. A similar remark applies to the sirups. Even the lowest priced sirups were found, with few exceptions, to contain no more glucose than was to be expected in a non-adulterated article. No free sulphuric acid, or excess of lime, was present in any case.

The specimens of flour examined were uniformly pure, no other meal or alum being found in any instance. In bread, however, sufficient samples showing the employment of alum were obtained to demonstrate its occasional use by bakers. Cream of tartar was found to be extensively adulterated, the adulterants being sulphate of lime, acid phosphate of lime and starch. The first-named substance was likewise present in some samples of bicarbonate of soda.

Some of the manufacturers of the baking powders now so extensively sold, use only bicarbonate of soda, cream of tartar and starch. Others employ either partly or altogether, in the place of the cream of tartar, alum or acid phosphate of lime, or a mixture of these two salts. Of the condiments and spices very few were pure, though in no instance was any injurious metallic adulterant detected.

Many of the samples of vinegar contained a much lower percentage of acetic acid than should have been present, but in no case were mineral acids present, and in only one instance a metallic substance—lead in traces. Some of the so-called white wine vinegars had all the characters of ordinary cider vinegar, decolorised by filtration through animal charcoal. None of the green pickles examined were free from copper—one pickle containing 15 milligrams—although the pickles prepared by the use of brine, and those imported, with the Crosse & Blackwell label, were found unexceptionable. The employment of tin cans in the preservation of vegetables is reprehensible, both tin and lead being present in the canned tomatoes examined. The skimming and watering of milk was still very extensively practiced in New York and New Jersey, although stringent laws had been passed for its repression.

Condensed milk varied remarkably in composition, the percentage of water ranging from 25.5 to 59 per cent., and of fat from 3 to 11 per cent.