

ECONOMIC IMPORTANCE OF BEANS APART FROM FOOD VALUE

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Boston baked, of course, are what almost any American thinks about first when beans are mentioned.

But it isn't the lowly bean, upon which armies since about the year 1500 have advanced, with which our economy is concerned today. The products that come from the legume family of plants, typified by the common bean, are of equal or greater importance. Many of these plants are scarcely recognizable as bean plants, even to a botanist, for they may have flowers that are not those of the familiar pea or bean, and fruits that have little resemblance to the ordinary bean or pea pod. The classic example of a bean plant that, in common parlance, "isn't one," is the peanut that matures its pods beneath the surface of the ground. Its blossoms, however, are characteristic bean or pea flowers—see the peanut plant exhibit in Case 36, Hall 25.

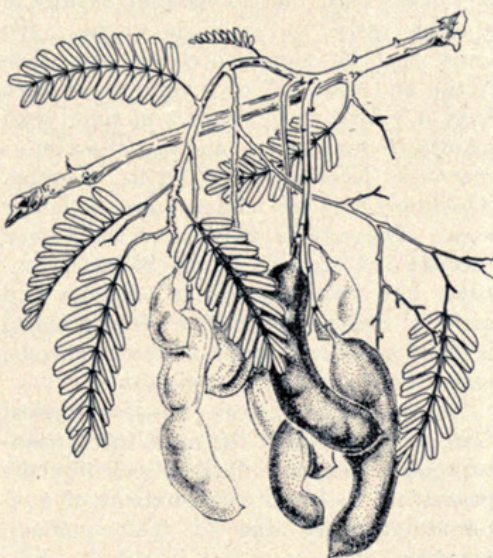
This example is easy to learn compared with some of the other "legumes" which are of economic interest. Gum Arabic, for instance, is the resin of an acacia, a spiny tree of northern Africa whose fruit is a pod, but whose flowers are almost minute and seem to consist mostly of stamens. The flowers are so closely crowded together in some sorts of acacias, and related mimosas, that they are fluffy in appearance and so ornamental that florists in the north and gardeners in Florida and California know them well in season. And there is cassia or senna with bright yellow or light pink flowers that are borne clustered in long loose sprays in one species often cultivated in warm regions for its beauty. The fruit is a pod, and furnishes a drug.

Among legumes with neither the flower nor the pod of the bean may be mentioned the "balsam of Peru," used pharmaceutically and in perfumery. Its fruit is something like that of a maple tree, but the winged portion of the stalked pod is below the solitary seed at the tip. In the seed portion are two pits filled with balsam. Curiously enough the tree, notwithstanding its name, was originally discovered in Central America and it is chiefly in Salvador that it is grown commercially, although it is also found in the forests of Peru. Other legumes unusual in fruit and flower include the "jutai" or dialium, a tree of Peru and the Amazon regions, valued for its hard wood resistant to moisture. Related is the courbaril that supplies copal, the resin exported from the Amazon.

TIMBER FROM BEAN PLANTS

The above gives an idea of the variation in flowers and fruits in this great family of plants, but we have mentioned only a few of the products that are important in the everyday life of men. These are as diverse as the plants themselves, and what diversity

there is! Blossoms so tiny that one can be picked up on the point of a pin—so large that one or two make a bouquet—sometimes with the lovely form of a butterfly or an orchid, sometimes like a fluff of down, sometimes almost like a wild rose! Often, too, the fragrance is unusual, exotic. There is, for example, the "cumaru," a huge Amazonian tree with crown, when in flower, bright rose-colored from its abundance of fragrant blossoms. Its egg-shaped fruits are often oily to the touch and exude an aromatic odor. The seed is the "tonka bean" exported for "coumarin," a common substitute for vanilla and a flavor for perhaps your own brand of cigarettes not to mention perfume or medicine. Similar in fragrance is a Peruvian tree, amburana, that attains a hundred feet, and is highly esteemed for its excellent wood. It is one of many



TAMARIND OF INDIA

Fruiting branch of a tree of the bean family, now grown everywhere in the tropics. The illustration is from a manual prepared by the Museum's Department of Botany at the request of the Surgeons-General of the Army and Navy, to provide Expeditionary Forces with information as to edible, and poisonous, plants.

tropical legumes that furnish timbers for all sorts of construction since they exist in a wide range of qualities. One of the best known is the purple heart.

But flowers, perfumes, even timbers and beans, important as these are, are not the outstanding products today of the legume family of plants—the most widely used "beans" today are a few rather allied and bean-like plants. These include the ancient soy bean, the usefulness of which has been greatly increased in our time. It looks like a bean plant and furnishes, under the impulse of modern industrial methods, an almost fantastic variety of things for man's needs ranging from food to oil and plastics (see case 30, Hall 25). Last year fifteen million bushels of soy beans were required for seed in the United States, whereas in 1917 a mere fifteen million pounds sufficed! Then there is crotalaria, long appreciated as a source of hemp known as "sunn," a fiber

produced from an Indian species, but recently of growing interest and importance as a soil builder because of its exceptional nitrogen fixing ability even in almost pure sand. Other bean or pea-like plants are proving to surpass by far the common clovers and alfalfa in usefulness for forage in many areas, especially on so-called marginal lands which, to a botanist, are simply lands for which adaptable crops have not been found. There are, for example, a species of "lotus" that yields like alfalfa; a lespedeza from Korea; and "kudzu," a trailing, tropical perennial bean—these are all legumes that have converted millions of unprofitable acres into profitable lands.

AN IMPORTANT INSECTICIDE

Finally, let us consider the sensational insecticide rotenone that is derived from a bean plant of the Amazon valley. This erect, bushy plant with pea-like flowers, called derris botanically, is perhaps, next to the erstwhile lowly bean, the most important bean of all—maybe even this statement is putting the cart before the horse, because of what avail is a bean plant if the insects eat it before the beans mature! Rotenone is one of the most potent insecticides and, although harmful to cold-blooded animals, it is harmless to the warm-blooded, including man. Although known from time immemorial to the natives as a "fish poison," its use in agriculture has come forward only during this decade. Actually the narcotic principle in the plant does not "poison" fish which have been trapped by damming a stream, but partially paralyzes them so that they are caught easily near the surface after pulverized derris plants, particularly the roots, have been strewn over the quiet water. In derris, rotenone is most plentiful in the roots which are thick and may extend for 75 feet or farther near the top of the ground. They are gathered from several wild species, some of which are now in cultivation and may yield as much as a ton of roots per acre after eighteen months. In 1940 the production was six and a half million pounds. The War Production Board has reported a two million pound shortage for 1942, the Army alone requiring an estimated 600,000 pounds.

SOME LEGUMES HARM LIVE STOCK

It is of interest that the same or other narcotics are found in a number of legumes. Sometimes these are harmful to animals as, for instance, the well-known loco weed of the western United States and the Andes which may be fatal to stock when grazed. The common "yopo tree" of Peru and the Amazon yields a narcotic bean that is apparently harmless; pulverized it is used by many native tribes as snuff.

All of which goes to suggest, among other things, that next time your friend tells you that you don't know beans, you may reply that there is still a great deal to be learned about legumes.



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