

this fatty matter is disseminated through it in minute clear globules, which in a short time rise to the surface and form cream. This cream is then separated from the milk, put through a process of churning, and the product worked to remove the water remaining in the churned mass. In obtaining the cream from the milk three methods are in more or less general use: Shallow setting, which consists of placing the milk in wide pans about four inches high; deep setting, employing pans about 18 inches deep; and the separator method, which is that most in use among the larger producers. In the shallow pan system there is a loss in skimming of from 0.5 to 1.5 per cent. of fat left in the skim milk. In the deep-setting the loss is less, often as little as 0.2 per cent. The separator, a mechanical device employing the principle of centrifugal force as a separating means, has reduced the loss of fat in the skim milk to a minimum, from 0.05 to 0.1 per cent. The centrifugal force of the separator is a thousand-fold greater than the force of gravity. The system of separation is continuous, a uniform flow of milk being conducted in a bowl or drum making from 5000 to 9000 revolutions a minute. Various sized machines are on the market, those worked by hand separating from 200 to 500 pounds of milk per hour, and power machines of 2000 pounds and over capacity.

The cream is churned sweet, or else "ripened" or soured, the object in the latter case being to develop certain flavors in the butter and also to aid in the process of churning. Ripening is due to the action of certain bacteria either present in the atmosphere or artificially introduced. Churning results in the rupture of the fat globules and their union in a mass separate from the buttermilk which is drawn off when the churning is completed; the butter is then washed, worked to remove buttermilk and water, salted and packed. The composition of butter varies, but is approximately: Fat, 85 per cent.; protein, 1 per cent.; ash (salt), 3 per cent.; water, 11 per cent. The food standard, given out by the U. S. Department of Agriculture requires not less than 82.5 per cent. of butter fat in butter. The quality depends upon the feed given the cows, their stage of lactation, the care of the milk, etc.

But'terbur (*Petasites vulgaris*), a composite plant, with large rhubarb-like leaves and purplish flowers, growing by the side of streams; allied to colt's-foot.

Buttercup (but'ér-cup), the popular name of two or three species of the *Ranunculus*, namely, *R. acris*, *R. bulbosus*, and *R. repens*. They are

common plants with brilliant yellow flowers.

Butterfly (but'ér-flī), the common name of all diurnal lepidopterous insects, corresponding to the original Linnæan genus *Papilio*. The family of the butterflies or diurnal Lepidoptera (so called to distinguish them from nocturnal or crepuscular Lepidoptera, such as moths) is a very extensive one, and naturalists differ much as to the manner of subdividing it. One of the most remarkable and interesting circumstances connected with these beautiful insects is their series of transformations before reaching a perfect state. The female butterfly lays a great quantity of eggs, which produce larvæ, commonly called caterpillars. After a short life these assume a new form, and become chrysalids or pupæ. These chrysalids are attached to other bodies in various ways, and are of various forms; they often have brilliant golden or argentine spots. Within its covering the insect develops, to emerge as the active and brilliant butterfly. These insects in their perfect form suck the nectar of plants, but take little food, and are all believed to be short-lived, their work in the perfect state being almost confined to the propagation of the species. Butterflies vary greatly in size and coloring, but most of them are very beautiful. The largest are found in tropical countries, where some measure nearly a foot across the wings. They may generally be distinguished from moths by having their wings erect when sitting, the moths having theirs horizontal. Some of them have great powers of flight. Among the most remarkable butterflies are those that present an extraordinary likeness to other objects—leaves, green or withered, flowers, bark, etc., a feature that serves greatly to protect them from enemies. See *Lepidoptera* and *Mimicry*.

Butterfly-fish. See *Blenny*.

Butterfly-weed, *Asclepias tuberosa* (see *Asclepias*), the pleurisy-root of America, where it has a considerable reputation as an article of the materia medica. It is an expectorant, a mild cathartic, and a diaphoretic, and is employed in incipient pulmonary affections, rheumatism, and dysentery.

Butterine (but'ér-in), an artificial butter, prepared from beef suet, milk, butter, and vegetable oil, and now largely made in the United States, Holland, etc. By the use of coloring matters it can be made to resemble butter of any given brand; but although quite wholesome when well made, it has