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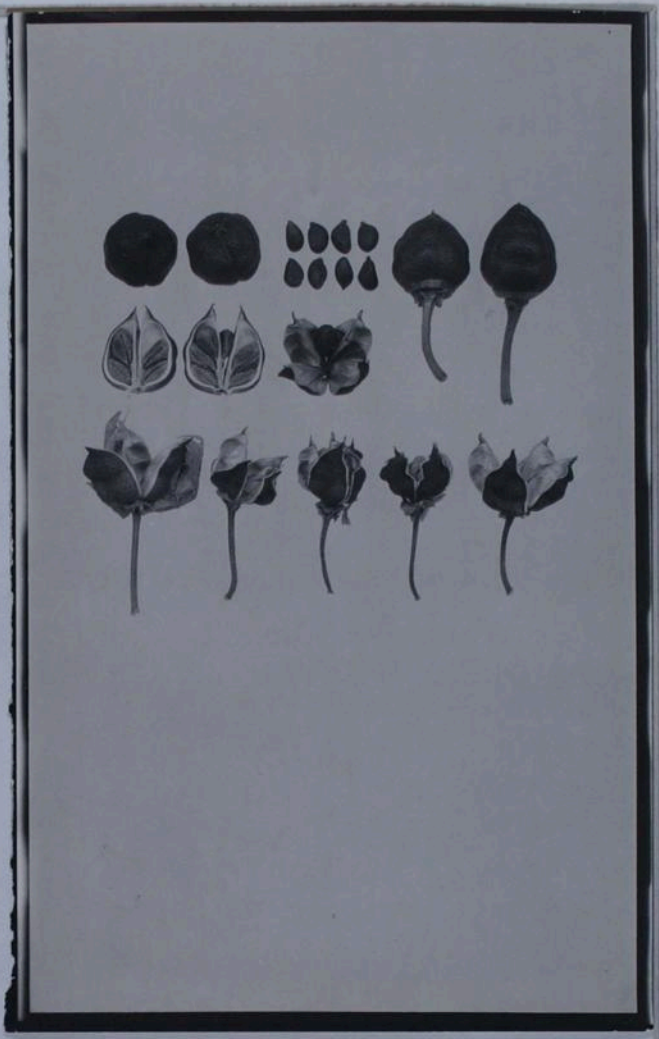
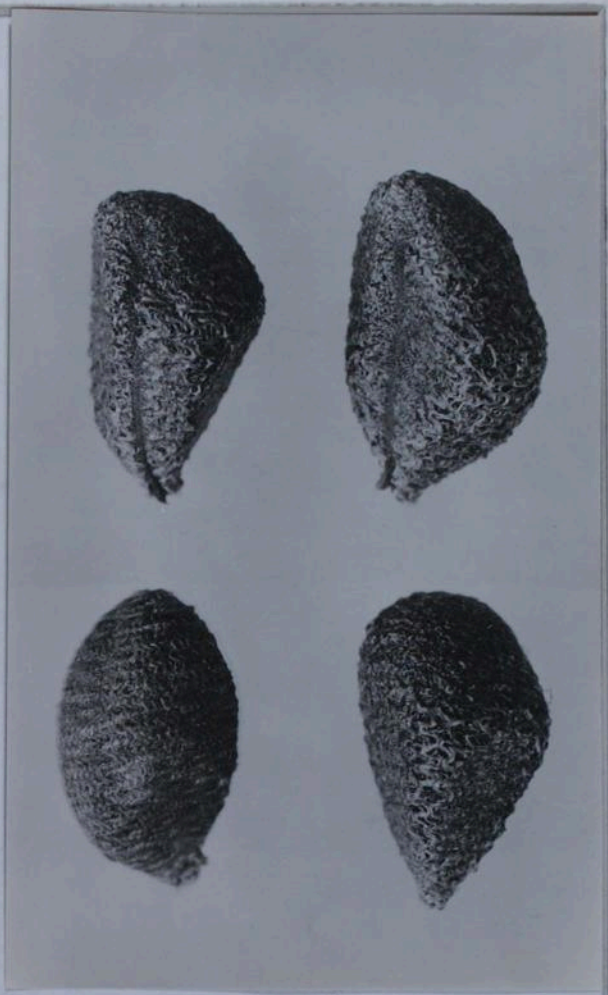
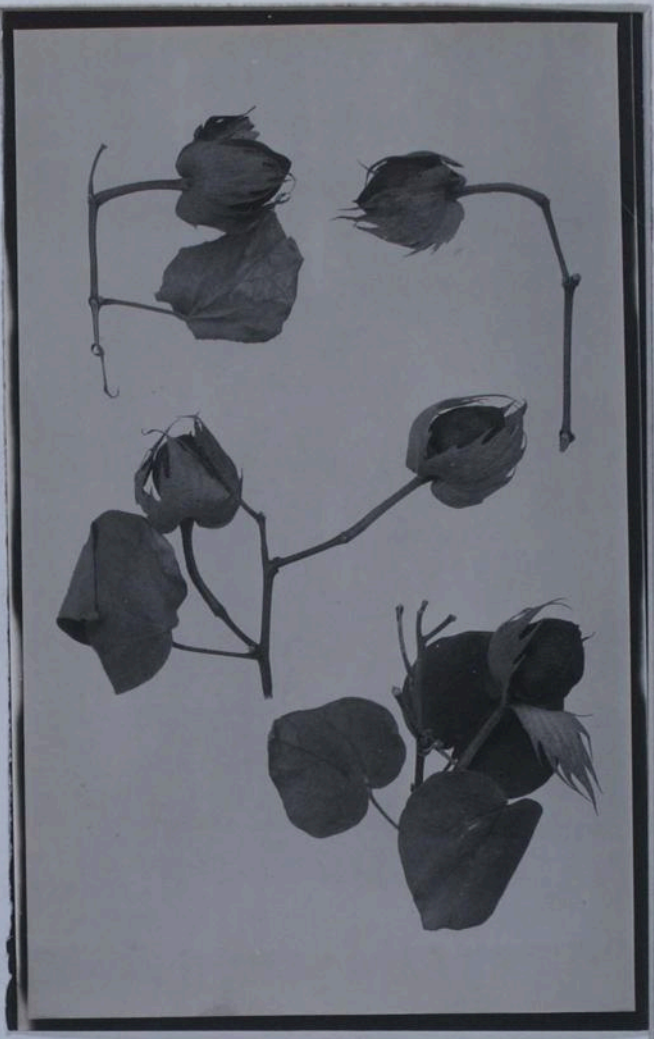
Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

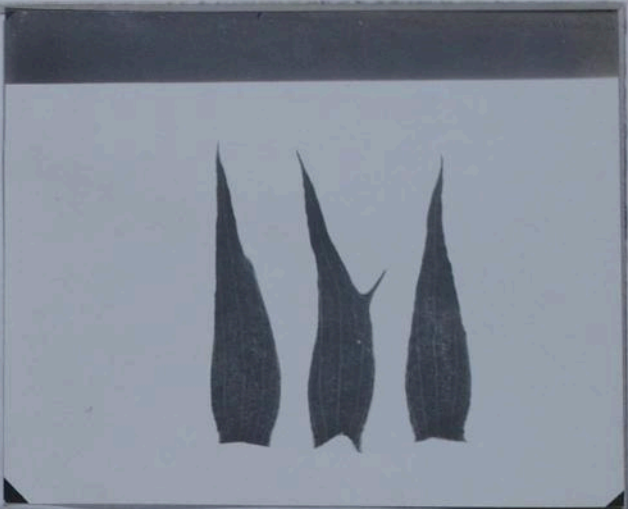
Get fls. of Thurberia to compare opening

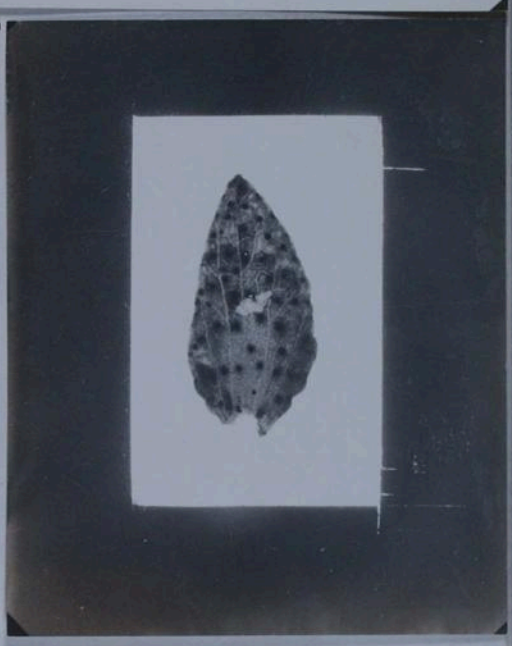
Perhaps use dark background fls as text figure for comparison

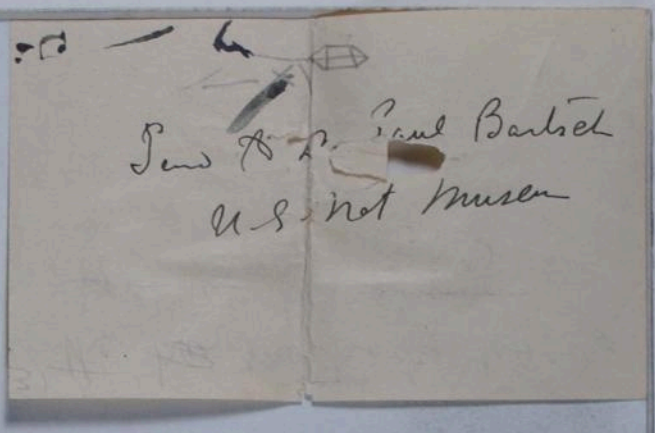












Cotton Involucre.

Flower-buds of cotton are enclosed in a triangular involucre of three large, deeply laciniate bracts. Other genera related to Gossypium have involucres, but not so large nor so completely enclosing the bud. Thus in the Arizona wild cotton (*Thurberia thespesioides*) the involucral bracts are so small that the bud is fully exposed and no protection is afforded for the boll-weevil. The bracts of Gossypium differ from those of Thurberia not only in the greater size but in being laciniate, that is, with the margins cut into numerous slender teeth. The bracts of Thurberia have either a simply triangular form or a single small tooth on each side. Cotton bracts have been interpreted as leaves with greatly reduced blades and greatly enlarged stipules, which seems to be indidated by the occurrence of many abnormal forms intermediate between bracts and foliage leaves.

The possibility of eliminating the bracts naturally suggests itself, and this would have other advantages. Fragments of the dry involucral bracts represent a large part of the "leaf" that depresses the grade of the commercial fiber. The possession of unusually small bracts has been considered as one of the desirable features of the Durango cotton, a new type of Upland long staple acclimatized from Mexico, the smaller bracts can be avoided more easily in picking, and the commercial grading of the fiber is likely to be higher.

Gossypium Harknessii.

California.

Plants From Baja California.

x x x Gossypium Harknessii. Shrubby, forming rounded clumps 2-3 feet high, with angled branches, glabrous throughout: leaves broadly cordate, often with closed sinus, entire or three lobed near the apex; petioles an inch or more long, equaling the blade: peduncles exceeding the petioles, jointed nearest the summit: bracts 3, broadly ovate-acuminate, entire, less than half the length of the sulphur-yellow petals: calyx truncate: petals an inch or more long, with purple spot at base: capsule ovate, pointed, 14 mm. long: carpels 3: seeds naked:

This handsome shrub belongs to the section to which the generic names Thurberia and Ingenhousia have been given. The specimens were in flower and lacked mature fruit, but fortunately some old empty capsules were yet persistent. It was seen only upon Santa Margarita Island where it is very common, often growing in masses. Named for Dr. H. W. Harkness, President of the California Academy of Sciences, as a tribute to his efforts in furthering the exploration of Lower California. x x x

(Extract from article entitled "A Collection of Plants from Baja California, 1889," by Townshend S. Brandegee, published in Proceedings of the California Academy of Sciences, Second Series, Vol. II, 1889, pages 136 & 137.)

Subject .....

Crop Physiology and Breeding Investigations.

O. F. Cook

In case you should be interested. I have the Proceedings on my book shelves.

S.C.M.

3.24.13.

Gossypium davidsonii San Xavier Mch 11, 1921

Foliage held - small branches through the winter or growing almost all very pale in color all leaves small, 2 inches wide or less - A few with slight lobes - One most pronounced taken as specimen, other leaves of same short quite entire.
stipules not so promptly deciduous, subulate or filiform, hairy

checked

Gossypium davidsonii S. Ant. Oct. 7, 1921

No lobed leaves observed - Plants flowers
& 3-4 small bolls set 4-locked & 5-locked
External nectaries present, all three distinct
in some involucres, but white, no red color
except petal-spots. Leaves many all entire
even in pulvinus - Fruit-branches usually
only one flower, the 1 the leaf aborting,
but is the leaf on the frtg. branch. Sometimes
2 buds, the terminal bud reddish aborting,
2 flow. leaves have only one nectary, but

This distinct odor in very small leaves. Nectary cuneate with distinctly swollen margins, with scattered rather prominent oil-glands. Calyx nearly truncate ~~x~~ slightly sinuate, but no definite indications of lobes. Studded with vertical rows of prominent head-like oil-glands — as seen in fresh state.

Leaves have three prime veins on each side, the lower rather close and nearly parallel to the margin.

Gossypium davidsonii San Ant. Oct. 16, 1921

Flowers in greenhouse at middle of October, 4 – 6 flowers per day, or less – ~~[illegible]~~ Stigmas exserted beyond stamens, not receiving pollen except by me artificially – Several flowers pollinated – oct 14 – 16

San Ant. Oct. 18, 1921

Cotton (Gossypium davidsonii)

2 fls open - pot with ~~nearly~~ & 2 with Pima Oct. 18, 1921.

Flowers open wide the upland cotton)

much wider than Egypt or Sea Is.

Spread nearly 2 1/2 inches at widest.

Petals turn back slightly at the edge

instead of being somewhat incurved as

in Thurberia. Color of fls pale

yellow, paler than Egypt or

Flower of Oct 2 had expanded 1.5 cm in diam Oct. 4.

Sea Island, but far from
being white like upland — Pollen
pale yellow, scarcely darker than upland, much paler than Egyptian — slightly smaller than Egyptian (Pollen grains)
stigmas with prominent green vesicular oil-glands showing between the
white stigmatic bands — no dark oil glands
Staminal column without oil glands (or
very few and small?) Contrasting with Upl & Egypt
which have ~~less~~ numerous yellow glands
on column, among filaments.

San Antonio Oct. 19, 1921

Gossypium davidsonii Slender trailing shrub, drooping branches no leaves with lobes detected after rather careful search. All entire simple more or less distinctly cordate at base – rather variable at tip some with small short rounded abruptly decurved tip giving effect of median notch, others with flat, tapering tip. Get photo –

Petal spots small composed of radial lines streaked with yellow in veins, at least above & below sometimes spot not solid but formed of alternating streaks. Spot does not reach margin of petal, occupies less than half the width

and is separated from the base by about the length of the spot the tissue below the spot being somewhat thickened and convex, no doubt representing the pulvinus that determines the angle of the petals in opening.

As in Thurberia the pedicels commonly are thicker than the branch that supports them. Pedicels always subtended by a reduced or rudimentary or fugacious leaf. In other words the fruiting branches do not have functional foliage leaves, as in cotton. Stamens acicular, densely pubescent fugacious -

Gossypium davidsonii San Antonio Dec. 5, 1921

Involucre hairy on inside surface & calyx on outside

hairs much sparser than outside, the bracts but

over whole surface ... Florida wild

cotton has these surfaces naked except

at tips of calyx lobes & on the along

margins & teeth of bracts

Gossypium davidsonii San Antonio Dec 5, 1921

Crop of plant in greenhouse, result of hand-pollination

4, 4, 4, 4, 4, 5, 5, 4, 4, 5, 4, 4, 4, 4, 4, 4

4, 5, 4, 5, 4, 4, 4, 4, 4, 4, 4, 5, 3, 4, 4,

4, 4, 4, 5, 4, 4, 4, 4, 4, 5.

1 – 3-locked
32 – 4- "
8 – 5- "
41

4/5 of bolls 4-l

San Antonio Dec 5, 1921

Grossypium davidsonii

Flower habit very distinct from cotton or Thurberia, even but in accord with trailing habit - Ends of all of the long slender vegetative branches go over into form with open inflorescences by shortening the internodes and reducing the leaves. The long branches with one or two joints & leaves absolute or much reduced no full size vegetative leaves on fruity branches as in cotton, or even in Thurberia.

flowers. Hence flowers and fruit at the ends of the stalks or vegetative branches would be feature of this genus — ~~a br. an a~~ strictly speaking has an open terminal inflorescence, but little specialized in comparison with some plants, but forming quite a definite contrast with Gossypium and Thurberia.

Gossypium davidsonii (S. [illegible] Dec 5, 1921)

Habit of ~~a~~ no slender trailing shrub, rather than an erect bush like Gossypium or Thurberia

Stipules slender, acicular, fugaceous, leaving only a round or somewhat triangular scar, not a long oblique scar as in Gossypium & Thurberia

Leaves entire – rarely with slight angles, but not lobed or ~~[illegible]~~ incised

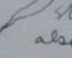
Leaves with distinct pulvinus at base swollen on upper side more than in Gossypium

Fruiting branches of only one or two joints, more slender and often shorter than the pedicels

Pedicel structure entirely
distinct fr Gossypium – has st hollow
at the center, with the channel
surrounded by delicate shreds of weak
webby parenchyma lining the
walls of a cylindrical, woody axis,
with 6 woody steles? outside of this. Gossypium
has an angular woody axis without free
elements outside & the central filled inside
with persistent large-chambered parenchyma

Gossypium Davidsonii San Antonio Dec. 5, 1921

~~2 capsules~~
~~Open~~- pol Oct. 18 ~~no~~ one capsule
not yet open Dec 5 -
all capsules ~~4~~ +5 - locks

o stipl scar davidsonii
 stipule scar arth
also stipular rim

—

Gossypium davidsonii San Antonio Dec 5, 1921

To be associated with Thurberia in absence of
lint from seed, presence of long hairs along
the ~~backs~~ seams of the carpels, the slender fugacious
stipules, ~~thickened swollen pedicels~~ ~~differing~~ but different in having
not the ~~involucral bracts broadly and low~~
~~as in Gosso~~ broad the involucre as in
Gossypium with triangular-cordate,
laciniate-dentate bracts.

San Ant., Dec 5, 1924

Gossypium davidsonii

Carpels with long hairs as in Thurberia

Bracts remain green till capsules are ready to open

Leaves with petioles somewhat thickened with pulvini at both ends much as in Gossypium.

2 capsules crossed Oct. 18 with Pima still unopened Dec. 5 — perhaps requiring longer to mature — Meade

crossed capsules appear to have fallen

Gossypium harknessii S. Ant. Dec. 5, 1924

As genus agrees with Thurberia in lacking lint on the seeds, and in structure of the pedicel. Differs fr. Thurberia in having involucral leaves, like Gossypium. Habit, stipules, hairs different fr. both

Bracts with 7–10 teeth

Pedicels distinctly 6-angled with 3 broader faces separated as many narrow grooves.

External nectaries often obsolete, ~~usually~~ usually only one present; no internal nectaries; no intermediate bractlets

Leaves with 3 or 4 principal veins on each side, rising from the small hairy callus. Posterior vein always close and parallel to the margin. Leaves truncate at base or distinctly but not deeply cordate. Apex short & rounded or distinctly acuminate —

Gossypium davidsonii

Could be described as Wild Cotton of Lower California ( ) after genera chan has been published in Science or Wash Acad Sci — but Thurberia should also be published as Wild cotton of Arizona —

Gossypium Davidsonii

Planted in Greenhouse July 10, 1919 – came up Aug 10 – probably from old seed recd 1900 – ~~CB~~

McKeever has other notes on young plant + specimens of angled leaves

Flowered in Oct. 1920 from flowers McKeever collected bracts ~~Oct.~~ Nov. 1, 1920.

Gossypium davidsonii

Watt refers to the fruiting branch as the "peduncle" –

Gossypium davidsonii. San Antonio, March 31, 1921.

Foliage held on small branches through the winter or growing slowly, all very pale in color, all leaves small, 2 inches wide or less. A few with slight lobes. One most pronounced taken as specimen, other leaves of same shoot quite entire. Stipules not so promptly deciduous, filiform, subulate, hairy.

(Oct. 7, 1921). No lobed leaves observed. Plants flowering and 3-4 small bolls set, 4-locked and 5-locked. external nectaries present, all three distinct on some involucres, but white, no red color except petal-spots. Leaves hairy all over, even on pulvinus. Fruiting branches usually with only one flower, the leaf abortive, that is the leaf on the fruiting branch. Sometimes 2 flower buds, the terminal bud readily aborting. Leaves have only one nectary, but this distinct even on very small leaves. Nectary cuneate with distinctly swollen margins, with scattered rather prominent oil-glands. Calyx nearly truncate, slightly sinuate, but no definite indications of lobes. Studded with vertical rows of prominent bead-like oil-glands, as seen in fresh state.

Leaves have three primary veins on each side, the lower rather close and nearly parallel to the margin.

(Oct. 16, 1921). Flowering in greenhouse at middle of October, 4-6 flowers per day, or less. Stigmas exserted beyond stamens, not receiving pollen except artificially. Several flowers pollinated, Oct. 14-16.

(Oct. 18, 1921). 2 flowers open-pol.with Meade and 2 with Pima, Oct. 18, 1921. Flower of Oct. 2 had capsule 1.5 cm. in diam. Oct. 18. Flowers open wider than Upland cotton, much wider than Egyptian or Sea Island. Spread nearly 2-1/2 inches at widest. Petals turn back slightly at the edge instead of being somewhat incurved as in Thurberia. Color of flowers pale yellow, paler than Egyptian or Sea Island, but far from being white like Upland. Pollen pale yellow, scarcely darker than Upland, much paler than Egyptian. Pollen-grains slightly smaller than Upland. Stigmas with prominent green vesicular oil-glands showing between the white stigmatic bands, no dark oil glands. Staminal column without oil glands (or very few and small?) contrasting with Upland and Egyptian which have numerous yellowy glands on column, among filaments.

Slender trailing shrub, drooping branches, no leaves with lobes detected after rather careful search. All entire simple, more or less distinctly cordate at base, rather variable at tip, some with small, short, rounded, abruptly decurved tip giving effect of median notch, others with flat, tapering tip, get photos.

Petal spots small composed of radial lines, streaked with yellow on veins, at least above and below, sometimes spot not solid but formed of alternating streaks. Spot does not reach margin of petal, occupies less than half the width and is separated from the base by about the length of the spot, the tissue below the spot being somewhat thickened and convex, no doubt representing the pulvinus that determines the angle of the petals in opening.

(Oct. 18, 1921). As in Thurberia the pedicels commonly are thicker than the branch that supports them. Pedicels always subtended by a reduced or rudimentary and fugacious leaf. In other words, the fruiting branches do not have functional foliage leaves as on cotton. Stamens acicular, densely pubescent, fugacious.

(Dec. 5, 1921). Involucre hairy on inside surface, and calyx on outside hairs much sparser than outside the bracts, but over whole surface Florida wild cotton has these surfaces naked except at tips of calyx lobes and along margins and teeth of bracts.

Crop of plant in greenhouse, result of hand-pollination.

4, 4, 4, 4, 4, 5, 5, 4, 4, 5, 4, 4, 4, 4, 4, 4, 4, 5, 4, 5, 4, 4, 4, 4, 4, 4, 4, 5, 3, 4, 4, 4, 4, 4, 5, 4, 4, 4, 4, 4, 5.

1 - 3-locked

32 - 4-locked

8 - 5-locked

41 4/5 of bolls 4-locked

Flowering habit very distinct from cotton or from Thurberia, but in accord with trailing habit. Ends of all of the long slender vegetative branches form simple open inflorescences by shortening the internodes and reducing the leaves. The fruiting branches with only one or two joints and leaves obsolete or much reduced, no full-sized vegetative leaves on fruiting branches as in cotton, or even in Thurberia. Hence flowering and fruiting at the ends of the stalks or vegetative branches would be feature of this genus. Has an open terminal inflorescence, but little specialized in comparison with some plants, but forming quite a definite contrast with Gossypium and Thurberia.

(Dec. 5, 1921). Habit a slender trailing shrub, rather than an erect bush like Gossypium or Thurberia.

Stipules slender, acicular, fugacious, leaving only a round or somewhat triangular scar, not a long oblique scar as in Gossypium and Thurberia.

Leaves entire, rarely with slight angles, but not lobed or incised. Leaves with distinct pulvinus at base swolleh on upper side more than in Gossypium.

Fruiting branches of only one or two joints, more slender and often shorter than the pedicels. Pedicel structure entirely distinct from Gossypium, hollow at the center, the channel surrounded by delicate shreads of weak webby parenchyma lining the walls of a cylindrical woody axis with 6 woody stales? outside of this, Gossypium has an angular woody axis without free elements outside and filled inside with persistent large-chambered parenchyma.

(Dec. 5, 1921). 2 capsules open-pod Oct. 18. One capsule not yet open Dec. 5. All capsules 4 and 5-locks.

o Stipular scar davidsonii.

Stipular scar cotton.

also stipular rim

Gossypium davidsonii

(Dec. 5, 1921). To be associated with Thurberia in absence of lint from seeds, presence of long hairs along the seam of the carpels, the slender, fugacious stipules, thickened hollow pedicels, but the involucre as in Gossypium, with triangular-cordate, laciniate-dentate bracts.

Carpels with long hairs as in Thurberia. Bracts remain green till capsules are ready to open. Leaves with petioles somewhat thickened into pulvini at both ends much as in Gossypium.

—

2 capsules crossed Oct. 18 with Pima still unopened Dec. 5, perhaps requiring longer to mature. Meade-crossed capsules appear to have fallen.

As genus agrees with Thurberia in lacking lint on the seeds, and in structure of the pedicel. Differs from Thurberia in having involucre like Gossypium. Habit, leaves, stipules, hairs different from both.

Bracts with 7-10 teeth.

Pedicels distinctly 6-angled with 3 broader faces separating as many narrow grooves. External nectaries often obsolete, usually only one present; no internal nectaries; [redacted] no intermediate bractlets.

Leaves with 3 or 4 principal veins on each side, rising from the small hairy callus. Posterior vein always close and parallel to the margin. Leaves transverse at base or distinctly but not deeply cordate. Apex short and rounded or distinctly acuminate.

Gossypium davidsonii

Could be described as Wild Cotton of Lower California ( ) after generic character had been published in Science or Washington Academy Science, but Thurberia should also be published as Wild Cotton of Arizona.

Planted in Greenhouse July 10, 1919. Came up Aug. 10 from old seed received 1900.

McKeever has other notes on young plants and specimens of angled leaves. Flowered in Oct. 1920 four flowers. McKeever collected bracts Nov. 1, 1920.

Watt refers to the fruiting branch as the "peduncle".

Gossypium davidsonii Berkely, Cal., 10-7-16, p. 225

Nectaries single, close to base 3 mm., up on leaf 5 cm. long. Style long projecting part as long as entire staminal(?) column. Stems and petioles also densely hirsute stellate. Stipules of fruiting branches rather large, narrowly lanceolate equal. External nectaries not detected. May be concealed in leaves. Short petioles, lack of lint, sharply angled pedicels with solid pith? Bracts free cordate, not different from Gossypium? Lack of lobes on leaves, for the most part. Some specimens more glabrous, perhaps on account of age. Pedicels seem to be rather sharply 6-angled at about equal distances.

Basal joint of fruiting branches very long in proportion to petioles. Capsules and seeds much like Thurberia, hairy along the fissures. Seeds with somewhat more fuzz but very short and closely appressed. Stems and branches apparently terete. No indication of bracts being deciduous more than in cotton. Strong contrast between dry stems and pedicels in the angles of the latter, but fruiting branches sometimes with a distinct angle. Some leaves rather deeply cordate, other specimens scarcely cordate, the base nearly transverse. Leaves with 5 distinct primary veins. Flowers with distinct purple spot. Seeds several in each lock. Number of locks 3-5, mostly 4 or 5.

According to original description "leaves densely hirsute-velvety on both surfaces." Petioles short, about half the length of the blade. Peduncles short, not articulated, bracts minute, linear, opposite at the base of junction with the stem, early deciduous." (doubtless refers to stipules?) Otherwise a very peculiar feature." "Involucres 3-leaved, somewhat unequal, cordate acute, cleft-dentate (7 to 10 teeth, or cleft-lobed toward the apex, 7-nerved or more; 1/2-3/4 inch long and 1/2 inch wide). Calyx cup-shaped, border repand-dentate or sub-5-toothed, dotted throughout with black glands mostly in parallel lines.

No capsules or seeds, doubtfully referred to Gossypium. Alleged that Thurberia has the peduncle articulated in the middle. Locality San Jose del Cabo.

Leaves broad with broad square lobes. Bracts all simple, like some of the very reduced bract-like leaves of Egyptian cotton. Petals on portions exposed in the bud densely covered with minute stellate scale-hairs. Leaves when entire very broadly and deeply cordate, but a large proportion have broad lobes, distinctly angled, but the angle somewhat more than 90°. Leaf-nectary single, but long and forming a distinct channel in the dried specimens. Located at the very base of the midvein. Some leaves apparently without nectary or nectary so far down as to be confused in the pulvinus, but nectary present on very small leaves. External nectaries paired, separated by a distinct vertical ridge with hairs and oil-glands (that is the ridge, the nectaries being naked.) Oil-glands of pedicels large and prominent, the surface of pedicel wrinkled lengthwise in drying, but the wrinkles fine and no distinct ridges. Pedicels probably terete in life. All the pedicels short, 1 cm. or less in length, some only .2 cm. Petioles 3-4 cm., strongly curved at the end indicating(?) along pulvinus. Compare with Thurberia.

Bracts evidently deciduous with age, like the stipules. Venation of bracts peculiar, with three rather distinct principal veins, or 3-4 separate veins on each side of the midvein, all connected with cross-veins.

Calyx apparently rather fleshy or cartilaginous in texture, sprinkled with very large black oil-glands, some in irregular vertical rows margin rather irregularly erose with occasional tufted scale-hairs. Stems and branches apparently terete.

Buds sharply apiculate  , unlike other species of cotton or Thurberia.

Capsules small with 2 seeds on each side of the chambers.

Nectaries of outside of involucre apparently very often absent, or single, but several cases of apparently double nectaries found. No inside nectaries detected.

No stipules on specimen. Scars very small and nearly round, indicating form or attachment different from other species. Habit of plant must be quite different from cotton, forming dense spreading bush or growing in clumps, according to Mr. Brandegee. According to Watt the "bracteoles" are "broadly-ovate-acuminate", but this misleading. The band of hairs at the base of the calyx inside is very broad and dense.

The very large size of the oil-gland suggests that they may be compound, or several together. They occur in nearly all parts of the plant, including the corolla, but are small there, though black. In the leaf they appear to be confined to the under surface, and are left in places where insects have eaten away everything but the inferior epidermis and the oil-glands. They are distinctly apparent on the

lower surface of the leaf but not on the upper.

Bracts measure 1.2-1.7 cm. long by .6-1.2 cm. wide, but always much longer than broad and rounded in at the base to the rather narrow insertion.

Leaves at base with deep narrow sinus and broad, evenly rounded auricles. Peculiar features the rounded slender woody stems, basal leaf-nectaries, narrow deciduous bracts. Distinct from Thurberia in broad leaves, terete pedicels, deciduous bracts, never toothed like Thurberia or like cotton. May represent blade elements alone, not stipules which are evidently near being eliminated. The bracts are like those of Thurberia in being narrow at the base, not decurrent like those of most cottons.

Petals purple at base. Filaments may have been purplish. No oil-glands in filaments, a few in connective of anthers? Style extremely long and slender, exserted more than the length of the entire staminal column, ending in a long gradually thickened stigmatic club. The style with numerous hairs, the stigmatic club with few .

Unlike Davidsonii in the long completely basal nectaries, deciduous bracts, &c. Foliage nearly glabrous, minutely hairy when young, like the petioles and stems. No seeds in the type specimen. Capsules very old. Surface of old carpels densely beset with very coarse, prominent glands. The development of glands carried farthest in this species, apparently style and stigma characters may prove

interesting. Texture of calyx likely to be different from cotton. Becomes hard and woody in the dry specimens. Some involucres have very large, simple nectaries, so that the double condition can hardly be considered as diagnostic.

Exposed parts of corolla covered with dense, felted, tuft-hairs. The specialization of this part carried further than in other species? Compare with Thurberia.

Pedicels with rather dense central pith, not a cavity.

Type collected by T. S. Brandegee, Santa Margarite Is. Lower California, March 1, 1889, with flowers, buds and old capsules. No. 109135 Herb. Univ. of Calif. Brandegee Herbarium.

Contrast with Thurberia in short terete pedicels with solid pith broad, short-lobed leaves, basal leaf nectaries, deciduous bracts. Like it in glabrous foliage, slender woody stems, &c. But this a low shrub, while Thurberia is a tall shrub or even becomes small tree.

Petioles scarcely equal to the blades. Capsules all 3-celled.

Checked RSTBW

<u>Gossypium</u> <u>davidsonii</u>

Foliage paler than cotton under same greenhouse
conditions and bracts notably paler than the leaves,
Bracts becoming nearly white as the boles mature, ~~an~~
contrasting notably with the color of the bolls, ~~though~~
~~this is not dark~~ Boll color not dark as in
Egypt[ian] cotton ~~not~~ but oil-glands ~~distinct~~ more
distinct than in upland cotton, the oil-gland
spots deeper green in young bolls, becoming black
with nearly mature boles, ~~and the also the oil-~~
~~gland~~ and still larger and more striking on
bolls that have opened and begun to

shrivel. Also the glands marked by more distinct depressions in the young bolls than in the adult bolls, ~~where the surface~~ after the surface begins to shrivel.

Calyx, ~~also~~ very pale in comparison with the boll — of the same color as the bracts,

As in cotton, the ~~p~~ grooves of the boll become deeper as maturity is approached.

Fissures of boll ~~do not open to the b~~ are formed completely to the base, though often not opening ~~of~~ lower than 2-3 mm of the base. Also the base is without oil-glands ~~found~~ within a radius of 3-4 mm of the receptacle

San Antonio Dec. 18, 1922

Gossypium davidsonii /

Capsules with 4 to 5 seeds per loch - 18 (each in two) = 4 l bolls

Only the extreme tip of the boll + base of the style with sutural grooves, but there the grooves are very distinct. The base of the style is persistent & the maturing of the boll with the both the fissure grooves and the suture grooves well marked. ~~Doubt this persistence of~~ sutural grooves in the persistent base - But so fissure grooves must run out above, while ~~fissure~~ suture grooves must separate the lobes of the stigma if these represent original pistils.

Generic Char?
Seed not borne on funicle?

Placentae of newly opened bolls show as a brownish flange widened to about 1 mm at insertions of the seeds which are attached directly to the placenta or have only a very minute rudimentary ~~funiculus~~ funicle (?) in this respect quite different fr cotton, which often has the raphe produced into a 'hard spine-like process.

The attachment of all the seeds are below the middle of the capsule

Gossypium davidsonii (oil glands) San Antonio Dec. 18, 1922

Number and distribution, size, color &c of the oil-glands of the bracts should be compared with those of cotton (upl., Egypt., & Sea I., 3) apparently the bracts are very small and scattering and light colored, often yellowish or reddish instead of black. Colors in seeds might also be compared.

Gossypium davidsonii San Anton Dec. 18, 1922

Late in season buds start in most of the leaf-axils producing 2-3 small leaves –

Gossypium davidsonii.

Foliage paler than cotton under same greenhouse conditions and bracts notably paler than the leaves. Bracts becoming nearly white as the bolls mature, contrasting notably with the color of the bolls. Boll color not dark as in Egyptian cotton but oil-glands more distinct than in Upland cotton, the oil-gland spots deeper green in young bolls, becoming black with nearly mature bolls, and still larger and more striking on bolls that have opened and begun to shrivel. Also the glands marked by more distinct depressions in the young bolls than in the adult bolls, after the surface begins to shrivel. Calyx of the same color as the bracts, very pale in comparison with the boll. As in cotton, the grooves of the boll become deeper as maturity is approached. Fissures of boll are formed completely to the base, though often not opening lower than 2-3 mm from the base. Also the base is without oil-glands within a radius of 3-4 mm from the receptacle.

Gossypium davidsonii (oil glands) San Antonio, Dec. 18, 1922.

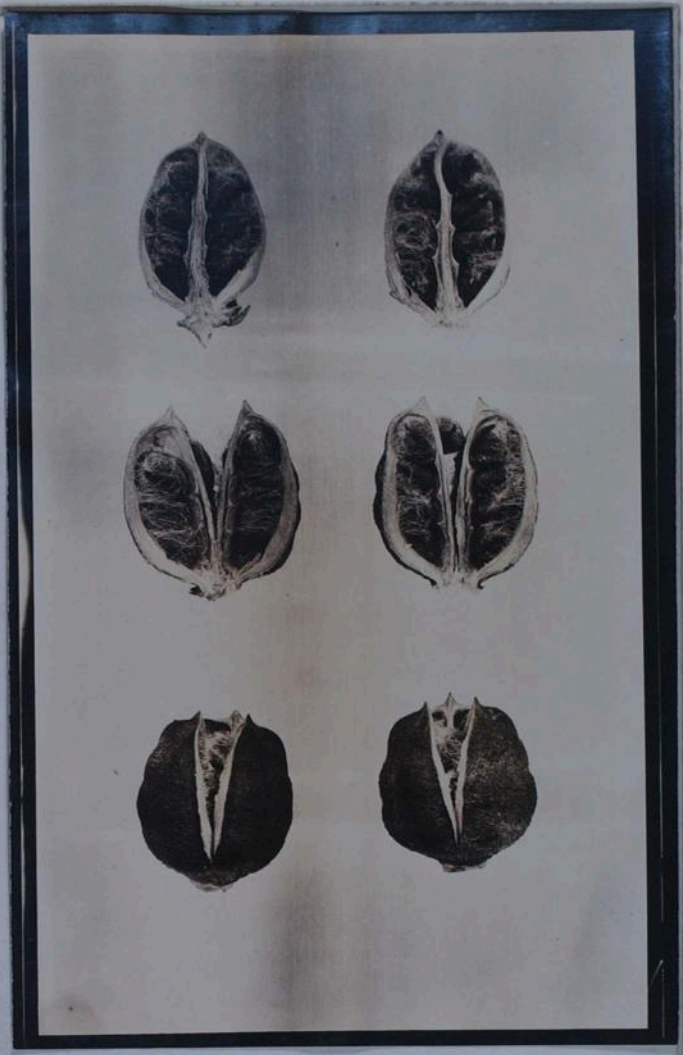
Number, distribution, size, color, etc., of the oil-glands of the bracts should be compared with those of cotton (Upland, Egyptian and Sea Island?). Apparently the oil-glands of the bracts are very small, scattering and light colored, often yellowish or reddish instead of black. Colors in seeds might also be compared.

Gossypium davidsonii San Antonio, Dec. 18, 1922.

Capsules with 4 to 5 seeds per lock. 18 in two 4-lock bolls. Only the extreme tip of the boll or base of the style with sutural grooves, but there the grooves are very distinct. The base of the style is persistent to the maturity of the boll with both the fissure grooves and the suture-grooves well marked on the persistent base. But fissure grooves must run out above, while suture grooves must separate the lobes of the stigma if these represent original pistils.

Placentae of newly opened bolls showing as a brownish flange widened to about 1 mm at insertions of the seeds which are attached directly to the placenta or have only a very minute rudimentary funicle (?) in this respect quite different from cotton, which often has the raphe produced into a hard spine-like process. Generic char.? Seed not borne on funicle. The attachment of all the seeds are below the middle of the capsule.

Late in season buds start in most of the leaf-axils producing 2-3 small leaves.



Thurberia. According to Ulbrich, Bot. Jahrb. 50 supp. 362, this genus has white or red flowers, with a caudate-truncate calyx. Ovary globose 3-parted with the divisions incompletely chambered with 6-8 ascending almost reversed ovules. Style undivided with cylindrical three lobed stigma. Capsule 3-locked with 5-8 seeds in each lock, the sections woolly on the margins. Seeds angular obovate, with crustaceous thin-woolly shell. Embryo laid together with black punctate cotyledons. Gossypium is supposed to be 5-locked. No reference to 3-locked or 4-locked.

The chambered locks of Selera and partly chambered of Thurberia represent specializations or primitive conditions depending on whether the lock is taken to represent the carpel or not. How are the locks related to the stigmas? Present partitions may represent midrib of carpels with approximating margins taken out so that locks may represent halves of two carpels.

Selera Ulbrich in Verh. des Botan Vereins der Provinz Brandenburg, 54 Jahrg. Heft. 1, p. 50. Abbildung Heft. 2. Translated from Bot. Jahrb. 50 supplement, 1914, p. 362.

Erect sparsely branched herb or low shrub with the habit of Gossypium, with variously shaped, mostly 3-lobed leaves, oval above and deeply cordate at the base, and large campanulate reddish flowers with large firm involucre of three simple oval bracts united at the base completely, covering the truncate cup-shaped calyx. All of the floral parts thickly punctate with black glands. Ovary conic, 3-locked, the locks chambered, each chamber with 3-4 ascending reversed ovules. Style deeply 3-parted with decurrent stigma. Fruit a 3-parted woody capsule with 1-2 seeds in each division; the sections naked, long-pointed above. Seeds angular obovate, with long-haired shells; embryo folded together, with black punctate cotyledons. One species in Mexico S. gossypioides Ulbrich, in the State of Oaxaca on dry hills.

Gossypium (Relatives)

Erioxylon

Seeds compressed angular elongate, with a distinct prominent naked raphe. Funiculus long, hairy like the surface of the seed. Hairs rather long, but all of one kind? Pale buff color.

Capsule with a few weak fibers along the edges of the seams. Lining thin but coriaceous, smooth and shining within, sometimes separating from the other layers.

Involucre consisting of three minute, simple triangular bracts, less than half as long as the calyx, with a deep transverse nectary at the base.

Staminal column, filaments and anthers with few or no oil-glands. Filaments long.

Pedicel very short, much shorter than the calyx, densely hairy, grooved between the bases of the bracts.

~~Thurberia~~ at Agua Caliente near Tucson has long attenuate ~~alternate~~ tips on large leaves of the main stalk which also have 5 very strong lobes. Does not this leaf-form attain same development as Gudelajara? Spec. in Dr. Rose's collection from Mexico? Mr. Coad thinks he has seen Thurberia with yellowish flowers in Arizona. Also tells of a broad leaved form seen at Pima Canyon, but could not find specimen. Inquire if he found another or perhaps write to him about it. Send copies of papers, also seeds of Durango and Egyptian cotton for planting next year.

Note

Thurberia seems to produce fruiting branches from subaxillary buds of fruiting branches. The branch arises on the opposite side of the axillary bud, away from the boll, and may represent the development of a bud from the base of an undeveloped vegetative branches. The same interpretation applies to cotton. Some of the secondary branches that arise on fruiting branches represent whole vegetative branches and ~~have~~ have no bud at the base, while others ~~have~~ have bud at base and doubtless represent basil branches, which should be fruiting branches, on the theory that they are branches from vegetative branches.

Thurberia has much narrower, much more promptly decidrous stipules that show no indication of completely encircling the end of the internode with an interstipular rim.

The pedicels relatively long and slender, and are distinctly triquetrous, but with the angles having two de-

current ridges, thickened above and bordering the deep grooves in which the nectaries are located.

In volucre composed of three narrow, simple, stipuliform bracts, not covering the young bud. Thus the bud is more exposed to drying out if injured and less suited to being parasitized by the weevil. Also the bud is very promptly deciduous, the pedicel end us a fleshy pulvinus, more highly developed than the base of the pedicel of cotton.

Capsule finally deciduous by separation at the top, not deeply splitting and folding back as in cotton. Sutures not in grooves, firmly united at the tips, but rounded and not ~~speculate~~ aveolate like cotton where the carpels extend gradually into style and a projecting tip is left after the style has disappeared. Base of style's much more abrupt in Thurberia leaving smoothly rounded capsule.

Comparison with Egyptian cotton shows a very much stronger development, in Thurberia, of the fringe of hairs that lines the base of the calyx, that is of the longer tapering hairs. There is also, below this fringe, a rim of short hairs, flattened or perhaps glandular hairs, as in the Egyptian cotton. Are these not papillae like those of the nectaries, in some of the Upland cottons?

Thurberia has the folias nectaries single, even on the large 5-lobed leaves, and closer to the base of the midvein than in cotton. The midvein is distinctly thicker below the

nectary than above, instead of being broadened at the nectary, as in cotton. On large deeply divided leaves the middle lobe is separated nearly to the level of the nectaries, but many of the smaller leaves are not so deeply cut.

Returning to the positions of the buds and branches, the bud appears in an axillary position when no secondary fruiting branch is developed, but when the branch develops it pushes the bud back out of the axil, the base of the secondary branch taking the position between the bud and the next internode of the primary branch.

The bracts have 5-6 longitudinal veins, while in cotton there are 15-20 veins, with numerous teeth, while in Thurberia there are only 3 teeth, and these not usually present. None noticed on the Thurberia at Agua Caliente.

Ends of vegetative branches finally become short-jointed and terminal buds abort, leaving a cluster of short fruiting branches like a compound terminal inflorescence. Some flowers have pale pinkish spots near the base of the petals, as in some types of cotton, though usually not in Upland type. Occasionally has 4-bracted involucre like cotton. One shown on bud photographed at Bard, Oct. 14, 1914. Thurberia capsules 3 and 4 locked, never 5-locked, but many cottons also not 5-locked. Photos show buds never enclosed in involucre. Bracts divergent instead of appressed to form closed involucre.

With reference to the structure of the pedicel Thurberia may be considered as less differentiated than cotton, for the veins that are decurrent from the bases of the bracts are still distinct, while they are fused or obscure in cotton. The middle vein is almost suppressed but is often distinguishable below the nectary, in Thurberia. The separation of the veins to run down the angles of the internodes from the bases of the leaves is the same in Thurberia as in cotton, but on the pedicels there is a distinct difference worthy of being taken int-o account in generic diagnosis. In general the cross section of the pedicel is triangular, but the angles have two ridges or veins, with a fine groove between. The pedicels of Thurberia are also hollow, while those of cotton have a firm central pith like the branches. The branches of

Thurberia have the internodes filled with pith but not the branches. The structure of the vascular system also seems to be different. Perhaps sections should be cut. See Dr. Mann.

note

Cotton (Thurberia)

Jatropha cardiophylla Torr.

"Bush with habit of cotton (somewhat); common in Papago country, Arizona, October 17, 1914."

Specimen turned over to Mr. Maxon.

Cotton (Thurberia)

List of Plants Collected on Thurberia Trip,
Ventana Canon near Tucson, Arizona, Oct. 30, 1912.

Erythrina flabelliformis Kearney

Acacia greggei Gray

Acacia constricta Benth.

Acacia constricta

Quercus sp.

Specimens turned over to Mr. Maxon.

Cotton (Thurberia)

COPY
htm

ARIZONA COMMISSION

of

Agriculture and Horticulture

Office of State Entomologist

Phoenix, Arizona.

Sept. 28, 1914.

Mr. O. F. Cook,

c/o Prof. Geo. F. Freeman,

Experiment Station,

Tucson, Arizona.

Dear Prof. Cook:

Mr. McLachlan called at my office to-day and informs me that you will be in Tucson in the course of a few days. As he thought that you would be going to McCleary's I am writing you in regard to my trip in August. At Mr. McLachlan's request, and in accordance with an understanding with Mr. Swingle, I placed some live weevils in the little bed of Durango, Egyptian, and wild cotton near Mr. McCleary's camp. I made observations on the 32 adults which I placed near this cotton and arranged with Mr. McCleary to pick off all of the squares of the three kinds of cotton and mail them to me about ten days after my visit. Unfortunately, the cultivated cottons had but few squares, only three being in the lot Mr. McCleary sent me. None of these three showed weevil punctures. Of the 16 squares from the wild cotton all but six had been punctured

by the weevils with a total of 35 punctures. Since there were 11 stalks of Egyptian cotton and 12 stalks of Durango cotton as against only four stalks of wild cotton it would appear that the chances of the three squares of cultivated cottons being injured by the weevils would be much greater than the chances of the wild cotton squares considered as individuals. I am writing especially to suggest that you examine every boll and square in the little patch near Mr. McCleary's camp and record the number of weevil punctures as well as of weevil larvae, pupae and adults inside of these squares and bolls. This will supplement the records which I have. I will be glad to give you a complete copy of my notes made on August 17th and 18th if you desire it.

Hoping that you will find it convenient to call at my office when you are next in the Salt River Valley, I remain,

Yours very truly,

(signed) A. W. Morrill,

State Entomologist.

Sacaton Ariz., Oct. 6, 1914.

Dear Mr. Morrill,

Your favor of Sept. 28 reached me here this morning, being forwarded from Tucson. I called at Professor Freeman's office last Saturday, but he was away in the mountains. I did not attempt to visit the experiment at Mr. McCleary's, on learning from Professor Thornber that Mr. McCleary ~~he~~ was not at home. It may be that McCleary & I can make the trip a little later, and in that case I shall go over the plants carefully, as you suggest. I appreciate your offer of the notes of your previous observations and shall be glad to cooperate in any way. I shall

We went out to Agua Caliente and saw Mr. Cond and ~~his the~~ his plantings of upland cotton.

probably come to Phoenix, at least
for a day and shall hope to
find you at home -

Yours sincerely,

O. F. Cook.

Has Aphis at McCleary's Camp. A few in bottle for identification. Note the general fact that the insect fauna of interest from the standpoint of other pests than the boll weevil. Refer to list of insects from Thurberia. Would be well to give list of all the papers published with reference to Thurberia.

Greater tendency to abort; also drier climate prevents weevils breeding in buds. Apparently lack this instinct. of Coad's work. Also interferes with hybridization. Shou d be triedon cotton.

Grown by the side of Egyptian and Durango cotton at McCleary's W.B. (P.O. Helvetia). No weevil injuries with p possible exception of one Egyptian boll in which some parasites had evidently bred, but now emerged. Boll had nearly ripened and lint was developed. Place within a few rods of wild Thurberia on which weevils breed. Some capsules were gathered and placed close to cotton, to insure proximity on emergence, but many of these weevils did not emerge. Weevils found in larva stage on plant less than a rod from the cotton. The plant was plant d

Egyptian plants.

No. 1. Not fruiting.
No. 2. Has bud large enough for weevil puncture, uninjured.
No. 3. Has full grown boll with numerous punctures not sealed, evidently some other insect. Next from bottom up a withered flower, no injury. Next a large bud, no injury.
No. 4. Half grown boll. No injury. Next above a very young boll. No injury, large bud; no injury.
No. 5. Large bud; no injury.
No. 6. A falling flower with the young boll punctured from the side through the bract and calyx. The puncture did not reach cavity, evidently the work of weevils. Hairs on suture distinct. Next a large bud uninjured. Small bud weevil puncture size, uninjured.
No. 7. Very small bud; no injury.
No. 8. Large bud; uninjured; numerous ants in involucre.
No. 9. Not fruiting.
No. 10. Not fruiting.
No. 11. A two-locked boll nearly mature; not injured.

Durango plants.

No. 1. Nearly mature boll, uninjured. Small boll uninjured.
No. 2. Mature boll, with what looks like a puncture on one dissepiment, proliferated inside. If a weevil puncture must have been an old one. No larva; stamens and ovules withered. (No larva developed. Aborted fallen boll & no puncture)
No. 3. A very small bud, uninjured.
No. 4. Ripe open boll; no injury.
No. 5. Abnormal involucre, bud aborted, no injury. Very small bud, no injury.
No. 6. Half grown boll, not injured. Flower very small, but uninjured. The above on a vegetative branch, also the following. Very young boll uninjured. Third vegetative branch also with very small boll, uninjured.

uninjured. On main stalk nearly mature boll, uninjured. Very young boll, uninjured, large bud uninjured.
No. 7. Mature open boll. One lock defective with carpels with very small proliferations in several places by punctures of some other insect. No indication of weevil larvae.
No. 8. Very small boll on a short vegetative branch uninjured. Another small boll on a fruiting branch also uninjured.

The bolls called large in the above are all larger than the stage for breeding weevils, the small bolls represent this stage, and the very small bolls are large enough for the weevils to feed upon, but not for the weevils to breed in. Mr. McCleary has already picked 12 Durango bolls from these plants. No weevils bred in these bolls.

Two plants in box. One Egyptian with nearly mature boll uninjured.

The other a Durango with a very young boll uninjured. A larbe bud uninjured, a small bud uninjured, another small bud uninjured, a falling flower uninjured. A large bud uninjured, a small bud uninjured. The above on branches. Two small bolls on main axis uninjured.

Pedicels with 9 longitudinal ridges, the middle ridge being usually distinct. In cotton there seems to be no sign of the middle ridge and the lateral ridges are fused, as far as surface indications go. The shape of the cross-section might be described as subtriangular with the angles truncate. There is seldom an indication of salient ridges or distinct grooves between.

Pedicels hollow, subtriangular, rather slender but often borne on more slender internodes, somewhat thicker at the base, strongly thickened above and bearing three transversely oval or subquadrate nectaries in deep depressions of the three faces, the pits extending below into a deep longitudinal groove bounded on each side by a longitudinal ridge, and often with a median ridge between the others, making 9 longitudinal ridges in all.

In cotton the pedicel is subtriangular with the angles subtruncate. The ridges at the angles are not prominent and there is no distinct median ridge. Thus the pedicel is more modified externally from the condition of a leaf with its three decurrent ridtes or bundles.

In comparison with Durango cotton - very large plant three years old at Bard, larger stalks lived through the winter this year, and put out early crop. Very abundant late crop now on, with thousands of capsules, stamens with simple filaments and anther cells simple, instead of with filaments or anther cells frequently united. Anthers dehiscent long before anthesis. In all the buds down to very small ones the anthers have opened. The connective has large yellow glands, apparently not present in cotton. Oil glands are also more numerous in the staminal column and in the filaments, as well as in the teeth at the end of the staminal column.

Petals obliquely obovate instead of triangular as in cotton, the side that is exposed in the bud being much shorter than the other, and rounded off so as to pass gradually into the outer margin instead of having a prominent corner as in cotton. The bud becomes globose before anthesis instead of subcylindric or long oval as in cotton, where on whole side of the triangular petal is exposed before anthesis instead of a very short side. The exposed margin is only half as long as the other instead of being subequal as in cotton. The petals are also strongly convex without and concave within and open widely to form a broad saucer shaped or rotate corolla, while the cotton flower is deeply cup-shaped or tubular. The opening of the Thurberia flower is due to the presence of a stronger pulvinus at the base of the petals, indicated by a cluster of

oil-glands visible on the inside, not shown in the Durango cotton.

Absence of stipular rim may mean that stipules are not dimorphic in their genus as in cotton, where those of fruiting branches are different from those of main stalk. Compare more carefully at Bard.

The pedicels even in the flowering stage are commonly thicker than the branches that bear them. The central channel is free but lined with loose webby strands projecting somewhat from the walls. The other internodes small and large have a permanent pith. Petioles also with solid pith.

Susceptibility to forst indicates that places where Thurberia is not killed back must be protected against low temperatures, or that plant is perhaps more hardy where thrown into dormant condition. Relatively slow increase of on outside indicates that four inch trees must be more than twice the age of two inch.

Thurberia (As tree) Sacaton, Ariz. 10-10-13, p. 67

Where not killed back by frost. The branches die back only a few inches and put out new shoots that bear flowers and fruit.

Flowers at Fish Creek with faint reddish spots at near bases of petals; corolla very broadly expanded becoming nearly rotate, the flowers really flat in the middle with only the margins of the petals upcurved. Corolla boardly saucer-shaped as in Upland cotton or tubular as in Egyptian cotton.

Corolla white, not yellowish or even distinctly creamy in tinge, becoming pinkish on the second day. But surfaces exposed in the bud are pinkish or reddish before the flower opens. Specimens of bud in alcohol. Also young bolls.

Buds exposed from the first not enclosed or wrapped up in an involucre. Dentate enclosing involucre of cotton genaric character seperatesupland cotton from Thurberia. Buds and corolla photo at Fish Creek. Lack of function of involucre in Thurberia except to bear nectaries.

Thurberia (as a tree) Mesa, Ariz. Oct. 7, 1913, p.61

Dimensions observed at Tucson much exceeded at Fish Creek. Two measured with circumference of 12 inches, and with branches 6 1/4. Bark of young trees and branches of old, with smooth grayish brown bark roughened only with scattered transverse lenticels, but old trunks becoming rimose longitudinally and distinctly roughened. Ten annual rings and upward, of very variable thickness showing seasonal vicissitudes doubtless. Specimens of base of trunk about 2 in. in diameter and branches of same tree to show difference of bark texture. The wood is of rather firm texture and white in color.

The habit of the plant is to branch from near the base but there is usually from one to three feet of clear trunk. No branches are sent up from the ground or from very close to it.

Thurberia found in a belt beginning at Fish Creek Canyon and extending for about five miles along the automobile road toward Mesa, including the top of the mountain and a part of the descent on the other side, to about 19/41 mile post, 19 miles from Roosevelt and 41 miles from Mesa.

The area is mostly extremely dry and rocky, and the present season has been apparently, unusually severe. Last year the crop of fruits must have been vastly larger, to judge by the display of old capsules still standing, which are much more numerous than those of the present year. Many of the plants that bore heavily last year are not flowering, or have only a few late flowers. Many have only a few leafy shoots near the base. Perhaps sever freeze of last winter may have contributed or it may be on account of an extremely dry season. The present crop of Thurberia capsules is very much smaller than last year. If dry weather is admitted as the cause, it might explain also the apparent absence of the weevils. Indeed such a set-back of the plants may make the weevils very scarce for two or three years. Hence it is hardly safe to assume that none exist because of failure to find them this year.

Began flowering at Bard about the middle of September. Plant about 9-10 ft. high. Last year about 5 ft.

Thurberia Sta Rita Mts., Ariz., 10-21-14, p.681

Very abundant on both sides of canyon with water course above McCleary's.

Thurberia (Seedlings) Sta Rita Mts., Ariz., 10-21-14, p.679

Very abundant on banks of creek above McCleary's Camp. First leaves simple, stalk 6-angled, by the decurrent leaf-bundles. Buds in the axils of the cotyledons. Plants grow usually as single stalks for 10-12 internodes or longer and branch afterward.

At McCleary's the Thurberia seems to have longer and more slit-like nectaries than noticed in other places.

Blair states that the three year old plant at Bard produced two crops of flowers and fruits this season. Mr. Coad states that the bolls with the contained weevils are likely to be broken off and washed down by freshets in the mountain streams at any time of year. He does not have the idea that the old capsules stay on the plants regularly till softened by the summer rains, or that the weevils can be supposed to estivate regularly till then.

~~Cotton (Bolls)~~ Bard, Cal., 5-10-12, p. 5

Thunberia

Only three-locked bolls seen in Ingenhousia at Tucson, May, 1912.

Capsules all three-locked at Tucson.

Thurberia

San Antonio, Texas. 9-10-16. p.132.

A good plate published by Torrey, United States and Mexican Boundary Pl. 6. Two localities mentioned in Sonora (p.40) and "algodoncello" as the Mexican name. Doubtless meant for "algodoncillo."

Plant at Bard grown very large, with five woody trunks one to three inches in diameter, one ten feet high with equal spread. Thousands of capsules said to be three crops in a season. External nectaries large and continuing active on the fruits. Visited regularly by . . . bees, wasps, and other insects. Proportions of lobes of leaves more like those of Sea Island cotton or "okra" variations of Upland. Not sure thatseeds should be described as without lint. A few long fibers of very fine webby texture seem to be attached around the microphyle. There is a long raphe or seam making a distinct ridge.

Plant photographed last year at corner of tennis-court was killed to ground in winter, but has grown a new top larger than last year. But no sign of fruit buds at this date (July 11). The nectaries are often very prominent with a broad oval depression and a thick raised rim, but found only on mid-vein.

Seeds sink promptly in water. Does cotton with naked seeds sink? Meloy says they do.

Thurberia

~~Umberia~~

See if hollow pedicel appears a distinctive character also distinct ridges of surface and their relation to decurrent bundles of the leaves.

Oil-glands of leaf-tissues yellow (like those of cotton flowers, etc.) but a few glands in the tissues of the midrib and smaller veins are black.

The petioles are sub-quadrangular, with distinct ridge above and somewhat more obtuse ridges on each side and below. This character is shared with the American cottons, but the ridges are much less pronounced so that the petioles are nearly terete.

The internodes of Thurberia are much more strongly angled than those of American cottons, the three ridges from each leaf being very prominent and separated by broad grooves. The ridges from the stipules stop at the next two internodes below, while that from the petiole runs down to the third leaf below. Thus the stem of Thurberia if cut transversely just below an internode shows a somewhat unequally hexagonal section. Cotton has the ridges less distinct and often appearing fused into four or five.

Has the stipules more reduced and more definitely deciduous than in the American cottons. Rhe ridge running up to the stipule is very prominent and under the stipule makes a sharp turn toward the base of the petiole.

Capsules on large plant raised in 1917 estimated, on vegetative branches 20 x 80=1600 and 30x10=300=1900. Old trees most be capable of bearing 3000- 4000 capsules. Thurberia is attached by leaf miners, the same as cotton, but the burrows seem to be more regularly confined to the tissues along the principal veins. The large tree is now nearly leafless, while the small one is only beginning to drop its leaves. It has produced in recent years two distinct crops of leaves, one from spring blossoms and another from blossoms in late summer, the second crop now mostly open. The young plant is shedding its outer bark, exposing a rough rusty brown coating underneath. Not apparent in cotton which shows prominent lenticels.

The bulbous bases of the pedicels are often nearly twice as thick as the internode below, but the internode is abruptly expanded at the end to provide for the insertion of the pedicel. The pith cavity of the pedicel sometimes has masses of pith tissue detached at either end, as though having failed to elongate when the structure grew.

Beginning at the 3rd or 4th node above the cotyledons the large plant produced vegetative branches for 24 nodes, only a few of the branches failing to develop. Then for 11 nodes no branches were produced, then a small fruiting branch followed by 3 more vacant nodes, then fruiting branches for 35 nodes, with a single skip. Small vegetative branches were also produced with three of the lower fruiting branches beginning with the third fruiting branch, that is, after the formation of fruiting branches became well established. The largest fruiting branch with 9-12 joints, but usually producing bolls on only 3-5 of the terminal joints, often producing vegetative branches from joints 2-6, but not with regularity; these vegetative branches sometimes with 8-10 joints and several small fruiting branches bearing 1 or 2 bolls apiece, so that the ends of these vegetative branches on the fruiting branches may exceed those of the primary fruiting branches.

Largest fruiting branches on the lower primary vegetative branches with 7-8 nodes, seldom branched again and then with branches of only 1 or 2 internodes which is true also of the shorter fruiting branches near the top of the plant.

Fruiting branches of Thurberia quite long on luxuriant young plant at Bard. Branching not infrequent, and then like cotton in that vegetative branches are produced. This is plain enough when these branches are large and produce fruiting branches of their own. When small they appear one-jointed like small fruiting branches, as often in cotton

Lacks internal calyx nectaries. Base of pedicel large, bulbous, smooth. Apex broad, 6-ridged with nectaries in deep depressions, a smaller ridge below the nectary making 9 ridges in the upper part of the pedicel, but below the level of the nectaries. The base of the pedicel is usually larger than the branch that bears it. Involucre of three narrow, widely separated bracts, simple or three tooth, with the apex and teeth sharp-pointed. Other generic characters absence of lint, the seed having only sparse fuzz, and strongly developed fibers along the dorsal sutures of the carpels. Texture of seed, with hard shell another difference.

A large, well-grown plant at Bard about 7 feet tall with numerous vegetative branches;above these a simple space and then fruiting branches. Ends of internodes distinctly enlarged to provide for insertion of pedicel.

Flowers abundantly and becomes quite ornamental at Tucson, according to Prof. Thornber. Extremely productive of seed-pods. Grows to large size and droops over like cotton where the conditions favor luxuriance.

DATA ON THE YIELD OF THURBERIA (#1) FROM BARD, CAL. 1918.

This plant is the smallest of the three on which these notes were taken and is the nearest one to the Office.

The total number of bolls 801 distributed as follows - 1 2-lock, 792 3-lock and 8 4-lock bolls. Total number of seeds 5266 with the weight 133.12 grams.

Tabulated data of seeds per lock in 3-lock bolls.

No.	locks			total	abor.	Wt.
1	6	6	6	18	0	.45
2	4	5	6	15	0	.22
3	6	6	4	16	0	.41
4	6	6	7	19	0	.44
5	5	5	6	16	0	.43
6	6	5	5	16	0	.17
7	5	5	4	14	0	.34
8	5	5	6	16	0	.33
9	4	5	5	14	0	.40
10	5	5	6	16	0	.42
11	5	4	5	14	0	.33
12	6	6	5	17	0	.40
13	5	5	5	15	0	.37
14	6	5	6	17	0	.42
15	5	5	5	15	0	.32
16	3	3	3	9	5	.20
17	6	5	4	15	0	.41
18	6	5	5	16	0	.33
19	5	7	7	19	0	.48
20	6	5	4	15	1	.26
21	5	5	3	13	1	.22
22	2	3	4	9	4	.24
23	7	3	4	14	5	.28
24	3	4	5	12	1	.25
				360	17	8.12

Tabulated data of seeds per lock in 4-lock bolls.

	locks			total	abor.	wt.
4	5	3	7	19	1	.47

Thurberia #1.

Weights of 20 100-seed samples.

1	2.50
2	2.63
3	2.49
4	2.51
5	2.62
6	2.54
7	2.47
8	2.56
9	2.55
10	2.51
11	2.53
12	2.53
13	2.56
14	2.53
15	2.54
16	2.60
17	2.60
18	2.51
19	2.53
20	2.54
	50.85 grams.

DATA ON THE YIELD OF THURBERIA (#2) FROM BARD, CAL. 1918.

This is the large plant near the tennis court.

The total number of bolls, 2912 distributed as follows 2874 3-lock and 38 4-lock bolls. Total number of seeds 34,418 weighing 843.78 grams.

Tabulated data of seeds per lock in 3-lock bolls.

No.	Locks			Total	Abor.	Wt.
1	5	5	4	14	1	.41
2	5	5	6	16	0	.48
3	6	5	3	14	1	.37
4	4	3	5	12	2	.30
5	4	4	5	13	0	.36
6	5	4	6	15	0	.34
7	5	6	4	15	0	.41
8	5	3	4	12	2	.24
9	4	4	5	13	0	.36
10	3	5	5	13	0	.32
11	6	5	3	14	0	.39
12	7	4	5	16	2	.45
13	6	5	7	18	1	.44
14	6	6	5	17	0	.42
15	6	6	6	18	0	.52
				220	9	5.81

Tabulated data of seeds per lock in 4-lock bolls.

No.	Locks				Total	Abor.	Wt.
1	5	5	5	5	20	1	.50
2	6	7	4	3	20	3	.50
3	5	5	6	5	21	1	.39
4	6	3	5	4	18	1	.48
5	6	6	4	5	21	1	.61
6	5	5	6	7	23	0	.59
7	6	6	5	5	22	0	.55
8	5	5	3	2	15	0	.42
9	4	5	5	6	20	1	.49
10	6	6	5	4	21	0	.52
11	5	2	2	1	10	1	.28
12	4	3	3	1	11	3	.24
13	5	5	5	3	18	3	.38
14	5	6	4	5	20	1	.51
15	5	6	6	6	23	0	.51
					283	16	6.97

Thurberia #2.

Weights of 20 100-seed samples.

1	2.50
2	2.56
3	2.48
4	2.54
5	2.52
6	2.59
7	2.52
8	2.53
9	2.58
10	2.47
11	2.54
12	2.51
13	2.59
14	2.63
15	2.49
16	2.61
17	2.56
18	2.54
19	2.54
20	2.57
	50.87 grams.

DATA ON THE YIELD OF THURBERIA (#3) FROM BARD, CAL. 1918.

This plant is the one nearest to the bunk house. It is intermediate in size between Nos. 1 and 2.

The total number of bolls, 1479, distributed as follows, 1463 3-lock and 16 4-lock bolls. Total number of seeds 17,893 weighing 480.51 grams.

Tabulated data of seeds per lock in 3-lock bolls.

No.	Locks			Total	Abor.	Wt.
1	6	6	5	17	1	.44
2	5	5	5	15	0	.38
3	5	1	4	10	5	.20
4	6	6	6	18	0	.47
5	5	4	5	14	1	.29
6	6	4	6	16	0	.43
7	5	4	5	14	0	.34
8	6	5	5	16	0	.36
9	5	5	5	15	0	.37
10	6	6	7	19	0	.47
11	6	5	6	17	0	.43
12	5	5	5	15	0	.40
13	5	5	6	16	0	.44
14	6	6	6	18	0	.51
15	6	5	6	17	0	.44
16	5	5	5	15	1	.42
17	6	5	4	15	0	.38
18	4	4	5	13	2	.39
19	5	5	6	16	0	.35
20	6	6	7	19	0	.44
21	4	6	5	15	1	.36
22	5	6	7	18	0	.37
23	5	5	5	15	2	.33
24	5	5	5	15	0	.37
25	5	6	6	17	0	.39
26	6	6	5	17	0	.43
27	5	5	4	14	0	.31
28	6	6	5	17	0	.42
29	6	5	5	16	1	.43
30	5	5	6	16	1	.41
31	5	4	4	13	1	.36
32	4	5	6	15	0	.40
33	5	5	6	16	0	.37
34	5	5	4	14	0	.32
35	5	6	7	18	0	.43

Table of 3-lock bolls continued.

Thurberia # 3.

No.	Locks			Total	Abor.	Wt.
36	6	6	7	19	0	.46
37	6	6	6	18	0	.40
38	6	6	5	17	0	.45
39	4	4	6	14	1	.34
40	4	4	5	13	0	.31
41	6	6	5	17	0	.41
42	6	7	5	18	0	.43
43	5	5	6	16	0	.44
44	6	4	7	17	0	.42
45	6	6	5	17	0	.47
46	5	6	6	17	0	.44
47	7	6	5	18	0	.49
48	6	6	5	17	0	.45
49	7	6	5	18	0	.48
50	7	6	5	18	0	.44
				805	17	20.08

Tabulated data of seeds per lock in 4-lock bolls.

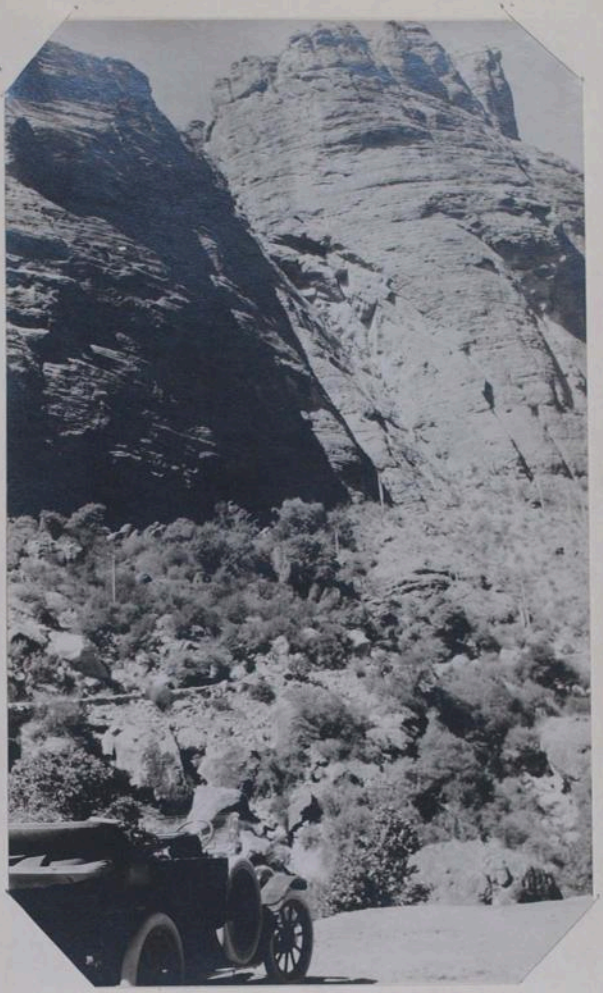
No.	Locks				Total	Abor.	Wt.
1	6	4	6	4	20	0	.50
2	5	3	4	5	17	0	.43
3	6	5	4	5	20	0	.53
4	6	7	6	3	22	1	.56
5	5	6	4	3	18	1	.41
					97	2	2.43

Thurberia # 3.

Weights of 20 100-seed samples.

1	2.40
2	2.34
3	2.45
4	2.38
5	2.40
6	2.47
7	2.45
8	2.39
9	2.43
10	2.42
11	2.47
12	2.43
13	2.43
14	2.46
15	2.48
16	2.49
17	2.46
18	2.40
19	2.45
20	2.47
	48.67 grams.

Ingenhousia
&
Thurberia
Angeles Calif.



Station of Thurberia in Fish Creek Canyon, among the loose boulders between the roadway and the base of the cliff. View across the canyon from bridge approach.------ Photograph by Mr. G. B. Gilbert.

Branch of Thurberia thespesioides showing several leaves, a floral bud, an open flower and a young boll. Roosevelt Road, Fish Creek Canyon, Ariz.

A Wild Relative of the Cotton Plant in Arizona.

The wild relatives of our cultivated plants are of much interest, and often of practical importance from the standpoint of breeding. The interest is not limited to the possibility of creating new forms by hybridization. By affording a basis of comparison with the domesticated species it becomes possible to secure a better understanding of the relations of the different characters and possibilities of adaption. And it is chiefly from to know how the related species or genera have varied is the best intimation of the tendencies that are likely to be found in any domesticated species.

The wild relations also afford the most reliable evidence regarding the origin of the domesticated forms. It is chiefly from this standpoint that attention has been given to the cotton relative that grows in Arizona. The plant is not new from the botanical standpoint. It was described by Asa Gray in 18 under the name Thurberia Thespesioides, but is believed to be the same as a plant described still earlier from Mexico as Ingenhousia triloba. This older name, applied by Sesse and Mocino in 18 must be used in accordance with the law of priority recognized in botanical nonenclature.

Ingenhousia a Close Relative of Cotton.

On account of the great multiplicity of cultivated species and varieties and the readiness with which they escape into a wild condition in many tropical countries it has been a matter of much difficulty to determine the origin of even the most important of the cultivated types. Without indications regarding the origins of desirable types we do not know where to look for others that may be still more desirable or with adaptions to special conditions.

Notwithstanding the very great industrial and commercial importance of cotton, we are still far from knowing whether the varieties now being cultivated in the United States are the best for our purposes. The recent introduction of valuable new types for Tropical America shows the desirability of further investagation of tropical types of cotton. Ingenhousia is of special interest in relation to the question of origin because it seems to be the nearest relative of the cotton plant outside of the genus Gossypium to which the cotton plant belongs. With any of the species of Gossypium it is difficult to deny the possibility of transportation by primitive man, but the seeds of Ingenhousia though covered with short hairs are quite devoid of anything that could be described as lint or putto any possible use as a fiber. Hence there is no reason to suppose that human agency has figured in the distribution of Ingenhousia.

Ingenhousia and the Origin of Cotton.

The fact that Ingenhousia is an American plant is one of the best reasons for believing that the cotton also is of American origin. The whole Central American region, including the tropical portions of Mexico, abounds in apparently indigenous varieties of cotton of the Upland and Sea Island types. These varieties are too numerous and too definitely localized to have been introduced since the time of the Spanish conquest.

That the Ingenhousia is not confined to Mexico but exists also within the borders of the United States, means that the cotton growing districts of the Southwestern States must be included as a part of the general region which may have been the native home of the cotton plant. The Hopi Indians of northern New Mexico still cultivate an apparently indigenous variety of cotton, and the same was true of the Pima Indians of Central Arizona, until a few decades ago when white traders began to them with machine made fabrics. Cotton is also supposed to have been cultivated and manufactured into cloth by prehistoric inhabitants of Arizona who constructed extensive irrigation works in the Salt River Valley.

It also appears probable from the archeological and ethuological evidence, that the primitive agriculture of Arizona and New Mexico formed a part of the ancient agricultural civilization of the plateau region of Mexico. The existence of ancient remains in many localities not to have had an Indian population in recent times show a much wider range of agricultural occupation in prehistoric times. Whether this was made possible by more favorable climatic conditions or because there was a higher development of the art of agriculture is a debated question. But in any event it is not unreasonable to suppose that the ancient cotton culture of the Southwestern region was at some time much more continuous with that of other prehistoric populations in Mexico. Such a continuity of cotton culture in ancient times would have made it possible for the parasites of the cotton plant including the boll weevil to extend their distribution into the Southwestern States, long before the recent invasion of the Cotton Belt by way of Texas.

These considerations may enable us to understand what must otherwise appear as an altogether mysterious fact that the Ingenhousia plants of the Santa Catalina Mountains to the north of Tucson are infested with boll weevils.

It appears altogether improbable that these weevils could be the result of any recent introduction from Texas, for even in the Cotton Belt the weevils have shown no marked tendency to distribute themselves more rapidly along railroad lines, the western limit of cotton culture in Texas is over 30 hours distant from Tucson. The mountains north of Tucson are several miles away from the town which would still further diminishes the chances of any insects that might be carried to Tucson reaching the Ingenhousia. The Ingenhousia seems to be entirely confined to the slopes of the mountains, and has not been seen anywhere in the valley.

With a sufficiently wide distribution of Ingenhousia would make the infestation of that plant quite independent of boll weevils from cultivated cotton either in ancient or in modern times. Ingenhousia may maintain and distribute its own independent weevil population, or may even compete with the cotton plant for the distinction of being the original host of this destructive insect.

Relation of Ingenhousia to Cotton Culture.

As no cotton is now grown in the vicinity of Tucson, the presence of the weevil-infested Ingenhousia on the slopes of the adjacent mountains is not a matter of immediate practical importance, but need to be taken into account in any efforts that may be made in the future to extend the range of cotton cultivation into the higher altitudes in Arizona. It is not certain of course, that the insects, even though they exist in the mountains would invade cotton fields in the valleys below, where they must encounter greater extremes of heat and dryness.

The Ingenhousia seems to have the habit of flowering for only a short period, late in the season. This has been the case with plants of Ingenhousia grown from seed at San Antonio, Texas and at Bard, California, and seemed also to be true of the wild plants in the mountains for all of the bolls seemed to be of nearly the same age. With flowering and fruiting confined to a short period the habits of the plant would not permit more than one or two generations of weevils to develop in a season. Cotton differs from Ingenhousia in having a much longer fruiting period, which makes it the more susceptible to weevil injury.

The breeding of more determinate, rapid fruiting varieties of cotton may be considered as an effort to make the habits of the plant more like those of Ingenhousia.

Thurberia

Dennstaedt 1818 Key to Rheedes Hort Malabaricus names a Vitis or cissus Ingenhoussia umbellata

De Candolles public of Ingenhouzia without direct ref to Sesse and Mocino - states that flowers are yellow

Dr. Rose has spec from Guadalajara with long tailed and larger leaves, ~~to which~~ capsules than Ariz spec. this may be the original Triloba

Bentham kept Thurberia as genus because carpels ~~alleged~~ to be 3-locked - Believed Gossypium ~~to~~ have five-locked capsules -

Gray evidently ~~would not~~ had no familiarity with Gossypium or would not have thought Thurberia was like Thespesia -

"Native wild cotton (Igenhauzia triloba D.G.): This handsome shrub of our lower, mountain canyons has proven to be a splendid ornamental for quick results in planting. From seedling plants it develops in a single season into shrubs five to ten feet high. The flowers appear in July and continue for upwards of two months; they are one and one-half inches in diameter and quite showy, the petals being cream-white and edged with rose. The leaves are glossy, bright green and deeply lobed or divided. In autumn these change to a reddish tinge with more or less yellow. Though the shrubs appear to be short lived, they grow readily from seeds, which is the easiest means of propagation."*

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* Thornber, J. J. The Small Range Enclosure. Twenty-Third Annual Report, Agric. Exp. Station, 1912, p. 675.

Thurberia

Pedicels long slender triquetrous ribbed. Involucre narrowly triangular, persistent bracts. Calyx short. Leaves long, slender lobes.

_____?

Pedicels short, robust, cylindrical. Involucre broadly oval, deciduous bracts. Calyx long. Leaves very short, broad lobes.

for Mr Fairchild's office

Get this address and send cotton parts

Amerifield
Mr Smith

S T Crose
Dana W

Ch. atrorugas

Em plobe

Homeric Society

Albert Galloway Keller
(Yale)

Longmans Green & Co
1902

Thomas H. Knight

Washington D.C.

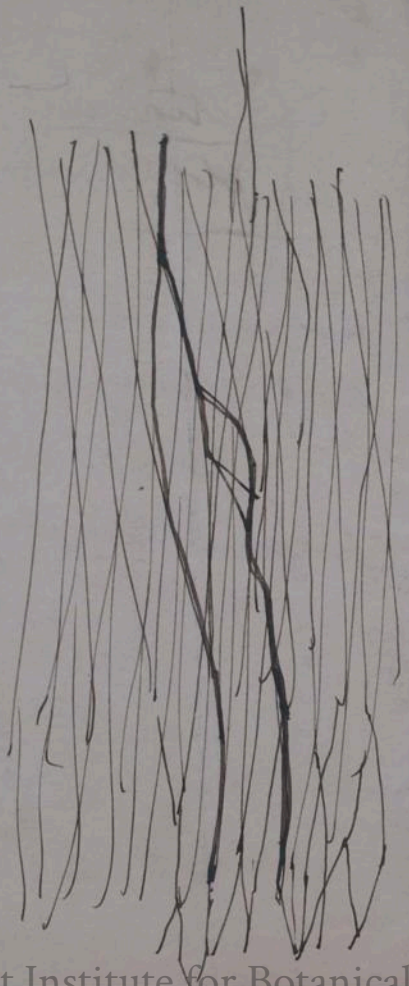
(over)

Retire concept

This conception is not mechanical in the sense that we do not undertake to ...

Thunbergia

August Flegel



Thurberia. Plants collected along Roosevelt Road

Plants collected at Fish Creek, Arizona, October 6, 1913 by Mr. T. H. Kearney.

Rhamnus crocea pilosa Trelease

Truncate oblong leaves toothed on margins.

Simondsia californica Nutt.

Very abundant on road to Roosevelt, Arizona. Bush 2-3 feet with elliptical olive-like leaves; fruits with 2 large seeds flat on one side.

Dodonaea augustifolia

Long style, 3-lobed, filiform stigma. With Thurberia. Upright bushes with narrow willow-like leaves, also suggestive of composite around Bard ( )

Rhus ovata S. Wats

Small laurel-like tree with simple ovate or cordate leaves 2-3 inches long. Looks something like California privet.

Muhlenbergia porteri The one with the stout? stem is M. dumosa Scribn. Tall very slender bamboo-like stems tufted or plumose like Chusquea.

Branch of Thurberia with bolls and flowers. Roosevelt Road, Fish Creek Canyon, Ariz. Photograph by Mr. G. B. Gilbert, Oct. 9, 1913.

Bolls, leaves, and flowers of Thurberia. Roosevelt Road, Fish Creek Canyon, Arizona. Photo by Mr. G. B. Gilbert. Oct. 9, 1912.

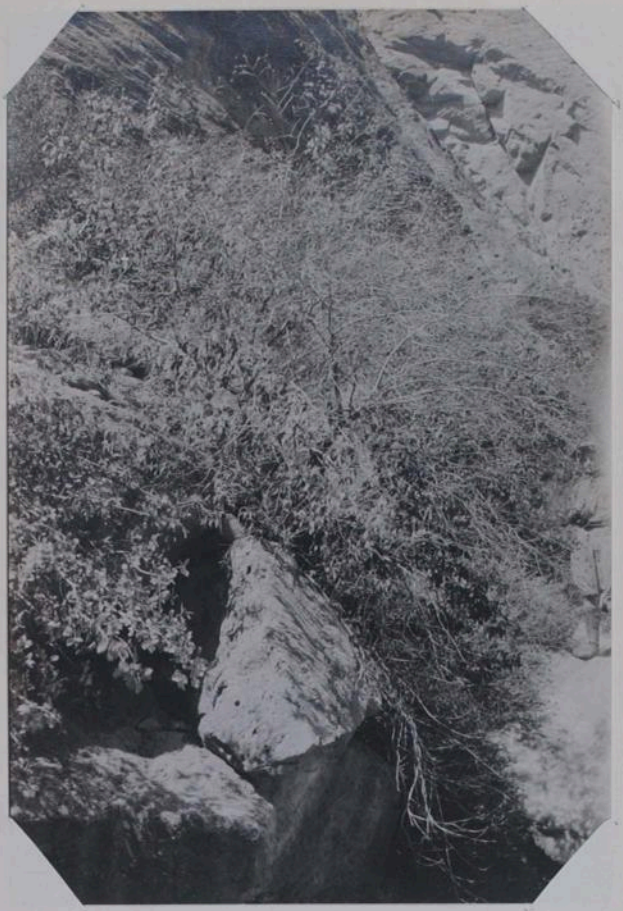
Fruits from Thurberia plant grown in the Greenhouse, Wash. D. C. Seed from Arizona. 1910.

Fruiting branches of Thurberia.

Roosevelt Road, Fish Creek Canyon, Arizona.

Photograph by Mr. G. B. Gilbert. Oct. 9, 1912.

Leaves and fruit of Thurberia,
Bard, California, Oct. 22, 1912.



Large plant of Thurberia. overhanging the Roosevelt Road, in Fish Creek Canyon, Arizona. Photograph by Mr. G. B. Gilbert.

Fruits and flowers of Ingenhousia,
San Antonio, Texas. Sept. 27, 1913.

40525 ALLOGYNE CUNEIFORMIS (DC.) Lewton. Malvaceae.
(Fugosia cuneiformis Benth.)

From Shark's Bay, Western Australia. Presented by Mr. T. S. McNulty, Under Secretary for Agriculture and Industries, Perth, Western Australia. Received April 4, 1914. Numbered April 17, 1915.

"A rare and little-known West Australian species of Fugosia, a genus, as observed by Bentham and Hooker fil., very nearly allied on the one hand to Hibiscus, on the other to Gossypium; differing from the former chiefly in the style, from the latter in the bracteoles. The present species seems to have been discovered in Dirk Hartog's Island by Allan Cunningham, who gave it a manuscript name implying that it has a goat-like odour. Milne, during the voyage of Captain Denham in H. M. S. Herald, found it in the same island, and remarks that it is a seashore plant (as indeed might be expected from its very thick and fleshy leaves). A much branching and very woody shrub, with copious oblanceolate or spathulate, rather than cuneiform leaves, thick and fleshy, readily breaking off in dry state. Flowers large, axillary, solitary; the peduncles clavate; the calyx leafy, downy; the petals broadly obovate, pure white, with a deep blood-coloured spot at the base. Anthers also blood-coloured, beautifully arranged in whorls, as in the Hibiscus huegelii; and the style and stigma, erect and connivent, are the same as in H. huegelii from which this seems hardly generically distinct." (Curtis' Botanical Magazine, 5413.)

The revival of Tournefort's
name by Medicus 1787
does not introduce any
new element for
the first species ~~used~~
~~placed~~ by Medicus is
Xylon ~~H~~ strictum
is undoubtedly our
old Upland cotton
(reduced in K. I. 45
~~H~~ G. herbaceum)

Medicus, F. K. Ueber einige
Gattungen Geschlechter aus der
Malven Familie - 1787.
(over)

Medicus transferred four species of Xylon - strictum, hirsutum, indicum and leoninum, the same having been described in 1783 ~~in Gossy~~ under ~~Xo~~ Gossypium

Med. - Botanische Beobachtungen 2: 195-200

~~Com~~ (Generic)

~~The ny post~~

~~The pre-Linnean genus Gossypium was based~~

Linnaeus based his genus
Gossypium on Tournefort's
genus Xylon, which
would stand in the way of
the use of Xylon for
any other genus the
~~ny post-Linnean~~ author
~~who attempted~~ to restore Xylon
178
who was Medikus, who
~~to use~~ was
and he used it in ~~the~~ correct
Tournefortian sense which
would give it the status of Gossypium
(...)

Thus if we accept the
~~Linn~~ substitution ~~of by~~
by Linnaeus of ~~Tourn~~
the generic name Gossypium
for ~~the~~ Tournefort's
generic name, Xylon,
~~there is no~~ the
~~better~~ must be
~~can be a~~ synonym
treated as a ~~syn~~ The use of
Gossypium
Xylon by Medikus or other
post-Linnaean writers does
not ~~make it available for~~ alter the previous history or
~~make~~ render the name ~~available for~~
applicable to a different
genus.

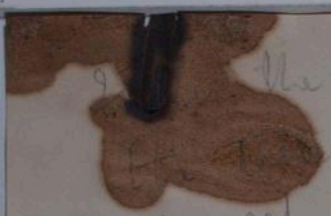
Quichua Maize Words

In addition to the complications arising from the different methods of writing Quichua followed by different authors, the actual pronunciation of the words is often varied in different districts or even among the individual Indians of the same locality.

The vowel sounds in particular are likely to be handled carelessly. Fluctuations between o and u are especially frequent, while e and i are also interchanged, ~~as when~~ the the word Quichua is also written Kechua, Keshua, Qquechua, or in other ways. There ~~of the~~ are also various renderings of the consonant sounds, ~~it need only~~ as will be seen from the ~~examples of~~ words ~~[illegible]~~ listed below. ~~The only [illegible] [illegible]~~ Attention may ~~be said that~~ called to the the combination cj, which has the sound of the German ch, the use of cj being necessitated by the very frequent occurrence of ch with the soft sound, usual in Spanish or English. Markham ~~does not distinguish~~

Hardly possible to exaggerate the importance of maize in the lives of Quichuas. Use of food, drink, ~~In~~ Religious ceremonies connected with it. Impressions of maize kernels on gold leaf as bound over forehead of mummy seen at Lima.

The Quichuas Had all types of corn sweet, flint, starch, but not pod corn. The large-kerneled Cuzco type not known ~~outside of Peru~~, ~~or at least not~~ ~~to~~ in any part of ~~North America~~ [illegible] diameters like those of North America.



the same as "Plum 4"
referred to in the Genera Pl
Other ref is Sp. Pl.
Sloane Jam 150 hist 2 p 124 t. 218
Pluk Alm 39 t. 268 f. 2
Hist Jamaica

Gossypium

First Edition of Species Plantarum has three species herbaceum (America) barbadense (Barbados) and arboreum (India) - apparent that only arboreum can relate to old world type of cotton shown in ~~Pla~~ Tourneforts plate and described by Linnaeus in Genera Plantarum "Gossypium foliis palmatis: lobis lanceolatis, caule fruticoso" with descr: References to arboreum. Gossypium caule erecto Hort cliff 350 Royen lugdb 359 -

~~Gossypium~~ Other references to Bauhin, Plukenet, and Rheede, but these not significant in comparison with these ~~to which~~ plants actually seen by Linnaeus-

Gossypium

Direct substitute for Xylon of ~~Genera Plant~~ ~~Linnaeus~~ Tournefort. Refers to Tournefort's plate in ~~4th~~ ~~5th~~ 5ed editions of Genera Plantarum ~~and~~ as in the first, and gives no other references. Tournefort's plate of Xylon ~~undoubtedly~~ relates to Old World cotton, as does ~~the~~ Linnaeus' description of ~~Xylon~~ Gossypium in the Genera Plantarum.

Gossypium

Linnaeus' Hortus Cliffortianus recognizes two ~~kinds~~ species of cotton, ~~an~~ "Gossypium caule decumbente", from America, and a "Gossypium caule erecto," ~~the~~ with no further ~~attempt~~ description, ~~except~~ only synonymy. ~~as~~ ~~sacca~~ The former has as synonym "Xylon sive Gossypium herbaceum ~~Xylon~~ Bauh," while the latter has ~~the~~ three polynomial synonyms ~~of~~ ~~which~~ containing the adjective arboreus. This ~~is of interest~~ ~~con~~ seems ~~confusing~~ ~~the~~ ... ~~to be~~ of interest only as ... ~~treatment~~ ~~showing~~ ~~of~~ of the Species Plantarum. The synonymy ~~as placed~~ ~~being~~ is not ~~affect~~ concerned ~~that~~ ~~This might be a re~~ ~~may be considered~~ of the Species Plantarum -

Gossypium (Xylon)

~~In the Hol~~ Linnaeus in the (first Ed Gen. Plant, and also in the) Hortus Cliffortianus applied the name Xylon to ~~two~~ Plumier's ~~tree afterward calle~~ Ceiba, which was called Bombax in the ~~Species Plantarum (2d Ed)~~ 5th Ed + ~~with~~ ~~with~~

Thus there was a Linnaean Xylon = Bombax founded on Plumier's ceiba, as well as Tournefort's Xylon founded on Cotton!

~~To carry the word X~~
to carry the name over to
~~a third genus~~

Cotton (Suppl.)

(Asiatic ?, arboreum)

According to Watt there can be no doubt of the identity of this species. The specimen that he considers the type is preserved in the Sloane Herbarium, from the herbarium of Plukenet, and there is also a specimen of the same species in the Linnaean herbarium of Linnaeus, labeled "3 arboreum", 3 being the number of Lisosyppum arboreum in the first edition of the Species Plantarum. There is justification (?) for taking Plukenet's specimen as the type in the fact that Plukenet's figure is the first to which reference is made in the synonymy given by Linnaeus. But this would not hold if it were found that Linnaeus had a specimen as the basis of his treatment.