

cents' worth of wheat flour. In the case of almonds this sum will supply 0.08 pound protein and about 1,100 calories of energy, and in the case of peanuts 0.28 pound protein and about 2,800 calories, while expended for cheese it would provide 0.17 pound protein and about 1,300 calories, and for flour 0.46 pound protein, as well as the large amount of energy noted above.

Although some of the dietaries showed that it is quite possible to obtain the needed protein and energy from a fruitarian diet, the majority of those studied fell below the tentative dietary standards. It is hardly just to ascribe this entirely to the form of diet since the same people might have consumed no larger quantities of nutrients on an ordinary mixed diet. The nutritive value of the fruitarian diet is perhaps most clearly shown in the case of one of these subjects, a university student, who though entirely unaccustomed to such fare gradually changed from an ordinary mixed diet to one of fruits and nuts without apparent loss of strength or health. He was then able for the eight days of the experiment to carry on his usual college duties and for a part of the time also performed heavy physical work on an exclusive fruitarian diet without material loss of weight.

The cost of the fruitarian diet per person per day varied from 18 to 46 cents, values which compare favorably with those found for an ordinary mixed diet.

Although it is undoubtedly advisable to wait until more data have been gathered before making definite statements regarding the digestibility of different fruits and nuts, enough work has been done to show that they are quite thoroughly digested and have a much higher nutritive value than is popularly attributed to them. In view of this it is certainly an error to consider nuts merely as an accessory to an already heavy meal and to regard fruit merely as something of value for its pleasant flavor or for its hygienic or medicinal virtues.

As shown by their composition and digestibility, both fruit and nuts can be favorably compared with other and more common foods. As sources of carbohydrates, fruits at ordinary prices are not expensive; and as sources of protein and fat, nuts at usual prices are reasonable foods.

In the investigations at the University of California the question of the wholesomeness of a long-continued diet of fruit and nuts is not taken up. The agreement of one food or another with any person is frequently more or less a matter of personal idiosyncrasy, but it seems fair to say that those with whom nuts and fruits agree can, if they desire, readily secure a considerable part of their nutritive material from such sources.

#### THE DANGERS OF DINING.

BY HUGO ERICHSEN.

Of late, food adulteration has become so common, that most of the State legislatures felt called upon to pass pure food laws, which are an effective safeguard against sophistication when enforced. But are they enforced? Is it not barely possible, in view of recent disclosures, that the position of food commissioner may afford petty politicians an opportunity for "graft"? In such a case neglect of duty would flood a State with foods that, while not positively harmful to health, are certainly not what they pretend to be. A few instances will suffice. Green tea is generally adulterated with soapstone, gypsum, China clay, indigo, turmeric, or graphite. The bulk and weight of coffee are increased by the admixture of numerous roasted grains; and some years ago letters patent were issued for the manufacture of a pressed coffee bean containing absolutely no coffee at all. Sugar and the various starches are commonly employed in the preparation of the lowest grades of cocoa and chocolate. Imitation butter consists mainly of lard, and, as might be expected, this material also enters largely into the composition of certain compounds dignified by the name of cheese. Two barrels of flour are made out of one by the addition of potato starch. The grocers of yore considered themselves pretty shrewd when they added a liberal quantity of sand to their supply of sugar. But the methods of their successors are far more subtle. And for the unsophisticated layman, it is indeed almost impossible to detect the adulteration of sugar with glucose, unless he has recourse to a chemist. Most of us have seen pickles that appeared to be preternaturally green, and, presumably, many a housewife has been filled with despair at being unable to obtain this beautiful color in "putting up" vegetables. The greening of these pickles is effected by the addition of sulphate of copper to the water in which they are boiled, a proceeding that is strongly condemned by sanitary authorities.

When sulphate of copper is indicated medicinally, however, the eating of these pickles might be a good way to introduce it into the system. Some day, in place of the druggist, we may have a dealer in medicated foods! Imagine a physician prescribing fruits preserved with salicylic acid in a case of rheumatism, or recommending milk containing formaldehyde to a patient requiring an intestinal antiseptic!

Somehow formaldehyde, in my mind, is closely associated with the lacteal fluid. I have no particular desire to slander the milkman, but presume it may be regarded as an accepted axiom that the milk sold in most of our large cities is impure. In some communities, as I know by experience, the so-called inspection of milk is a farce, and intrusted to men as a recompense for political services rather than because of efficiency.

The recent typhoid fever epidemic at Ithaca, N. Y., shows how the water supply of a whole city may be polluted. Now suppose that milk cans are rinsed out in this water, and you have an idea how the typhoid-fever germs might be transmitted to the customers of a milk route. Nor is this illustration without precedent. Several cases have been cited by authorities on the subject, in which milk was thus contaminated.

Auto-intoxication is a condition with which many persons are afflicted without knowing its precise nature.

Some folk are taken violently ill after the ingestion of strawberries, butter, peas, beans, crabs, or canned asparagus. That is to say, they cannot eat any of these articles of diet without experiencing very unpleasant consequences, although they may consume every other kind of food with impunity. Apples, although generally regarded as most wholesome, do not agree with everybody.

But the dangers arising from auto-intoxication and idiosyncrasies are not the only ones that threaten the epicure. There is always a possibility of mistaking poisonous fungi for mushrooms. It is an old saying that the best way to tell the difference between a poisonous fungus and a mushroom is to eat it—if one lives it is a mushroom, if one dies it must have been a toad-stool.

It is strange yet true that some animals develop immunity with reference to certain poisons. For instance, it is a well-known fact that hares and rabbits feed upon the leaves of the deadly nightshade with impunity. In the course of time, however, a sufficient quantity of atropine is deposited in their muscular tissues to poison anyone who may use them as food. For this reason, it is advisable not to dine upon rabbits in regions in which the belladonna plant abounds.

The dangers of eating tainted meat are well illustrated by an occurrence at Middleburg, Holland, where 256 soldiers and 36 citizens were prostrated after eating meat from a cow that had been killed while afflicted with puerperal fever. Ballard, to whom we owe this report, also refers to fifteen cases of ptomaine poisoning, with one death, that were caused by the ingestion of baked pork. Ptomaines are found in many articles of food besides fish and shellfish, and their presence cannot be easily ascertained. In Arizona whole families were poisoned by eating fish, and yet the fish did not give forth any perceptible odor. Ptomaines are formed in edibles through chemical changes, and are not due to the uncleanness of the receptacle in which the food was kept or carelessness in serving it.

At Wellback, England, 72 persons were poisoned with boiled ham that was served as a lunch, during an auction sale, by the proprietress of a neighboring hotel. Of these unfortunates, four died.

According to statistics, sausage poisoning is a rather common occurrence. By bacteriologists it is commonly ascribed to the presence of an anaerobic bacillus. The toxemia partly involves the digestive tract and partly the nervous system. Kerner reported 155 cases of sausage poisoning, with 84 deaths. Most of these occurred in Wuerttemberg and Baden, Germany, where the methods of curing sausages favored putrefaction. Mueller recently reported 124 cases of sausage poisoning, and stated that 6 died within 24 hours out of 48 cases that proved fatal.

Among the most recent reports concerning ptomaine poisoning, two are particularly interesting. One of these pertains to the case of Comte Lionel de Laubespin, of Paris, who died in the early part of June, 1904. The count, with a dozen other guests, including the Marquis de la Guiche, partook plentifully of duck à la Rouennaise. All were ill next day, but the count alone succumbed. To cook Rouennaise duck, the bird is strangled and the blood coagulates. The meat, therefore, quickly goes bad in hot weather. Inquiry revealed that in order to prevent this, some dealers inject corrosive sublimate before strangling. At about the same time, Francisco Mora-Silva, secretary of the Consulate of Ecuador at New York, died at the Roosevelt Hospital of ptomaine poisoning due to eating strawberries.

Some of the fish in the waters of Japan are said to contain an active poison, wherefore their sale is prohibited in the realm of the Mikado, for fear that they might be utilized for suicidal purposes.

Rye, while in the ear, is very subject to a disease by which the grain becomes soft and black, a condition equivalent to mortification. When eaten in this state, the corn produces the most serious consequences in those who partake of it. Pellagra, a very foul condition of the skin, in which the cuticle loses its natural character and becomes squamous or scaly, and dry, dis-

colored, and thickened, has been traced to this source. Gangrene also not infrequently follows its ingestion. In Austria-Hungary whole villages have been afflicted in this way, and it is no uncommon sight in those countries to meet men and women who have lost part of their anatomy by eating bread prepared from diseased rye.

Some years ago Vaughan and Novy discovered a poison in decomposed dairy products which they termed tyrotoxin. This is the toxin to which a number of cases of poisoning from cheese and ice cream have been attributed. The scientists named have also been able to isolate it from oysters that had caused illness at a church festival.

Many persons would be ready to believe that the malodorous Limburger is a menace to public health, though they would be loth to ascribe toxic effects to the cheese commonly served in aristocratic households. And yet about 300 cases of cheese poisoning have been reported to the Michigan State Board of Health alone, to say nothing of the long list that might be compiled from the sanitary records of other commonwealths.

I shall content myself with a mere mention of the fact that parasites are occasionally introduced into the gastro-intestinal tract by means of fruits and vegetables. But meat also harbors the eggs of these creatures. And there was a time when trichinosis was comparatively common, but since the government introduced obligatory meat inspection, and no pork is sold without having been subjected to microscopic examination, the disease is seldom encountered.

From the incidents mentioned it will be clear that dining is not the innocent occupation it was supposed to be, that it is, in fact, attended by some risk. And I can vividly imagine the effect produced by the perusal of this essay upon the average reader. Possibly he may feel as did Wolsey when Henry VIII. said to him, according to one Shakespeare:

"Read o'er this; and, after, this:

And then to breakfast with what appetite you have!"

But, fortunately for mankind, every bullet does not find its mark, and the chances of dying of ptomaine or tyrotoxin poisoning are not any greater than those of perishing in a railway accident or being struck by a brick falling off a roof. We may, therefore, indulge in a certain fatalism, and continue to enjoy our meals as long as we have anything to eat and are blessed with a good appetite.

#### NEW COMPOUND FORMED IN ELECTRIC FURNACE.

A new compound, the boride of manganese, has been recently formed in the electric furnace by M. Binet de Jassoneix, of Paris. The method of obtaining this body is described in a paper read before the Académie des Sciences. Amorphous boron reduces a considerable number of metallic oxides. With the oxides of iron, nickel, and cobalt it gives a metallic mass from which crystallized borides of these metals can be separated, as M. Moissan has already shown. Troost and Hautefeuille have prepared a boride of manganese,  $MnB_2$ , containing 28 per cent of boron. The oxides of manganese are reduced by boron in an air furnace, but it is difficult to obtain a metallic mass. In the electric furnace where the temperature is higher, the boric acid which is formed is volatilized, and a melted mass containing boron and manganese is formed. The present experiments were carried out by placing a carbon trough in the furnace, containing a compressed mixture of oxide of manganese and boron. This is reduced in a few seconds. When the manganese is in excess, the metallic mass may contain 97 per cent of the latter, and takes the file easily. With an excess of boron, on the contrary, we obtain a hard and granular mass containing some 20 per cent of boron. These metallic masses are attacked by acids and burn with incandescence in chlorine, but the action stops at once in the latter case and the melted chloride of manganese protects the residue from further action. This residue contains the new compound, boride of manganese, which is separated by washing with water and alcohol. It is a brilliant metallic powder, formed of small broken crystals. Its density is 6.2 at 15 deg. C. In fluorine gas it burns with a flame, and in chlorine with incandescence. When heated in oxygen it glows brightly and forms a fusible borate. It is attacked slowly by cold water giving off hydrogen and forming manganic hydrate. Hydrochloric acid dissolves it, and forms a gas which burns with a green flame. The author analyzed the compound, and finds that it corresponds to the formula  $MnB$ . It is to be placed in the series of definite and crystalline borides of iron, nickel, and cobalt which M. Moissan has already formed.

#### NEW SUN SPOTS.

Another group of sun spots has appeared on the eastern meridian. They cover an area of possibly 3,000,000,000 square miles and are more active than the great spots which appeared last month, and which are breaking up and disappearing beyond the central meridian.

These new spots are likely to cause disturbances of some importance in the atmospheric conditions later, but it is too early to predict positively as to that.