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Utilization Abstract

Panama Hats. In his recently published book, "Ecuador and the Galapagos Islands", Victor Wolfgang von Hagen has provided a very interesting chapter on the Panama hat industry which has been reprinted in the March, 1949, Journal of the New York Botanical Garden. The picturesqueness of the native market where these hats enter world trade and the haggling that is involved in the sale of each item are briefly and effectively described, but defy abstraction without serious detracting. The more prosaic parts of this brief account furnish the following information. The manufacture of Panama hats, so called because Panama was formerly their point of distribution, is genuinely a cottage industry of Ecuador carried on by over 200,000 weavers—children, adults, Indians and cholos—within a radius of 40 miles of Cuenca, 8,500 feet above sea level. Today 85% of all Panama hats come from this region, in the province of Azuay, though the original center of the industry was the province of Manta, particularly the towns Montecristi and Jipijapa (hé-pe-há-pa). These original centers are in the hot and arid littoral where the Panama-hat plant (*Carludovica palmata*) is indigenous. This palm-like plant "is a small stemless species six to fourteen feet high with fan-shaped leaves, four feet in diameter, having the deep indentations in the leaf of the family Cyclanthaceae. The natives call it 'paja toquilla'. Now, with the growth of the panama indus-

try, whole plantations are given over to its culture. To convert it into fiber, the large green palm leaf is cut from the base of the tree, stripped of its outer filaments, thrown into boiling water, then set out to bleach under the equatorial sun. When sufficiently whitened, the straw is cut into small strands, which shrivel dry into cylindrical form. Cordlike in texture, they are over a yard in length".

In Manta, where the climate is hot and dry, the weavers must frequently moisten the desiccated straw to keep it pliable, and this custom has given rise to the legend that the fine straw hats are woven under water. Whereas the finest hats, earning for the weaver \$10 to \$30 each but eventually retailing for \$100, are still made in Manta, the bulk of the trade comes from Cuenca.

After being woven the hats are bleached with sulphur fumes emitted from small braziers, and for this purpose 1,000 tons of sulphur are gathered yearly from the volcanoes of Ecuador. A bath in the milk of sulphur follows, and subsequent blocking, pounding, pressing and cleaning render the hats ready for market. In Cuenca, where every Thursday is marked as the day of the Panama Hat Fair, as many as 30,000 hats may be sold to a variety of buyers, including agents of the Ecuadorian Panama Hat Company buying for fashionable shops in New York and elsewhere.

Utilization Abstracts

Opium. In October, 1949, the Department of Social Affairs of the United Nations published No. 1 of a new quarterly known as "Bulletin on Narcotics" which will "attempt to give the most recent news on the results obtained in the control of narcotic drugs and the struggle against addiction, by Governments, by the United Nations and by the organizations established under the Conventions. It will contain technical and scientific articles on narcotic drugs and articles on the legislation and administration in various countries as well as bibliographical material".

This first bulletin contains two articles on opium, one on its production throughout the world, the other on the physical and chemical tests that aid narcotics authorities in identifying opium seizures and thus finding the sources of illicit traffic. Production, trade and use of the drug in 30 countries of the world are discussed under as many headings.

The more general information in this bulletin may be excerpted as follows:

"The opium poppy can be grown in most of the habitable parts of the world except the northernmost, up to at least latitude 56°. Where this poppy can be grown, opium can be produced, though not always profitably or legally. In a number of countries the opium poppy is grown for its seeds, and not for opium at all. It is then referred to as 'the garden poppy', instead of 'the opium poppy', but it is just the same plant, scientifically known as *Papaver somniferum* Linnaeus. The seeds are a valuable oil-containing food, and are also pressed for the oil, which may be used as a table oil and for other purposes, such as artists' paints. The pressed-out poppyseed-cake is used as feed for cattle".

"There are many species of poppies, but only *P. somniferum* is known to elaborate morphine, and therefore it is the only poppy known to produce a true opium. It is also the only poppy grown commercially for edible seeds. Sometimes, like other poppies, it is grown merely for its flowers. It has numerous floral varieties, single and double, with petals spotted at the base with either

violet or white, and colors ranging from pure white through pink, lavender and red, to very dark violet. The familiar Shirley poppies, and their progenitor the common red poppy (*P. rhoeas*), and the showy Oriental poppies (*P. orientale* and *P. bracteatum*) produce no morphine and should not be mistaken for opium poppies. In this article, when there is reference simply to the poppy or poppies, *Papaver somniferum* is meant".

"*Papaver somniferum* is grown primarily for its seeds, both commercially and in the home vegetable gardens, in a great belt across central Europe, taking in the Netherlands, Belgium, northern France, southern Germany, Switzerland, Austria, Hungary, northern Yugoslavia, Czechoslovakia, Poland, Romania and the Ukraine. The southern European countries very seldom grow the poppy for its seeds because as an oil producer it cannot compete with the olive. In the great poppy belt of Europe there is almost never any production of opium, but since the 1930's, a number of these countries have begun to utilize, to some extent, the dried poppy plant material or capsule chaff left over from threshing out the seeds, for the direct extraction of morphine and the manufacture of opiates. The United States, Australia, Chile, Argentina and Italy may also be mentioned as having experimented with the utilization of poppy chaff".

"Occasionally, e.g., in France or England, a limited cultivation is primarily for the capsules which are cut green and dried for pharmaceutical use. They are used in official medicine in some countries and in some for home medicines such as sleeping potions or cough syrups".

"But the greatest cultivation of the poppy, chiefly in Asia, is for opium. A few days after the flower petals fall the cultivator scratches the outside of the green capsule with a knife. A white, milky juice flows out. Usually it is left to dry on the capsule for several hours, then collected. It gradually turns brown on exposure to the air and coagulates with standing and drying. This coagulated juice of the poppy is opium".

"The opium poppy is an annual plant.

Mainly, the seed is sown in the fall. It can also be sown in spring, either by choice or to replace a fall sowing which has failed. The harvest takes place between May and August".

"The original home of the opium poppy is probably the Mediterranean region, and probably its cultivation first began near the eastern end of the Mediterranean. The culture for seed seems to have come first, perhaps coupled with a knowledge of the soothing and sleep-producing powers of the capsules, when made into 'poppy tea'. The knowledge of the concentrated drug, opium, is known to be more than 2,000 years old in eastern Mediterranean lands. The culture for seed has moved chiefly northward and westward, and is very ancient in Europe. The culture for opium, and with it the common use of opium as a drug of addiction, reversing most world-trends has spread from west to east. Originally, opium as a drug of addiction was eaten, or drunk as an infusion. The smoking of opium, which became such a terrible vice among the Chinese, is comparatively recent, only some hundreds of years old. Opium culture is believed to have reached Japan about 500 years ago. Only in recent years has it crossed the Pacific and become established to a certain extent, though wholly illicit and under constant attack, in the mountains of western Mexico".

"Here it may be mentioned that opium is often, though by no means always, produced in mountainous regions. Illicit production, of course, is likely to be located in hidden valleys and places of difficult access. But even licit production is more likely to be in out-of-the-way places. Opium is a good cash crop in many lands; it has a fairly high value in proportion to its bulk and weight, and no important difficulties of transport or storage. Where good roads offer easy access to large markets, some more bulky crop may be as profitable to the farmer as opium, even if there are no important governmental restrictions. In mountainous, backward areas, where roads are few or non-existent, opium may be one of the very few crops that can be produced profitably for sale in the outside market".

"Turkey is the chief opium exporting country of the world. There is no domestic manufacture, and there has been no exportation to opium-smoking countries since 1941

—the entire production, except for some possible smuggling, is exported to the manufacturing countries. The Ministry of Agriculture fixes each year the areas where opium can be produced. Ordinarily the same twelve vilayets are named in which production is permitted in the whole vilayet, and some counties in other vilayets, which may be changed from year to year. There are three producing districts. . . . There are some additional areas in which the poppy may be cultivated for seed alone. No production of opium is permitted within about 100 kilometres of the border or coast. Turkey tries to maintain a constant production of opium. The area is intended to be about 30,000 hectares or a little less each year. . . . The average production has been some 243 tons annually (1938-1947) and the average exports nearly 201 tons. The difference is largely due to drying . . . trade in opium is free in Turkey. That is, any one may possess opium".

Sisal. After eight years investigation a British report on byproducts obtainable from sisal (*Agave sisalana*), which is extensively cultivated in Tanganyika for its rope-making fiber, states:

"In years to come the fibre and tow which have heretofore been the only saleable products of the estates may become of much less importance in the economics of the sisal industry, possibly sinking to the status of a byproduct of secondary importance to the higher priced new products extracted from the fleshy non-fibrous material which constitutes an equal proportion of the leaves to that represented by the fibre".

These potential byproducts obtainable from sisal waste and regarded as eventually capable of surpassing the fibre in value are:

a) Cold water extracts of malic, succinic and citric acids, glucosides, fermentable sugars and saponins. One such extract has been found to have excellent anti-corrosive properties, and another to prevent scale formation in boilers. "The fermentable sugars could be used for the production of power and industrial alcohol and other fermentation products".

b) Chemical extracts containing pectins and pectates. This group "represents about 15 per cent of the waste and is of most immediate importance since it is already being

produced on a commercial scale and a number of derived products are now being marketed. They are in active demand and future requirements of the market may soon prove large enough to absorb all that can be extracted from the waste obtainable from existing plantations".

"Pectins represent only a small proportion of the chemical extract . . . Pectates (sodium, calcium and other metallic salts of the acid) are being produced for a number of industrial and agricultural uses".

c) Solvent extracts—wax, chlorophyll, xanthophyll, carotene. Of these, wax is the most important, amounting to about 5% of the waste and resembling carnauba wax [the most important of vegetable waxes, obtained from the leaves of the wax palm, *Copernicia cerifera*, of Brazil].

d) Residual materials—50% of the waste. Useable as sources of acetic and butyric acids, sugars, lignin, plastics and wallboards. (*Chemical Age* 60: 7. 1949).

Straw Paper-Pulp. "Straw pulp has been used for the manufacture of paper and board since about 1800. Straw paper was widely used for wrapping meats in the United States until the early part of this century, and is still used for this purpose in some parts of Europe. Newsprint and many types of fine paper at that time also contained straw pulp blended with rag and other paper-making pulps. Even after the introduction of wood pulp, straw continued as a part of the furnish for many fine as well as coarse papers produced in this country.

"In both Europe and South America bleached straw pulp is still an important ingredient of many types of fine papers and boards, including writing, book, magazine, bond, and bristol and art papers and boards. The straw pulp is generally blended with wood and rag pulps and the desired characteristics of the products are obtained by judicious proportioning of the various types of fibers".

"The main commercial use for straw in the paper and board industry in the United States today is in the manufacture of corrugating strawboard. Wood pulp has replaced straw pulp in practically all other types of paper and board, and is also being used for corrugating. The higher density of wood,

the relatively low cost of groundwood (mechanical) pulp, the long fibers of coniferous wood pulp and the relative ease of wood collection have been among the more important factors favoring the use of wood over straw".

"Straw pulp and paper are manufactured and used in Europe and South America, particularly in those countries which lack pulpwoods. A number of mills in Holland, France, Germany and Italy produce excellent bleached papers and boards with wheat and rye straw pulps as major constituents of these products. . . . The English turned to straw during the war, and produced good grades of many types of paper from straw pulps prepared in their esparto (*Stipa tenacissima*) and wood-pulp mills. At present Great Britain is in the process of establishing a permanent straw pulp industry. Argentina has one of the largest straw-pulp and paper mills in the world, with a daily production of about 100 tons of bleached pulp from wheat straw. Paper and board products from wheat and rice straws are also produced in Brazil and in other South and Central American countries. Beautiful, bright, strong bleached papers are made from rice straw in Java. Many other countries use straw pulps for the production of fine specialty papers and boards".

Investigations are now under way at the Northern Regional Research Laboratory, Peoria, Ill., toward improving the pulping processes whereby there may be greater utilization of surplus cereal grain straw on American farms, enormous quantities of which are burned every year. In this work straw pulp is not regarded as a substitute for paper pulp, but as a supplement to it, for "it is believed that every plant fiber, or at least every class of plant fiber, has some characteristic property or properties peculiar to it. . . . Well-known commercial enterprises based on the specific properties of the raw materials involved are the production of superior insulating board from the sugarcane bagasse, of corrugating paper from wheat straw, of cigarette paper from seed flax straw, and of thin book and Bible paper from esparto". Straw pulp may be used pure or in mixture with other pulp, according to the characteristics desired in the final product. (S. I. Aronovsky, *Chemurgic Digest* 8(7): 4. 1949).