

THE REED & CARNRICK FOOD LABORATORY.

Our first page illustration represents a portion of Messrs. Reed & Carnrick's laboratory, apparatus, and machinery devoted to the manufacturing of Carnrick's Food for Infants, and Beef Peptonoids, located two miles south of Goshen, Orange Co., N. Y., in the middle of the best milk district in the United States. The laboratory in which their other products are manufactured is at Yonkers, N. Y.

Carnrick's Food is composed of 45 per cent of powdered milk, 45 per cent of dextrine, and 10 per cent additional milk sugar. As soon as the milk is received, it is drawn into digesting tanks and brought to a temperature of 115 to 120 deg. Fahr. A freshly made extract of the pancreas of the pig is then added, the milk being kept at the above temperature for sixteen minutes. Repeated experiments have shown that the digestion of the milk with an extract of pancreas of sufficient strength for sixteen minutes will render the casein of cow's milk partially a peptone and leave the remaining undigested portion light and flocculent like the casein of human milk. When the manufacture of this food was commenced, comparisons were carefully made with average samples of human milk. The extract of pancreas is made for each batch from perfectly fresh sweetbreads.

The partially digested milk is then raised to 200 degrees Fahr., to entirely destroy any further activity of the digestive ferment, after which it is drawn into the vacuum pan, and evaporated nearly to the consistency of ordinary condensed milk. At this stage it is drawn from the ordinary condensed milk vacuum pan to a special vacuum pan, which contains revolving and mixing machinery, where the milk is combined with the 45 per cent of dextrine and 10 per cent of milk sugar, forming a homogeneous mass, the evaporation being continued till the water is practically removed. The product is then powdered and bolted as finely as ordinary flour.

The dextrine is prepared by taking wheat flour and baking it into crackers, which requires the mixing of the flour with water, so that the starch granules will swell and be in a better condition for further conversion into dextrine. The crackers are then powdered and placed in a dextrine apparatus for six hours, subject to a heat of 400 degrees Fahr., which completes the conversion of the starch into soluble starch and dextrine.

Messrs. Reed & Carnrick commenced business twenty-four years ago, and their preparations are used extensively by the medical profession in every civilized country on the globe. About three years since, they commenced the manufacture of Carnrick's Food for Infants. This preparation is entirely different from the various foods in the market in use for infants deprived of the breast milk, approaching so near human milk in composition and digestibility that the demand has been unprecedented, and the manufacturers have been compelled to produce machinery that will turn out about ten times the quantity that was sold a year ago. They therefore concluded to erect their plant in the center of the most important milk district in the country, so that the milk would be absolutely pure and free from all possibility of contamination. The cause of the great mortality of infants in large cities, especially in the summer season, is unquestionably due, in a large measure, to feeding infants condensed milk composed of nearly one-half cane sugar and impure milk brought in from the country. There is a great deal of milk sold in large cities in hot weather that has undergone deleterious changes, and some of the infant foods in the market are composed of simply roasted flour and malt sugar. These must be added to cow's milk, or the child would starve. There are several preparations called milk foods which contain so little milk in proportion to the roasted flour or malt sugar that they also must necessarily be added to cow's milk. Carnrick's food for infants perfectly nourishes the child without the addition of cow's milk, and their mode of treating the milk is of such a character that it is digested as easily by the child as human milk.

The ingredients of milk are nitrogenous or flesh-forming matter, fatty or heat-giving and respiratory food, sugar, mineral matter or ash, and water. The butter and sugar of milk produce fat, being styled by physiologists heat producers. The casein or cheesy portion resembles the gluten of wheat in composition, and belongs to the class of food substances termed flesh formers. The ash or mineral part of the milk is chiefly employed in forming the bones of the young it is destined to nourish. In point of nitrogen, or flesh-forming food alone, one gallon of milk is equal to one pound of lean meat, and two quarts are equal to one pound of bread, while it takes eight pounds of potatoes to yield the equivalent of four pounds of milk. In estimating the nutritive equivalents, calculated according to the amounts of nitrogen in the dry substances, human milk being at 100, Indian corn stands at 100, wheat 119, beans 320, cow's milk 237, and cheese 331. Cow's milk is composed of about eighty-six parts of water and fourteen parts of solid matter, the latter made up of about 4.1 casein, 3.9 butter or fat, 5.2 sugar or

lactin, and 0.8 of mineral substance. At first sight the proportion of water seems large, although this is all driven off in Messrs. Reed & Carnrick's preparations, yet eggs have 74 per cent of water, salmon 77, lean beef and mutton 72, fat beef and mutton 52, and potatoes 75 per cent. As an article of food, therefore, milk is more economical generally than beef, its purely economic value in this respect being generally unappreciated by either the producer or consumer, as it contains all the elements of nutrition within itself, and in the most digestible form. The breed of cattle, nature of their food, and care and cleanliness in the handling of the product, are all important factors in determining the value of the milk; but the facilities of the firm for obtaining milk of the very best quality, from their location at the center of the great dairy district of New York State, in Orange County, are unrivaled.

The agreement made by the firm with those who furnish the milk used is in the form of a regular legal contract, and very strict in its provisions. It provides that the milk shall be pure and unadulterated, and its temperature not to exceed 52° Fahrenheit, when kept at home; that it shall not be produced from glucose, starch feed, brewers' grains, sprouts, slop feed, or any feed named and prohibited by the firm; that the udder and teats of the cow shall be thoroughly washed or brushed before milking, especially in winter, when stabling and stables shall be cleaned twice a day, and the cows are to be bedded with clean straw when stabled; that all milk shall contain an equal amount of fat; that all strainers, pails, and other vessels used in the handling of milk must be thoroughly cleaned immediately after milking, and that representatives of the firm shall have the right and privilege of entering the premises of those selling them milk and examining the manner of handling the milk, and the right to test the same; that all night's milk delivered the following morning must be cooled immediately after milking, in water, remaining therein over night, and not be left in the stable after milking; that the cows must have free access to pure, clean, and fresh water, and under no circumstances be allowed to drink from stagnant pools or go thirsty, while low places in pastures, where water may gather after heavy rains, must be drained or fenced in; that only spring wagons must be used in delivering the milk to the works, to prevent churning, while all cans must be provided with tight fitting covers and over these a canvas cover, such covers to be kept clean; that in summer, before starting for the works, a cloth wet with cold water shall be placed over the cans to keep them cool, as under no circumstances will the firm receive milk warmer than 64°; that in winter, when cows are milked in their stalls, the milk must be immediately removed from the stable, and out of reach of bad odors; and that the stalls and stables must be kept thoroughly clean, provided with good ventilation, and whitewashed at least twice every year. Great care must also be used to guard against freezing, for the firm will not accept milk that has been frozen.

The above contract is enforced strictly in every detail, and the rules governing the care and feeding of the cows and the handling of the milk are based on those laid down by Prof. Vaughan for the production of perfect milk. A competent person is employed, who devotes his time to visiting, at irregular intervals, once or twice a week, those who supply the milk.

Touching the value of "Carnrick's soluble food," Prof. Stockbridge, of the Imperial College of Agriculture, Japan, in forwarding an order for a package, volunteered a specific and most emphatic testimonial. Prof. Stockbridge wrote that his baby boy, when about four weeks old, "showed signs of serious indigestion, passing material which analysis proved to be almost wholly unchanged casein. The most natural course was to attempt to remedy the difficulty by changing the diet of the mother, but, after two weeks of unsuccessful experiment, recourse was had to 'Carnrick's food,' followed by immediate disappearance of all digestive trouble. The analysis of the mother's milk showed that its nutritive ratio (relation of albuminoid to carbohydrate constituents) was too low, the amount of fat and milk sugar present was not sufficient to enable the infant to digest the excess of nitrogenous food furnished. By supplying this deficiency by feeding soluble carbohydrates, the proper nutritive ratio was restored, and the mother's milk, thus supplemented, afterward accomplishing all that could be desired, and all that was gained by the use of the 'Carnrick's food' alone." The Professor adds that "the Carnrick food is as perfect and efficacious in practice as its composition is correct in theory, and appears to be compounded on thoroughly scientific principles, in this respect differing from most of the other articles placed on the market for similar uses."

Dryness of Walls, etc.

The author lays a very thin slip of gelatine against the object. If this is not thoroughly air dry, the gelatine becomes curved, with its convexity toward the object.—*J. Nessler, Chemiker Zeitung.*

Leprosy.

The question of the contagiousness of leprosy has again been raised by the action of the board of health of Philadelphia in fining a physician \$100 for not having reported two cases of that disease which were under his care. The editor of the *New York Medical Journal*, in commenting on this subject, claims that there is a mass of incontrovertible evidence to be found in medical literature which ought to place its contagiousness beyond question. In the Sandwich Islands the physicians believe strongly in its communicability, and a number of instances are given which confirm this belief. One of these is that of a Belgian priest who lived in the leper settlement for the purpose of nursing and otherwise caring for those who, having the disease, were here isolated. The result is that the priest himself is now a victim of the disease. The medical attendants of these outcasts will not go near them without having their hands protected by gloves. The editor of the journal quotes the opinions of other writers who agree with him in his views, and refers to the report of the English commission appointed by the Royal College of Physicians in 1867, which holds that leprosy is not contagious. He concludes by saying:

"In the face of all this reliable evidence, a reasonable doubt can scarcely be entertained of the contagiousness of leprosy. In its power of contagion, leprosy may well be, as it often has been, compared to syphilis, and, like that disease, it is frequently contracted through sexual intercourse, and is also just as frequently transmitted to the offspring."

Utilizing the Tin Can.

Probably no one article has been put to such a variety of uses as the tin can. A woman up in Maine has found a new use for them, and she tells, in the *Lewiston Journal*, how those too good to throw away she utilized:

"I learned to use them for brown bread when tenting out at the seashore where dishes were scarce and cans plenty, and I liked them so well that I kept up the practice after coming home, especially after finding out that four of them just laid in my steamer. But this is not all the uses I find for them. In a few weeks my kitchen will be decorated with old salt boxes each filled with as many cans, minus the bottoms, as will stand up in it, each can filled with good garden soil and each of these tin pots holding a tomato, dahlia, or other plant. I find it easier to transplant without disturbing the roots when the plants are so treated, and having no bottoms, the cans do not hold water enough to spoil the roots, as might be the case were they used separately. Sometimes I have sunk in the soil in the garden, near a plant that needed a good deal of water, an old can with a hole or two punched in the bottom to help it to leak, and then filled this can with water each night or morning. I also found this a good chance to add fertilizers by putting them in the water. John likes the cans to put around the trunks of young fruit trees. He says he has saved enough trees from the mice in this way to pay for all the canned tomatoes, corn, and peaches we have eaten. He takes off the bottom, cuts open one side, fits them around the stem, and draws the sides together again, and then pushes them down so that an inch or two is below the top of the soil. The pieces of tins straightened out have also done duty as scarecrows, dustpans, and several other things in an emergency."

What Advertisers Like to Know.

George P. Rowell & Co., the publishers of the *American Newspaper Directory*, undertake to rate newspaper circulations very much as the mercantile agencies give the capital and credit ratings of the business community. They state that only about one publisher in ten is willing to have his exact issue known, and tells it with truthful precision, but in a card to us they state: "It is a fact that less than one paper in sixteen has furnished such a straight-out statement of actual issues as you have done, for your **SCIENTIFIC AMERICAN** publications."

In the twentieth annual issue of their book, now in the binder's hands, they plainly designate every paper which is rated in exact accordance with a detailed statement from the publisher.

The Adventures of a Horse.

Among the incidents of the storm in Boston, the *Electric Review* relates how the entanglement of a horse attached to one of L. G. Burnham's coal delivery teams was caused by the wires. It was in the evening. The horse got entangled and the wires threw him down. Some of the snarl of wires proved to be those of electric lights. The kicking and the struggles of the horse brought the wires in contact, and in the words of the teamster, "Every time he kicked it would lighten, and every time it lightened he would kick! I thought to myself, 'He is bewitched with lightning.' I tried to unbutton him, and every time I unbuttoned one place he was struck with lightning in another." The poor horse was finally released from his peril by somebody who understood the cause of the trouble.