method of cultivation in Turkey is simple, and the plants are set out close together. For the best qualities the leaves are primed, air­cured, and then subjected to a lengthy treatment corresponding to mild fermentation. High prices arc obtained for the best Turkish tobaccos. Thus in 1906 from Cavalla and Xanthi 11,000 tons were exported of a value of about *£1,101,000,* the range of the various qualities per kilo (21/5 lb) being:—

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ghienbek. . | . . . 10S. | 5d. to | 16s. | od. |
| Kir | . . . 4s. | 10d. „ | 6s. | od. |
| Pursuccian . | 2S. | 11d. „ | 3s∙ | 9d. |
| Drama ... | 2S. | od. „ | 2S. | 10d. |
| Inferior brands | . . . OS. | 7d. „ | 2S. | od. |

The exports go mainly to Austria-Hungary, Rumania, Italy, Egypt, the United Kingdom and the United States.

*Japan.—*Tobacco cultivation is a government monopoly, and in 1905 the crop amounted to about 106,572,000 lb, yielding a profit to the government of some ₤3,500,000. The produce is usually leaf of considerable size, of medium colour and suited only for cigarette and pipe smoking.

*China.*—The cultivation is widespread throughout Southern China. The picked leaves are usually either prepared for market by simple exposure to the sun for a few days, or in addition arc sprinkled with groundnut oil and sometimes other materials also, which result in an increase of strength.

*Sumatra.—*The tobaccos of Sumatra are especially valued for outside wrappers of cigars, being very uniform, of fine texture, light brown colour, thin and elastic. They do not, however, possess the aroma essential to cigar-fillers. The industry is of quite recent growth, dating only from 1862. The famous tobacco region, about 15,000 sq. m. in area, is on the east coast of the island, almost directly on the equator, and has a very uniform and high temperature and a very high rainfall. The soil is mainly of volcanic origin. Deli is the principal district and produces the best tobaccos. The estates arc usually very large, and are divided up into fields which are cultivated in rotation, each field being given several years’ rest after producing one crop. The tobacco is air-cured, fires being only employed during continuous wet weather, and the process of curing occupies four or five weeks. The fermentation is very carefully controlled, and to obtain the desired light colour the temperature is kept comparatively low. The leaves are graded with the most scrupulous care and finally packed in bales of about 176 lb each. The high quality of Sumatra tobacco is due in part to the local conditions of soil and climate, and perhaps to an even greater degree to the care taken at every stage in its cultivation and preparation. The work is done by Chinese coolies under Euro­pean—chiefly Dutch—supervision. The commercial success of some of the companies has been very striking, dividends as high as 111 % having been paid.

Java and Borneo tobacco is very similar to that of Sumatra.

*The Philippines.—*Tobacco is extensively cultivated in the plains and on the rich alluvial deposits along the sides of rivers. During recent years the average value of the product has fallen, due ap­parently to deterioration in quality. The exports of manufactured tobacco, such as Manila cheroots, find their principal market in China, British India, Australasia and the United Kingdom, whilst of the leaf tobacco fully three-quarters goes to Spain.

*British Empire.—*Tobacco is grown for local use in many parts of India, but the principal centres of its cultivation on a commercial scale are Bombay, Madras and the Punjab. American experts are frequently employed to superintend the estates and factories. In Ceylon tobacco is grown in the northern portion of the island; the produce is but little suited to the European market and is mainly exported to southern India and Cochin China.

British North Borneo competes with Sumatra as the source of the best cigar wrappers. The cultivation was begun in the island in 1883 by planters seeking new lands free from the heavy taxation to which theý were subjected in Sumatra. The industry is now in the hands of three large companies, the survivors of some twenty or more which have started at various times. The greater portion of the most suitable land appears to be already under cultivation and there is little immediate prospect for much expansion of the industry. The annual value of tobacco exported is over £300,000.

In Australia tobacco is produced on a small scale in Queensland, New South Wales and Victoria. Efforts are being made to develop the industry. New Zealand has attempted to produce tobacco as a commercial crop, but the effort was abandoned several years ago.

In the West Indies tobacco is grown on a small scale in many of the British colonies, but only in Jamaica is there a definite in­dustry. An expert, Mr F. V. Chambers, recently reported on Jamaica tobacco as of good quality and flavour but often of a heavy nature. The shade-grown tobacco was, however, hardly likely for making wrappers to be excelled by any tobacco in the world.

In the British African possessions the outlook for tobacco cultiva­tion is in several instances favourable. Rhodesian-grown Turkish tobacco is already on the English market, as also various brands of tobacco from the Transvaal. Natal and Cape Colony have also industries of considerable local importance. Tobacco cultivation has made considerable progress in Nyasaland (British Central Africa). In 1900 there were 69 acres under this crop, the yield being

4480 lb of the value of £113. In 1907 the acreage had increased to 2330, the yield to 413,316 lb, and the value to £6889. Flue-cured bright tobacco is principally produced, but sun-cured is also exported; and in 1906-1907 experiments with Turkish tobacco gave encouraging results.

Canada produces in Ontario and Quebec coarse Virginian type tobacco.

*Chemistry.*

The constituents of tobacco, as of all other vegetable matter, can be grouped under three heads : water, mineral acids and bases (which pass into the ash on combustion) and organic substances. The following analyses of upper leaves made at the Connecticut state station, and recorded in Report No. 63, Office of Experiment Stations, U.S. Department of Agriculture, indicate the more important constituents and also the changes which take place during fermentation.

|  |  |  |
| --- | --- | --- |
|  | Unfermented. | Fermented. |
| Water | %  23∙50 | %  23∙40 |
| Ash | 14∙89 | 15∙27 |
| Nicotine .... | 2∙50 | 1∙79 |
| Nitric acid (N2O5) . . | 1∙89 | 1·97 |
| Ammonia (NH∣) . . | 0·67 | 0∙71 |
| Other nitrogenous matters | 12∙19 | 13∙31 |
| Fibre | 7∙90 | 8∙78 |
| Starch | 3∙20 | 3∙36 |
| Nitrogen free extract | 29∙39 | 27∙99 |
| Ether extract.... | 3∙87 | 3∙42 |

Nicotine (*q.v.*) (C10H14N2) is a volatile alkaloid which appears to be present only in plants of the genus *Nicotiana* (see Nicotine).

*Manufacture.*

In the manufacture of tobacco for smoking, we have to do with the numerous forms of tobacco used for smoking in pipes, embracing cut smoking mixtures, cake or plug, and roll or spun tobacco. Under this heading come also the cigar and cigarette manufacture.

The raw material in the warehouses is of various qualities: some is strong, rough and harsh, and so is unfit for ordinary smoking; other samples are mild and fine, with aromatic and pleasant flavour, but devoid of strength. By a proper mixing and blending the manufacturer is enabled to prepare the smoking mixture which is desirable for his purpose; but certain of the rough, bitter qualities cannot be manufactured without a preliminary treatment by which their intense disagreeable taste is modified. The storing of such tobacco for a lengthened period matures and deprives it of harshness, and the same result may be artificially hastened by macerating the leaves in water acidulated with hydrochloric acid, and washing them out with pure water. The most efficient means, however, of improving strong, ill-tasting tobacco is by renewed fermentation artificially induced by moisture and heat.

The manufacturer having prepared his mixture of leaves, proceeds to damp them, pure water alone being used in the United Kingdom, whereas on the Continent and in America certain “ sauces ” are employed, which consist of mixtures of aromatic substances, sugar, liquorice, common salt and saltpetre, &c., dissolved in water. The primary object is to render the leaves soft and pliant; the use of the sauces is to improve the flavour and burning qualities of the leaves used. When uniformly damped, the leaves are separately opened out and smoothed, the midrib, if not already removed, is torn out, except when “ bird's- eye " cut is to be made, in which mixture the midrib gives the peculiar “ bird’s-eye ” appearance. The prepared tobacco, while still moist and pliant, is pressed between cylinders into a light cake, and cut into fine uniform shreds by a machine analogous to the chaff-cutter. The cut tobacco is now roasted, partly with the view of driving off moisture and bringing the material into a condition for keeping, but also partly to improve its smoking quality. The roasting is most simply effected by spreading it on heated slabs, on which it is constantly turned, or a roasting machine is used, consisting of a revolving drum in which the tobacco is rotated, gradually passing from one end to the other, and all the time under the influence of a current of heated air. The increase in favour of packet tobaccos has brought about the invention of elaborate packing machines.

For roll, twist or pigtail tobacco the raw material is damped or sauced as in the case of cut tobacco. The interior of the roll consists of small and broken leaf of various kinds, called "fillers”; and this is enclosed within an external covering of large whole leaf of bright quality, such leaves being called “ covers.” The material is supplied to the twisting machinery by an attendant, and formed into a cord of uniform thickness, twisted and wound on a drum by mechanism analogous to that used in rope-spinning. From the drum of the twisting machine the spun tobacco is rolled into cylinders of various sizes. These are enclosed in canvas, and around the surface of each stout hempen cord is tightly and closely coiled. In this form a large number, after being cooked or stoved in moist heat for about