

It will be seen that the United States not only takes the greatest quantity of our output, but also the most expensive grades of gum, the average price per ton being £68 8s. as against £54 4s. for the United Kingdom. The comparatively low price of the gum exported to the United Kingdom is explained by the fact that the export includes a considerable proportion of low-grade chips and dust used in the linoleum-manufacture. In regard to the figures given for Germany and Austria it may be noted that these countries confined their trade almost exclusively to the linoleum trades.

RESINS WHICH MORE OR LESS COMPETE WITH KAURI IN THE VARNISH-MAKING INDUSTRY.

Amber.—This resin is found in small quantities in many countries, but the commercial supply comes from the Baltic provinces of Germany, from Russia, and from Burmah. It is obtained by fishing with nets during storms (small pieces being washed up by waves), by diving and dredging, and also by mining. In the latter case the resin is found in clay strata, which is brought to the surface and washed through large troughs. In colour amber varies from pale yellow to black, some specimens being transparent, others opaque, while cloudy varieties are also found. This resin has physical and chemical properties different from any other resin, and has the highest melting-point. It yields an excellent varnish, but is seldom used owing to its cost and the fact that it is difficult to manipulate. It is said that almost all the "amber" oils and varnishes now on the market are made from other fossil resins and not from amber. The specific gravity varies from 1.08 to 1.094, and the melting-point from 600° to 615° F.

Animi.—This resin comes from Zanzibar, being exported in both fossil and recent forms, and is only produced in small quantities. The fossil is found in the ground in depths up to 3 ft., in small pieces of varying size. It has neither taste nor smell, and makes the best oil varnish known, being unsurpassed for brilliancy and durability, and is used in all the best varnishes. It is of a yellow or brownish-yellow tinge, and in destructive distillation loses from 20 to 25 per cent. of its weight.

Animi is peculiar from the fact that when first dug from the ground it is covered with a red crust, on the removal of which small indentations appear on the surface, known in the trade as "goose-skin." The specific gravity is from 1.062 to 1.068, and the melting-point from 450° to 465° F.

Copals.—These resins are found on the west coast of Africa from latitude 8° N. to latitude 4° S., and are used in most of the better class of oil varnishes. They are fossil resins, and, with the exception of the pebble copal, which is found in river-beds, they are all found in the earth at depths varying up to 10 ft. Copals from different parts of the coast vary a great deal, and the varieties are known by the names of the country in which they are found.

In the trade the term "copal" includes not only the true copal but also animi, manila, kauri, and other resins. The following extract from the Commerce Reports issued by the Bureau of Foreign and Domestic Commerce, Washington, D.C., 20th December, 1915, shows the present magnitude of the trade in Congo copal:—

"It has been stated in previous reports that gum copal would in the near future probably become the chief agricultural product of Kongo, the exports during 1911 having been 2,101 tons; in 1912, 3,689 tons; and in 1913, 4,614 tons, thus surpassing the rubber exports in quantity. The rapid advancement in the interest taken in gathering the gum was due to its increasing size in the manufacture of varnish and the corresponding advance in prices. Upon this product the unsettled business conditions had little effect, the exports for the six months ended 31st January, 1915, having amounted to 2,739 tons, as against 2,659 tons during the corresponding months of 1913-14, a creditable increase, notwithstanding the lower prices offered on the European market. It is almost certain that the increase would have been much larger under normal conditions. Only small quantities of gum copal pass through Kongo in transit from the neighbouring colonies, 7 tons in 1914-15 and 5 tons in 1913-14.

"As a result of the low market prices the benefits to the traders in Kongo were small and the year's trade not as satisfactory as in 1913. The average price paid to the Native gatherers of the gum is only about 2 cents per pound, so that it cannot be considered as one of the rich natural resources of the colony; but the industry gives employment to many, and the trade is still capable of considerable development. In November, 1914, a shipment of more than 65 tons was made to the United States, this having been the first direct shipment to the American market. The amount realized thereon was very satisfactory to the local shippers, who appear to be interested in creating a permanent market there."

The principal copals are as follows:—

Sierra Leone.—This is the very best variety of copal found. It is found in rough angular pieces, almost colourless or of a pale yellow. It is largely used on account of its freedom from acids, and by a judicious selection of the resins makes a good pale varnish. Its specific gravity is from 1.055 to 1.068, and the melting-point from 330° to 400° F.

Pebble Copal.—This resin is found in the river-beds and comes in small round pieces, mostly colourless. It is the hardest of all the copals, but the supply is very uncertain, and it is not much used in good varnishes. The specific gravity is 1.055, and the melting-point 475° F.

Angola Copal.—This is found in Angola, Benguela, and Congo. It comes in small globular pieces, and is covered with a red crust. In colour it is mostly a very light yellow. It is not so hard as the other copals, but makes a fairly durable and good varnish, and is coming into more general favour than hitherto. The specific gravity is 1.065, and the melting-point varies a great deal according to the variety, but none of it is as hard as Sierra Leone or pebble copals.

Various other varieties of copal comes from Loanga, Accra, Gaboon, &c., but these are all very much inferior to Sierra Leone copal, and are not used in the best varnishes.

Demarara Copal.—This resin, which comes from British Guiana, is a copal in name only. It comes into the market in large pieces covered with a thick crust, and when cleansed is transparent