JOURNAL
OF THE
WASHINGTON ACADEMY OF SCIENCES

VOL. 15 FEBRUARY 19, 1925 No. 4

BOTANY.—*Notes on the taxonomy of American and Mexican Upland cottons.* FREDERICK L. LEWTON, U. S. National Museum.

A testimony to the difficulties in the way of assigning the proper botanical names to the many cultivated species and varieties of cotton is seen in the fact that students of the taxonomy of the genus *Gossypium* are not in accord as to the proper name which should be assigned to the group of varieties yielding the bulk of our annual crop of Upland cotton amounting to millions of bales.

The name most commonly accepted for this important crop plant is *Gossypium hirsutum* L., the first American species to be recognized by Linnaeus as distinct from Old World cottons. Some students of this question, like Fletcher and Watt, after examining the Linnean specimens, noting that his name *hirsutum* was intended to apply to a cotton plant having seeds with green fuzz and a flower with red spots on the bases of the petals, have restricted the name *G. hirsutum* to a small group of varieties of Upland cotton having the above named characteristics: and have assigned other names to the bulk of the cultivated forms yielding American Upland Cotton. Sir George Watt uses *G. mexicanum* Todaro to cover "Mexican cotton and the bulk of the Upland Americans;"[1] while Fletcher believes *G. siamense* Tenore to be the true name of our plant.[2] Before trying to decide between these two views let us examine the validity of the arguments presented by the above writers in advocating the names proposed by them.

[1] Watt, Sir George: *The wild and cultivated cotton plants of the world*, pp. 226–244. 1910.

[2] Fletcher, F.: *Botany and origin of American Upland cotton*, Cairo Sci. Journ. 3: 264–266. 1909.

MEXICAN UPLAND COTTON NOT GOSSYPIUM MEXICANUM

The bulk of the commercial cotton crop of Mexico is yielded by a species of *Gossypium* for which as yet we have no adequate name. To supply this deficiency, Sir George Watt makes use of an apparently appropriate specific name, *G. mexicanum* Todaro.

Todaro's name does not seem to have been taken up by any other student of the cottons until used by Watt in 1910. The latter does not cite any of Todaro's actual specimens, nor indeed any specimens from Mexico, but apparently after deciding to apply *G. mexicanum* to the broad-leaved Mexican cottons of the general upland type he finds specimens from all over the world in the herbaria of Kew, British Museum, Geneva, and Calcutta, which he assigns to this species. Before accepting Watt's identification of "Mexican cotton" let us see if we can determine what kind of a cotton plant was in the mind of Agostino Todaro when he proposed the name *Gossypium mexicanum*. A brief description in Latin under this name was first published in 1868 in the list of seeds which ripened in 1867 in the Royal Botanic Garden at Palermo, Sicily; later a fuller and more detailed description was presented by Todaro in his monograph of the genus *Gossypium*, published in 1878. This description was strengthened by an excellent colored plate, and shows a shrubby small-bolled plant yielding tawny colored cotton and small flowers with a spot at the base of each petal. He gives the habitat of the plant as "Northern Mexico" and says that seed of this species was sent to him in 1864 by the "celebrated Professor Decaisne" under the name "*Coton sauvage de Siam dit Siam clair*," with the statement that it was shrubby and perennial. The label on the specimen of cotton seed sent by Decaisne from the Botanic Garden at Paris at once arouses a question in the mind of the reader as to what "Wild Siamese Cotton" was doing in Mexico about 1864. At first thought it would seem that Todaro had misquoted Decaisne and unintentionally connected Siam and Mexico together, but an examination of Todaro's writings develops that in three distinct papers he mentions the wild Siamese cotton having a habitat in Mexico.[3]

That such a species of cotton as was described and figured by Todaro is really to be found in Northern Mexico was proven by that indefatigable collector of Mexican plants, Dr. Edward Palmer, who brought to Washington from Victoria, Tamaulipas, Mexico, specimens and fresh seeds of a shrubby brown-linted cotton which he said was locally known as *socollo* or *cocoyo*. Plants grown by the writer in Texas and Florida from the seeds brought by Dr. Palmer appear as almost exact counterparts of Todaro's plate of his *G. mexicanum*.[3] From carefully made field notes put down from the living plants at Brownsville, Texas, the following description has been drawn:

[3] Todaro, Agostino: *Relaziane sui cotoni caltivati al R. Orta Botanico nell'anna 1864*, in Atti della Societa di Acclimazione e di Agricoltura in Sicilia **4**: 164. 1864.

Todaro, Agostino: *Index seminum Horti Regii Botanici Panarmitani, ann. 1867*, p. 20 and 31. 1868.

Todaro, Agostino: *Relazione sulla cultura dei cotoni in Italia*, 193, *pl. 6*. 1877.

Gossypium mexicanum Todaro

Plant woody 1.5 to 2.5 meters high, very strict and open, branching very low. Stem erect, slightly hairy, green or reddish. Basal limbs numerous, ascending, gradually becoming smaller upwards. Fruiting branches 15 to 20, ascending internodes very long, bolls not clustered nor fasciated.

Leaves 10 to 13 cm. long from base to tip, width the same, dark green, quite smooth above, smooth below, very flat, not thrown up in folds at the sinuses, 3-lobed, divisions broad, basal sinus deep, open; pulvinus very small, red; petioles 6 to 10 cm. long, slightly hairy; nectaries present, small, oval very deep, edges not raised.

Bracteoles small 2.5 to 4 cm. long, 2 cm. wide, oval, auriculate at base, almost smooth, thin, laciniae 6 to 8, hairy, extremely long, especially the middle one; nectaries 3, medium-sized, oval, shallow, not hairy; bractlets absent.

Calyx, much appressed to the corolla tube, with conspicuous teeth, smooth; extra-floral nectaries on the calyx 3, medium-sized, smooth, elliptical; internal floral nectary broad, hairy hand broad.

Petals small, 3.5 cm. long, yellow, usually with a small purple red spot on the claw.

Stamens variable in length, scattered, staminal tube not toothed at apex; pollen cream-colored, plentiful, style exserted.

Bolls exceedingly small, 1 to 1.5 cm. in diameter, round, blunt, 3- and 4-locked, short-stalked, erect, open poorly; oil glands very prominent, but a little below the surface, scattered.

Seeds average 5 per lock, rather small, loose, very fuzzy; fuzz at first gray-green, later becoming rusty brown.

Lint sparse, pale greenish brown changing to light brown on exposure to light; fine, soft, short, weak.

The growing plant appears much like the common Mexican tree cotton, with its long ascending limbs and smooth, thin, flat leaves.

The assigning of a specific name in the form of a geographical adjective to a plant whose limits of distribution are not known at the time often leads to the choice of a name which does not at all indicate the region where the plant is most abundant. Witness for example the many plants whose specific name *canadensis* is far from indicating their true range of distribution. A geographical specific name is also misleading even when it truly expresses the plant's native home if it is bestowed upon an obscure species when the same area is occupied by more common or conspicuous species. However this may be, the rules of taxonomy provide that even if the specific name is inappropriate for either of the above reasons, it must be used if properly published and not set aside by an older name. We have such a case in *Gossypium mexicanum* Todaro.

How much influence the Mexican types of Upland cottons have had in the development of particular varieties cultivated in our cotton belt is still a matter of conjecture rather than of record, but certainly the species described by Todaro and the small-bolled, brown-fibered cotton found by Dr. Palmer had no part in the development of the Upland cottons of the United States, and none of the varieties belonging to this group of Upland cottons are referable to *G. mexicanum* Todaro.

"SIAM" COTTON

Fletcher's argument,[2] that *G. siamense* Tenore is the true name for American Upland cotton, is not to be disposed of so easily, even though he misquotes both Du Pratz and Tenore, on whose accounts he mainly depends. His argument, in brief, is as follows: (1) That *G. hirsutum* L. is typified by a plant bearing 3 to 5-toothed bracteoles and flowers with dark red petal spots in the center, neither of which characterize our Upland cottons; (2) that in a large collection of varieties grown by him, the one most typical of the Upland cotton was a Cambodian variety, considered a native of that country; (3) that in 1758 "Du Prate" (Du Pratz) tells of the French colonists growing white cotton of Siam in preference to the Turkey kind "cultivated in our colonies;" (4) that in 1839 Tenore figured and described under the name *G. siamense*, "apparently from the country of origin," a cotton of the Upland type; and (5) that although *G. religiosum* L. "is undoubtedly the Upland plant," and has priority over the name given by Tenore it has been applied by others to so many totally different varieties "that it seems best to drop it altogether." However, Tenore's name *siamense* of 1839 was already preoccupied by Tussac in 1818 for a different type of cotton known at that time in San Domingo as Siamese cotton.

Fletcher brings no proof of the Asiatic origin of his Cambodian Upland cotton other than the opinion of the agricultural authorities there that it is indigenous, and the existence of a similar supposedly wild type in the Philippines. Undoubtedly the presence of this cotton in the Philippines is due to the same cause as that of many other American plants found there; the early commerce between Spain and her eastern colonies *via* Mexico. Although Tenore was unable to trace the geographical origin of his white cotton of Siam he used the specific name *siamense* because he was unable to find that this variety had in Italy ever borne any other name. Du Pratz did say that the cotton successfully raised by the French colonists in Louisiana was of the "white cotton of Siam," but the statement often credited to him, that the cotton "cultivated in our colonies is of the Turkey kind," was added in a footnote by the English translator and refers to the British Colonies. Moreover, a few years later, a number of quite distinct types of cotton were known and described from the West Indies as "Siam cotton."

The following quotations and translations taken from the works of several 18th and early 19th Century writers indicate the widespread knowledge of "Siam" cotton 100 to 200 years ago:

PÈRE LABAT:[4] "There is in the islands another species of cotton whose seeds have been brought from Siam, and named for this reason cotton of Siam. It has naturally the color of clear coffee. It is of an extraordinary fineness, it is long and softer than silk. There is made of it stockings of an admirable fineness and so beautiful as to make blush the best silk stocking."

DU PRATZ:[5] "The cotton which is cultivated in Louisiana is of the species

[4] Labat, Père: *Nouveau voyage aux Isles de l'Amerique* **2**: 406. 1724.

[5] Du Pratz, Le Page: *Histoire de la Louisiane* **3**: 364. 1758.

of the White Siam, though not so soft nor so long as the silk-cotton it is extremely white and very fine, and very good use may be made from it."

Note *added* by translator of the English edition of 1774: "This East-India annual cotton has been found to be much better and whiter than what is cultivated in our colonies, which is of the Turkey kind. Both of them keep their color better in washing, and are whiter than the perennial cotton that comes from the islands although this last is of a better staple."

Bossu:[6] "The cotton of this country is of the species called white cotton of Siam. It is neither so fine nor so long as the silky cotton, but it is however very white and very fine. Its leaves are of a lively green and resemble spinage very much; the flower is of a pale yellow, the seed contained in the capsule is black, and oval like a *kidney* bean."

Lamarck:[7] "It is claimed that there exists in the Kingdom of Siam, a cotton plant which produces cotton of a russet or reddish color and of an extreme fineness, and it is said to be of a quality superior to other cottons. This cotton plant would appear to us to be still unknown to Botanists and should be different from the species that we come to mention, seeing that these all produce strong white cotton, even those which are grown in the East Indies and Moluccas. They cultivate in the West Indies a cotton plant analogous to that in question and which they call there *Cottonier de Siam*. It is remarkable in that it produces a reddish cotton or one of a good chamois color and very fine. They make of it stockings of an extreme fineness and which are preferable to silk stockings by their cost and their beauty. There are nevertheless very few of them made because they consume so much time."

Cavanilles:[8] "In the Royal Garden of Paris I saw a plant, not in bloom, named *Gossypii flavi Siam*, which seems to be reducible to this (*G. religiosum*); the leaves themselves are quite the same as *G. religioso* and it is true also the wool is yellow and not white as in other species."

Von Rohr:[9] Of the 34 varieties of cotton described by Von Rohr and experimented with by him on Saint Croix, 4 were obtained from Martinique where they were known as "Siam rouge" or "Siam blanc" (Von Rohr's numbers 13, 16, 19 and 25).

The following paragraphs are from Von Rohr's notes describing the varieties grown by him:

"No. 13 *Siam lisse*, brownish smooth Siam, plain nankeen; grows the highest of all and already in the second year is 12 feet and spreads its branches 8 feet. Bolls small, fall easily, the staple weak; seeds smooth."

"No. 16 *Siam couronne*, brownish crowned Siam; wool paler in color than No. 13 and swells out of the boll better."

"No. 19 *Siam blanc*, white Siam; raised at Aux Cayes and Martinique. Outside of the harvest it is impossible to tell this (white Siam) from No. 16 (brown Siam), even when they stand next to one another. . . . .

"One would naturally think the white Siam was a sub-variety of No. 16, but such is not so. I have grown both in quantities since 1785 and both have held to their own characteristics. The wool of the white Siam is unusually white, never gets dirty on the tree and never has a colored fiber."

[6] Bossu: *Travels through Louisiana* **1**: 377–379. 1771.

[7] Lamarck, Chev.: Encyc. Method. Bot. **2**: 136. 1786.

[8] Cavanilles, A. J.: Monodelphiae classis Dissertationes, Sexta Dissert. **3**: 314. 1788.

[9] Von Rohr, Julius Philip Benjamin: *Anmerkungen über den Cattunbau zum nuzen der Daenischen Westindischen Colonien 1791.*

"No. 25 *Brownish fuzzy Siam*, mossy nankeen. In Guadeloupe called *Siam rouge velu*. Has been grown for many years by Mr. Von Oxholm. The color of the wool is isabella, it is very tender and elastic; seeds fuzzy."

RAFINESQUE:[10] This prolific writer, fifty years after the appearance of Von Rohr's book, assigned Latin names to each of Von Rohr's 34 varieties and published very brief descriptions in Latin drawn from Von Rohr's notes. Rafinesque of course never worked with cotton plants, either living or in herbaria.

The following are the names given to Von Rohr's Siam cottons by Rafinesque:

Gossypium fuscum Raf. Plain nankeen, Von Rohr No. 13.
G. pallens Raf. Crowned nankeen, Von Rohr No. 16.
G. asiaticum Raf. White Siam, Von Rohr No. 19.
G. isabelum Raf. Mossy nankeen, Von Rohr No. 25.

DE LASTEYRIE:[11] This author includes an annotated list of 18 cotton varieties which he credits to M. de Badier, a cotton farmer of Guadeloupe, who made his experiments there in 1785–1787 (same time as Von Rohr in St. Croix). The list is divided into two groups, the commercial cottons and the uncultivated varieties which are used only by the Indians.

"*Cotonnier Siam batard a graines recouverte d'un duvet verdatre obscur.* Distinguished by its dirty red cotton and by its seeds which are obscurely greenish."

"*Cotonnier Siam batard a graines noires et lisses.* It differs from No. 3 by its seeds; the rest is the same."

"*Cotonnier Siam franc.* Cotton brownish red; differs from Nos. 3 and 5, by the felt which adheres to the seeds, and of a brownish red. The cotton is very good." De Lasteyrie also gives a table of Von Rohr's 34 varieties, using his names and tabulating his data as to character of lint and habit of plant.

DE TUSSAC:[12] "There is found in the Antilles only one species of indigenous cotton which is commonly known under the name of "Maron" cotton. I consider it identical with the one I have just described (*G. tricuspidatum*). The other species cultivated there have been brought from the East Indies. . . . . The species cultivated by preference in the Antilles is the hairy cotton (*G. hirsutum*) with white lint and its variety with brown lint, the one with hairy seed adherent to the lint, the other with smooth seed easily detached from the lint. . . . .

"A fourth species of cotton, less cultivated than the three others, is the cotton of Siam (*G. siamense*), this is a small annual shrub which does not attain a height of more than three feet, whose reddish branches are spread out and hang to the ground, and produces a kind of cotton brown in color, or sometimes white, whose lint surpasses in fineness and length all the other species known. The shrub on account of its smallness does not bear much cotton. Its culture is convenient, but for one reason, that is, because it can be cultivated in dry places where other varieties do not succeed. Some authors have claimed that the Chinese manufacture the nankeens, which are sold to Europeans with this species of cotton, but I assured myself that the brown cotton of Siam bleaches upon being exposed alternately to dew and sunlight. It is therefore probable that if it is really with this species of cotton that the Chinese make their nankeens they surely have a method of fixing the brown color."

[10] Rafinesque, C. S.: *Sylva Telluriana* pp. 14–19. 1838.
[11] De Lasteyrie, C. P.: *Du cotonnier et de sa culture*, pp. 139–146. 1808.
[12] Tussac, F. R. de: *Flore des Antilles* **2**: 67–68. 1818.

Conclusions

A study of the above arguments and quotations must bring us to the following conclusions: (1) That neither *G. mexicanum* nor *G. siamense* are proper names for American Upland cotton; (2) that for more than a hundred years "Siam cotton" was a general name given to several species or varieties of West Indian cottons having tawny or brownish lint and to occasional white forms of these; and (3) that there has been brought forward no valid evidence to indicate an Asiatic origin for our American Upland cotton.

ZOOLOGY.—*Some new intermediate hosts of the Asiatic human blood fluke.*[1] Paul Bartsch, U. S. National Museum.

The rôle played by fresh-water mollusks as intermediate hosts of Trematode worms parasitic upon man, has received considerable attention in the last few years. As the elimination of the mosquito, or the curtailment of its development, eliminates or curtails malaria, so the elimination of the intermediate molluscan host of flukes will place a check upon fluke diseases. Great work has been done by Japanese workers in this field and more recently by Doctors Faust and Melaney in China.

The known intermediate hosts of *Schistosoma japonica*, the Asiatic human blood fluke, belong to two genera, namely, *Katayama* and *Oncomelania*. The first of these is typified by *Katayama nosophora* Robson, made known to us by the careful studies of Robson based upon specimens secured in the Katayama district in the Province of Bingo on the Island of Hondo, Japan. In the present paper I am recognizing as subspecifically distinct from this, the form that occurs at Kurume on the Island of Kiushiu, Japan, under the name of *Katayama nosophora yoshidai*. The Island of Formosa harbors the third race, *Katayama formosana*, described by Pilsbry and Hirasí as *Blanfordia formosana* some time ago.

Dr. Faust's researches in Chinese Schistosomiasis have brought to light the occurrence of *Katayama* on the mainland, and I am describing as *Katayama fausti* the species discovered by Faust at Shaohing, Chekiang Province, China, and as *Katayama fausti cantoni* the race which he found at Canton, Kwangtung Province, China.

The genus *Oncomelania*, of which there is more than one race, is the intermediate host of the human blood fluke in the Yangtse Valley, China. More material will be needed than I have at hand before a systematic discussion of this group can be undertaken.

[1] Published by permission of the Secretary of the Smithsonian Institution.