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Experiments in Crossing for the Purpose of Improving the Cotton Fiber.

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INTRODUCTION.

In as much as this bulletin is prepared largely for the benefit of the farmer, who is but little versed in botanical literature, scientific terms have been carefully avoided where simple language will intelligibly convey the information desired without destroying scientific accuracy.

There are also some remarks presented on the subject of plant growth, with which all botanists are familiar; but it is deemed best to submit them in this connection in order to make the topic under discussion more clear to the farmer, and, therefore, no other apology is necessary for reprinting these well known principles of botanical knowledge.

The author of this bulletin makes no claim to new discoveries; and, although problems have been presented for solution, little more than an introduction to future investigations on the subject under consideration, has been attempted. The effort has been made to give an intelligent account of how the cotton plant might be developed so as to force it to yield the planter the greatest remuneration for his labor. Nature has been carefully followed, as far as her works have been understood, and all theories have been eliminated. The bulletin is intended to be one of facts and not of theories.

The conclusions submitted are based on the results of investigations extending over a period of three years. Several hundred crosses were successfully made, and the developments from year to year carefully watched and studied. A large amount of microscopic work was required to determine the transformation of the fiber.

The following represent the so-called varieties used in the experiments :

Allen's long staple, Bailey, Barnett, Cherry's cluster, W. A. Cook, J. C. Cook, Dixon, Gold Dust, Hawkins' improved,

Herlong, Hunnicutt, Jones' improved, Jones' long staple, Keith, T. J. King, Okra leaf, Peeler, Peerless, Peterkin, Petit Gulf, Rameses, Rust proof, Storm proof, Southern Hope, Truitt, Welborn's Pet, Wonderful, Zellner.

The following species, included in the table of results, were also planted the past season to acclimate them for future experiments :

Two Egyptian types, "*Mit-Afifi*," and "*Bamieh*;" *Nankin*; *Sea Island*. The name, "*Mit-Afifi*," is derived from a village in Egypt, near which place a Greek merchant first discovered this variety of cotton. The form closely resembles the *Sea Island* in many particulars, although it is distinct enough to be determined a separate species. This cotton is very highly thought of by the Egyptian planters and is extensively cultivated by them. The staple has a light brown tinge and is long and moderately strong. The seed are black, and, with the exception of a bluish tuft at the extremity, they are smooth. The plants grew on the college farm at Auburn, Alabama, to the height of twelve feet. The leaves are large, three to five lobed and dark green in color. The stem is more or less branched with three or four bolls at each joint of the branch. The bolls are small, slender and pointed, and divided into three cells or carpels. The flowers are bright yellow with a red spot at the base of each of the five petals. This plant seems to be a variety of *Gossypium Braziliense*. The "*Bamieh*" is about as valuable as the *Afifi* in the development and strength of the fiber. The plant is tall, reaching a height of ten feet. The leaves are dark green with red veins, very large and five lobed. The bolls grow on slender stalks, six inches in length, attached to the main stem. There are no limbs. The divisions of the bolls are three, and, in some cases, four in number. The involucre is very prominent, almost covering the boll. The flowers are bright yellow with a red spot at the base of each of the five petals. Cotton caterpillars refuse to attack these plants, although all the ordinary plants around them were stripped of their leaves.

THE PLAN OF THE COTTON FLOWER AND THE METHOD ADOPTED BY NATURE FOR MATURING THE SEED.

In entering upon the prosecution of any work we must first have an adequate conception of the nature of the object upon which we propose to experiment. Few people, who cultivate the cotton, can give an intelligent description of the plant and the methods used by it for maturing its seeds. Not many persons understand that the fiber consists of elongated cells growing from the outer surface of the seed-coat. Yet these very parties are amazed when they fail to make the plant accomplish what is so readily secured under the management of a more intelligent and careful agriculturist—the farmer who studies all the peculiarities of the plant, watching each development as it is unfolded under the guidance of natural laws. To the observant man it may be unnecessary to say that the best developed flower on the healthiest plant will produce the best staple. It is not the fast growing plant, greatly multiplied in leaf and wood surface, that is apt to produce the best matured flowers and bolls. The food necessary for all the demands of a healthy flower must come to it unstinted. If it is diverted from its flow by the demands of rapidly growing leaves and wood the generative organs must suffer, and this deficiency of food may cause the flower to wither and fall off—at least it will dwarf the organs and result in immature bolls.

Before proceeding to discuss the results of the experiments secured in the cross-fertilization of the cotton it may be best to describe the construction of the flower for the

benefit of some of my readers who are not well acquainted with the working of this organ. This knowledge is necessary to a correct understanding of the experiments, the results of which are given in this bulletin. The flower consists of five separate sets of organs. 1. An outside green circle of three leaves, called *involute* (see *a* fig. 1), the leaflets of which are united and heartshaped at the base, deeply incised, and remain in contact with the boll during its entire growth. The peculiar shape of

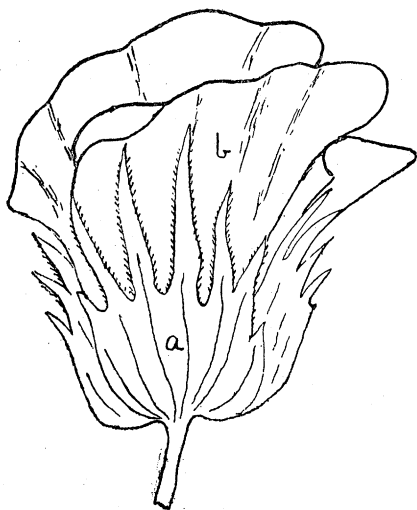


Fig. 1

E. J. Malt. Del.

these forms gives the name "square" to the young buds. 2. An inner circle of cup shaped leaves, obtusely five toothed, called *calyx*, the divisions of which are termed *sepals*. These forms are not visible in the fig. 3. Just inside the calyx cup is another circle of leaves called *corolla*, divided into five *petals* (see *b* fig. 1). The petals are generally of a delicate cream color when they first unfold from the bud, but in a few hours they change to deep red, after which they wither and fall off. These outside circles of leaves are termed the *non-essential* organs, because they simply serve a secondary purpose in the development of the seed—they are in fact the *protecting* organs for the delicate germ. 4. The next set of organs is called *stamens*; they are found crowded in large numbers around, and growing upon, the *pistil* (see *a* fig. 2). These stamens produce the male function, called *pollen*, which has the appearance, to the unassisted eye, of a mass of fine yellow powder. A grain has been greatly enlarged in fig. 3. Without the presence of

this pollen the seed cannot be produced. 5. The *pistil* (bd fig. 2), is the female organ, and there are three to five in each flower, united and twisted around each other. The pistil consists of three parts: (1) *stigma b*, to which the pollen is first attached after it leaves the stamens; (2) the *style*, a slender shaft separating the stigma from the (3) *ovary d*. The ovary, after fertilization with pollen, forms the boll in which the seed and fiber are found.

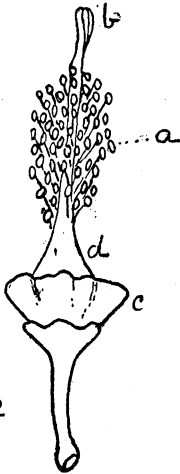


Fig 2

Sea Island Pistil.

Z. H. Mott Del.

Now a few words as to the action of the pollen grains after they find lodgment on

the stigma or female organ. A cotton pollen grain is a sphere covered with two coatings, or thin membranes, inside of which is a mass of matter (A fig. 3), that carries the male principle. The coat, P, has

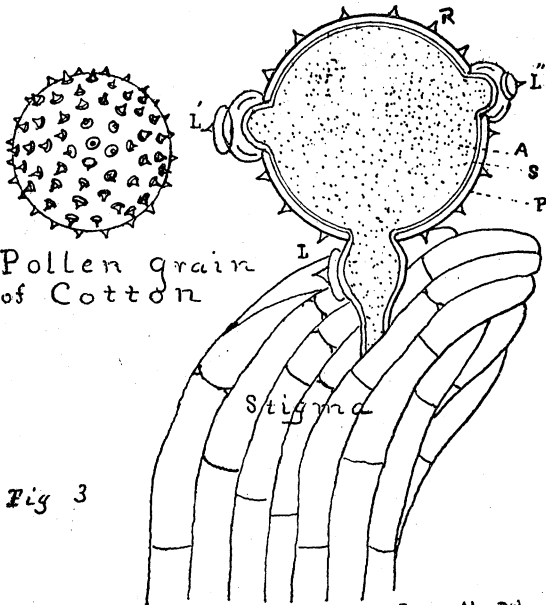
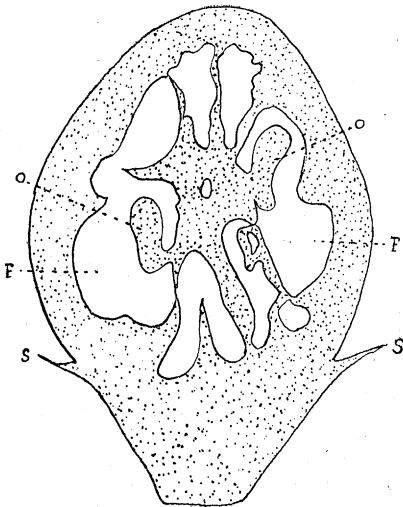


Fig 3

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a number of circular openings closed by lids, L, L', L'', R, underneath which the inner membrane, S, is thickened. When the flower opens in early morning the pistil exudes a quantity of sticky fluid on and about the numerous fine hairs growing on the stigma, by means of which the pollen grains are caught when transported by the wind and insects. Very soon after the pollen lodges on the pistil, the lid, L fig. 3, is thrown aside by the growing of the inner membrane coat, S, into a tube. This tube pushes its way between the tissues of the stigma down the style and into the ovary at d fig. 2, where the end of the tube opens and the female germ becomes fertilized, thus producing the seed. The most remarkable fact in regard to this matter is the rapid growth of the pollen tube in such a short time, because the work must be accomplished in twenty-four hours.

Shortly after the fertilization has taken place in the ovary, the petals, stamens and the upper portions of the



Section of Ovary.

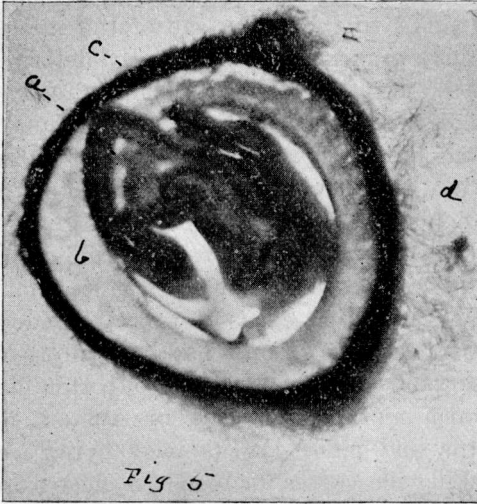
Fig 4

R.H. Mell Del.

pistil wither and fall off, leaving the ovary and its surrounding involucre leaves. This ovary, as has been already stated, is the young boll containing the rapidly growing seeds with their fiber coatings. A section of a half grown boll is given in fig. 4. This is a longitudinal section showing seeds at oo, and the cells (or *carpels*) FF which will be filled with the staple when the boll is complete in its growth. SS represent the calyx. The involucre

is not shown in the drawing.

Fig. 5 is a cross section of the seed exhibiting the young germ or plant at *a*;



the food stored up for its use at *b*; and the fiber *d* growing from the outer surface of the seed coat *c*. When the germ *a* begins to enlarge under the influence of the moisture of the soil and the invigorating power of the sun's rays, it breaks the coat or "hull" *c* and starts with its leaves towards the light. In this young stage of its

growth it lives upon the delicate food prepared and stored up by its parent plant at *b*. When this food is exhausted the young plant is old enough to take care of itself and drink in through its roots and assimilate the food materials from the soil in which it is growing.

It will be readily understood from the foregoing how important it is to have pollen grains of the best character and a well developed pistil, if we expect to secure high grade fiber. Inferior plants cannot produce healthy organs and superior seed, any more than inferior grades of stock can produce fine blooded cows and horses. So little attention is paid to this subject by planters generally no comparative estimate can be made on the results after the seed are planted. The farmer does not know whether the seed came from first-class plants or not; whether they are good, bad or indifferent. No attempt is made to select the seed, but good, bad and worthless are planted in the drill together. When the plants are ready to bloom the inferior as well as

the superior individuals are permitted to grow side by side, while the insects and winds are busy blending the two together by means of the transmitted pollen, and, of course, the healthy plants suffer to the advantage of the inferior forms. The seed thus produced become greatly deteriorated in the course of a few years, and the farmer is ready to heap denunciations on the head of the man from whom he bought the improved seed a few years before, at a high price. It does not pay to cultivate inferior grades of cotton in the neighboring fields where improved cotton is growing. Insects will soon transmit pollen from one grade to the other so as to cause the fine seed to greatly lose its vitality and superior qualities, and soon cause it to retrograde to the original inferior stock from which it had been improved. An intelligent, observant man, standing in a cotton field during a bright, warm morning, in July or August, will notice humming birds and many insects busy flying from flower to flower sucking the nectar for food. A close examination of the bodies of these insects will disclose the fact that over them is scattered quantities of pollen. When the insect crowds down into the corolla cup to reach the nectar at its base, the pollen on its body is attached to the stigma and fertilization is accomplished. Now if the insect has visited the flowers of inferior grades of cotton before reaching the improved flower, the inferior pollen will have a chance to put in its effects on the germ of the improved cotton. *All seed should be carefully selected each season; and inferior plants noted in the field should be rooted out before they begin to bloom.*

With these facts concerning the development of the flower well understood we are prepared to enter upon the discussion of the results secured from the experiments in crossing.

METHODS ADOPTED IN THE FIELD FOR PRODUCING THE CROSSING.

The term "crossing" in botany signifies the blending of two varieties of the same species by transmitting the pollen of the flower of one form to the pistil of the other. In this

manner the peculiar properties of both varieties are united in a new offspring, and results of special advantage are often secured.

In the experiments conducted at Auburn the "W. A. Cook" and "Peerless" varieties were selected to carry the female function, because these plants had distinctive and desirable features which were strongly marked; and a stable basis was thus offered upon which to develop the future improved bolls.

Having succeeded in raising strong and healthy plants of all the varieties mentioned in another part of this bulletin, a number of flowers on the best plants of the W. A. Cook and Peerless were prepared in the following manner, on an evening just before sundown, when there was no indication of rain for at least forty-eight hours :

The buds on the most mature limbs were selected, the petals of which would fully expand during the early hours of the next morning, and by means of small scissors these petals (*b* fig. 1) were cut off just above their bases, thus exposing the stamens and pistils fully to view. The stamens (*a* fig. 2) were then carefully removed by means of a pair of forceps, without bruising the pistil. Thus denuded of all male organs the pistil was covered with a thin paper bag, as a protection against the wind and insects, and left until next morning by which time it was fully developed with all its functions ready for the reception of the pollen. A healthy flower from a plant of another variety was plucked next morning and carried to the flower prepared the afternoon before, and, by means of a small soft brush, the pollen was dusted on the stigma (*b* fig. 2) of the pistil. The bag was replaced and carefully fastened around the limb so as to prevent any possibility of pollen from any other source being introduced upon the pistil. A tag, properly labeled, was suspended at the base of the flower for future reference. After two or three days this bag was taken off and the new boll left to grow under the influence of the sun's rays. Many hundreds of these bolls were grown, the fiber gath-

ered and the seed carefully selected and planted the following season. The seeds were again gathered, carefully selected and planted the third season. The fiber of the last planting was then subjected to the most rigid examination under the microscope and submitted to severe tests to determine its valuable and weak properties.

The strands of fiber, as already stated, are elongated tubes growing from the outer surface of the seed coat. In their young state they are filled with a fluid, but as maturity advances this fluid disappears, the walls of the tube collapse, and a twisted form is assumed which is more and more complete as the development of the tube approaches perfection. The value of the staple is largely controlled by the degree of this twist; and this property also enables the spinner to manipulate the fiber to the best advantage.

Now, in as much as the fiber is a portion of the seed coat, the full and perfect maturity of the seed will also produce in the staple a complete twist and maximum degree of strength. The plant, therefore, in all its stages should be closely watched and carefully studied in order to fully understand its peculiar properties—what characteristics are desirable and what are objectionable. Two varieties of the same species, well understood, should be blended, in the manner already indicated, so as to intensify the desirable traits and greatly diminish the inferior qualities. For instance, if the male organ on one plant matures fine grades of pollen, and the female organ is healthy and well developed on the other, the blending of the two will tend to improve the resulting form. A careful selection of the seed, planting only the best, will still further aid in producing superior results.

In conducting the experiments at Auburn special importance has been placed on eliminating all objectionable and weak forms, as progress is made, and in intensifying the strong features until the best types are firmly established. The fact has been borne in mind at all times that no satisfactory results could be secured from this work unless the

plants under investigation were cultivated far removed from inferior grades of cotton.

SOME OF THE PROBLEMS TO BE SOLVED.

1. Are all the so-called "varieties" of cotton grown in the South entitled to separate names?

2. How many species of the *Gossypium* are cultivated in the cotton-belt? Are the upland forms—so-called "Upland Cotton"—true species or are they hybrids, the product of blending two or more distinct species during the long period of years in which the cotton has been cultivated in the South?

3. In "improving" the cotton plant is the fiber strengthened and developed, or is there simply an increase in the size of the plant to the detriment of the fiber? Is it not often the case that the fiber is weakened and damaged by forcing the plant, as we sometimes notice is the case when certain forms of fruits are forced to ripen earlier than the usual period, causing the outside coating to mature before the inferior is thoroughly developed?

4. At what stage of growth of the boll does the fiber attain its full development?

5. What are the properties of a well formed cotton fiber?

Some of these problems are not yet fully answered by the results so far secured, but valuable information has been obtained on all the questions propounded, and, in some instances, decided answers will be rendered.

1. Are all the "so-called" varieties entitled to separate names?

This question seems to be answered in the following classification of these "varieties."

(1) Short staple forms, under 1.2 inches :

Bailey, Barnett, Cherry's cluster, J. C. Cook, Dixon, Gold dust, Hawkins' improved, Herlong, Hunnicutt, Jones' improved, Keith, King, Okra leaf, Peeler, Peerless, Peterkin, Petit gulf, Rust proof, Rameses, Southern hope, Storm proof, Truitt, Welborn's pet, Zellner.

(2) Long staple, 1.3 inches and above :

Allen's long staple, W. A. Cook, Jones' long staple, Wonderful.

(3) Prolific forms :

Allen's long staple, Bailey, Barnett, Cherry's cluster, W. A. Cook, Dixon, Gold dust, Hawkins' improved, Herlong, Hunnicutt, Jones' improved, Keith, King, Okra leaf, Peerless, Truitt, Welborn's pet, Wonderful.

(4) Non-prolific :

J. C. Cook, Jones' long staple, Peeler, Peterkin, Petit gulf, Storm proof, Southern hope, Zellner.

(5) Those forms which have leaves alike :

Allen's long staple, Cherry's cluster, Dixon, Jones' improved, Jones' long staple, Gold dust, Hunnicutt, Keith, King, Peeler, Truitt, Wonderful, Zellner. (Three to five lobed leaves.)

W. A. Cook, Hawkins' improved, Peerless, Petit gulf, Southern hope, Storm proof, Welborn's pet. (Four to five lobed leaves.)

(6) Long limbed forms :

Allen's long staple, J. C. Cook, Gold dust, Herlong, Hunnicutt, Jones' long staple, King, Peeler, Peerless, Peterkin, Petit gulf, Rameses, Southern hope, Truitt, Wonderful, Zellner.

(7) Short limbed forms :

Bailey, Barnett, Cherry's cluster, W. A. Cook, Dixon, Hawkins' improved, Jones' improved, Keith, Okra leaf, Storm proof, Welborn's pet.

(8) Clustered varieties :

Cherry's cluster, Herlong, Peerless, Welborn's pet.

(9) Large boll varieties :

Allen's long staple, W. A. Cook, Hawkins' improved, Hunnicutt, Jones' long staple, Wonderful.

(10) Medium and small varieties :

Bailey, Barnett, Cherry's cluster, J. C. Cook, Dixon, Gold dust, Herlong, Jones' improved, Keith, King, Okra leaf, Peeler, Peerless, Peterkin, Petit gulf, Rameses, Southern hope, Storm proof, Truitt, Welborn's pet, Zellner.

(11) The dark, smooth seed forms :

Bailey.

(12) The furry, dark and small seed forms :

J. C. Cook, Petit gulf.

(13) The large light brown, furry seed forms :

Allen's long staple, W. A. Cook, Gold dust, Hawkins' improved, Hunnicutt, Jones' long staple, Keith, King, Peeler, Peerless, Peterkin, Rameses, Southern hope, Storm proof, Truitt, Welborn's pet, Wonderful, Zellner.

(14) The small, light brown, furry seed forms :

Barnett, Cherry's cluster, Dixon, Herlong, Jones' improved, Okra leaf.

Selecting from the above classification those forms which have features alike, we may rearrange our plants into the following seven groups :

1. Allen's long staple, W. A. Cook, Hunnicutt, Jones' long staple, Wonderful.

2. Bailey, Okra leaf.

3. Cherry's cluster, Herlong, Peerless, Welborn's pet.

4. J. C. Cook.

5. Barnett, Dixon, Hawkins' improved, Jones' improved, Keith, King, Rameses, Truitt.

6. Gold dust.

7. Peterkin, Peeler, Petit gulf, Storm proof, Southern hope, Zellner.

It may not be far wrong to assert that each of the many so-called varieties now on the market belong to one of these groups; and, in a number of instances, coming under the observation of the writer, the "new cotton" has no right to a new name, but is only an improved production of seed under an excellent system of cultivation and selection from year to year.

The second problem in our investigations, viz.: How many species of the gossypium are cultivated in the cotton belt, &c., is quite difficult to solve with the present data at hand. We may say, however, that indications point to the presence of the following species at least :

Gossypium herbaceum, L.; *gossypium roseum*, Tod; *gossypium nankin*, Mey; *gossypium Mexicanum*, Tod; *gossypium maritimum*, Tod; *gossypium hirsutum*, Mill; *gossypium barbadense*, Linn.

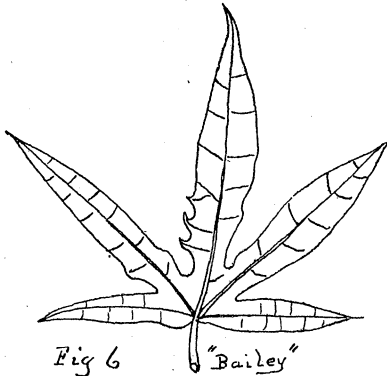


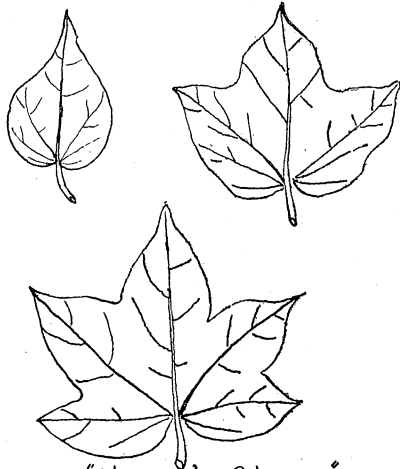
Fig 6

"Bailey"

P. H. Mill Del.

Some of these have been blended and intercrossed to such a degree as to almost conceal the distinctive features of each species. There is strong reason to suppose that the "upland cotton" is a hybrid produced by blending the properties of several species, under the cultivation

of a long series of years. For instance the Bailey and Okra leaf varieties seem to be the offsprings from the *gossypium maritimum* Tod, and *g. roseum* Tod. They have the Sea Island properties in the small black, smooth seed, the long fiber and the deep lobing of the leaves. Cherry's cluster, and other forms like it, have properties resembling *gossypium Wightianum* Tod, *g. Mexicanum* Tod, and *g. maritimum* Tod. Cotton has been cultivated in the South for such a long period, and seed from so many different sources have been planted in such near localities to each other, every opportu-



"Cherry's Cluster"

Fig 7

P. H. Mill Del.

nity has been presented for favorable hybridizing, and in

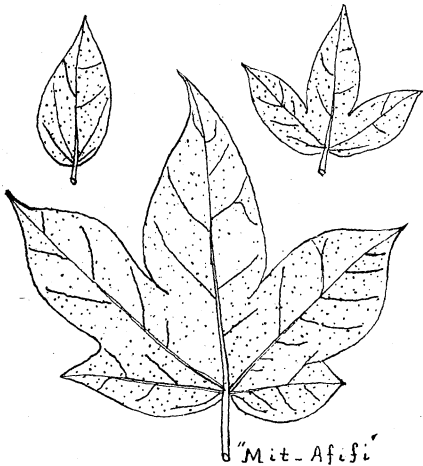


Fig 8

E. H. MELL DEL

the repeated replanting of these seed year after year, the types have been well established. It becomes, therefore, a difficult problem to determine from what kind of species the individuals are derived. Investigations will be continued on this line and it is hoped that future results will warrant a more decided answer to the problem.

Figures 6, 7, 8, and 9, show the forms of the

leaves grown on the plants cultivated at Auburn for our experiments, and they also represent the number of species. It may not be far wrong to say that they also give us the majority, if not all, the types grown in the South. If this position is correct these leaves will be of some interest in enabling us to answer the problem concerning the number of species now found in the cotton belt.

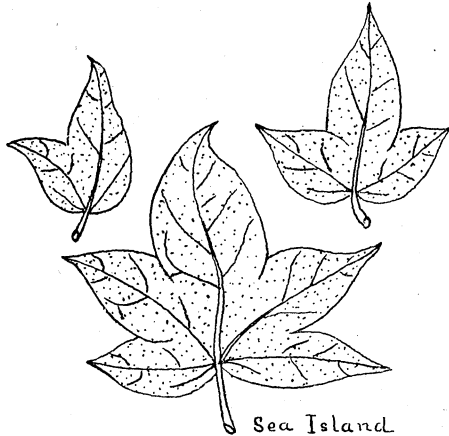


Fig 9

E. H. MELL DEL

In a future bulletin this subject of the identification of the cotton will be more fully and definitely treated.

3. *In improving the cotton plant is the fiber strengthened and developed, or is there simply an increase in the size of the plant to the detriment of the fiber?*

The experiments seem to give an unmistakable answer to this question. It was only on those plants which were large, strong and healthy that the best condition of the fiber was secured. But, this being true, it was noticed on the other hand, that on those plants where there was a very rapid growth of wood-limbs and leaves there was a diminution in the number of flowers. This was caused, no doubt, by the great draft on the supply of sap to satisfy the demand of these growing parts. All things being equal, therefore, it is safe to say that the best condition of the fiber will be secured by a steady, constant growth of the plant in all its parts. It should not be stunted or retarded for lack of proper fertilization and cultivation, but every demand should be met so that a vigorous growth will be secured in all the functions of the plant. Nature often needs assistance to enable her to do her best work, particularly in her attempt to accomplish healthy results in the poor soils so prevalent throughout the cotton belt. The plant must be fed with the same judicious care that the stockman bestows upon animals under his intelligent management. It must be equally fed for wood-making, leaf development and seed maturity. And these ends can only be reached through painstaking care and observation of all stages of the plant growth and development.

The experiments conducted at Auburn give conclusive evidence that the improvement of the cotton plant under the influence of the crossing processes does not deteriorate the fiber, but tends greatly towards making it superior in its properties. There was no effort made to force the plant in its growth, but every inducement was offered it to perfect itself in all its functions. In the careful examinations made of the cotton stalk in the field it was noticed that on those

plants which were strong and vigorous from the start and grew slowly to large, well developed stalks the flowers were larger, brighter in color and the bolls were also well formed and healthy in looks. The resulting fiber, of course, under such conditions, was possessed of the best qualities. The twenty-eight best forms given in another part of this bulletin (page 21) were large, finely developed plants that were well fruited, and in all respects healthy and vigorous.

The experiments are not yet far enough advanced to answer the fourth question, and it will, therefore, be deferred until progress will warrant the printing of another bulletin on this subject.

5. *What are the properties of a well formed cotton fiber? and how near do the crossed forms in this bulletin approach the perfect condition?*

Experience has proven that the perfect staple must have—

- (1) Complete maturity throughout the entire length.
- (2) Uniform twist from end to end.
- (3) Uniform width in all parts.
- (4) Maximum length.
- (5) Purity in color.

The table of results show that the crosses, in nearly every instance, have improved the condition of the cotton, and, in some individuals, remarkably so. The length of the fiber has been increased in numerous cases, and the strength almost doubled. It is true that the percentage of fiber is not as great as we would desire, but this is due to the increased size of the seed. Both female forms on which the crosses were made, are large seed varieties and the resulting cross would naturally tend towards an increased size in the portion of the plant. Experiments may enable us to raise the percentage of the fiber after the seed-coat has been evolved into a stable, healthy condition. It may be noticed, however, that although the percentage of fiber in the crossed plants is smaller than that produced by the originals, still, the actual weight of the former is frequently nearly double that of the latter.

After a careful study of the tables in this bulletin the following plants have been selected because they seem to sustain in great measure the best traits of superior grades of fiber, viz., strength, maturity, length, twist and purity of color. These are named in the order of their superiority, and, in some cases, they show a remarkable degree of development from the original forms. For instance, the cross resulting from blending Barnett and Peerless, the first mentioned in the list following, shows certain decided improvements that are interesting. The number of seed to each boll increased from 27 in Barnett and 42 in Peerless (or an average of 34.5) to 38 in the crossed plant. The increase in weight of seed is from 3.115 grammes in Barnett, 3.217 grammes in Peerless to 4.866 grammes in the crossed plant, or a gain of 1.700 over the average results of the two originals. In the case of the fiber the weight has increased over the original forms in the following manner: Barnett, 1.737 grammes; Peerless, 1.751 grammes, and the crossed plant, 2.244 grammes, or an increase of 0.500 of a gramme over the average results of the originals. These facts are quite interesting, because they show the possibility of wonderful results if the experiments of crossing are continued far enough to established these tendencies towards perfected forms of development. If nothing else is gained than simply an increased length in the fiber with maturity in twist the results of the investigations will more than repay the amount of work and time expended.

The table on pages 22 and 23 was prepared to show more strikingly the decided improvement secured over the original varieties, and some most remarkable and interesting facts are shown in this comparison. The marked improvement in every instance establishes beyond doubt the importance of the experiments, the results of which are submitted in this bulletin.

TABLE I.

Twenty-eight of the best forms of cotton produced by the crossing process. Named in order of superiority.

No. *	NAMES.	STRENGTH.†	MATURITY.	LENGTH.‡	TWIST.
12.	Barnett on Peerless.....	14.57	Excellent..	1.6	Excellent.
70.	Truitt on Peerless.....	14.14	Very good..	1.1	Excellent.
14.	Cherry's Cluster on Cook.....	13.08	Very good..	1.3	Excellent.
56.	Petit Gulf on Peerless.....	13.04	Good.....	0.9	Good.
43.	King on Cook.....	12.79	Good.....	1.0	Excellent.
58.	Rust Proof on Peerless.....	12.58	Very good..	1.0	Very good.
54.	Peterkin on Peerless.....	12.46	Excellent..	1.1	Excellent.
76.	Wonderful on Peerless.....	12.44	Excellent..	1.2	Excellent.
55.	Petit Gulf on Cook.....	11.96	Good.....	0.9	Good.
2.	Allens long staple on Peerless.....	11.95	Good.....	1.3	Very good.
79.	Wonderful on Peerless.....	10.79	Very Good..	1.2	Very good.
74.	Welborns pet on Peerless.....	10.75	Excellent..	0.9	Excellent.
38.	Jones' long staple on Peerless.....	11.71	Good.....	1.2	Good.
51.	Peerless on Cook.....	11.56	Very good..	1.4	Good.
83.	Zellner on Cook.....	11.56	Very good..	1.4	Very good.
46.	Okra leaf on Peerless.....	11.32	Good.....	1.1	Very good.
77.	Wonderful on Peerless.....	11.28	Excellent..	1.0	Excellent.
3.	Allen's long staple on Peerless.....	11.04	Good.....	1.3	Good.
49.	Peeler on Peerless.....	10.97	Good.....	1.2	Good.
33.	Hawkins' improved on Peerless.....	10.89	Very good..	1.2	Excellent.
71.	Truitt on Cook.....	10.78	Excellent..	1.2	Excellent.
19.	J. C. Cook on Peerless.....	10.55	Good.....	1.4	Good.
15.	Cherry's cluster on Cook.....	10.51	Excellent..	1.2	Excellent.
37.	Jones' improved on Peerless.....	10.39	Very good..	1.2	Good.
7.	Bailey on Cook.....	10.27	Good.....	1.2	Good.
11.	Barnett on Cook.....	10.21	Good.....	1.4	Good.
50.	Peeler on Cook.....	10.06	Very good..	1.4	Very good.
47.	Peeler on Peerless.....	10.05	Good.....	1.4	Very good.

* The numbers in this column are the same found in Table IV—first column. † The measurements of strength are in grammes (a gramme is equivalent to 15.4 grains). ‡ The length is determined in inches.

TABLE II.
COMPARISON BETWEEN THE ORIGINAL PLANTS AND 25 OF THE BEST IMPROVED FORMS.

Numbers (Table IV.)	NAME OF PLANT.	Number Seed.	Wt. Seed in		Per cent. Seed.	Per cent. Lint.		Length of Fiber in inches.	Diameter of Fiber in millimeters.	Character of Twist.	Max. strain for breaking one strand in grammes.	Min. strain for breaking one strand in grammes.
			grammes	grammes.		grammes	grammes.					
12	Barnett on Peerless	38	4.866	2.244	68.4	31.6	1.10	0.022	Excellent	14.99	13.95	
	Peerless	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good			
	Average	34.5	3.166	1.744	64.5	35.5	0.94	0.020				
70	Barnett	27	3.115	1.737	64.2	35.8	1.00	0.020	Fair.			
	Truitt on Peerless	37	5.197	2.580	68.1	31.9	1.10	0.021	Excellent	15.38	12.79	
	Peerless	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good			
	Average	37.5	4.122	2.085	66.2	33.8	0.89	0.017				
	Truitt	33	5.027	2.419	67.6	32.4	0.90	0.015	Poor.			
14	Cherry's Cluster on Cook	36	4.326	1.979	68.6	31.4	1.30	0.020	Excellent	14.20	12.31	
	Cook, W. A.,	42	5.675	2.740	67.4	32.6	1.50	0.020	Good.			
	Average	42	4.796	2.465	65.5	34.6	1.20	0.018				
	Cherry's Cluster	42	3.917	2.190	63.5	36.5	0.90	0.017	Fair.			
56	Petit Gulf on Peerless	44	4.276	3.214	57.1	42.9	0.90	0.018	Good.	13.71	11.75	
	Peerless,	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good			
	Average	42	4.557	2.251	66.5	33.5	0.94	0.020				
	Petit Gulf	42	5.897	2.751	68.2	31.8	1.00	0.020	Very good			
43	King on Cook	38	4.656	2.007	69.7	30.1	1.00	0.018	Excellent	14.47	10.81	
	Cook, W. A.,	42	5.675	2.740	67.4	32.6	1.50	0.020	Good.			
	Average	43.5	4.082	2.135	64.4	35.6	1.10	0.019				
	King,	45	2.470	1.530	61.4	38.6	0.70	0.018	Fair.			
58	Rust Proof on Peerless	33	4.608	2.396	65.8	34.2	1.00	0.022	Very good	13.10	12.10	
	Peerless,	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good			
	Average	41.5	4.279	2.229	65.6	34.0		0.017				
	Rust Proof,	41	5.340	2.706	66.3	32.7		0.014	Fair.			
54	Peterkin on Peerless	43	4.945	2.630	65.3	34.7	1.10	0.022	Excellent	14.40	10.43	

	Peerless, }	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good		
	} Average	43.5	3.522	2.125	62.6	37.5	0.94	0.020			
	Peterkin, }	45	3.826	2.499	60.3	39.7	1.00	0.020	Fair.		
76	Wonderful on Peerless	34	5.010	2.575	64.7	35.3	1.20	0.020	Excellent	14.48	11.22
	Peerless, }	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good		
	} Average	42	4.316	2.087	66.9	33.1	1.11	0.019			
	Wonderful, }	42	5.415	2.423	69.0	31.0	1.35	0.018	Very fair.		
55	Petit Gulf on Cook	43	4.216	2.507	62.7	37.3	0.90	0.016	Good.	15.30	9.25
	Cook, W. A., }	42	5.675	2.740	67.4	32.6	1.50	0.020	Good.		
	} Average	42	5.786	2.746	66.8	32.2	1.25	0.020			
	Petit Gulf, }	42	5.897	2.751	68.2	31.8	1.00	0.020	Very good		
2	Allen's Long Staple on Peerless	34	4.540	2.194	67.4	32.6	1.30	0.020	Very good	12.25	11.77
	Peerless, }	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good		
	} Average	43.5	3.469	1.893	64.8	35.2	1.09	0.020			
	Allen's Long Staple, }	45	3.722	2.035	64.7	35.3	1.30	0.020	Fair.		
79	Wonderful on Peerless	40	5.154	2.490	67.4	32.6	1.20	0.017	Very good	11.34	9.78
	Peerless, }	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good		
	} Average	42	4.316	2.087	66.9	33.1	1.11	0.019			
	Wonderful, }	42	5.415	2.423	69.0	31.0	1.35	0.018	Very fair.		
74	Welborn's Pet on Peerless	38	4.123	1.394	74.7	25.3	0.90	0.037	Excellent	12.98	10.32
	Peerless, }	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good		
	} Average	38	2.265	1.320	62.2	37.8	0.89	0.017			
	Welborn's Pet, }	34	1.312	0.899	59.6	40.4	0.90	0.014	Good.		
38	Jones' Long Staple on Peerless	43	6.337	2.500	71.7	28.3	1.20	0.020	Good.	16.76	8.24
	Peerless, }	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good		
	} Average	42	4.329	2.156	66.4	33.6	1.06	0.020			
	Jones' Long Staple, }	42	5.440	2.560	68.0	32.0	1.5	0.020	Very poor		
51	Peerless on Cook	33	4.607	1.941	70.4	29.6	1.40	0.020	Good.	15.20	8.85
	Cook, W. A., }	42	5.675	2.740	67.4	32.6	1.50	0.020	Good.		
	} Average	42	4.446	2.246	66.1	33.9	1.19	0.020			
	Peerless, }	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good		
83	Zellner on Cook	41	4.916	1.653	74.8	25.2	1.40	0.021	Very good	14.88	10.50
	Cook, W. A., }	42	5.675	2.740	67.4	32.6	1.50	0.020	Very good		
	} Average	37.5	5.345	2.289	70.6	29.7	1.20	0.020			
	Zellner, }	33	5.015	1.837	73.8	26.8	0.90	0.020	Fair.		

TABLE II—Continued.
COMPARISON BETWEEN THE ORIGINAL PLANTS AND 25 OF THE BEST IMPROVED FORMS—Continued.

Numbers (Table IV).	NAME OF PLANT.	Number of Seed.	Wt. Seed in grammes.	Wt. Lint in grammes.	Per cent. of Seed.	Per cent. of Lint.	Length of Fiber in inches.	Diameter of Fiber in millimeters.	Character of Twist.	Max. strain for breaking one strand in grammes.	Min. strain for breaking one strand in grammes.
46	Okra Leaf on Peerless.....	37	4.933	2.630	65.3	34.7	1.10	0.020	Very good	14.84	9.27
	Peerless, } Average.....	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good		
77	Okra Leaf, } Average.....	36.5	3.035	1.804	62.7	37.3	1.04	0.021	Very good	13.77	9.25
	Wonderful on Peerless.....	38	5.344	2.660	66.8	33.2	1.00	0.022	Excellent		
77	Peerless, } Average.....	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good	14.42	9.10
	Wonderful, } Average.....	42	4.316	2.087	66.9	33.1	1.11	0.019	Very fair.		
49	Peeler on Peerless.....	39	4.988	2.216	69.2	30.8	1.20	0.022	Good.	16.78	7.38
	Peerless, } Average.....	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good		
33	Peeler, } Average.....	42.5	4.039	2.037	66.7	33.8	1.04	0.017	Fair.	12.35	9.68
	Hawkins' Improved on Peerless.....	43	5.260	2.346	69.2	30.8	1.20	0.020	Excellent		
71	Peerless, } Average.....	41.5	3.217	1.751	64.8	35.2	0.87	0.020	Very good	13.87	7.87
	Hawkins' Improved } Average.....	41	1.670	1.096	60.3	39.7	0.87	0.020	Fair.		
71	Truitt on Cook.....	43	5.670	2.554	68.9	31.1	1.20	0.014	Excellent	12.08	8.61
	Cook, W. A., } Average.....	42	5.675	2.740	67.4	32.6	1.50	0.020	Good.		
19	Truitt, } Average.....	37.5	5.352	2.580	67.5	32.5	1.20	0.017	Good.	13.87	7.87
	J. C. Cook on Peerless.....	35	5.029	2.419	67.6	32.4	0.90	0.014	Poor.		
19	Peerless, } Average.....	42	4.363	1.793	70.9	29.1	1.40	0.021	Good.	13.87	7.87
	J. C. Cook, } Average.....	42	3.217	1.751	64.8	35.2	0.87	0.020	Very good		
15	Cherry's Cluster on Cook.....	44	4.840	2.545	65.5	34.5	1.20	0.022	Excellent	12.08	8.61

	Cook, W. A.,		42	5.675	2.740	67.4	32.6	1.50	0.020	Good.		
		Average	42	4.796	2.465	65.5	34.6	1.200	0.018			
	Cherry's Cluster,		42	3.917	2.190	63.5	36.5	0.90	0.017	Fair.		
37	Jones' Improved on Peerless		42	5.240	2.490	67.8	32.2	1.200	0.020	Good.	11.00	9.75
	Peerless,		42	3.217	1.751	64.8	35.2	0.87	0.020	Very good		
		Average	36	3.894	2.246	63.8	36.3	0.890	0.017			
	Jones' Improved,		30	4.570	2.740	62.8	37.4	0.90	0.014	Good.		
11	Barnett on Cook		35	5.175	2.090	71.2	28.8	1.400	0.020	Good.	11.01	8.85
	Cook, W. A.,		42	5.675	2.740	67.4	32.6	1.50	0.020	Good.		
		Average	34.5	4.395	2.239	65.8	34.2	1.250	0.020			
	Barnett,		27	3.115	1.737	64.2	35.8	1.00	0.020	Fair.		
50	Peeler on Cook		40	6.382	2.252	73.9	26.1	1.400	0.018	Very good	11.16	8.54
	Cook, W. A.,		42	5.675	2.740	67.4	32.6	1.50	0.020	Good.		
		Average	42.5	5.263	2.531	67.5	32.5	1.350	0.017			
	Peeler,		43	4.860	2.322	67.6	32.4	1.20	0.014	Fair.		

TABLE III.
CHARACTERISTIC FEATURES OF ORIGINAL

Name of Cotton.	Length of Branches.	Height of Stalk in feet	Number of lobes to leaves	Number of bolls to each limb.	Size of bolls.	Shape of bolls.
Allen's L'g St'ple	Long...	5.6	3.	.....	Large.....	Pointed.....
on Cook...	Long...	5.6	3.5	.....	Medium.....	Pointed.....
on Peerless	Medium	5.6	3.	6-7	Large.....	Pointed.....
Bailey.....	Medium	3.	5.	.....	Small.....	Round.....
on Cook...	Medium	4.5	3.4.5	6-7	Medium.....	Pointed.....
on Peerless	Long...	5.	3.4.5	6-7	Large.....	Pointed.....
Barnett.....	Short.	Tall.	.....	.....	Medium.....	Round.....
on Cook...	Medium	4.5	3.	5-8	Medium.....	Pointed.....
on Peerless	Medium	4.	3.4.5	4-6-7	Medium.....	Round.....
Cherry's Cluster	Medium	4.	3.5	.....	Small.....	Round.....
on Cook...	Long...	6.7	3.	5-9	Small.....	Pointed.....
on Peerless	Long...	7.	3.	6-7	Medium.....	Pointed.....
W. A. Cook.....	Short.	Tall.	5.	.....	Large.....	Tapering.....
J. C. Cook*.....	Long...	4.	.....	.....	Small.....	Round.....
on W.A. Cook*	Long...	4.6	3.5	3-6	Large.....	Tapering.....
on Peerless..	Short...	4.5	3.5	8-10	Small.....	Round.....
Dixon.....	Short.	Short.	3.5	Scatt'rd	Small.....	Round.....
on Cook...	Long...	6.	3.5	7-12	Small.....	Tapering.....
on Peerless	Medium	4.5	3.5	4	Small.....	Round.....
Gold Dust.....	Long.	Short.	3.5	.....	Small.....	Round.....
on Cook...	Long...	5.6	3.	7-8	Medium.....	Tap'ng round
on Peerless	Long...	4.5	3.5	5-7	Medium.....	Round.....
Herlong.....	Long...	4.	3.4	.....	Medium.....	Round.....
on Cook...	Long...	5.6	3.	4	Long.....	Tapering.....
on Peerless	Short...	4.	3.5	6-8	Small.....	Tapering.....
Hawkins' Imp.	Short.	Tall.	3.4.5	.....	Large.....	Round.....
on Cook...	Long...	5.6	3.5	5-6	Large.....	Tapering.....
on Peerless	Long...	4.5	3.	7	Small.....	Round.....
Hunnicutt.....	Long.	Tall.	3.5	.....	Large.....	Pointed.....
on Cook...	Long...	6.7	3.5	5	Medium.....	Tapering.....
on Peerless	Long...	4.6	3.5	3-4	Large.....	Pointed.....
Jones' Improved	Short...	3.	3.5	.....	Medium.....	Round.....
on Cook...	Long...	3.4	3.	5-8	Small.....	Round.....
on Peerless	Long...	4.5	3.5	5-7	Small.....	Round.....
Jones' L'g Staple	Long.	Tall.	3.	.....	Large.....	Pointed.....
on Cook.....	.....	.....	.....	.....	.....	.....
on Peerless	Long...	4.5	3.5	5-6	Medium.....	Tapering.....
Keith.....	Short...	5.	3.5	.....	Medium.....	Round.....
on Cook...	Long...	6.8	3.5	8-10	Large.....	Tap'ng round
on Peerless	Long...	3.4	3.	3	Small.....	Round.....
T. J. King.....	Long...	3.	3.5	.....	Small.....	Round.....
on Cook...	Long...	3.4	3.	3-4	Small.....	Tapering.....
on Peerless	Long...	5.6	3.	5-6	Medium.....	Tapering.....
Okra Leaf.....	Medium	4.	3.5	5-7	Small.....	Tapering.....
on Cook.....	.....	.....	.....	.....	.....	.....
on Peerless	Long...	6.	3.5	5-7	Small.....	Round.....
Peeler.....	Long.	Tall.	3.5	.....	Medium.....	Tapering.....
on Cook...	Average	4.5	3.	3-4	Small.....	Tapering.....
on Peerless	Long...	6.7	3.4.5	5	Large.....	Tapering.....
Peerless.....	Long...	4.	4.5	.....	Small.....	Round.....
on Cook...	.....	4.6	3.5	3-5	Large & small	Tap'ng round

* This type is probably a hybrid from a blending of the *G. nanking* or *sanguineum* on the upland types. The color of stalk and smooth, black seed indicate *G. nanking* or *sanguineum* and shape of leaves, bolls, etc., the upland type.

†Fiber adheres tenaciously to the boll rendering it troublesome to pick.

TABLE III—Continued.

PLANTS AND THE CROSSES PRODUCED.

Prolific or Non-prolific.	Color of Seed.	Length of Staple.	Time of maturity.	Remarks.
Prolific....	Light brown	Long.	Medium	Seed large, furry.
Prolific....	Light brown	Long.	Medium	Seed large, furry.
Prolific....	Light brown	Long.	Medium	Seed large, furry.
Prolific....	Black.....	Med.	Early..	Seed small, smooth.
Prolific....	Light brown	Long.	Medium	Seed large, furry.
Prolific....	Light brown	Long.	Early..	Seed large, furry.
Prolific....	Light brown	Med.	Late..	Seed medium, furry—limbs scarce.
Prolific....	Light brown	Long.	Medium	Seed medium, furry—limbs numerous.
Prolific....	Dark brown	Short.	Medium	Seed small, furry—limbs numerous.
Prolific....	Light brown	Short.	Early..	Seed med., furry—resembles Peerless clust'd.
Prolific....	Light brown	Long.	Early..	Clustered. Seed med., furry—limbs num'ous.
Prolific....	Light brown	Short.	Early..	Seed medium, furry—limbs numerous.
Prolific....	Light brown	Long.	Late..	Seed large, furry.
Non-prolific	Dark brown	Short.	Vry late	Purple stem—Seed small, furry.
Average....	Dark brown	Long.	Medium	Seed medium, furry—limbs numerous.
Prolific....	Dark brown	Long.	Medium	Seed medium, furry—limbs numerous.
Prolific....	Brown.....	Short.	Early..	Seed medium, furry.
Prolific....	Brown.....	Long.	Early..	Seed medium, furry—limbs numerous.
Non-prolific	Brown.....	Short.	Early..	Seed medium, furry—limbs numerous.
Mod. Pr'lific	Brown.....	Short.	Early..	Seed large, furry—limbs few—very yel. pol'n.
Prolific....	Light brown	Long.	Early..	Seed large, furry—limbs numerous.
Prolific....	Light brown	Short.	Early..	Seed large, furry—limbs numerous.
Prolific....	Green.....	Short.	Early..	Seed medium, furry—clustered.
Non-prolific	Light brown	Long.	Early..	Seed large, furry—limbs numerous.
Prolific....	Dark Green	Short.	Early..	Seed medium, furry—limbs numerous.
Prolific....	Light brown	Short.	Medium	Seed large, furry.
Prolific....	Light brown	Short.	Medium	Seed small, furry—limbs numerous.
Prolific....	Light brown	Short.	Medium	Seed small, furry—limbs numerous.
Prolific....	Light brown	Short.	Late..	Seed large, furry—limbs numerous.
Mod. Pr'lific	Light brown	Long.	Medium	Seed large, furry—limbs numerous.
Non-prolific	Light brown	Short.	Medium	Seed large, furry—limbs numerous.
Moderate..	Light brown	Short.	Early..	Seed medium, furry—limbs drooping.
Prolific....	Light brown	Short.	Early..	Seed large, furry—limbs numerous.
Prolific....	Light brown	Short.	Early..	Seed large, furry—limbs numerous.
Non-prolific	Light brown	Long.	Late..	Seed large, furry—limbs straggling.
Prolific....	Light brown	.....	.....	Cross failed.
Prolific....	Light brown	Short.	.....	Seed large, furry—limbs numerous.
Prolific....	Light brown	Short.	Early..	Seed large, furry—limbs few.
Prolific....	Light brown	Long.	Early..	Seed medium, furry—limbs numerous.
Non-prolific	Light brown	Long.	Early..	Seed medium, furry—limbs numerous.
Prolific....	Brown.....	Short.	Early..	Seed large, furry—limbs few.
Non-prolific	Brown.....	Short.	Early..	Seed medium, furry.
Prolific....	Dark Brown	Short.	Early..	Seed medium, furry.
Prolific....	Light brown	Med..	Early..	Seed medium, furry.
Prolific....	Light brown	.....	.....	Cross failed.
Prolific....	Light brown	Short.	Early..	Seed large, furry—limbs numerous.
Non-prolific	Brown.....	Long.	Late..	Seed large, furry—limbs straggling.
Non-prolific	Brown.....	Long.	Medium	Seed large, furry.
Non-prolific	Brown.....	Long.	Medium	Seed large, furry—limbs numerous.
Prolific....	Light brown	Short.	Early..	Two bolls at joints—seed large, furry, clust'd.
Non-prolific	Brown.....	Long.	.....	Seed medium, furry.

TABLE III—Continued.

CHARACTERISTIC FEATURES OF ORIGINAL

Name of Cotton.	Length of Branches.	Height of Stalk in feet	Number of lobes to leaves	Number of bolls to each limb.	Size of bolls.	Shape of bolls.
Peterkin Imp'd.	Long...	Tall...	.....	.....	Small.....	Round.....
on Cook...	Long...	3.4	3.	2-3	Small.....	Tapering.....
on Peerless	.....	5.6	3.4.5	5-6	Large.....	Tapering.....
Petit Gulf.....	Long...	Tall...	5.	.....	Medium.....	Tapering.....
on Cook...	Long...	4.	3.	3	Medium.....	Tapering.....
on Peerless	Long...	6.	3.	4	Small.....	Round.....
Rameses.....	Long...	4.	.....	.....	Medium.....	Round.....
on Cook...	Long...	4.5	5.	5-6	Small.....	Round.....
on Peerless	.....	4.	3.	4-5	Small.....	Tapering.....
Storm Proof †	Medium	Tall...	3.4.5	.....	Medium.....	Pointed.....
on Cook...	Long...	4.5	3.	2-3	Medium.....	Pointed.....
on Peerless	Long...	4.5	3.5	4-6	Medium.....	Pointed.....
Southern Hope	Long...	Tall...	4.5	.....	Medium.....	Pointed.....
on Cook...	Long...	4.5	3.	3-5	Large & small	Pointed round
on Peerless	.....	5.	3.	6-7	Small.....	Round.....
Sea Island.....	.....	6.	5.	5-6	Small.....	Pointed.....
Bamieh †.....	No limb	10.	5.	2-3	Long.....	Pointed.....
Affi †.....	Short...	12.	3.5	3-4	Small.....	Pointed.....
Truitt.....	Long...	Av'ge	3.5	.....	Small.....	Round.....
on Cook...	Very 1'g	3.4	3.5	3	Small.....	Tapering.....
on Peerless	Long...	4.5	3.5	5-7	Small.....	Round.....
Welborn's Pet.	Short...	Tall...	4.5	.....	Medium.....	Round.....
on Cook...	Medium	6.	3.5	3-4	Large.....	Pointed.....
on Peerless	Long...	4.6	3.5	3-5	Small.....	Round.....
Wonderful.....	Long...	Tall...	3.5	.....	Large.....	Pointed.....
on Cook...	Long...	4.6	3.	2-3	Large.....	Pointed.....
on Peerless	Long...	6.7	3.5	5-7	Large.....	Pointed.....
Zellner.....	Long...	4.	3.5	.....	Medium.....	Round.....
on Cook...	Long...	5.6	5.	3	Small.....	Pointed.....
on Peerless	Long...	3.4	3.5	3-4	Small.....	Round.....

‡ The cotton worm passed these plants by even after all other plants had been stripped of leaves.

TABLE III—Continued.

PLANTS AND THE CROSSES PRODUCED.—Continued.

Prolific or Non-prolific.	Color of Seed.	Length of Staple.	Time of maturity.	Remarks.
Non-prolific	Brown	Med.	Late . . .	Seed medium, furry—plant straggling.
Non-prolific	Brown	Long	Early . .	Seed medium, furry.
Prolific . . .	Brown	Short	Average	Seed medium, furry.
Non-prolific	Dark brown	Med..	Late . . .	Seed medium, furry—plant straggling.
Non-prolific	Dark brown	Short	Late . . .	Seed medium, furry.
Non-prolific	Dark brown	Short.	Late . . .	Seed medium, furry.
Prolific . . .	Brown	Short	Early . .	Seed large, furry.
Prolific . . .	Brown	Short.	Early . .	Seed medium, furry.
Mod. Pr'lific	Brown	Short.	Early . .	Seed medium, furry.
Non-prolific	Brown	Med..	Late . . .	Seed large, furry.
Non-prolific	Brown . . . .	.. . .	Late . . .	Seed large, furry.
Mod. Pr'lific	Brown	Long	Average	Seed large, furry—very little rust present.
Non-prolific	Brown	Long	Late . . .	Seed large, furry—plant straggling.
Mod. Pr'lific	Brown	Short.	Average	Seed medium, furry.
Prolific . . .	Brown	Long.	Average	Seed medium, furry.
Prolific . . .	Black	Long.	Late . . .	S'd sm'l, sm'h-lvs larg-b'ls 3 lob.—st'lks red'h.
Non-prolific	Black	Long	Late . . .	S'd sm'l, sm'h-leaves larg'-bolls on main stem.
Non-prolific	Black	Long.	Late . . .	Leaves large—seed small, smooth.
Prolific . . .	Brown	Short	Average	Seed large, furry.
Non-prolific	Brown	Long.	Average	Seed medium, furry—limbs numerous.
Prolific . . .	Brown	Short.	Average	Seed large, furry—limbs numerous.
Prolific . . .	Brown	Short.	Early . .	Seed large, furry—clustered.
Non-prolific	Brown	Long	Early . .	Seed large, furry.
Non-prolific	Brown	Short.	Early . .	Seed large, furry—limbs numerous.
Prolific . . .	Light brown	Long.	Late . . .	Seed large, furry.
Non-prolific	Light brown	Long	Average	Seed medium, furry.
Prolific . . .	Light brown	Long	Average	Seed large, furry—limbs numerous.
Non-prolific	Brown	Short.	Early . .	Seed large, furry.
Non-prolific	Brown	Long	Early . .	Seed small, furry.
Non-prolific	Brown	Long	Early . .	Seed small, furry—limbs numerous.

TABLE IV.

Number.	Name of Varieties containing male flowers supplying pollen.	Name of variety with female organ.	Length of bolls original varieties in inches.	Circumference of bolls original varieties in inches.	Number of carpels to boll—original varieties.	Length of boll on crossed plant—inches.	Circumference of boll on crossed plant—inches.
1	Mit Affi				3		
2	Allen's Long Staple	Peerless	2.5	4.8	4		
3	Allen's Long Staple	Peerless					
4	Allen's Long Staple	Cook, W A					
5	Allen's Long Staple	Cook, W A				2.3	4.4
6	Bailey	Cook, W A	2.0	5.0	5	2.5	5.0
7	Bailey	Cook, W A					
8	Bailey	Peerless				2.5	4.5
9	Bailey	Peerless					
10	Barnett	Cook, W A	3.3	4.4	3	2.3	4.5
11	Barnett	Cook, W A				2.5	5.0
12	Barnett	Peerless					
13	Bamieh				{ 3 4		
14	Cherry's Cluster	Cook, W A	2.1	4.3	5	2.5	4.8
15	Cherry's Cluster	Cook, W A					
16	Cherry's Cluster	Peerless				2.2	4.1
	Cook, W A		2.1	4.8	5		
17	Cook, J C	Cook, W A	2.1	4.3		2.4	4.8
18	Cook, J C	Cook, W A				2.4	4.9
19	Cook, J C	Peerless				2.1	4.0
20	Dixon	Cook, W A	2.1	4.5	5	2.5	5.0
21	Dixon	Cook, W A					
22	Dixon	Peerless				2.0	4.0
23	Gold dust	Cook, W A	2.0	4.1	5		
24	Gold dust	Cook, W A				2.4	5.2
25	Gold dust	Peerless					
26	Gold dust	Peerless					
28	Herlong	Cook, W A	2.3	4.7	5	2.4	4.7
29	Herlong	Cook, W A				2.5	4.9
30	Herlong	Peerless					
31	Herlong	Peerless					
32	Hawkins' Improved	Cook, W A	2.5	5.1	4	2.8	5.5
33	Hawkins' Improved	Peerless				2.3	3.7
34	Hunnicut	Cook, W A	2.5	4.6	5		
35	Hunnicut	Peerless				2.5	5.0
36	Jones' improved	Cook, W A	2.4	4.8	5	2.5	5.3
37	Jones' improved	Peerless				2.1	4.4
38	Jones' long staple	Peerless	2.3	4.8	5	2.1	4.3
39	Jones' long staple	Peerless				2.4	4.6
40	Keith	Cook, W A	2.0	4.3	4		
41	Keith	Cook, W A				2.3	4.5
42	Keith	Peerless				2.3	4.3
43	King, T J	Cook, W A	2.4	4.5	5	2.4	4.3
44	King, T J	Peerless				2.3	4.7
45	Nankin				{ 3 4		

TABLE IV—Continued.

	Number of carpels to boll on crossed plants.	Number of seed to boll—original variety.	Number of seed to boll—crossed plants.	Weight of seed original plants per boll—grammes.*	Weight of seed per boll crossed plants—grammes.*	Weight of fiber per boll original plants—grammes.*	Weight of fiber per boll crossed plants—grammes.*	Per cent of seed per boll original plants.	Per cent of seed per boll—crossed plants.	Per cent fiber per boll—original plants.
4	20	34	3.096	1.582	2.194	66.6	33.8			
5	45	40	3.722	4.540	2.035	64.7	35.3			
5	43	39	5.117	4.283	2.309	69.0	31.0			
5	39	41	6.430	2.4860	2.210	66	34.0			
5	35	41	4.2578	6.132	2.639	74.6	25.4			
5	39	42	6.104	5.702	2.706	69.3	30.7			
5	45	42	5.702	5.707	3.058	65.4	34.6			
5	42	42	5.707	4.779	2.704	67.8	32.2			
5	27	42	3.115	4.779	1.737	64.2	35.8			
4	35	35	5.175	5.175	2.090	71.2	28.8			
5	38	38	4.866	4.866	2.244	68.4	31.6			
4	21	36	3.158	1.429	68.8	31.2				
5	42	44	3.917	4.326	2.190	1.979	63.5	68.6	36.5	
4	36	36	4.840	4.840	2.545	65.5	34.5			
5	42	44	4.090	4.090	1.950	67.7	32.3			
5	44	44	5.675	5.675	2.740	67.4	32.6			
5	44	44	4.556	4.556	2.993	65.5	34.5			
5	44	44	4.866	4.866	2.399	66.9	33.1			
4	35	35	4.363	4.363	1.793	70.9	29.1			
4	44	35	5.1068	4.976	2.5456	2.363	66.8	67.8	33.2	
5	40	40	5.817	5.817	2.421	70.6	29.4			
5	37	37	3.860	3.860	1.907	66.3	33.7			
5	39	39	4.5850	4.841	2.1200	2.655	69.9	64.6	30.1	
4	31	31	4.079	4.079	1.944	67.7	32.3			
5	45	45	4.873	4.873	2.140	69.5	30.5			
5	44	44	5.038	5.038	2.819	64.1	35.9			
5	45	44	4.7900	5.892	2.4670	2.512	67.9	60.6	32.1	
4	36	36	5.222	5.222	2.578	66.9	33.1			
4	38	38	4.430	4.430	1.778	71.3	28.7			
4	40	40	4.686	4.686	2.093	69.1	30.9			
5	41	43	1.670	7.020	1.096	3.557	60.3	66.3	39.7	
5	43	43	5.260	5.260	2.346	69.2	30.8			
4	42	34	5.4136	4.940	2.4518	2.120	69.2	69.8	30.8	
5	47	47	6.471	6.471	2.846	69.5	30.5			
5	30	41	4.570	5.340	2.470	2.289	62.6	70.0	37.4	
5	42	42	5.240	5.240	2.490	67.8	32.2			
5	42	43	5.440	6.337	2.560	2.500	68.0	71.7	32.0	
4	34	34	3.927	3.927	1.992	66.2	33.8			
4	35	34	4.1076	4.675	1.6756	2.002	69.9	69.4	30.1	
5	40	40	4.984	4.984	1.870	72.7	27.3			
5	42	42	6.766	6.766	3.376	66.7	33.3			
5	45	38	2.490	4.656	1.530	2.007	61.4	69.7	38.6	
5	34	34	4.724	4.724	2.228	67.9	32.1			
36	4.067	1.838	68.9	31.1						

TABLE IV—Continued.

Number.	Name of varieties containing male flowers supplying pollen.	Name of variety with female organ.	Per cent. fiber per boll — crossed plants.	Length fiber original plants expressed in inches—4 tests.	Diameter of fiber original plants in millim's—av. 6 str'nd†	Length of fiber cross'd plants in inches—av. 6 strand.
1	Mit Affi			1.30	0.013	
2	Allen's Long Staple	Peerless	32.6	1.30	0.020	1.3
3	Allen's Long Staple	Peerless	31.0			1.3
4	Allen's Long Staple	Cook, W. A.	34.0			1.4
5	Allen's Long Staple	Cook, W. A.	32.8			1.3
6	Bailey	Cook, W. A.	30.0	1.10	0.016	1.5
7	Bailey	Cook, W. A.	30.7			1.2
8	Bailey	Peerless	34.6			1.2
9	Bailey	Peerless	32.2			1.4
10	Barnett	Cook, W. A.	32.1	1.00	0.020	1.6
11	Barnett	Cook, W. A.	28.8			1.4
12	Barnett	Peerless	31.6			1.1
13	Bamieh			{ 2.50 1.70	0.017	
14	Cherry's Cluster	Cook, W. A.	31.4	0.090	0.017	1.3
15	Cherry's Cluster	Cook, W. A.	34.5			1.2
16	Cherry's Cluster	Peerless	32.3			1.0
	Cook, W. A.			1.50	0.020	
17	Cook, J. C.	Cook, W. A.	39.6	0.75	0.020	1.5
18	Cook, J. C.	Cook, W. A.	33.1			1.2
19	Cook, J. C.	Peerless	29.1			1.4
20	Dixon	Cook, W. A.	32.2	0.75	0.020	1.4
21	Dixon	Cook, W. A.	29.4			1.3
22	Dixon	Peerless	33.7			0.9
23	Gold dust	Cook, W. A.	35.4	0.75	0.014	1.2
24	Gold dust	Cook, W. A.	32.3			1.3
25	Gold dust	Peerless	30.5			0.9
26	Gold dust	Peerless	35.9			1.0
28	Herlong	Cook, W. A.	39.4	0.75	0.022	1.2
29	Herlong	Cook, W. A.	33.1			1.2
30	Herlong	Peerless	28.7			1.1
31	Herlong	Peerless	30.9			0.9
32	Hawkins' Improved	Cook, W. A.	33.7	0.87	0.020	1.1
33	Hawkins' Improved	Peerless	30.8			1.2
34	Hunnicut	Cook, W. A.	30.2	1.00	0.020	1.4
35	Hunnicut	Peerless	30.5			1.1
36	Jones' Improved	Cook, W. A.	30.0	0.90	0.014	1.1
37	Jones' Improved	Peerless	32.2			1.2
38	Jones' Long Staple	Peerless	28.3	1.25	0.020	1.2
39	Jones' Long Staple	Peerless	33.8			1.1
40	Keith	Cook, W. A.	30.6	1.00	0.020	1.2
41	Keith	Cook, W. A.	27.3			1.3
42	Keith	Peerless	33.3			1.4
43	King, T. J.	Cook, W. A.	30.1	0.70	0.018	1.0
44	King, T. J.	Peerless	32.1			0.9
45	Nankin				0.018	0.9

TABLE IV—Continued.

Diameter of fiber crossed plants in millim's—av. 6 str. nd†	Condition of twist original plants.	Condition of twist crossed plants.	Strength of fiber original plants— grammes.†	Strength of fiber crossed plants— grammes.†	Degree of maturity of fiber— crossed variety.	Degree of maturity of fiber— original variety.
0.020	Fair.....		14.2			Fair.
0.018	Fair.....	Very good.....	8.92	11.95	Good.....	Fair.
0.018		Good.....		11.04	Good.....	
0.020		Good.....		8.42	Good.....	
0.020		Fair.....		10.37	Good.....	
0.021	Fair.....	Excellent.....	8.10	8.15	Very good.....	Fair.
0.019		Good.....		10.25	Good.....	
0.018		Poor.....		8.19	Poor.....	
0.018		Fair.....		8.45	Fair.....	
0.020	Fair.....	Excellent.....	5.57	6.95	Excellent.....	Good.
0.020		Good.....		10.21	Good.....	
0.022		Excellent.....		14.57	Excellent.....	
0.020	Fair.....		15.17			Fair.
0.022	Fair.....	Excellent.....	14.75	13.08	Very good.....	Fair.
0.020		Excellent.....		10.51	Excellent.....	
0.020		Fair.....		13.23	Good.....	
0.013	Good.....		7.59			Good.
0.013	Good.....	Fair.....	11.67	11.88	Good.....	Good.
0.021		Fair.....		12.45	Good.....	
0.018	Fair.....	Good.....	9.85	10.55	Good.....	
0.014	Fair.....	Excellent.....	10.24	8.58	Excellent.....	Good.
0.020		Poor.....		9.37	Poor.....	
0.016	Fair.....	Fair.....	10.74	9.23	Fair.....	Fair.
0.018		Fair.....		13.04	Fair.....	Fair.
0.020		Poor.....		13.03	Poor.....	
0.016		Good.....		6.47	Good.....	
0.021	Poor.....	Poor.....		13.83	Very poor.....	
0.016		Fair.....	8.85	13.00	Good.....	Fair.
0.018		Fair.....		9.94	Fair.....	
0.018		Fair.....		8.42	Fair.....	
0.017		Poor.....		9.04	Poor.....	
0.018	Fair.....	Poor.....	4.31	9.75	Poor.....	Fair.
0.020		Excellent.....		10.89	Very good.....	
0.017	Very good.....	Good.....	7.89	7.86	Good.....	Very good
0.021		Good.....		6.16	Very good.....	
0.018	Good.....	Poor.....	9.75	6.57	Good.....	Good.
0.020		Good.....		10.39	Very good.....	
0.020	Very poor.....	Good.....	7.55	11.71	Good.....	Good.
0.020		Fair.....		11.05	Fair.....	
0.020	Very fair.....	Very good.....	7.12	7.08	Excellent.....	Good.
0.017		Fair.....		8.89	Good.....	
0.020		Very good.....		7.72	Good.....	
0.018	Fair.....	Excellent.....	7.91	12.79	Good.....	Fair.
0.014		Fair.....		11.28	Fair.....	
.....	Very fair.....	.....	8.88	.....	.....	Good.

TABLE IV—Continued.

Number.	Name of Varieties containing male flowers supplying pollen.	Name of variety with female organ.	Length of bolls original varieties inches.	Circumference of bolls original varieties inches.	Number of carpels to boll—original varieties.	Length of boll on crossed plant—inches.
46	Okra leaf.....	Peerless.....	2.1	4.4	5	2.3
47	Peeler.....	Peerless.....	2.4	4.5	5	.....
48	Peeler.....	Peerless.....	.....	.....	.....	.....
49	Peeler.....	Peerless.....	.....	.....	.....	.....
50	Peeler.....	Cook, W A.....	.....	.....	.....	2.5
51	Peerless.....	Cook, W A.....	2.3	4.8	5	2.3
52	Peerless.....	Cook, W A.....	.....	.....	.....	2.6
53	Peterkin.....	Cook, W A.....	2.5	4.8	5	2.5
54	Peterkin.....	Peerless.....	.....	.....	.....	.....
55	Petit gulf.....	Cook, W A.....	2.4	4.8	5	.....
56	Petit gulf.....	Peerless.....	.....	.....	.....	2.4
57	Rust proof.....	Cook, W A.....	2.5	4.5	.....	2.5
58	Rust proof.....	Peerless.....	.....	.....	.....	.....
59	Rameses.....	Cook, W A.....	2.3	4.4	.....	.....
60	Rameses.....	Cook, W A.....	.....	.....	.....	.....
61	Rameses.....	Peerless.....	.....	.....	.....	.....
62	Storm proof.....	Peerless.....	.....	.....	.....	.....
64	Sea Island.....	.....	.....	.....	4	.....
65	Southern hope.....	Peerless.....	2.6	4.8	5	2.0
66	Southern hope.....	Cook, W A.....	.....	.....	.....	2.8
67	Southern hope.....	Cook, W A.....	.....	.....	.....	2.4
68	Truitt.....	Peerless.....	2.4	4.8	5	2.5
69	Truitt.....	Peerless.....	.....	.....	.....	2.5
70	Truitt.....	Peerless.....	.....	.....	.....	.....
71	Truitt.....	Cook, W A.....	.....	.....	.....	2.6
72	Welborn's pet.....	Cook, W A.....	2.1	4.5	5	2.4
73	Welborn's pet.....	Peerless.....	.....	.....	.....	.....
74	Welborn's pet.....	Peerless.....	.....	.....	.....	2.0
75	Wonderful.....	Peerless.....	2.5	4.3	5	2.0
76	Wonderful.....	Peerless.....	.....	.....	.....	.....
77	Wonderful.....	Peerless.....	.....	.....	.....	.....
78	Wonderful.....	Peerless.....	.....	.....	.....	.....
79	Wonderful.....	Peerless.....	.....	.....	.....	.....
80	Wonderful.....	Cook, W A.....	.....	.....	.....	2.3
81	Zellner.....	Peerless.....	2.3	4.8	5	.....
82	Zellner.....	Peerless.....	.....	.....	.....	2.0
83	Zellner.....	Cook, W A.....	.....	.....	.....	2.5

TABLE IV—Continued.

Circumference of boll on crossed plant—inches.	Number of carpels to boll on crossed plants.	Number of seed to boll—original variety.	Number of seed to boll—crossed plants.	Weight of seed original plants per boll—grammes.*	Weight of seed per boll crossed plants—grammes.*	Weight of fiber. per boll original plants—grammes.*	Weight of fiber per boll crossed plants—grammes.*	Per cent. of seed per boll original plants.	Per cent. of seed per boll crossed plants.	Per cent. fiber per boll—original plants.
4.8	4	31	37	2.852	4.933	1.857	2.630	60.6	65.3	39.4
.....	5	43	44	4.860	6.443	2.322	2.784	67.6	69.9	32.4
.....	5	.....	41	.....	5.939	.....	2.297	.....	72.1	.....
.....	4	.....	39	.....	4.988	.....	2.216	.....	69.2	.....
4.9	5	.....	40	.....	6.382	.....	2.252	.....	73.9	.....
4.4	4	42	33	3.217	4.607	1.751	1.941	64.8	70.4	35.2
4.8	5	.....	41	.....	5.245	.....	2.765	.....	65.5	.....
4.4	5	45	39	3.826	4.944	2.499	2.159	60.3	69.7	39.7
.....	5	.....	43	.....	4.945	.....	2.630	.....	65.3	.....
.....	5	42	43	5.897	4.216	2.751	2.507	68.2	62.7	31.8
4.8	5	.....	44	.....	4.276	.....	3.214	.....	57.1	.....
5.1	4	41	33	5.340	5.026	2.706	2.076	66.3	70.8	32.7
.....	4	.....	33	.....	4.608	.....	2.396	.....	65.8	.....
.....	5	34	43	2.417	4.910	1.029	2.460	70.2	66.6	29.8
.....	5	.....	44	.....	5.610	.....	2.755	.....	67.1	.....
.....	4	.....	32	.....	4.129	.....	1.802	.....	69.6	.....
.....	5	45	48	5.8028	7.314	2.8880	3.237	68.9	69.3	31.1
.....	.....	15	.....	2.023	.....	0.658	.....	.....	.....	29.3
4.4	4	40	36	4.975	4.068	2.239	1.838	68.9	73.4	31.1
5.2	4	.....	37	.....	4.070	.....	1.612	.....	71.6	.....
4.8	5	.....	44	.....	6.149	.....	2.842	.....	68.4	.....
4.3	4	33	36	5.029	5.439	2.419	2.258	67.6	70.7	32.4
4.1	4	.....	35	.....	5.183	.....	2.3.5	.....	68.8	.....
.....	5	.....	37	.....	5.197	.....	2.580	.....	68.1	.....
4.6	5	.....	43	.....	5.670	.....	2.454	.....	68.9	.....
5.0	5	34	35	1.312	5.193	0.890	1.926	59.6	73.1	40.4
.....	5	.....	43	.....	5.238	.....	2.316	.....	68.5	.....
4.4	4	.....	38	.....	4.123	.....	1.394	.....	74.7	.....
4.2	4	42	33	5.415	5.624	2.423	2.320	69.0	71.8	31.4
.....	4	.....	34	.....	5.010	.....	2.575	.....	64.7	.....
.....	4	.....	38	.....	5.344	.....	2.660	.....	66.8	.....
.....	4	.....	34	.....	5.397	.....	2.338	.....	68.6	.....
.....	5	.....	40	.....	5.154	.....	2.490	.....	67.4	.....
5.0	4	.....	33	.....	4.574	.....	2.118	.....	68.3	.....
.....	5	33	42	5.015	5.349	1.837	1.900	73.8	73.8	26.8
4.3	5	.....	47	.....	5.294	.....	2.610	.....	66.4	.....
5.1	5	.....	41	.....	4.916	.....	1.653	.....	74.8	.....

TABLE IV—Continued.

Number.	Name of varieties containing male flowers supplying pollen.	Name of variety with female organ.	Per cent. fiber per boll—crossed plants.	Length fiber original plants expressed in inches—4 tests.	Diameter of fiber original plants in millim's—av. 6 strand ⁺	Length of fiber in inches—av. 6 strand.
46	Okra leaf	Peerless	34.7	1.20	0.022	1.1
47	Peeler	Peerless	30.1	1.20	0.014	1.4
48	Peeler	Peerless	27.9			1.1
49	Peeler	Peerless	30.8			1.2
50	Peeler	Cook, W. A.	26.1			1.4
51	Peerless.	Cook, W. A.	29.6	0.87	0.020	1.4
52	Peerless.	Cook, W. A.	34.5			1.3
53	Peterkin	Cook, W. A.	30.3	1.00	0.020	1.4
54	Peterkin	Peerless	34.7			1.1
55	Petit gulf.	Cook, W. A.	37.3	1.00	0.020	0.9
56	Petit gulf.	Peerless	42.9			0.9
57	Rust proof	Cook, W. A.	29.2		0.014	1.1
58	Rust proof	Peerless	34.2			1.0
59	Rameses	Cook, W. A.	33.4	0.87	0.025	1.2
60	Rameses	Cook, W. A.	32.9			0.8
61	Rameses	Peerless	30.4			1.2
62	Storm proof.	Peerless	30.7	1.00	0.020	1.4
64	Sea Island			1.50	0.017	
65	Southern hope	Peerless	26.6	1.20	0.018	1.3
66	Southern hope	Cook, W. A.	28.4			1.1
67	Southern hope	Cook, W. A.	31.6			1.3
68	Truitt.	Peerless	29.3	0.90	0.014	1.0
69	Truitt.	Peerless	31.2			1.1
70	Truitt.	Peerless	31.9			1.1
71	Truitt.	Cook, W. A.	31.1			1.2
72	Welborn's pet.	Cook, W. A.	26.9	0.90	0.014	1.4
73	Welborn's pet.	Peerless	31.5			1.2
74	Welborn's pet.	Peerless	25.3			0.9
75	Wonderful	Peerless	25.3	1.35	0.018	1.0
76	Wonderful	Peerless	35.3			1.2
77	Wonderful	Peerless	33.2			1.0
78	Wonderful	Peerless	31.4			1.2
79	Wonderful	Peerless	32.6			1.2
80	Wonderful	Cook, W. A.	31.7			1.2
81	Zellner	Peerless	26.2	0.90	0.020	1.2
82	Zellner	Peerless	33.6			1.2
83	Zellner	Cook, W. A.	25.2			1.4

TABLE IV—Continued.

Diameter of fiber crossed plants millim's—av.6 str.nd.†	Condition of twist original plants.	Condition of twist crossed plants.	Strength of fiber original plants— grammes.‡	Strength of fiber crossed plants— grammes.‡	Degree of maturity of fiber— crossed variety.	Degree of maturity of fiber— original variety.
0.020	Very fair....	Very good....	7 12	11 32	Good....	Fair....
0.017	Fair.....	Very good....	8 53	10.05	Good....	Fair....
0.017	.....	Fair.....	8 43	Fair....	.....	.....
0.022	.....	Good.....	.....	10.97	Good....	.....
0.018	.....	Very good....	.....	10.06	Very good	.....
0.020	Very good....	Good.....	10.42	11 56	Very good	Very good
0.017	.....	Excellent....	.....	6 52	Very good	.....
0.020	Fair.....	Very good....	7 33	9 24	Very good	Fair....
0.022	.....	Excellent....	.....	12.46	Excellent	.....
0.016	Very good....	Good.....	7 77	11 96	Good....	Very good
0.018	.....	Good.....	.....	13 04	Good....	.....
0.020	Fair.....	Very good....	11 02	7 90	Very good	Fair....
0.022	.....	Very good....	.....	12.58	Very good	.....
0.013	Fair.....	Fair.....	13 08	12 12	Fair....	Good....
0.018	.....	Very fair....	.....	9.67	Very good	.....
0.016	.....	Poor.....	.....	6.96	Poor....	.....
0.018	Very good....	Very good....	7.48	9 25	Very good	Good....
.....	Very good....	.....	8 51	12.70‡	.....	Very good
0.011	Very fair....	Fair.....	10 26	12 05	Good....	Good....
0.017	.....	Excellent....	.....	8 61	Excellent	.....
0.017	.....	Very good....	.....	7.26	Good....	.....
0.018	Poor.....	Fair.....	15.16	13 05	Fair....	Poor....
0.022	.....	Fair.....	.....	12.63	Fair....	.....
0.021	.....	Excellent....	.....	14 14	Very good	.....
0.014	.....	Excellent....	.....	10 78	Excellent	.....
0.013	Good.....	Poor.....	7.34	7.03	Poor....	Good....
0.025	.....	Fair.....	.....	6 86	Fair....	.....
0.037	.....	Excellent....	.....	10.75	Excellent	.....
0.021	Very fair....	Good.....	.....	8 52	Good....	Fair....
0.020	.....	Excellent....	9.61	12.44	Excellent	.....
0.022	.....	Excellent....	.....	11.28	Excellent	.....
0.014	.....	Very good....	.....	9 31	Good....	.....
0.017	.....	Very good....	.....	10.79	Very good	.....
0.018	.....	Good.....	.....	8.26	Good....	.....
0.016	Fair.....	Fair.....	12 43	16 12	Fair....	Good....
0.020	.....	Good.....	.....	9.65	Good....	.....
0.021	.....	Very good....	.....	11.56	Very good	.....

* A gramme is equivalent to 15.4 grains.

† A millimeter is equivalent to 0.03937 of an inch.

‡ Results of cultivation at Auburn.

MICRO-PHOTOGRAPH, FIG. 10.

1. Affi.
2. Bamieh.
3. Sea Island.
4. Nankin.
5. Bailey.
6. Okra Leaf.

These strands were taken at random from the bolls, but rather indicate the average condition of the fiber in each instance. In the case of the Sea Island and Okra leaf, and the Bailey the character of the twist is excellent. The Affi and Bamieh are not so well twisted, but the degree of strength to resist rupture compares very favorably with the others. With the exception of Nankin these are long staple cottons.

MICRO-PHOTOGRAPH, FIG. 11.

The figures in brackets () correspond to those found in first column in table on pages 30-37.

1. Hawkins' improved, *original form*.
2. Hawkins' improved crossed on W. A. Cook (32).
3. Hawkins' improved crossed on Peerless (33).
4. Hunnicutt, *original form*.
5. Hunnicutt crossed on W. A. Cook (34).
6. Hunnicutt crossed on Peerless (35).
7. Jones' improved, *original form*.
8. Jones' improved crossed on W. A. Cook (36).
9. Jones' improved crossed on Peerless (37).
10. Jones' long staple, *original form*.
11. Jones' long staple crossed on Peerless (38).
12. Jones' long staple crossed on Peerless (39).
13. Keith, *original form*.
14. Keith crossed on W. A. Cook (40).
15. Keith crossed on Peerless (42).
16. King, *original form*.
17. King crossed on W. A. Cook (43).
18. King crossed on Peerless (44).

Some of these strands have been untwisted to show more clearly the comparative widths and degree of maturity.

MICRO-PHOTOGRAPH, FIG. 12.

These figures in brackets () correspond to those found in first column in table on pages 30-37.

1. Herlong, *original*.
2. Herlong crossed on W. A. Cook (28).
3. Herlong crossed on Peerless (31).
4. Gold dust, *original*.
5. Gold dust crossed on W. A. Cook (23).
6. Gold dust crossed on Peerless (26).
7. Dixon, *original*.
8. Dixon crossed on W. A. Cook (21).
9. Dixon crossed on Peerless (22).
10. Cherry's cluster, *original*.
11. Cherry's cluster crossed on W. A. Cook (14).
12. Cherry's cluster crossed on Peerless (16).
13. Bailey, *original*.
14. Bailey crossed on W. A. Cook (7).
15. Bailey crossed on Peerless (8).
16. Allen's long staple, *original*.
17. Allen's long staple crossed on Peerless (3).
18. Allen's long staple crossed on W. A. Cook (4).

MICRO-PHOTOGRAPH, FIG. 13.

The figures in brackets () correspond to those found in first column in table on pages 30-37.

1. Southern hope, *original*.
2. Southern hope crossed on Peerless (65).
3. Southern hope crossed on W. A. Cook (67).
4. Truitt, *original*.
5. Truitt crossed on Peerless (68).
6. Truitt crossed on W. A. Cook (71).
7. Welborn's pet, *original*.
8. Welborn's pet crossed on W. A. Cook (72).
9. Welborn's pet crossed on Peerless (73).
10. Wonderful, *original*.
11. Wonderful crossed on Peerless (77).
12. Wonderful crossed on W. A. Cook (80).
13. Zellner, *original*.
14. Zellner crossed on Peerless (82).
15. Zellner crossed on W. A. Cook (83).

FIG. 14.

Size and shapes of bolls secured from the plants developed by the crossing experiments:

*1.	Affi	1%
2.	Allen's long staple on W. A. Cook.....	4
3.	Allen's long staple on W. A. Cook.....	4
4.	Allen's long staple on Peerless.....	2
5.	Allen's long staple on Peerless.....	2
6.	Allen's long staple on W. A. Cook.....	5
7.	Allen's long staple on W. A. Cook.....	5
8.	Allen's long staple on Peerless.....	3
9.	Allen's long staple on Peerless.....	3
10.	Bailey on W. A. Cook.....	6
11.	Bailey on W. A. Cook.....	6
12.	Bailey on W. A. Cook.....	7
13.	Bailey on W. A. Cook.....	7
14.	Bailey on W. A. Cook.....	7
15.	Bailey on Peerless.....	8
16.	Bailey on Peerless.....	8
17.	Bailey on Peerless.....	9
18.	Bailey on Peerless.....	9
19.	Barnett on W. A. Cook.....	10
20.	Barnett on W. A. Cook.....	10
21.	Barnett on W. A. Cook.....	11
22.	Barnett on W. A. Cook.....	11
23.	Barnett on Peerless.....	12
24.	Barnett on Peerless.....	12
25.	Bamieh	13
26.	Bamieh	13
27.	Cherry's cluster on W. A. Cook.....	14
28.	Cherry's cluster on W. A. Cook.....	14
29.	Cherry's cluster on Peerless.....	16
30.	Cherry's cluster on Peerless.....	16
31.	Cherry's cluster on Peerless.....	16
32.	Cherry's cluster on Peerless.....	16
33.	Cherry's cluster on W. A. Cook.....	15
34.	Cherry's cluster on W. A. Cook.....	15
35.	J. C. Cook on Peerless.....	19
36.	J. C. Cook on Peerless.....	19
37.	J. C. Cook on W. A. Cook.....	18
38.	J. C. Cook on W. A. Cook.....	18
39.	J. C. Cook on W. A. Cook.....	17
40.	Dixon on W. A. Cook.....	20

41.	Dixon on W. A. Cook	20
42.	Dixon on Peerless	22
43.	Dixon on W. A. Cook	21
44.	Dixon on W. A. Cook	21
45.	Gold dust on W. A. Cook	23
46.	Gold dust on W. A. Cook	23
47.	Gold dust on Peerless	26
48.	Gold dust on Peerless	26
49.	Gold dust on W. A. Cook	24
50.	Gold dust on W. A. Cook	24
51.	Gold dust on Peerless	25
52.	Gold dust on Peerless	25
53.	Green fiber boll	
54.	Green fiber boll	
55.	Herlong on W. A. Cook	28
56.	Herlong on W. A. Cook	28
57.	Herlong on W. A. Cook	29
58.	Herlong on W. A. Cook	29
59.	Herlong on Peerless	30
60.	Herlong on Peerless	31
61.	Herlong on Peerless	31
62.	Hawkins' improved on W. A. Cook	32
63.	Hawkins' improved on W. A. Cook	32
64.	Hawkins' improved on W. A. Cook	32
65.	Hawkins' improved on Peerless	33
66.	Hawkins' improved on Peerless	33
67.	Hawkins' improved on Peerless	33
68.	Hunnicutt on W. A. Cook	34
69.	Hunnicutt on W. A. Cook	34
70.	Hunnicutt on Peerless	35
71.	Jones' improved on W. A. Cook	36
72.	Jones' improved on W. A. Cook	36
73.	Jones' improved on Peerless	37
74.	Jones' improved on Peerless	37
75.	Jones' long staple on Peerless	38
76.	Jones' long staple on Peerless	38
77.	Jones' long staple on Peerless	39
78.	Jones' long staple on Peerless	39
79.	Jones' long staple on Peerless	39
80.	Keith on W. A. Cook	40
81.	Keith on W. A. Cook	40
82.	Keith on W. A. Cook	41
83.	Keith on Peerless	42
84.	Keith on Peerless	42

85.	King on W. A. Cook.....	43
86.	King on W. A. Cook.....	43
87.	King on Peerless.....	44
88.	Nankin.....	
89.	Nankin.....	
90.	Okra leaf on Peerless.....	46
91.	Okra leaf on Peerless.....	46
92.	Peeler on Peerless.....	47
93.	Peeler on Peerless.....	47
94.	Peeler on Peerless.....	48
95.	Peeler on Peerless.....	48
96.	Peeler on W. A. Cook.....	50
97.	Peeler on W. A. Cook.....	50
98.	Peeler on Peerless.....	49
99.	Peeler on Peerless.....	49
100.	Peerless on W. A. Cook.....	51
101.	Peerless on W. A. Cook.....	52
102.	Peerless on W. A. Cook.....	52
103.	Peterkin on W. A. Cook.....	53
104.	Peterkin on W. A. Cook.....	53
105.	Peterkin on Peerless.....	54
106.	Peterkin on Peerless.....	54
107.	Petit gulf on W. A. Cook.....	55
108.	Petit gulf on W. A. Cook.....	55
109.	Petit gulf on Peerless.....	56
110.	Rust proof on W. A. Cook.....	57
111.	Rust proof on W. A. Cook.....	57
112.	Rust proof on Peerless.....	58
113.	Rust proof on Peerless.....	58
114.	Rameses on W. A. Cook.....	59
115.	Rameses on W. A. Cook.....	59
116.	Rameses on Peerless.....	61
117.	Storm proof on Peerless.....	62
118.	Storm proof on Peerless.....	62
119.	"Scrub" on Peerless.....	
120.	"Scrub" on Peerless.....	
121.	Sea Island.....	64
122.	Sea Island.....	64
123.	Southern hope on Peerless.....	65
124.	Southern hope on Peerless.....	66
125.	Southern hope on Peerless.....	66
126.	Southern hope on W. A. Cook.....	67
127.	Southern hope on W. A. Cook.....	67
128.	Truitt on Peerless.....	68

129.	Truitt on Peerless.....	68
130.	Truitt on W. A. Cook.....	
131.	Truitt on W. A. Cook.....	
132.	Truitt on Peerless.....	69
133.	Truitt on Peerless.....	69
134.	Truitt on Peerless.....	70
135.	Truitt on Peerless.....	70
136.	Welborn's pet on W. A. Cook.....	72
137.	Welborn's pet on W. A. Cook.....	72
138.	Welborn's pet on Peerless.....	73
139.	Welborn's pet on Peerless.....	73
140.	Wonderful on Peerless.....	75
141.	Wonderful on Peerless.....	75
142.	Wonderful on W. A. Cook.....	80
143.	Wonderful on W. A. Cook.....	80
144.	Wonderful on Peerless.....	76
145.	Wonderful on Peerless.....	76
146.	Wonderful on Peerless.....	79
147.	Wonderful on Peerless.....	79
148.	Wonderful on Peerless.....	78
149.	Wonderful on Peerless.....	78
150.	Wonderful on Peerless.....	77
151.	Wonderful on Peerless.....	77
152.	Wonderful on Peerless.....	77
153.	Zellner on Peerless.....	81
154.	Zellner on Peerless.....	81
155.	Zellner on W. A. Cook.....	83
156.	Zellner on W. A. Cook.....	83
157.	Zellner on Peerless.....	82
158.	Zellner on Peerless.....	82

* Numbers found on the plate.

% Numbers found on the table, pages 30-37, first column.

PLATE 15.

Open bolls with the fiber protruding in a condition to be picked for the gin. These bolls show distinctly the improvement resulting from crossing. In most instances the size has been perceptibly increased. The numbers over each boll correspond to those in column one in table on pages 30-37.

1. Affi.
2. Allen's long staple on Peerless.

3. Allen's long staple on Peerless.
4. Allen's long staple on W. A. Cook.
5. Allen's long staple on W. A. Cook.
6. Bailey on W. A. Cook.
7. Bailey on W. A. Cook.
8. Bailey on Peerless.
9. Bailey on Peerless.
10. Barnett on W. A. Cook.
11. Barnett on W. A. Cook.
12. Barnett on Peerless.
13. Bamieh.
14. Cherry's cluster on W. A. Cook.
15. Cherry's cluster on W. A. Cook.
16. Cherry's cluster on Peerless.
17. J. C. Cook on W. A. Cook.
18. J. C. Cook on W. A. Cook.
19. J. C. Cook on Peerless.
20. Dixon on W. A. Cook.
21. Dixon on W. A. Cook.
22. Dixon on Peerless.
23. Gold dust on W. A. Cook.
24. Gold dust on W. A. Cook.
25. Gold dust on Peerless.
26. Gold dust on Peerless.
27. Green fiber.
28. Herlong on W. A. Cook.
29. Herlong on W. A. Cook.
30. Herlong on Peerless.
31. Herlong on Peerless.
32. Hawkins' improved on W. A. Cook.
33. Hawkins' improved on Peerless.
34. Hunnicutt on W. A. Cook.
35. Hunnicutt on Peerless.
36. Jones' improved on W. A. Cook.
37. Jones' improved on Peerless.
38. Jones' long staple on Peerless.
39. Jones' long staple on Peerless.
40. Keith on W. A. Cook.
41. Keith on W. A. Cook.
42. Keith on Peerless.
43. King on W. A. Cook.
44. King on Peerless.
45. Nankin.
46. Okra leaf on Peerless.
47. Peeler on Peerless.

48. Peeler on Peerless.
49. Peeler on Peerless.
50. Peeler on W. A. Cook.
51. Peerless on W. A. Cook.
52. Peerless on W. A. Cook.
53. Peterkin on W. A. Cook.
54. Peterkin on Peerless.
55. Petit gulf on W. A. Cook.
56. Petit gulf on Peerless.
57. Rust proof on W. A. Cook.
58. Rust proof on Peerless.
59. Rameses on W. A. Cook.
60. Rameses on W. A. Cook.
61. Rameses on Peerless.
62. Storm proof on Peerless.
63. "Scrub³" on Peerless.
64. Sea Island.
65. Southern hope on Peerless.
66. Southern hope on W. A. Cook.
67. Southern hope on W. A. Cook.
68. Truitt on Peerless.
69. Truitt on Peerless.
70. Truitt on Peerless.
71. Truitt on W. A. Cook.
72. Welborn's pet on W. A. Cook.
73. Welborn's pet on Peerless.
74. Welborn's pet on Peerless.
75. Wonderful on Peerless.
76. Wonderful on Peerless.
77. Wonderful on Peerless.
78. Wonderful on Peerless.
79. Wonderful on Peerless.
80. Wonderful on W. A. Cook.
81. Zellner on Peerless.
82. Zellner on Peerless.
83. Zellner on W. A. Cook.

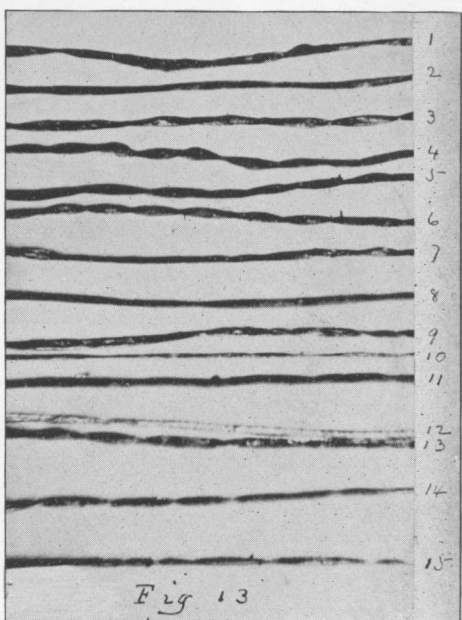
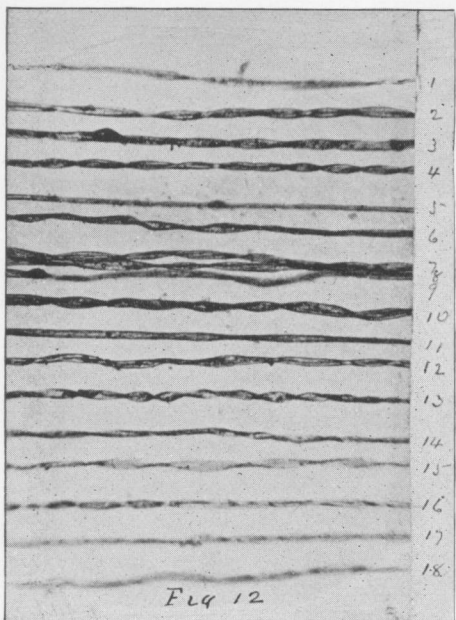
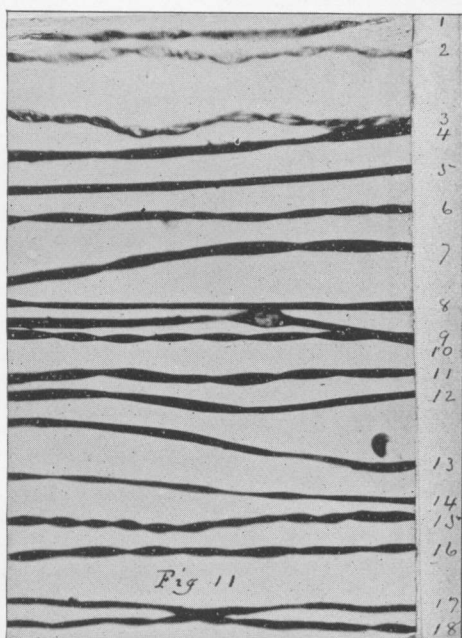
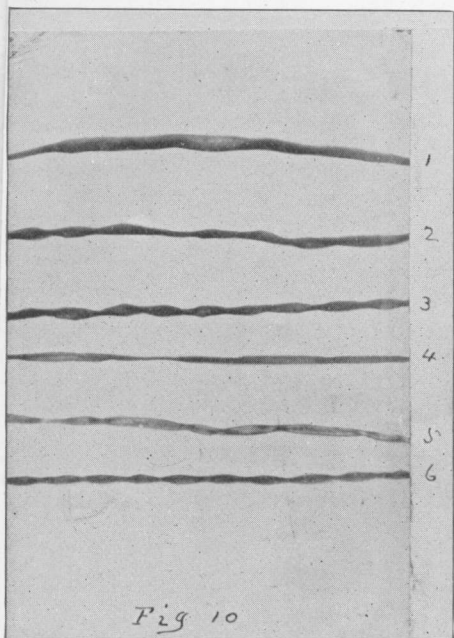
PLATE 16.

This plate represents a seed from each boll with its fiber adhering, but spread out so as to exhibit the relative length of each specimen. The figures correspond to those found in table on pages 30-37, first column :

1. Affi.
2. Allen's long staple on Peerless.

3. Allen's long staple on Peerless.
4. Allen's long staple on W. A. Cook.
5. Allen's long staple on W. A. Cook.
6. Bailey on W. A. Cook.
7. Bailey on W. A. Cook.
8. Bailey on Peerless.
9. Bailey on Peerless.
10. Barnett on W. A. Cook.
11. Barnett on W. A. Cook.
12. Barnett on Peerless.
13. Bamieh.
14. Cherry's cluster on W. A. Cook.
15. Cherry's cluster on W. A. Cook.
16. Cherry's cluster on Peerless.
17. J. C. Cook on W. A. Cook.
18. J. C. Cook on W. A. Cook.
19. J. C. Cook on Peerless.
20. Dixon on W. A. Cook.
21. Dixon on W. A. Cook.
22. Dixon on Peerless.
23. Gold dust on W. A. Cook.
24. Gold dust on W. A. Cook.
25. Gold dust on Peerless.
26. Gold dust on Peerless.
27. Green fiber.
28. Herlong on W. A. Cook.
29. Herlong on W. A. Cook.
30. Herlong on Peerless.
31. Herlong on Peerless.
32. Hawkins' improved on W. A. Cook.
33. Hawkins' improved on Peerless.
34. Hunnicutt on W. A. Cook.
35. Hunnicutt on Peerless.
36. Jones' improved on W. A. Cook.
37. Jones' improved on Peerless.
38. Jones' long staple on Peerless.
39. Jones' long staple on Peerless.
40. Keith on W. A. Cook.
41. Keith on W. A. Cook.
42. Keith on Peerless.
43. King on W. A. Cook.
44. King on Peerless.
45. Nankin.
46. Okra leaf on Peerless.
47. Peeler on Peerless.

48. Peeler on Peerless.
49. Peeler on Peerless.
50. Peeler on W. A. Cook.
51. Peerless on W. A. Cook.
52. Peerless on W. A. Cook.
53. Peterkin on W. A. Cook.
54. Peterkin on Peerless.
55. Petit gulf on W. A. Cook.
56. Petit gulf on Peerless.
57. Rust proof on W. A. Cook.
58. Rust proof on Peerless.
59. Rameses on W. A. Cook.
60. Rameses on W. A. Cook.
61. Rameses on Peerless.
62. Storm proof on Peerless.
63. "Scrub" on Peerless.
64. Sea Island.
65. Southern hope on Peerless.
66. Southern hope on W. A. Cook.
67. Southern hope on W. A. Cook.
68. Truitt on Peerless.
69. Truitt on Peerless.
70. Truitt on Peerless.
71. Truitt on Peerless.
72. Welborn's pet on W. A. Cook.
73. Welborn's pet on Peerless.
74. Welborn's pet on Peerless.
75. Wonderful on Peerless.
76. Wonderful on Peerless.
77. Wonderful on Peerless.
78. Wonderful on Peerless.
79. Wonderful on Peerless.
80. Wonderful on W. A. Cook.
81. Zellner on Peerless.
82. Zellner on Peerless.
83. Zellner on W. A. Cook.
84. W. A. Cook.
85. Peerless.



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

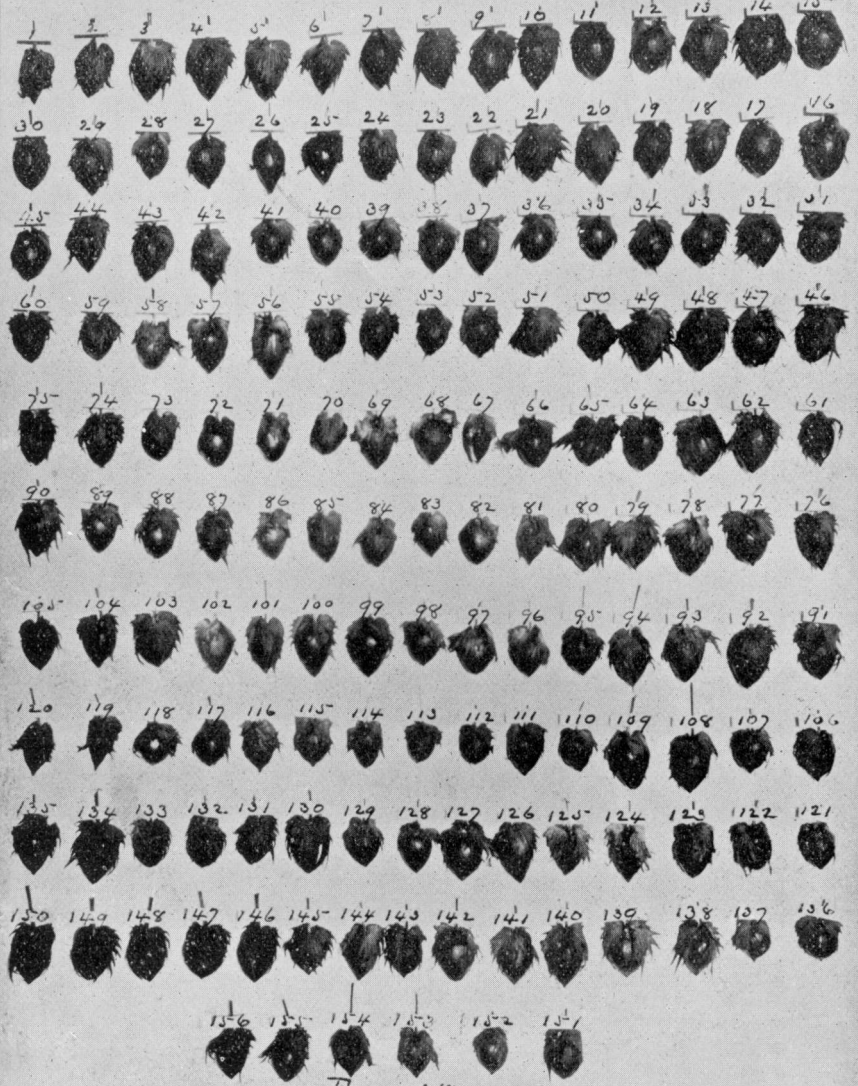


Fig 14

