

being very short and the weather rainy or stormy, and often snowy and cold. The fishermen do not reside near their fishing grounds, but assemble in large numbers at the latter (as many as 16,000 sometimes at the Lofoden islands); nor are there any accommodations to be had for housing the men on shore any more than for storing or properly manipulating the captured fish.

As soon as caught, the dorsch are brought on shore, cleaned, their livers, roes, and intestines removed, and either sold to dealers or manufacturers, or utilized by the fishermen themselves for the preparation of the oil. There are five grades of the latter:

1. Steam-ried cod-liver oil,
Oleum jecoris album vapore paratum.
2. Ordinary medicinal cod-liver oil,
Oleum jecoris flavum.
3. Light-yellow cod-liver oil.
4. Light-brown cod-liver oil,
Oleum jecoris flavum fuscum, for medicinal and industrial purposes.
5. Brown tanner's oil.

The method of manufacturing the first of the above grades is in principle the same everywhere. The livers are delivered at the factory as fresh as possible, as they are liable, in common with all oily bodies, to become rancid on exposure to air. They are placed into large tinned-iron kettles, exposed to direct or indirect steam-heat, and the exuding oil is removed into closed receptacles as speedily as possible. It was customary, formerly, to pass the oil through linen, woollen, or other filters (a custom which still prevails in Scotland and some parts of North America), but this practice has been abandoned, the oil being transferred, while still warm, into *leaden* tanks, where the stearin and accidental impurities (shreads of liver, etc.,) are gradually deposited. Treated in this manner the oil is much less prone to become rancid than when passed through filters. According as the livers have been exposed to more or less heat and pressure, the quantity of stearin contained in it varies in proportion. After having stood at rest one or two months, the oil is drawn off clear. At this time, however, the temperature is of great importance. If it be drawn off at 4° C. (39.2° F.) it will not deposit any stearin when cooling down to this point; while if it be drawn at 12° C. (33.6° F.) it will certainly do so if exposed afterwards to a colder temperature. Whether an excess of stearin in cod-liver oil diminishes its medicinal value, is a question which need not be discussed here, but it certainly makes a considerable difference to the manufacturer as well as to the dealer, whether he sells oil nearly deprived of stearin, or such as contains notable quantities of it. A good deal of the variation in price of otherwise fine cod-

liver oil depends upon this difference. The above method was introduced by P. Möller; but as it is so simple and used by all manufacturers, it makes no difference whether the oil be obtained from Möller himself or from other large firms, as H. Meyer, Ibenfeldt, F. Hausen, or others.

Accidental circumstances will sometimes furnish to one or the other manufacturer the freshest livers, and therefore yield the freshest oil. Generally the factories are situated near the established fishing grounds. The proprietors make contracts with the fishermen for a supply of fish, and it may sometimes happen that the yield of a haul is too small, and has to be kept until supplemented by a second supply before it is worth while to begin operations, thereby endangering the quality of the product.

The name of the manufacturer is no criterion whatever as to the quality of the oil; it is necessary to judge from the oil itself. The best is made upon Sindmer, in the Lofoden islands, and in Finnmarken; the latter, however, generally requires a second clarifying process before being as handsome as the other.

The price of the oil depends in the first place upon the proportion of the stearin it contains, and in the second place upon the yield of the season. In some years the harvest is everywhere abundant, in other years stormy weather may interfere with fishing operations, and besides the Newfoundland fisheries exercise a considerable influence upon the price. In seasons where the yield of the latter fishing grounds is below the average, England, France, and America draw large supplies of cod-liver oil from Norway, and often cause a rise of the price by 50 per cent.

The second grade of cod-liver oil is that prepared by the old method: namely, by allowing the livers to stand in the cold, whereby the oil exudes spontaneously. Owing, however, to the long exposure to air, this oil has a more fishy odor, and a coarser taste than the first quality. Still it may be obtained of good color and agreeable taste by keeping the livers in new oaken tubs, and removing the oil as soon as separated. Unfortunately, the methods of manufacture and the appliances vary greatly; sometimes the livers are placed into wooden tubs, which have been used for years for the same purpose, and is moreover often drawn off into casks lined with paraffin or tar, whereby it acquires a most disgusting odor or taste. There is no remedy for this drawback as long as this quality of oil is inquired for upon the drug market at an advance, over the most ordinary oil, of only one or two thalers per ton of about 1,000 kilos.

Producers receive the same price at the spot for the first grade of oil as for the second; foreign purchasers, however, are compelled to buy the finer oil from the commission dealers at a slightly advanced price. In general, the price of good cod-liver oil depends upon the general