

Methods of drying fish differ according to the locality. The main principles consist, however, of washing and eviscerating the fish and then drying them, usually in the sun, although where suitable plant is available, they may be dried in moving air currents or *in vacuo*. The more rapidly the fish are dried, the more rapidly they may be re-hydrated when required for use. In some districts the fish are salted or boiled for a short time before being dried. When unfavorable weather conditions are likely to make drying difficult and prolonged, preliminary salting is probably advisable. For drying, the fish may be hung on poles or placed on mats in the sun.

Although dehydration of fish helps to prevent autolytic changes and bacterial growth, it does not prevent oxidation of the fat in the fish. Dried fish should, therefore, be stored away from sunlight and warm air. Storage *in vacuo* or in inert gas such as carbon dioxide is preferable, where possible, although where the fish is for fairly immediate consumption such precautions need not be taken.

Dried fish normally weighs only about one-tenth of its weight when fresh, and in this form it can be economically stored and transported.

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### A NEW FLY SPRAY.\*

*Science News Letter*, 16th December, 1939, p. 392, under title "New Family of Chemicals Parade at New York Show", states: "Any new use for castor oil to divert it from the use that you think of when you hear the name is news. Castor oil is being used to make paint, replacing tung oil largely imported from China and now difficult to get on account of the Japanese invasion."

To this important new use for castor oil may be added another valuable discovery involving the use of castor oil. Large quantities of pyrethrum obtained from a species of chrysanthemum plant are used in suitable hydrocarbon oil bases as fly sprays. The most important of the chief sources of pyrethrum is Japan, and, as in the case of tung oil, the supply is adversely influenced by the war. Castor oil again comes to the rescue.

Castor oil, when subjected to heat, is broken down into undecylenic acid, heptaldehyde and residues. The undecylenic acid is separated by distillation and treated with isobutylamine to form isobutyl undecylenamide. This, when used in combination with small amounts of pyrethrum in a suitable base oil, is an excellent spray for flies, better than either pyrethrum alone in the base oil, or isobutyl undecylenamide alone. Synergism appears to be demonstrated by the mixture. The isobutyl undecylenamide replaces about two-thirds of the pyrethrum formerly used and represents about  $\frac{1}{2}$  per cent. in the spray. In addition to the superior killing properties of the mixture, the castor oil derivative has the advantage of being a stable compound that can be manufactured according to specification. This is in contrast to pyrethrum, which is unstable and uncertain as to quality and supply. Extensive commercial use has proved the high efficiency of this fly spray, which was previously shown experimentally.

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