

FOOD-DRYING PROCESSES

The scarcity and high cost of food materials during the war and since have made the preservation and conservation of everything edible more imperative than ever before. Known and tried methods of canning, drying and otherwise preserving foodstuffs have been widely employed and much time and effort have been expended in the hope of improving old processes and discovering new ones.

Many of our foods, particularly milk, fruits and vegetables, are made up largely of water, with only a small percentage of solids. The ideal methods of preserving them would be to remove this water without affecting deleteriously the solids for food purposes. Probably dehydrated foods, as the dried products are called, will never be as good as fresh but with processes now in use excellent results are obtained. This is particularly true in the case of milk, grapes, prunes, peaches, apples, eggs, etc.

In warm, dry climates the products to be dried may be simply spread out in the sun. This method, while simple and inexpensive, has several objectionable features. For instance, the food is exposed to insects and other contaminating agencies during the drying process unless special precautions are taken against them. Moreover a sudden shower may damage or ruin large quantities of the product, entailing heavy financial loss.

Government experts who have been trying to determine the best drying processes to reduce the weight and bulk of fruits, vegetables, etc., and at the same time preserve them indefinitely have found several that work well. In one the food material, sliced, chopped or otherwise prepared, is placed on racks or screens which for convenience may be mounted on trucks. The material is then placed in special tunnels through which water operated fans force strong currents of warm, dry air. The trays are gradually moved through the tunnel, the air taking up the moisture in food until it is finally dehydrated sufficiently.

Another method that has proved highly satisfactory in many respects is to place the food material on shelves in closed chambers. Warm air much below normal pressure is then introduced and this rapidly absorbs the moisture in the fruit or vegetables. The chief objection to this process is that the cellular structure of the food may be broken down while in the partial vacuum of the chamber.

In a third process which has been tried with fairly satisfactory results the material to be dried is placed on the perforated floor of a kiln, heated by stoves underneath it. The material, spread over the floor to a depth of four or five inches, is stirred and turned from time to time so that the warm, dry air coming up through it rapidly extracts its surplus moisture. But unless the greatest care is exercised in this process the product is likely to lack seriously in uniformity. On the whole, however, results obtained with the kiln are more satisfactory than those obtained with the tunnel as in the latter the material may be overheated or scorched.

Foods properly dried by these methods, it is said, retain their natural color and flavor remarkably well.

When the work is carefully done they come out very much the same as they go in except that most of the water is removed. On soaking them in water they resume their former shape and size and after being cooked they taste about the same as when fresh.

SUBSTITUTE FOR X-RAYS

Beyond doubt the majority of our readers have some knowledge of the x-ray and its wonderful utility along certain lines. It is quite probable that they will be interested to know that still further advancement along this avenue of science has been made.

One night while waiting for a car, says a writer in the *Electrical Experimenter*, Dr Hunter held his hand over the glowing lens of a small flashlight and was much interested to note the red glow of the fleshy part of the member and the shadowy outlines of the bones. He reasoned that the red rays of the light penetrated the flesh and that by intensifying them a photograph similar to those obtained with the x-rays would be possible. The chance observation particularly interested him because he realized that a simple device that could be more readily carried about than the ordinary x-ray apparatus would greatly facilitate the diagnosis of fractures and would make the advantages of shadow photography available to patients who otherwise would be denied them.

He first tried placing his hand over a panchromatic photographic plate and exposing it to an electric light. The result was a fairly good picture of the bones of his hand. Then he made a black box with an opening at one end sufficiently large to admit a hand or a foot. The box was made collapsible so that it could be carried about easily. In the top was fixed an iris diaphragm similar to that of an ordinary camera. A shutter was provided with an extreme red ray filter above it. In the bottom of the box a plate-holder was fixed with a developing tank beneath it to facilitate the development of plates after exposure.

Using this apparatus with a panchromatic photographic plate brushed with rosin solution to render it more sensitive, excellent pictures of the bones have been obtained. The filtered light—rays which pass most readily of all visible light through blood—is thus made to do essentially the same work as the x-rays, produced by expensive, complicated apparatus.

Dr. Hunter is convinced that by increasing the sensitiveness of the photographic plate and intensifying the light it will be possible to use his invention for abdominal and intercostal examinations. With a camera of this kind, he says, a physician can readily assure himself before leaving the home of a patient whether the broken bone he has set has been attended to properly. Eventually he believes, the device will be widely used for this purpose.

The x-rays sometimes have a harmful effect and if injudiciously used may cause incurable burns or malignant growths of tissue. The new direct light system, it appears, is without these objectionable features.

Dr. Hunter will not patent his invention but proposes to give it freely to the world, hoping that others will develop and improve it so that finally it will be possible to secure with a simple \$2 outfit pictures as good as those obtained with a \$1000 x-ray machine.