IMPROVED METHODS OF HANDLING AND MARKETING COTTON.

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INTRODUCTION.

One of the most vital subjects before the country to-day is the efficient and economical handling and marketing of the products of the farm. It presents a problem of the first magnitude both from an agricultural and economic standpoint. Upon its correct solution hinges in great part the reduction of the high cost of living. Present systems of distribution of many agricultural products are indirect, wasteful, expensive, and even destructive. In this respect cotton suffers fully as much as any other crop. A complex commercial mechanism has been developed, many elements of which are distinctly not in the interest of the producer, the manufacturer, or the ultimate consumer. It is not too much to say that our present method is susceptible of a great deal of improvement at every step from field to factory. It has been estimated by close students of the question that the present slipshod and wasteful system entails an annual loss to the growers of from $25,000,000 to $70,000,000. It is impossible to do more than approximate the total loss, but it is certainly exceedingly large.

It so happens that cotton, the purest known natural form of cellulose, will bear more abuse than any other crop material and still retain a large proportion of its value. It is so stable and enduring that it demands little care and gets less. Corn, because of its perishable nature, demands better treatment and gets it. If our billion-and-a-half-dollar corn crop were treated half as badly it would no doubt shrink in value fully a half billion dollars annually. There are corn cribs on the farm and elevators and warehouses at the railroad stations and primary and secondary markets for the protection of our corn crop. Still, 10 bushels of corn, worth usually at primary market prices only from $5 to $6, require as much space for storage as a bale of cotton worth from $50 to $60.

COOPERATIVE ORGANIZATION AMONG COTTON GROWERS.

Cotton planters persist in growing too many varieties in each community, and are careless in many things, including picking and the care of both unginned and ginned cotton on the farm. Through
lack of thorough cooperation and organized business methods they share with too many middlemen the profits that are rightly theirs. Nevertheless, in a broad sense the individual farmer is absolutely unable, because of the complexity of the system and the industrial character of the crop, to cope with the great problems that exist. Most of the abuses about which spinners, especially foreign spinners, complain against the American farmer arise after he has parted with his cotton and when he no longer has any voice in its treatment. These facts must be clearly recognized, as necessary and permanent reforms can be brought about only by united community action among farmers and by cooperation between growers, ginners, compress men, common carriers, bankers, buyers, spinners, and merchants. In no department of agricultural activity is the formation of growing and marketing associations likely to secure greater advantages than in cotton.

Permanent and necessary improvement can be brought about only when communities handle and market their product as a whole. The same is true as to fundamentally improved conditions in cotton production. The individual farmer can rarely sell a few bales of cotton as advantageously as a community organization could sell uniform lots of 50 or more bales. The individual can not afford to construct the necessary warehouses, nor can he as readily secure needed credit and many other things which organization would bring within his reach.

The California citrus-fruit organizations are handling about 50,000 carloads of fruit per annum. They have established packing houses, cold-storage and precooling plants, and have their own selling agencies all through the United States and in certain foreign ports. Their activities have revolutionized the business of marketing citrus fruits by controlling the supply placed on the market and by avoiding its glutting. They have given the country better fruit without increasing the cost to the consumer, and at the same time have increased their profits. They have also brought about greatly reduced freight rates on their products and more uniform prices have been maintained than would otherwise be possible. Before citrus exchanges were established 15,000 carloads of fruit were being marketed with greater difficulty than are 50,000 at the present time.

The grain-growing farmers of the Northwestern States have organized more than a thousand cooperative elevator companies and handle annually possibly as much as $250,000,000 worth of grain. A single farmers’ elevator company in South Dakota handled over a million bushels of wheat in 1910.

1A discussion of the benefits that may accrue to cotton communities which will unite in the growing of single varieties and in the adoption of improved methods of breeding appeared in the Yearbook of the Department of Agriculture for 1911 in an article entitled “Cotton Improvement on a Community Basis,” by Mr. O. F. Cook.
The cotton growers of the South have the same need, if not a greater need, to organize for the purpose of marketing their product to the best advantage as have the grain and fruit growers. Furthermore, especially in comparison with the fruit growers, the imperishable nature of their product should make handling and marketing problems easier. Something has already been accomplished along the line of cooperation in many localities through the educational work of such organizations as the Farmers' Union, the Grange, the Alliance, and other less widespread movements. Many people are inclined to think that most of these organizations have proved flat failures. This is not true, for even where after a period of years they have become moribund, the educational work they have done has been eminently worth while and will be a factor in bringing the fruits of cooperation home to the cotton farmer.

Many cooperative activities have failed, but some have succeeded. There are several cotton enterprises in the hands of farmers that are being operated with such success as to leave no doubt that others could do the same if they had the same determination and the same willingness to put self aside to some extent for the common good. Farmers are extremely individualistic, and naturally so; hence, the greatest trouble has been not that the farmers were slow to organize, but that they were altogether too willing to fall out with one another when matters did not go to their liking.

At Montgomery, Ala., the farmers have constructed a ginnery and warehouse, and conduct a general store. In marketing cotton they have operated successfully in both domestic and foreign business. Some of the members of the organization haul their seed cotton as far as 20 miles in order to have it ginned and handled through the farmers' company. They have two batteries of four gins each, one of which is connected with a square-bale gin compress. Warehouse facilities are furnished at reasonable rates. Gin-compressed bales are stored the first month free of charge, while flat bales are charged 25 cents per month, with a fairly low rate for the season. Direct connections have been established with Liverpool cotton buyers, and most of their gin-compressed cotton is shipped directly to England.

At Glendora, Miss., a group of planters has its own oil mill, which has been operated at a distinct profit to its membership. In fact, in a market that paid $17 per ton for the planters' seed they netted about $22 per ton through carrying out the manufacturing process as far as the crude oil. At Greenwood, Miss., the same group of farmers in part organized a cotton buying and selling company, dealing in about 4,000 bales over and above what they themselves produced. Their profits on this business ran into a number of thousands of dollars.
At Purcell, Okla., there is a cooperative gin and elevator owned by the farmers that has been operated successfully for several years. In this case no marketing of cotton is carried on, but considerable grain is sold for the members of the organization.

The cotton growers of the Imperial Valley, in California, who organized an association less than a year ago, already have accomplished several things of substantial benefit, not only to their own members, but also to those producers of cotton who for various reasons have not joined the organization. Even before they organized they subscribed for more than $60,000 worth of stock to bring an oil mill and ginnery into the valley. Unfortunately, in a way, their plans were on such a scale and the type of plant erected so expensive that it was necessary to call upon outside capital for additional help; as a consequence, the business, while in the hands of men who show every inclination to further cotton growing in the valley by dealing fairly, is not actually under the control of the growers. Without united action the required equipment could scarcely have been secured.

Early in the season of 1912 the growers organized an exchange, which has made banking arrangements for its members that enable them to secure loans of $35 per bale on their short and $60 per bale on their Egyptian cotton at a moderate rate of interest. As soon as the cotton has been ginned the grower places it in the custody of the exchange at the cotton yard. There is less need for warehouses in the desert country than in the humid cotton areas. The cotton is then classed at a fixed charge per bale by a grader secured through the exchange. A certificate is issued to the farmer, upon which, as collateral, the loan is obtained. There is no better security than cotton adequately protected and insured. The loan is enough less than the actual value of the cotton to give no undue encouragement to holding beyond a reasonable time.

The securing of a capable grader who is disinterested, representing neither side of the market, is a distinct service that every organization could perform for its membership.

The Imperial Valley growers also secured by united action the installation of a suitable equipment of roller gins for handling their Egyptian crop. The selling end of their organization has not been tested as yet, but promises to be successful. In case of direct sales to certain mills or to mill buyers the 50 cents commission usually paid to brokers will be paid to the exchange.

The southern California cotton industry is new and comparatively small. In 1911 something less than 10,000 bales were produced. Now excellent arrangements have been made for concentrating the seed cotton. Loading facilities have been provided along the railroads, a reasonable freight rate has been granted, and the seed cot
tton is to be loaded into cars at the nearest station and shipped to the central ginnery. This system should prove to have many advantages and should also make it possible for the central plant to install facilities for compression at the gin. There is an important point to be considered in every community where an organization is effected. Each grower, whether he joins or not, is benefited in many ways by the existence of a properly conducted association. The burden of costs should not be borne by a few of the beneficiaries. All cotton growers in the territory should join, and they should conduct their business on a partnership and not a competitive basis.

The establishment of an adequate system of agricultural credit would benefit the cotton planter greatly, especially as he progresses in the formation of cooperative cotton handling and marketing organizations.

**FORMS OF COOPERATIVE ORGANIZATION.**

In connection with the cotton handling and marketing work of the Bureau of Plant Industry some study has been made of suitable methods of organization. The laws of very few States provide adequately for cooperative business activities; hence proper care should be taken to insure the legality of any form adopted and, so far as may be found desirable, additional or remedial legislation should be sought. The Wisconsin law is pronounced by experts in cooperation to be admirable and might serve as a basis of legislation in other States. It is, of course, desirable that the laws governing the matter in all of the cotton States be as uniform as possible, as cotton, particularly, is an interstate crop.

The true cooperative plan of organization will probably prove the most satisfactory and effective in the long run. Under this each person has but one vote, regardless of the number of shares held. A reasonable, limited, and uniform rate of interest is paid to all who invest capital in the stock of the cooperative organization. Division of expenses and profits is made purely on the basis of the amount of business done with or through the organization. Satisfactory financial responsibility is absolutely essential to every cooperative organization. Direct or semidirect dealing will be possible only to such extent as the just claims of spinners can be settled promptly and equitably. Where organizations are to act together merely in the growing and handling of their crops, without owning any particular property, gins and the like, the form of organization used so successfully by a number of mutual insurance companies in various parts of the country is suggested. The basic idea of this method, when adapted to cotton, is for the farmer to give the association his note.

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1 Those desiring a full discussion of the organization of cooperative associations should consult the article entitled "Cooperation in the Handling and Marketing of Fruit," by G. Harold Powell, in the Yearbook of the Department of Agriculture for 1910, pp. 391-406.
each year for a stated number of dollars per bale of lint or per ton of seed, to bear interest at a certain fixed per cent. The rate of interest and the valuation basis will depend upon the cost of conducting the business of the association. Assuming the assessment rate to be $10 per bale of lint, the same per ton of seed, and the rate of interest 6 per cent, if a farmer produces and proposes to market through the association 100 bales of cotton and 50 tons of seed, he would make his note to the organization for $1,500 at 6 per cent. The principal of these notes is not collected and the notes are canceled and returned to the makers at the close of each season. They simply guarantee his responsibility for just claims. To provide for any extraordinary losses that might arise, he would obligate himself in addition for a further assessment of interest, the extent of which would be determined by the board of directors, with the concurrence of a majority vote of the members. The cotton could be bulked and pooled in the seed and ginned to get even running lots, or the bales could be numbered so that in case of complaint against any particular lot adjudication could be made and the individual who furnished that bale would pay the claims against it or the amount involved would be taken from his credit with the association.

Probably in most cases it will pay ultimately for organizations to own their gins, warehouses, seed houses, and possibly oil mills, obligating all members of the organization legally to have their work done at their own ginnery and sold through their own selling agencies. When this is determined upon they should by all means, whenever a good plant can be purchased, buy one already in existence, for it is altogether likely that one of the troubles with the cotton industry at present is that there are too many gins with too low an average output and too high an expense account. Proportionately, it takes much more labor to conduct a one-stand ginnery with an output of 500 bales a year or less than it does one with an output of 1,000 or 1,500 bales a year. There is already a strong tendency toward a reduction in the number of active gins. The census figures show that between 1906 and 1911 the number of gins was reduced by more than 2,000—from more than 28,000 to about 26,000.

**IMPROVED HANDLING OF COTTON ON THE FARM.**

Work in two distinct directions is needed in cotton. The first should aim at the ultimate attainment of a general cooperative system of growing, handling, and marketing the crop. The other should have for its purpose the improvement of present methods in every possible way. No amount of work along either line will greatly lessen the need of all possible development along the other. The changes in present methods, discussed later, are all desirable under any conditions, and can be brought about most readily in
those sections where the development of community action has made the greatest progress.

There are many changes needed which the farmer alone can not bring about; others are within his own reach. Cotton should be accorded, to the required degree, the same good treatment that is given corn. Seed-cotton storage houses should be built, holding from 5 to 25 bales or more, according to the needs of the individual farmer. Facilities should be provided so that cotton after it is picked can be placed in these houses and left from two to five weeks. The desirability of this procedure is urged more especially on growers of staple varieties. The farm storage of seed cotton will benefit both the cotton and the farmer in a number of ways. In the first place, it is the consensus of opinion that the luster and strength of the lint is improved measurably. In some experiments conducted by the Office of Cotton Standardization, in the Bureau of Plant Industry, an increase of several per cent in strength was noted in the case of cotton stored in the seed as compared with the same growth of cotton ginned immediately. That the luster of the fiber is improved by a sweating-out process is not surprising, and it is possible that both of these beneficial results may be due to the slight diffusion of the oil in the seed through the mass of the cotton. Still another benefit accruing through the storage of seed cotton on the farm is a reduction in the amount of time now wasted by men and teams in hauling the seed cotton to the ginnery and standing in line awaiting their turn. It is true that commonly the least valuable boy or man drives the team. Nevertheless, the time spent standing at the gin in many parts of the country represents a very heavy item of cost chargeable to the bale. With seed-cotton storage houses in common use much of this could be obviated. Another important benefit would be secured in maintaining the uniformity of the individual farmer's cotton. As ginning is done at present, a farmer with a low-grade bale may precede one with a high-grade bale at the gin, or a farmer with a three-fourths staple may stand just ahead of one with an inch and an eighth staple. The gin is rarely thoroughly cleaned out, with the result that the farmer who grew the better grade or staple gets a plate of poorer cotton, varying from a few to 20 pounds in weight, on his better bale. As a result of this careless method the buyer, sampling both sides of the bale, calls it a "mixed" bale and refuses to pay what it is really worth. Cases like this result in great injustice to the growers of better grade and longer staple cotton, and in the course of a season in the country at large cause much loss to the very class of cotton growers who deserve the greatest consideration. Another benefit that would appear under this method is that farmers producing from 50 bales upward may thereby produce commercial lots of even-running cot-
to\textsuperscript{1}, which they should be able to market to much better advantage than the odd lots which the present system forces them to offer.

Many ginners who buy cotton in the seed claim that a higher yield of lint is secured after storage, owing to cleaner ginning from the seed. It is possible that the ripening or curing out that takes place in storage causes the fiber to loosen from the seed more readily.

Another great benefit from storing seed cotton on the farm and then having it ginned in quantity is that it will more readily enable each individual farmer to keep his seed pure. Under the present system the same difficulties exist in keeping seed pure as in preventing "plated" bales. The conveyors and feed roll are not completely cleaned out and the last of one farmer's seed is mixed with the first of the next farmer's. This is of great importance to all farmers who are growing staple varieties in short-staple districts. It is difficult and sometimes almost impossible for the ginner to clean out his machines completely after each load of cotton. The loss of time would constitute a heavy charge against his outfit and probably reduce the number of bales which he could turn out in a day. In case of stored cotton this would partly be compensated for by the fact that it can be ginned at a higher speed without gin cutting or other injury than can newly picked cotton.

Another benefit that would accrue is the even distribution of moisture through the mass of seed cotton in the farm storehouse. When the pickings of the morning are thrown upon the drier pickings of the previous afternoon the excess moisture will distribute itself evenly and not be a menace to the ginning quality of the fiber. Cotton with any noticeable degree of moisture should, of course, be dried to some extent before it is put in the storage house.

In an experiment in South Carolina in the season of 1912, 40,000 pounds of thoroughly ripe seed cotton were stored in a single body for several weeks without "heating" in the least. Early-season pickings are most likely to heat. They should be watched carefully and either ginned immediately or forked over.

Farmers should begin at once a far more general practice of sheltering properly all bales retained on the farm. Platforms with galvanized roofs can be constructed at small expense, and much country damage, which in the aggregate is a great drain on the industry, can be obviated. Furthermore, such shelters will enable the grower who can afford to do so to hold his cotton without wasting fiber or danger of injury to its spinning value. A respectable appearance of the bale could also be maintained. It is a noticeable fact that in the cotton country, generally, bales are left exposed to all sorts of untoward conditions, but that spinners have substantial brick warehouses for the protection of the staple. Plate LIII, figure 1, shows the condition in which bales often reach the railroad platform.
Discussion of facilities for protecting the fiber from injury on
the farm naturally brings up the general question of the holding
of cotton by farmers. Any form of storage, whether in the seed
or after ginning, should tend to do away with the present sharp
drop in the price of cotton which usually begins late in September
and continues until November. Having no adequate means of stor-
age and being usually in need of money, the farmer rushes into the
market as soon as cotton-picking time arrives and acts as the greatest
bear on his own product. Ordinarily, by the middle of November
from two-thirds to three-quarters of the crop has been ginned and
the greater part of this has passed to the hands of middlemen and
spinners. In other words, under present conditions as soon as
ownership of the major portion of the crop passes from the farmer
the price begins to rise. It is impossible, even after a careful study
of the statistical movement of prices from month to month for a
period of years, to say definitely to what extent “holding” is a
paying venture under present conditions. The average gain in
prices in the leading Upland markets during the last 15 years indi-
cates that October and November ginnings might be expected to in-
crease in value about \( \frac{5}{2} \) per cent if held for 6 months. Taking into
account insurance and other costs, including loss of interest on the
money tied up in cotton and the fact that the farmer’s money comes
high when he borrows it unsecured by real estate, it seems that the
profits of holding cotton, while decidedly worth while, would not
be excessively large. The whole question of holding must neces-
sarily depend upon the cost of production to the farmer as compared
to the price offered. Each farmer should determine this cost as ac-
curately as possible for his individual conditions. Only in this way
can the question of holding be settled. If it costs a farmer 8 or 10
cents per pound to produce his cotton he can far better afford to hold
it, provided suitable warehouse facilities are available, than can any
middleman or spinner who pays 10 or 12 cents per pound for the same
cotton. This general fact is modified, of course, by the prevailing
rate of interest paid by the two classes of holders.

Holding merely for the purpose of raising the price when the pre-
vailing price is fair and when the supply is ample and equal to the
demand is bad economics and probably wholly indefensible. Any
widespread movement to bring about excessively high or fixed prices
will certainly result in the stimulation of cotton culture in foreign
countries and the ultimate restriction of the market for American
cotton. Storing in the seed, holding to secure a fair price consider-
ing the cost of production, or any other methods that tend to stabilize
the price or improve the quality of the staple are desirable and
proper and should be practiced by all who can afford to do so. It is
good economics to hold over the surplus of a year of big production to another year of lesser production. This is done at present by those into whose hands the cotton passes on leaving the farmer. In June, 1911, when the farmer no longer had cotton to sell “middling” brought about $15.5 cents; in the previous November, when the farmer was selling his crop, the average farm price was reported as 14 cents per pound.

MORE CAREFUL GINNING.

Cotton often reaches the mills badly gin cut. This reduces the value to the spinner and may result in claims and losses and attendant expenses, especially if the cotton has gone into the export trade. Such injury is probably most common when long-staple cotton is ginned with the ordinary saw-gin installation at the usual high speed. Eagerness to utilize fully the capacity of all machines is natural, and for the most part commendable, but it should be remembered that increased output will not represent any real gain if the fiber has been injured. When longer staple cottons are ginned with saw gins lower speeds and looser gin rolls should be employed, and the longest staple cottons should probably always be ginned with special gins. This bad practice rests largely with the ginner himself, as do many others. Nevertheless, there center at the gin other bad practices for which the ginner is in no wise responsible and which must be brought home to the farmer. Perhaps the worst of these is the delivery of cotton for ginning which is too damp to gin properly. If morning finds the cotton damp it should be properly dried out before it is offered to the ginner. The sale of morning dew as cotton is very likely to injure the staple and reduce the value of the bale.

A second prolific source of complaint at the gin is due to an excess of various kinds of dirt in the cotton. A great deal of sand and earth is considered perfectly legitimate in cotton. It is regrettable that this is the case, as the grade of the cotton and hence the price given for it will always depend to some extent upon the presence of this waste. There are farmers who object to cleaning attachments and cleaner feeders because they remove sand and dirt, which they would otherwise hope to sell as cotton or cotton seed. However, in fairness it should be said that while individual farmers indulge in a few bad practices the farming community is by far the greatest sufferer in our present wasteful system of handling and marketing the cotton crop. It happens altogether too often that a man who goes to a gin that has the proper equipment of cleaners receives no more for his lint than his neighbor who goes to an outfit where cleaners are not in fashion and where sand and dirt go in part into the bale and in part into the seed. It is very rarely indeed that the farmer who exercises great care in producing and picking his cotton receives the consideration that the better quality of his product deserves. The
present system puts a premium on carelessness. In some markets, even during the season when the highest class of staple is being harvested, no grade above “strict middling” is recognized.

Ginners frequently allow their plants to get out of repair, defective saws and worn-out brushes are used, and the speed of the brush is not properly regulated. A complete modern gin plant is shown in Plate LIII, figure 2. In the eastern and older part of the cotton belt especially, out-of-date types of machinery are still in general use. Many improvements in the way of feeders, cleaners, huller breasts, condensers, and the like have been devised in recent years. Their use is recommended, and farmers should give their business to the ginner who is most progressive in giving his patrons the advantage of modern equipment and the better style of cotton that results.

Gin press boxes are made in different sizes by different manufacturers. After being used for a time all boxes expand in varying degrees, depending on construction and kind of usage. This adds to the lack of uniformity that has resulted already from the great variation in the quantity of cotton put in bales. The standardization of gin boxes is exceedingly desirable. State departments of agriculture could advantageously have one or two competent gin inspectors on their staffs, who could investigate equipments and suggest needed changes and improvements. In addition, the farmer must educate himself, and be educated as to what constitutes satisfactory ginning.

THE INADVISABILITY OF SELLING COTTON IN THE SEED.

Selling cotton in the seed is a sort of game of chance based on the law of averages and should be discouraged. The practice is confined almost exclusively to the western end of the cotton belt. The better class of buyers base their calculations of lint percentages in making their offers for cotton on the comparative yield from day to day of lint to seed in their own gin or the one which they patronize. As a result the farmer who grows a better variety yielding a higher percentage of lint gets only the average price; the one who grows a “sorry” variety will in most cases receive some of the benefits that belong to his more progressive neighbor. Oil-mill ginners are most likely to urge this method of selling upon farmers, but the better class are willing to help terminate the practice, and some of them are already taking steps toward educating the farmer to a more universal practice of having cotton custom ginned.

NEED OF A WAREHOUSE SYSTEM IN HANDLING AND MARKETING COTTON.

The most important step to be taken in the direction of permanent improvement in cotton-marketing conditions is the establishment of a general warehouse system, and the gradual marketing of the crop. Farm storage of ginned cotton as at present practiced is in large
part wholly undesirable. It means leaving the bales out in the weather, sometimes on platforms or boards, but often also flat on the ground. This way of "storing" is the most prolific source of country damage, and occasions a large waste in the industry. Farmers who can afford to hold their cotton without facilities for obtaining loans on it should construct suitable shelters and thus save the cost of warehousing. The cooperative organizations which must be formed before we can go far with improvement work should build gin or primary market warehouses, properly located and equipped for economical handling to cars. Concrete platforms with galvanized iron roofs can be constructed at reasonable cost in most sections. They will be fireproof to a great extent and will usually furnish desired protection from country damage and deterioration.

The warehouse alone is not sufficient. Growers must have the interest and support of their local banks in a far greater measure than is now the case. Negotiable warehouse receipts, covering adequately insured cotton that has been graded, stapled, and properly certified, should command their confidence and furnish a tangible opportunity for cooperation between the producer and banker. The latter craves active accounts, the frequent "turning over" of money, collections, exchange, and other revenue-producing forms of banking activity. The interior buyer's account has a greater earning capacity for the bank than has the farmer's; hence its preference. A uniform and efficient warehouse system would not reduce the amount of banking business in the interior, but would spread it over a longer period. Neither would it prevent legitimate middlemen handling the crop, as their functions are necessary and must be performed by some one. The support of the banking interests could be so handled as to attract a large short-time loan business to insured warehouse cotton at reasonable rates. Southern bankers handling cotton accounts can do more for the cotton industry than almost any other element.

From the cooperative standpoint, the warehouse is a necessity for concentration purposes. Here the cotton can be graded while still in the farmer's ownership, and sold at its intrinsic value. Even-running commercial lots, such as the market demands, can be made up and many other advantages realized.

The adoption of a uniform and comprehensive code of laws on the subject of warehouses by the cotton States would do much to assist in a more rational marketing of the crop. There are no accurate statistics covering the point, but it is probably true that available warehouse space would not accommodate more than one-sixth of the crop. This is too low a proportion to have any marked effect in bringing about the gradual marketing that is desired.

The present system has developed largely on the theory that even-running lots of cotton can be secured only by having large concen-
tration points. Concentration is largely synonymous with congestion and delay. The need for it can be removed in considerable part by the installation of better types of cleaning and ginning systems, bulk- ing or pooling seed cotton in certain classes, and the inauguration of means of compressing it at the gin and warehouse.

**THE NEED OF STANDARDS AND GRADING.**

Standards for the proper classification of cotton are, of course, a necessity. In accordance with an act of Congress, official grades were established by the Department of Agriculture in 1909. Although these have been distributed quite widely and have been adopted by a number of exchanges and other cotton organizations, some influential bodies have taken no action on them as yet. Their adoption is purely voluntary. To secure the benefits that the prevalence of one uniform standard for all commercial grades should confer, a unanimous adoption is most desirable. Several different standards are now in use. These are usually referred to by the names of the exchanges which promulgate them, as Liverpool grades, New York grades, Augusta grades, etc. The "middling" of one market is not the same as that of another, and likewise with other grades. Identical names are applied in different markets to cotton that differs in quality, value, and price. The national standards were prepared to remedy this condition. Nine official grades are recognized, as follows: Middling fair, strict good middling, good middling, strict middling, middling, strict low middling, low middling, strict good ordinary, and good ordinary. The grades designated by the prefix "strict" are known in the trade as half grades.

At present the fine distinctions that are drawn between grades arise not when the farmer is disposing of his staple to the first buyer, but in arbitrations between buyers and between buyers and spin- ners. In other words, the benefits of proper classification are largely lost to the farmer, a condition which deserves correction. He usually gets the basis "middling" price minus charges to port, deductions for tare, and the like. For his best cotton he may get "strict middling," but rarely anything higher. Experience soon gives the buyer a knowledge of grade and staple, which the grower can never acquire in equal detail. The latter is practically compelled to sell his product on a quality basis specified by the person who is purchas- ing it. The farmer must either know more about grade and staple, or he, collectively as a community, must have some one in his employ who will put him in a position to trade as other people trade in their products. Country buyers are frequently almost as ignorant of

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1 The national standards have been prepared and distributed under the direction of Dr. N. A. Cobb, agricultural technologist, Bureau of Plant Industry, to whom communications with reference to them should be addressed.
grades as planters; hence they "buy safe" to protect themselves. A wide dissemination of knowledge as to grades and grading is necessary. The official grades based on the national standards should be more widely used in the United States; if possible, their adoption by all the more important foreign exchanges also should be secured.

**Better Compressing and the Introduction of the Gin Compress.**

Under the present system the gin-box, plantation, flat, or uncompressed bale, as it is variously called, has a density of about 11 or 12 pounds per cubic foot. Its usual dimensions are 54 by 27 by 45 inches. An average of 25 flat bales are loaded in cars of ordinary size and shipped to the nearest compress, usually known as a recompress or railroad compress. (See Pl. LIV, fig. 1.) As the usual commercial lot is 100 bales, four cars may be required for the haul. The compress collects its fee for service, amounting usually to 10 cents per hundred pounds of cotton or 50 cents per bale, direct from the railroad company, the latter having included this charge in its freight rate. The producer pays this, as well as insurance, freight, and other charges, all of which are deducted before the price is fixed.

On arrival at the compress platform, which often has insufficient roof to protect more than a small proportion of the cotton on hand, the hundred bales are unloaded, weighed, put on range (that is, lined up side by side with faces out), and sampled. They are now classed, compressed, and patched while in the press, and then are ready for reloading for shipment to port or domestic mill. Compressed bales in good average condition are shown in Plate LIV, figure 2. Compression reduces their thickness one-half or more, bringing them to a density of 22 pounds per cubic foot. Two cars will now accommodate the hundred-bale lot.

Compresses ordinarily employ low-priced labor, and are under pressure to show a large output of bales during the time they are in operation. In the Southeast their earnings must be ample, as the average number of bales handled is relatively large. Georgia, for instance, with a crop averaging 2,000,000 bales annually, has only 35 compresses. Oklahoma has about 36 compresses, with a crop averaging about three-fourths of a million bales.

Although the bad condition of many bales delivered to the compresses furnishes some extenuation, the quality of the work is in many cases unnecessarily poor, because of overcrowding and carelessness. That it can be improved is shown by the better average condition of bales this year, brought about by the new rules of the South Atlantic and Gulf steamship carriers.

Pressure by carriers, legislation, and systematic compress inspection could vastly improve existing conditions. However, no amount of betterment in the present method of handling the crop should be
Fig. 1.—Ordinary flat bale of cotton as it frequently appears after sampling and rough handling. It invites fire, country damage, and robbery.

Fig. 2.—Typical commercial gin plant in southern Texas, showing octagonal storage house for seed cotton, with modern system of pneumatic unloading and conveying pipes.
Fig. 1.—Railroad Compress at Shreveport, La., Showing Cotton Bales on End in Foreground and Placed "On Range" for Sampling on Platform.

Fig. 2.—Ordinary Compressed Cotton Bales Ready for Export, Showing Patches of Coarse Bagging Bound on to Cover Sample Holes and to Increase Tare.
Fig. 1.—The Round Cotton Bale, which is put up at the Gin with a density greater than that of the compressed bale. It is about 3 feet long by 20 inches in diameter, weighs about 250 pounds, carries 1 per cent tare, and can be shipped direct from Ginney to Mill.

Fig. 2.—Gin-Compressed Square Cotton Bales, completely covered, having a greater density than ordinary compressed bales and carrying less than half the tare. Those shown are for shipment direct from Gin platform to Bremen, Germany.
Fig. 1.—Farmers' cotton bales in dilapidated condition, for which the farmer is not responsible, due chiefly to the use of second-hand bagging by the ginner, a condition more prevalent in the East than in the West.

Fig. 2.—Farmers' cotton bales produced by the best custom ginneries, symmetrical and covered with new bagging, although the latter is very coarse and heavy.
allowed to prevent the gradual introduction of gin compression in all communities where conditions are suitable. As gins make replacements of out-of-date and worn-out equipment, one of the several proved types of gin compresses should be installed with the new system of gins. Under prevailing conditions it seems probable that gin plants with an output of less than 1,500 bales can not afford to put in square-bale compresses, while the round-bale press may be used to advantage. The character of bales produced by a round-bale gin compress is shown in Plate LV, figure 1. The ever-increasing world's consumption of cotton makes it likely that a gradual change to a new basis can be made with little or no actual money loss, even to the old-line compresses. There will always be competition for the business, and a large number of cotton ginneries will never be able, because of their small output, to use the gin compress.

As already pointed out, the use of six ordinary freight cars is involved in moving 100 plantation bales from the primary market to port or mill. The completion of the bale in final form at the gin would reduce this number to two, or, by the use of one of the slightly larger cars, to one. This means a great saving of rolling stock, motive power, labor, and time. Such reductions in transportation expenses should call for a measurably corresponding reduction in transportation charges. These have not yet been granted by the carriers. In fact, in the eastern part of the cotton belt the compress fees are not remitted. As a broad matter of policy it will work to the ultimate advantage of the carriers to encourage the introduction of all improvements in the cotton industry that make for economic efficiency. In the West the railroads deduct these fees from their freight charges when either round or square bale gin-compressed cotton is offered for shipment.

Formerly there was some prejudice against round-bale cotton, which is put up in 250-pound bales. The ground for this has apparently been removed, and now it is taken freely by foreign spinners. There has never been any great criticism of the square gin-compressed bale, which is similar to but much better than the present recompressed bale. Gin-compressed square bales are shown on the platform ready for shipment in Plate LV, figure 2. When covered with burlap or other closely woven material they resemble bales of cotton goods. The density of these bales ranges from 28 to 35 pounds per cubic foot, against 12 pounds for the plantation and 22 pounds for the railroad-compress bale. There are several types of both square and round bale gin compresses on which thousands of bales are made yearly. Hence, their practical operation is no longer open to question. The prices at which the square ones are offered stand in the way of their general adoption. Round presses are handled mostly on a lease basis, to which frequent objection is heard.
Gin compression has many advantages which cannot be touched upon in the confines of a Yearbook article. A comparison of the farmers' bales as delivered to a railroad platform in South Carolina, shown in Plate LVI, figure 1, with the gin-compressed bales on the plantation, shown in Plate LV, figure 2, summarizes the difference in results under the two methods. The gin-compressed bale as now handled is not ragged, has no sample holes and no patches; is completely covered, and is sold on net weight, doing away with the vicious 6 per cent tare provision under which exporting is done at present. It commands a lower insurance rate, economizes warehouse space, and is shown preference in ocean shippers' rates.

PRESENT TARE PRACTICES AND THE STANDARDIZATION OF TARE.

The character of the American cotton bale, both as to condition and covering, has been a source of complaint and criticism for many years. The blame is quite generally laid at the farmer's door. He in reality is merely the victim of an out-of-date, incorrect, and oppressive method of arriving at the net weight of cotton in a bale. The buyer, whether for domestic or foreign trade, does not pay cotton prices for the bagging and ties placed on bales at the gin, although many farmers are of that opinion. Southern mills using locally produced cotton usually buy it flat (i.e., uncompressed) on a tare basis of 22 pounds per bale. New England mills allow 24 pounds for tare, while practically all export cotton is sold on Liverpool terms of "c. i. f. and 6 per cent," which means a deduction of 30 pounds for every 500-pound bale.

Allowance for tare always is figured in some form in the price offered to farmers for their cotton. In other words, a 500-pound bale is considered as containing 470 pounds of cotton. If the "middling" price in Liverpool is 12 cents, the bale is worth not $60 but $56.40. As the buyer purchases on a gross-weight basis he must protect himself against the tare rule; hence his offer to the farmer, profit and other items of expense having already been reckoned in, is $56.40 divided by 500 pounds, or 11.28 cents per pound. The above represents the logical working out of the terms of the contract. As a matter of fact, in a majority of cases the actual method of applying the rule to cotton suspected of being overtared does not coincide with the stated terms. Instead of weighing the bagging and ties and determining whether they amount to more than 6 per cent of the gross weight, an arbitrary allowance of 9 pounds for bands and \( \frac{3}{10} \) per cent of the remaining 491 pounds for bagging is substituted.

1 The provision "c. i. f. and 6 per cent," referring to the contract form under which American cotton is sold in Liverpool, means that the seller bears all costs, including land and marine insurance and interior and ocean freight, and accepts a deduction of 6 per cent for tare. A detailed discussion of this subject may be found in a bulletin entitled "Cotton Tare," issued Sept. 3, 1912, by the Bureau of Corporations, Department of Commerce and Labor.
The latter amounts to 17\(\frac{1}{2}\) pounds, so that the actual allowance for tare is only 26\(\frac{1}{2}\) pounds, instead of 30. Although much cotton is now handled under terms that modify the 6 per cent clause, this anomalous condition results in gross injustice to the American shipper. Immediate steps should be taken to correct it.

The effect of the whole tare situation is vicious. Its net result is to introduce complications and confusion in all cotton transactions from planter to spinner. The farmer rarely knows whether his fleecy staple is destined for foreign or domestic sale, and, if the latter, whether it will go to New England or to some of the many southern cotton mills. In other words, he does not know whether he should put on 22, 24, or 30 pounds of tare. As a matter of fact, he practically always puts on the same amount of bagging and ties, weighing usually from 19 to 22 pounds. If he attempts to "tare it up" he is met by a notice from the large cotton-buying firms that operate in his section or from mill buyers if in southern mill sections, that they will not purchase cotton that carries more than the usual amount of bagging and ties (6 yards of bagging and 6 ties), or if they do buy his bales they will be penalized in the price paid.

In the interest of good, straightforward business and for the protection of farmer, cotton merchant, and spinner the present diversity in assessing tare and in making tare calculations should be terminated. The economic waste involved in the purchase of millions of pounds of extra canvas, on which freight and handling charges must be paid, should be stopped. The reason or excuse for using old bagging and for plastering cotton bales with old fertilizer sacks and similar fabrics in order to bring the tare up to the limit of protection which the contract calls for should be removed. These and many other reforms could be brought about much more readily if compression at the gin were put into general practice. The use of old bagging is more prevalent in the East than in the West. The common result is shown in Plate LVI, figure 1. Plate LVI, figure 2, shows the best type of gin or plantation bale covered with new jute bagging.

The present gin-box bale, after frequent and often very wasteful sampling, must be recompressed and the sample holes patched. Slashing bales completely across the front and back is unnecessary. Some universal rules in the matter of sampling should be adopted, to cover the length and location of the cut and possibly also to limit in a measure the number of holes permissible. It should also be practicable to devise automatic sampling mechanisms that would be both dishonesty proof and "fool proof" and could be attached to gins, thus doing away with the need of much later cutting. Sampling abuses, with their attendant pickings and city crop, do not amount to much in individual cases, but in the aggregate result in a large and partly preventable waste. The most likely cure for the
tare troubles of the present system lies in the use of more closely woven and probably lighter bagging, preferably a burlap, such as is used on the Egyptian bale, and the buying and selling of cotton on net weight. The covering should be made in patterns of standard size and weight, standard patches should be adopted, and a fixed number of ties of standard weight and length should be used. There are practical difficulties in the way of all changes and even the most beneficent reforms encounter strong opposition. It is believed that the greater part of the cotton industry is ready to assist in any sane and practical changes that will put cotton transactions on a net-weight basis. Experiments are in progress on the standardization of tare. The needed reforms should be brought about by mutual consent of all parties. Failing in this, legislation might be resorted to.

There are students of cotton economics who profess to believe that general net-weight buying will result in the bale becoming wholly uncovered. In other words, that the tare rules are the only reason why the planters put bagging on the bales. The writer's observations throughout the cotton belt discredit this opinion. Even if it were true, the penalization which is so effective at present to prevent overtaring would be just as useful to compel proper wrapping.

**IRREGULARITIES IN WEIGHING.**

Complaint is heard so frequently of the weights declared by compresses, public weighers, and some warehouses as to force the conclusion that "there must be some fire where there is so much smoke." Most of the cotton States have adequate laws covering weights and measures and properly constituted officers charged with their enforcement. More thoroughgoing inspection and checking up are all that is needed in such States. Other States, among which Texas is most notable, as she produces practically one-third of the American cotton crop, do not have laws or proper administrative machinery for the protection of seller and buyer. The enactment of uniform laws and their just enforcement are highly desirable.

The writer recently purchased for experimental purposes three bales of staple cotton.

<table>
<thead>
<tr>
<th>Description</th>
<th>Weight (Pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The planter's weight was</td>
<td>1,756</td>
</tr>
<tr>
<td>The public weigher's weight was</td>
<td>1,732</td>
</tr>
<tr>
<td>The storage-house weight was</td>
<td>1,760</td>
</tr>
</tbody>
</table>

The reason for this variation has not yet been determined. Similar experiences occur in many places. "Safe" weighing to protect buyers appears to be more or less of an institution in the cotton trade. It is usually excused on the ground of variable moisture content and loss of moisture and is indefensible.
The issue of moisture in cotton has not yet been squarely met anywhere. There is some complaint abroad that American cotton contains an excess of moisture. In regard to this it can be said with absolute truth that except in very rare cases of individual dishonesty no artificial dampness is added intentionally to American cotton. So-called "water-packed" bales are due chiefly to leaking pistons resulting from equipment that is out of date or in disrepair.

Cotton changes hands so many times, claims for underweight are made so regularly by both domestic and foreign purchasers, and farmers are penalized so promptly in the price paid them if excess moisture is at all apparent that there is little tendency toward intentional dampening at the gin. In both Egypt and India, on the other hand, humidifying is practiced quite openly and defended as proper and in part necessary. The whole subject deserves careful investigation and subsequent action based on actual findings.

CONCLUSION.

The conclusion seems warranted that the most desirable and far-reaching reforms and improvements must be based upon changes in ginning practice and must involve laying an increased responsibility upon the ginner.

"Water-packed" and "plated" bales are wholly preventable, and it should be a misdemeanor to produce such a package. The ginner should also be liable in damages to the owner of the cotton thus injured. Gin-cut cotton results either from operating defective equipment, which competent gin inspection could remedy or condemn, or from ginning cotton when too damp. The ginner can readily detect the latter condition and should not be permitted to gin wet cotton even at the request of a valued customer. As a matter of fact most of the wet cotton offered is "rent cotton," or cotton already pledged as the sole security for debts and in the quality of which the grower no longer feels an interest. In such cases the interests of the creditor are entitled to legal protection at the gin. Uniformity in size of bale and in style and quality of covering can come only through the unanimous action of ginners by agreement or by legal requirement. Samples taken at the gin and protected by suitable regulations can be made a satisfactory basis for determining grade and staple and will remove the necessity of cutting the bale for sampling in primary markets.

Coupled with a proper grading system the ginner's sample would be made to furnish an acceptable basis for every necessary transaction between producing and consuming organizations, eliminating the cutting and consequent robbing and deterioration of bales, obvi-
ating the patching and resultant changes in tare at compress points, removing the most common grounds for claims, and reducing to a minimum the city crop, which is a needless tax on the industry.

Through the gin the entire crop must pass and at that point the cotton first comes within the reach of official or trade regulation. From the gins can come the only conclusive statistics of the crop. Through the ginner alone can the careless, ignorant, or dishonest producer be effectively reached. The gin plant is, in short, the vital point in the cotton-handling situation and offers an effective agency through which to bring about improved conditions. Well-organized, responsible cooperative growing and handling associations, acting in concert with the other elements of cotton trade, can ultimately bring about improvements that will save millions of dollars.