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The Gold Medal Newest  
Agricultural-Horticultural  
Opuntias

"SPINELESS CACTUS"

Illustrations and descriptions of the most valuable improvements in vegetable life made during the centuries. "Fully equal in importance" (as many prominent people who know have said) "to the discovery of a New Continent."

"How to judge novelties; look to their source."

"A gigantic international experiment station conducted by one man."

**Luther Burbank**

SANTA ROSA, SONOMA CO., CAL. U. S. A.

JUNE 1st 1911





# PREFACE

## TWENTIETH CENTURY FARMING

### BETTER FORAGE, BETTER FRUIT

For hundreds, probably thousands of years, the great, rapid growing, desert thorny cactus (Opuntias and others) have furnished food for stock and fruit for man, especially in Southern Europe, Northern Africa and Mexico, where the fruit, though rather seedy and difficult or almost dangerous to handle, is very highly prized, more so perhaps than any other fruit except the orange and banana.

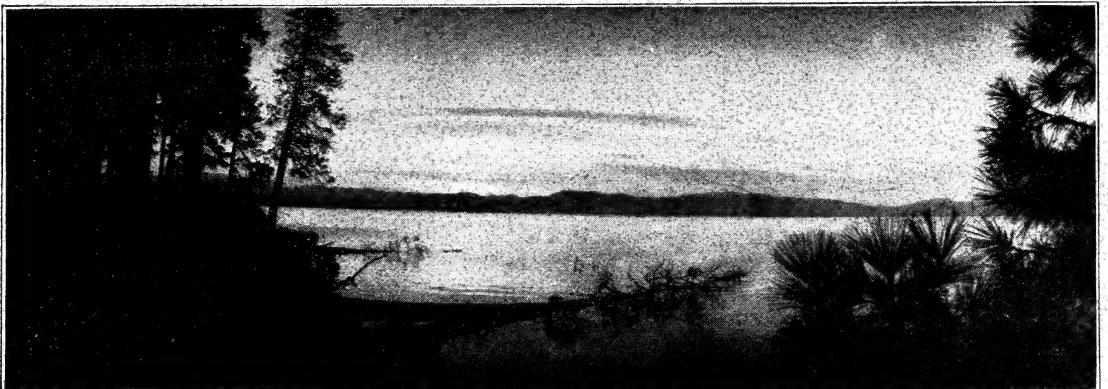
The whole plant furnishes nutritious food in abundance, yet great pain and often death was the penalty for using them.

Fifteen years ago the first scientific experiments for their improvement were instituted on my farms and the interest in these new products has been so far reaching that the official representatives of almost every government on earth have shown their profound appreciation for the work, either by correspondence, personal investigation or purchase of some of the new varieties first offered four years ago.

It has now been fully demonstrated that these new Burbank Opuntias (cactus) thrive even better in the fertile valleys than on the desert wastes, producing most astounding crops not only of forage for stock and poultry but most nourishing and most delicious, large and strikingly beautiful fruits of many forms, colors and qualities. **Sixty to One Hundred Tons per acre** of it on good soil.

Some of the new Burbank fruiting varieties have yielded and will yield more fruit per acre even the third and fourth year from rooted cuttings than the best apple orchards will in ten years, and at one-tenth the expense; And better yet, the crop of fruit is as certain as the return of the seasons, increasing in quantity each season with no cultivation and no care whatever except to pick and market when ripe or nearly ripe like other fruits.

LUTHER BURBANK, Santa Rosa, Cal., May, 1911.



# HISTORICAL

## EARLY EXPERIMENTS

For more than fifty years I have been quite familiar with "thornless cactus" of many species and varieties. In fact, one of the first pets which I had in earliest childhood was a thornless cactus, one of the beautiful Epiphyllums. The Phyllocactus and many of the Cereus family are also thornless, not a trace to be found on any part of the plants or fruit. Thus the somewhat indefinite popular name of "spineless cactus" has been used by persons unacquainted with these facts, for be it known that "thornless cactus" is no more of a novelty than a "thornless" watermelon. But among the Cacti which grow to an immense size with great rapidity and which can be readily cultivated in garden, field or desert **no perfectly thornless ones were known and very little interest taken in the cacti of any kind either thorny or thornless as to their agricultural or horticultural value until some sixteen years ago when the work of improvement was taken up on my experiment farms and improved perfectly smooth, rapid-growing varieties had been produced and made known.** Some of the best growers among these will produce five to ten times as much weight of food as will the wild thorny ones (which some ignorant or unprincipled dealers have recommended for cultivation) under exactly the same conditions. These wonderful results were not unexpected as the genus *Opuntia* is a surprisingly variable one even in the wild state. The best botanist—even those who have made the *Opuntias* a special study—declare it to be one of the most difficult genera to classify, as new forms are constantly appearing and the older ones so gradually and imperceptibly merge together. The facts without doubt are that their ancestors had leaves like other vegetation and were as thornless as an apple tree, but in ages past were stranded in a region which was gradually turning to a desert, perhaps, by the slow evaporation of some great inland lake or sea. Being thus stranded the plants which could adapt themselves to the heat and drought which as the years passed by became each season more and more severe, survived, at first by dropping the leaves thus preventing too much evaporation, leaving the fat smooth stems only to perform the functions of leaves. **The *Opuntias* even to this day always shoot out very numerous rudimentary leaves which persist a few days or weeks and then having no function to perform drop off.** These rudimentary leaves which always appear for a time on the young slabs are often mistaken for big thorns by those who are not familiar with the growth and habits of the plant. But the *Opuntias* had yet to meet another enemy; desert animals were hungry for their rich stores of nutriment and water, so the rudimentary leaves were replaced by the awful needle-like thorns placed at exactly the right angles for the best defense, and, at the base of these—partially embedded in the stems—(now leaves) are numerous bundles of smaller needles, more than ten thousand to each leaf and these are even more dangerous than the larger needles, often producing great pain, inflammation and at last death, to animals who were pressed by starvation to consume them for food.

Some fifteen years ago, while testing the availability of a great number of proposed forage plants from the various arid regions of the world with a view to the improvement of the most promising, I was greatly impressed with the apparent possibilities in this line among the ***Opuntias*** which from their well known vigor and rapidity of growth, easy multiplication and universal adaptability to condition of drought, flood, heat, cold, rich or arid soil, **place them as a class far ahead of all other members of the great cactus family, both as forage plants and for their most attractive, wholesome and delicious fruits, which are produced abundantly and without fail each season.** These fruits which are borne on the different species and varie-

ties, vary in size from that of a small peanut to the size of a very large banana and in colors of crimson, scarlet, orange, yellow and white and also shaded in various colors like apples, pears, peaches and plums, and with **more various attractive flavors** than are found in most other fruits except perhaps the apple and the pear, **the product of a single plant being often from 50 to 200 pounds per annum**, some bearing one crop, others two or more each season like the figs, the first or main crop ripening as the second comes into bloom on the same plants.

The Opuntias, from root to tip, are practically all food and drink and are greatly relished by all herbivorous animals from a canary bird to an elephant and for this very reason have had to be on the defensive and perhaps nowhere in the whole vegetable kingdom have such elaborate preparations been made; the punishment inflicted is immediate, the pain severe and lasting, often ending in death, so that all living things have learned to avoid the Opuntias as they do rattlesnakes, and notwithstanding their **most delicious and nourishing fruit produced unflinchingly in greatest abundance** have never before been systematically improved by the Agriculturist and Horticulturist as their merits so well deserve.

By the collectors and others, for the earliest experiments in this work the best Opuntias from all sections of Mexico, from Central and South America, from North and South Africa, Australia, Japan, Hawaiian and the South Sea islands, were secured. The United States Agricultural Department at Washington, through my friend, Mr. David G. Fairchild, also secured eight kinds of partially thornless ones for me from Sicily, Italy, France and North Africa, besides a small collection of Mexican wild thorny ones which were in the government greenhouses at the time. Besides these I had the hardy wild species from Maine, Iowa, Missouri, Colorado, California, Arizona, New Mexico, Dakota, Texas and other states. All these were grown and their agricultural and horticultural values studied and compared with great care. Many so-called thornless or partly thornless ones were obtained, **but not one among the thousands received from all these sources was free from thorns and spicules and even worse, those which were the most promising in these respects often bore the poorest fruit, were the most unproductive of fruit or produced less fodder or were less hardy than the wild thorny species and varieties.** The first work was to select the best of these, cross them, raise numerous seedlings, select the best of these and so continue hoping for improvement. One of the first and not unexpected facts of importance to be observed, was that by crossing, the thorns were often increased rather than diminished, **but not so with all. Some very few still became even more thornless than their so-called thornless parents** greatly increased size and quality of leaves (raquettes or slabs) and among them **a combination of the best qualities of both parents with surprising productiveness of slabs for feeding.** The work is still in progress but on a still larger scale and now these improved Opuntias promise to be one of the most important food-producers of this age, some of these new creations grown from the same lot of seed **yielding fully ten times as much feed** as others under exactly the same conditions.

**Old half thornless ones have been grown for ages.** Among the very numerous wild seedling Opuntias, partially thornless ones have appeared from time to time and these have been growing generally unnoticed here and there in every part of the earth where the thorny ones grew, the seeds no doubt scattered by birds and other agencies. Some of these bore fairly good but seedy fruits and have been locally cultivated for ages, but **have never received specific horticultural names or descriptions** though the fruits of these and the thorny ones have long been used extensively as food and are the principal source of food for millions of human beings in Southern Europe, North Africa, Mexico and other lands, for about three months in each year.

Systematic work for their improvement has shown how pliable and readily moulded is this unique, hardy denizen of rocky, drought-cursed, wind-swept, sun-blistered districts and how readily it adapts itself to more fertile soils and how rapidly it improves under cultivation and improved conditions.

Some one asks: "Won't they run wild again and produce thorns, when placed under desert conditions?"

Has the "Burbank" plum which though introduced twenty-two years ago and is now more widely grown than any other plum on this earth, shown a tendency to be different in Africa, Borneo, Japan, Egypt, Madagascar or France? No, it is the same everywhere and the residents of Chicago, Auckland, London, San Francisco, New York and Valparaiso consume them in great (and rapidly increasing) numbers of carloads each season. The same may be said



of the later introduced Wickson, America and numerous other plums and of my improved fruits and flowers which are extensively grown and generally offered for sale by most responsible firms in **all civilized countries** and are generally slowly but very surely replacing the old and heretofore standard varieties.

It will be so with these "new creations" in Opuntia which I now offer. Tens of thousands of others not now ready to be distributed are under test, this circular partially describing only the beginnings of a great work with the Opuntias, which in importance may be classed with the discovery of a new continent.

Does this work which has been only just briefly outlined mean anything? Intelligent people everywhere know well that it means a new agricultural era for whole continents like Australia and Africa and millions of otherwise useless acres in North and South America, Europe and Asia. And now during the past three years the United States Department of Agriculture have despatched agents to all parts where cacti grow to look up this matter among those who had for years been feeding the wild, thorny ones to their stock with good results when properly prepared by fire, though it is acknowledged that thus prepared a portion of their nutritive value is lost and though the dangers of loss from feeding to stock are lessened, are not by any means made safe, even by singeing or any other process, while many of these **new thornless ones are as safe to handle and as safe to feed as beets, potatoes, carrots or pumpkins.**

But let it be understool that these thorns are not growing on the wild Opuntias for ornament any more than poison fangs, teeth, claws and stings are possessed by various animals. They are for defense, and when deprived of these defenses they must be protected from stock like any other feed grown in farm, fields or gardens. Still some doubter who has no knowledge of desert conditions or of these new plants will say, "Will it pay?" Does anything pay? Some people seem to think that corn, wheat, oats, barley, cotton, rice, tobacco, melons and potatoes pay. How many tons of hay, beets or potatoes can be raised each season on an acre of good soil? Yes, well, by actual weight in the summer of 1906 in the cool coast climate of Sonoma County, Cal., on a heavy, black "adobe" soil, generally thought wholly unsuited for cactus, my new Opuntias produced the **first year, six months** from single rooted leaves, planted about June 1st, an **average** of 47½ pounds per plant on one-fourth acre, yielding at the distance planted 2½x5 feet) **at the rate of 180,230 pounds** (over ninety tons) of forage per acre. Some of the best varieties produced **very much above this average.** Though planted much too closely for permanent field culture yet these notes are of interest on a subject of which little has been known. These Opuntias are always expected to and do produce nearly or quite double as much feed the third and succeeding years as they do the second season of planting. Yet, I would not expect one-fourth the above yield on desert soil **without** irrigation but would expect nearly or quite **twice as much as the yield mentioned above** in a very warm climate with one or two light irrigations each season.

These improved Opuntias must of course be fenced from stock when young but after two or three years' growth stock may safely be turned loose among them as with age the main stem becomes woody and will not be injured, but on removal of stock will at once make a most rapid new growth. The leaves are to be fed to stock when most needed, and in countries where great numbers of valuable stock are lost in times of unusual drought, will be of inestimable value and will also prove of enormous value in less arid countries **as a common farm or orchard crop even on the best agricultural soils** but more especially on barren, rocky, hill and mountain sides and gravelly river beds which are now of no use whatever.

The small, hard, wild thorny cactus has been a common everyday food for horses, camels, mules, oxen, growing and beef stock, dairy cows, pigs, and poultry for more than fifty years, though millions have died from the thorns,\* yet, **no systematic work for their improvement had been taken up until some fifteen years ago: now** agriculturists and horticulturists in every land are deeply interested and the governments of all countries are taking measures to secure a stock of the improved Burbank Opuntias to avoid if possible the too common occurrence of famines, for the Opuntias can remain uncultivated and undisturbed year after year, constantly increasing in size and weight until needed; then each acre will preserve the lives of a hundred animals or even human beings for months until other food can be obtained.

\* The wild cactus is prepared by boiling or steaming in Australia in times of drought, but even though great loss of stock is sometimes reported when thus prepared, some are saved from otherwise certain starvation.

# Samples of Various Comments on the Work

"Mr. Burbank's first publication on economic cacti serves to set at rest many groundless suppositions as to the character of the work he has had under way for years on these plants. Some persons forgetting that Mr. Burbank has made up to now no official announcement of his work jumped to the conclusion that he had merely hit upon one of the common nearly spineless forms of *Opuntia Ficus Indica*. Others more dishonest have been offering for sale so-called "Burbank's Thornless Cactus" despite the fact that not a single plant or seed of Mr. Burbank's new creations has left his grounds up to a few weeks ago.

Mr. Burbank was perfectly well aware at the inception of his work on the opuntias that there were many forms nearly thornless and he has even brought to light one kind, which he calls the "Marin," grown in many countries that has neither spines nor spicules. The Marin is not of much value, however, as it is a rather small plant and is not hardy. The new forms are much more rapid growers and are also more hardy."

—Dr. Walter T. Swingle, U. S. Dept. of Agriculture, Washington, D. C.

"To Luther Burbank has been granted the knowledge, supreme beyond other men, of the susceptibility of plants to vary under the influence of new environments, delicate manipulation, and intelligent direction."

—"Scientific American."

"The man who always does most says the least. Your good works will bless humanity long after you have said "Good Night." Your work is always a source of inspiration to me, and I am continuously wondering "What will he accomplish next?"

—Col G. B. Brackett, Pomological Chief U. S. Dept. of Agriculture, Washington, D. C.

"While I have long been impressed with your work, I am now overwhelmed with the vast amount of good which you have been able to accomplish. I respect your work above all that has ever been done for horticulture."

—Prof. Wm. B. Alwood, Virginia College and Experiment Station.

"Burbank has never made any false pretense as to the spineless cactus, and it must hurt his feelings to have some blundering pencil-pusher hurtle his "discoveries" at the world."—"News Letter," San Francisco, Cal.

## TO BEGIN PLANTING THE THORNLESS CACTUS

### David Griffiths Assigned by the Government to Locate Burbank's Plant in Arid Sections for Experimental Purposes

"The work of "locating" Luther Burbank's thornless cactus and establishing the plant in the State as a forage for stock will be undertaken by the United States Agricultural Department.

"The smooth cactus having no thorns is a very nutritious fodder plant and is greedily eaten by stock. It was developed from the ordinary thorny cactus by Luther Burbank. The Agricultural Department at Washington, recognizing the great benefit to be derived from this desert plant, when available as a forage plant, is making a determined effort to introduce it into the desert regions of the Western States."—San Francisco "Examiner."

"Burbank's thornless cactus is certainly proving itself to be the modern vegetable marvel. Nothing like it has ever been produced before. Its vitality surpasses the limit of belief, for nothing in the vegetable world has ever shown such wonderful resistant capacity, such reproductive powers, such exuberance of growth."—"Standard," Eureka, Calif.

## BURBANK'S SPINELESS CACTUS

By Prof. H. A. Adrian

"There is so much of misunderstanding on the part of the general public concerning Burbank's spineless cactus and so many foolish and misleading statements going the rounds that were born of ignorance and envy, that it seems worth while to give a little of the history of this famous plant and make clear the claims it has for a place among the greatest food-producers known to man.

"That there should be much of envy and any amount of misstatement of him and his work is to be expected. It has always been so and will perhaps always be the lot of those who do the world's great things. Meantime he toils placidly on in his wonderful gardens secure in the knowledge on the world-wide and age-long good he is doing in the high place that even conservative scientists have accorded him among the great ones for all time."—"Press" Santa Barbara, Calif.

"There are several good reasons why Mr. Burbank and his work may be reported erroneously in the public prints. Chief of these is, naturally, the difficulty of understanding him or the matters that pertain to his work. There is the subtle mystery of his peculiar intellectual faculties, the intricate processes he has evolved for the work of carrying on plant creation, and finally those creations themselves, which truly are such marvels of newness, beauty and worth that extravagant praise of them and eulogies of their originator are not surprising.

"Mr. Burbank has, for twenty-five years past, kept notes and records of his work in the greatest profusion and with perfect exactness. These invaluable records have not yet been published, but the fact of their existence is a guarantee to the public that it may yet hope to read and study the history of the work of Luther Burbank from his own pen."—"Out West."

"He is one who, like Edison in the sphere of human industry, stands near the apex of mundane possibilities. He is to be believed. One day this week he stood before an assemblage of learned, practical men, who were having under consideration, the reclamation of the arid wastes in the Great West and told that he had discovered how to produce and cultivate a thornless cactus which would yield tons per acre of nutritious food for both man and beast, without irrigation. \* \* \* \* In that great convention of irrigationists, he was the chief figure, the idol of the hour. \* \* \* \*

"Such men as Burbank, Edison and Agazzis have proved to be a great blessing to mankind."—"Irrigation Age."

"It must be an immense satisfaction to you to see your creations so thoroughly vindicated after such malignant attacks, but no doubt you are accustomed to that, even the thoroughly vicious and villainous articles of the R— N— Y—,—"Prof. W. — "College."

#### CACTUS ERA INEVITABLE

"The cactus era is just opening. Ten or twenty years hence many well-informed men believe, the cactus will have supplanted and displaced alfalfa throughout a great area of the civilized world. Why? Because the cactus will grow with little or no irrigation, upon any kind of soil, with infinitely less attention than alfalfa must have and will produce far greater results in yield of fodder.

"The romance and marvel of the Burbank Cactus would fill a large book. The story of the sixteen years of patient effort employed by that wonder-worker, Luther Burbank, justly calls for a place in literature.

"Imagine, if you please, a man collecting the cacti of the world, selecting from all of these varieties the best, then growing millions of seedlings, crossing and recrossing them selecting and reselecting and, finally, after sixteen years triumphantly evolving

from this patient, laborious process and from millions of discarded cacti, seven plants which were not only free from spines but which possessed the growing and feeding values for which he had so long striven. This, in a nutshell, is what Luther Burbank did with the cactus. Sometimes out of 100,000 seedlings, he destroyed 99,999. The remaining individual he watched and tended as carefully as a mother her nursing babe. Patience, infinite patience, had to be added to the Burbank genius the truly Spineless Cactus.

"Of those anxious ones who have endeavored to detract from the merit of this, the greatest of the Burbank triumphs, we will say nothing. The Burbank Thornless Cactus speaks for itself. It will, by its wonder-working accomplishments, best answer all critics, whether malicious or ignorant."—Ex.

"The largest ostrich farm in the world (situated in Arizona), having over 3000 birds, are preparing to put out 100 acres for their ostriches, as it is an ideal food. They now feed alfalfa exclusively, but find cactus as good and not one-fourth as costly."

#### JUMBO XXIII EATS THORNLESS CACTUS

##### Elephant Refuses Ordinary Food and Burbank Product Has to Be Shipped From Arizona

"Because one of the elephants with the Norris & Rowe shows took a liking to the thornless cactus when at the winter quarters in Arizona, the show managers are now compelled to ship the Burbank product to every point along the line of travel at a heavy expense. The show is to be in Seattle for three days, commencing next Monday, and several bales are expected here by express.

"Thornless cactus is to our managers what the proverbial red rag is to the bull," said J. H. B. Fitzpatrick, the circus press agent, last night. "When the California plant wizard announced to the world his latest creation, the managers of the show began a few experiments. They have a big camel and elephant ranch in Arizona, and an acre of the cactus was planted. When ready, small quantities were fed to the animals as from the quantity which grew on that one acre we had the food problem for the animals at the winter quarters solved. At first the elephants did not like it, but later nothing else would satisfy them.

"After the show got on the road one of the elephants spurned the hay, oats and peanuts which constitute the usual food, and seemed to be pining for his daily cactus. Finally Norris & Rowe were compelled to have it shipped to each town in bales, and when Jumbo XXIII spies that bale he trumpets and takes on in a manner which causes joy among the spectators. Norris & Rowe, however, do not appreciate the joke, as the freight charges are considerable."—"Post-Intelligencer," Seattle, Wash.



## HOW TO PLANT

The Opuntias differ from nearly all other plants as the cuttings should be wilted some before they will root and grow rapidly after which nothing grows so readily. When received place them in some warm shady place and allow them to remain a few days or a week after which they will readily form roots and start to grow anywhere, even on a board, a pile of rocks or the roof of a house if you choose. When wilted, the usual way is to plant so that about one-third or one-half of the cutting is below the soil, they may be planted in an upright position or at any angle from the perpendicular, or even thrown flat on the ground, it makes no difference to the Opuntias.

## DISTANCES FOR PLANTING

On fairly good soil in general field culture for stock feed, these New giant-growing kinds should be planted about three or four feet apart in the rows and the rows should be about ten feet apart. In orchard planting for the large growing, fruiting varieties four by twelve feet would be more convenient.

The selection of ordinary Opuntia cuttings is of some importance. Those who have grown them on the shores of the Mediterranean for hundreds of years always select "bearing wood" if fruit is the object, and the least thorny and bristly leaves if a plantation is to be produced for forage; even some of the partially spiny ones may be made less so by careful selection of cuttings but this labor is wholly useless since the new Burbank varieties are offered.

When Alfalfa was generally introduced about twenty years ago, many wiseacres declared it was no feed for milch-cows. Who says it is not good for them now?

### THE SPINELESS CACTUS

"There are two essential features of the subject which are but little understood by the average American farmer or gardener, on both of which Mr. Burbank has been very candid in his public writings. \* \* \* \* To the average American man the cactus is a painful and useless thing. That it has always been, even in its wild state, a valuable article of commerce in Texas, Mexico and some foreign countries as a food for humans and live stock and poultry will be surprising to many."—"Herald," City of Mexico.

"It is universally recognized throughout the cactus region of Texas that the plant has a decided tendency to increase the flow of milk. There are hundreds of ox teams in Texas that work all the year on ration consisting very largely of cactus all the time, and practically nothing else for months.

"The condition of the stock which have received the cactus during the winter appears to be very much better than that of those wintered on good dry pastures. Feeders without exception make this observation.

"Cattle and working oxen will eat a large ration of (wild) cactus properly prepared (burning off thorns) when there is an abundance of the best green grass for them to eat."—"Beacon," Fortuna, Calif.

"It is demonstrated beyond the possibility of a doubt that cattle will eat cactus in preference to alfalfa."—"Press," Long Beach, Cal.

### SPINELESS CACTUS

"Luther Burbank's spineless cactus has been introduced in Yuma, and the results of its propagation by local agricultural experimenters are highly satisfactory. They have thrived prodigiously. The plants are now from three to four feet high, and each plant has put out from twelve to twenty leaves. These leaves have grown until they are from two to three feet long, a foot or more wide, and two to three inches thick."—"Times," Los Angeles Calif.

"The growing of the spineless cactus is no longer a dream. The wonder of the desert, as brought out by "Wizard Burbank" in his experimental farms in California, has been tested in several parts of Arizona and has been found to do well."—"Enterprise" Gallup, New Mexico.

### SOME MORE ABOUT SPINELESS CACTUS

"On one of our experimental farms, in this state, we have some of Mr. Burbank's thornless cactus growing side by side with the best varieties of the government's thornless cactus, distributed last spring.

"The rate of increase on the part of the poorest of the Burbank cactus as compared to the best of the government cactus, is about fifteen to one. At our Eagle Rock nursery, near this city, we have obtained a reproduction of 400,000 from 25,000 since January of this year, and that without one drop of irrigation."—"Enterprise," Silver City, N. M.





LUTHER BURBANK SCHOOL

PROPOGATING HOUSE AND PACKING SHEDS

HOME

**VIEW OF ONE CORNER OF THE FIVE EXPERIMENT FARMS**

# Only Nine Years Required to Wake Up the "Experts"!!!

The existence of the United States Department of Agriculture has been rightly supposed to be, among other things, for the purpose of fostering and encouraging improved methods of culture and of improved forms of plant life which promises to be of benefit to Agriculture. That the cause of agriculture and horticulture would receive a great and lasting benefit by the prompt dismissal of some of the low browed, narrow gauge, "pin headed" employees who have to keep shouting to hold their places and who are largely responsible for the trash, free seed, and the trash, so-called "spineless" cactus distribution is too well known to need further comment.

After my own experiments in the improvement of the Opuntias had been in progress nine years (1905) astounding variations and numerous improvements were rapidly appearing, such as **absolute spinelessness** (never before known), greatly increased size and nutrient qualities of the pads or slabs for feeding, enlarged fruits of exquisite forms and colors, delightful aromas and flavors, wonderfully increased abundance of fruit and forage production per acre, and gradual but sure approach to one of the greatest desideratums of all, **seedlessness**. (This has since been fully accomplished here): About this time some of the Government "experts" became ludicrously earnest in their interest in my experiments and soon after secured a large appropriation for the purpose of a study of the Opuntias; agents were hurriedly sent in all directions to discover if possible some wild or cultivated Opuntia of agricultural value which was absolutely spineless. All known regions of the earth were literally scoured in this vain effort. **No such plant was found, for none existed outside of my own grounds at Santa Rosa.**

The employees of the Department of Agriculture are, with very few exceptions, upright and honorable gentlemen with whom I am on the most friendly terms. Sometimes, however, one of the "other kind" gets a job. One of the "other kind" of government "experts," a certain David Griffiths, after visiting my grounds on several occasions, awoke at last with a shock and took occasion to publish under the cover of the Department a bulletin (see Bulletin 140) on the "Spineless Prickly Pear," its whole end and aim and too evident purpose being only to deride and belittle the long and very expensive experiments which had been made here before he or the Department had awakened from their drowsy indifference to the great value of this long neglected gift of nature only awaiting man's development of its latent possibilities as a forage and fruit producer, and now promising to be of as great or even greater value to the human race than the discovery of the practical application of steam, producing as several of these new ones do, **more food with less care and less water and on poorer soil than any other plant which grows on this earth**, excelling even the banana in their never failing bountiful crops of fruit.

## GOVERNMENT "EXPERTS" AND MR. BURBANK

"It has reached such a stage that every time Burbank announces a new "discovery" the scientists employed by Uncle Sam shout "nature faker," and prove conclusively, to their own satisfaction, that what the Californian has brought forth is not only not new, but that it is worthless from every point of view and is unworthy of space in any garden plot in the world.

Burbank's "spineless cactus," some of which he has lately sold to a syndicate and which is now being heralded as the future good food of the arid lands, is the latest item to be "thrown down" by the Agricultural plant "experts."

"In the first place the spineless cactus was not discovered by Burbank," said one of the officials of the Bureau of Plant Industry. "It was discovered by mother nature long before Burbank was ever heard of. I saw it growing in Mexico many years ago.

"In the second place the spineless variety is not as good for the use of the farmers of the arid lands as the kind that is provided with natural arms for use against its enemies."—Washington D. C. "Post."

## "EXPERT" CRIBBING METHODS

"There lies before us a copy of an Agricultural Department Bulletin treating of the Spineless Cactus, which gives one the impression of seeing a stage presentation of

Hamlet, with nary a melancholy Dane. It graciously says that there are "a number of nursery men who have now on hand a stock of some varieties of prickly pears and are offering the plants for sale, usually under the name of Spineless Cactus," but we fail to see any reference to Burbank, who has done more than all the other agencies combined to perfect the plant and bring it to public notice. This cribbing of ideas and experiments without due credit, don't look good to us. Caesar seems to have ill luck in getting his denarius in the Department; and as for the Infinite and Eternal Energy, why, bless your soul, it is out of the running. In Washington they take the denarius and everything else in the shop."—Editorial Rural Californian.

#### FOLLOWING, NOT LEADING

"It is announced that the Department of Agriculture is preparing to experiment (?) with spineless cactus on the Government Plant Introduction Garden at Chico, Cal. This is like 'bringing coals to Newcastle.' Within a distance of one hundred miles from Chico the problem of spineless cactus has been solved, and the utility of the product demonstrated, by **Luther Burbank**. Just why the Department of Agriculture ignores the great work of this world's most famous plant scientist is beyond comprehension. It would at least appear that the envious salaried experimenters at Washington would have sense enough to keep miles and states distant from the great successful plant transformer and propagator in the pursuit of its attempts to do what he has already done."—Orchard and Farm, San Francisco, Cal.

"In Bulletin 140, the United States Department of Agriculture has placed itself on record as antagonistic to one of the greatest plant industries of the age. \* \* \* Those who are privileged to know Mr. Burbank are forcibly impressed with the modesty of the man whose creations have had so great a bearing on the agricultural and horticultural world."—Irrigation Age, Chicago.

#### SPINELESS PRICKLY PEARS

"Bulletin No. 110, just issued by the Bureau of Plant Industry of the United States, is upon the subject of the spineless prickly pear. The bulletin was prepared by David Griffiths, assistant agriculturist. Either purposely, or through ignorance of well known facts, this bulletin ignores Luther Burbank's work in removing spines from the cacti family, and makes much pretense that the bureau itself has been successfully working along lines of discovery. As a point-blank snub to the greatest of all human producers of new plant life, Griffiths says: 'The origin of 'spineless prickly pears is shrouded in as much obscurity as that of the cultivated wheat, barley, apples or any other crop long cultivated by man.' Parenthetically it may here be stated that long after the names of Dr. Griffiths

and the bureau itself are obscured by time, the name and fame of Luther Burbank will be revered as a benefactor of the human race.

"The entire bulletin shows a labored effort to detract from the great developing magic with which Mr. Burbank has added hundreds of new forms of plant life to the products of human cultivation. Just why the Bureau of Plant Industry of the United States should lend itself to the derogation of any public benefactor is difficult to understand, unless jealousy prompts the course of official personages vested with brief and vaunting authority. It is an exhibition of small business, to say the least."—Orchard and Farm."

#### GOVERNMENT EXPERTS AND MR. BURBANK.

"A dispatch from Washington, D. C. says that some of the men of the United States Department of Agriculture have been speaking disparagingly of some of Luther Burbank's creations. This is not the first time this has been done by them. Some writers in commenting on the matter have said that jealousy on the part of the department men has prompted their adverse criticism. They have gone further and have stated that at some of the United States experiment stations experiments have proved unsuccessful which Burbank has made the greatest kind of a success.

"The last attack according to the word from Washington, is centered upon the thornless cactus and its adaptability to the arid desert lands."—Courier, Petaluma, Calif.

"There appears to be a consistent attempt on the part of some petty officials at Washington to discredit the discoveries and the work of Luther Burbank. The claim of Mr. Burbank to distinction in the world of science is so thoroughly recognized that caviling by men of such caliber is not likely to detract from his fame."—Enquirer, Oakland, Cal.

"Clerks of the Department of Agriculture in Washington have called Luther Burbank a nature faker. It is hardly probable that Mr. Burbank will stop his valuable labors long enough to call them anything."—Post, Houston, Texas.

"Independent investigators must win their victories in the face of opposition on the part of the government scientists."—W. F., Washington, D. C.

#### BURBANK ASSAILED BY LOT OF LILLIPUTIAN "EXPERTS"

"The Star has no brief for the defense of Luther Burbank against his "expert" detractors. It would be a libel on Mr. Burbank to suggest that he needs defense against this crowd of Lilliputs.

"The United States Department of Agriculture has done a monumental work in experimenting, discovering and disseminating valuable information on plant and animal life. It has been fortunate in acquiring the services of a few men of eminent talents who do things. It has at the same time been unfortunate in annexing a lot of impractical, narrow-minded laboratory "experts" who assume to know more about Nature and natural processes than Nature has ever taught or will ever teach. In fact, they go so far ahead of Nature or lag so far behind they are unnatural. Their chief employment consists in keeping up a round of mechanical "duties" in laboratories or hot-houses, as far removed from Nature as possible; and in clubbing every man who dares by his achievements, to dispute the limelight with their claims.

"For instance the Federal horticultural "experts," some of whom would hardly know cactus from Canada thistles, if they were to see the two growing in the open, unlabeled, are assailing Luther Burbank's spineless cactus achievement. It is not original, they say. They knew all about its existence before Luther Burbank was ever heard of. And, besides, it does not amount to anything. Cactus without spines is liable to be eaten up by jackrabbits, whereas the ordinary cactus can be made into fodder by burning off its spines. Luther Burbank is just a cheap "nature faker," wasting his time with

Mother Nature and gulling the public with a lot of "discoveries" that these "experts" have known all about since the pre-Adamite period.

"Meanwhile as this shattering of Burbank preparatory to his annihilation is going on, the public will not be stampeded away from him. The practical, level-headed masses of the American people are old-fashioned enough to believe in a man who sticks so close to Nature that he can help her to improve on herself and bring forth new and far better products. If the "experts" at Washington, after they get through weighing the heels of the thrip, and reckoning the stomach capacity of the tobacco worm, succeed in wiping Burbank off the face of the earth by their invincible text-book logic and hot-house "facts," still the ignorantly blind public will be vulgar enough to regard the Burbank annihilation as only another sham-battle achievement, in which the annihilation of armies in theory is always shown to be sadly defective when it comes to annihilating in real fact a real flesh and blood army.

"Burbank keeps cheerfully on at his work, sleeping well and accomplishing more for the real advancement of horticulture in a week than the censorious "experts" at Washington accomplish in a year. Their critical buzzing no more concerns him than the buzzing of mosquitos disconcerts an elephant."—Pasadena, Cal. "Star."

It has been proved (see page 7) that the poorest of the **Burbank** spineless cactus will produce fifteen to one as compared to the best "expert" Government cactus. Is it then surprising that practically all the nations of the earth are anxious to obtain the new **Burbank cactus** as soon as possible? Be very careful, however, that you get the **Burbank cactus**, not the half spineless ones so very often sold as the "**Burbank**" or "just as good as the Burbank," such as the builders of the pyramids of Egypt may have cultivated, which some of the "pin-headed experts" at Washington are exploiting.

Many of these so-called "Spineless" Cactus plants are steadily and persistently being palmed off on the public as "Burbank's" or "Just as good as Burbank's."

These old so-called spineless varieties were well known hundreds of years ago, and have been growing in California, Mexico, Southern Europe and North Africa for ages. Twelve tons of this ancient trash is being sent out this season, through ignorance or worse, by the United States Department of Agriculture. We have now on hand some sixty tons of these same kinds (used in past years for experiments) which we offer at \$3.50 per ton, but do not recommend them except to save starving cattle in times of extreme drought; life is too short also for unfortunate growers of this prehistoric type to be constantly under the surgeon's knife for the removal of spines, they are dangerous to handle except with shovels, pitchforks or very thick leather gloves.

The following quotations are from a late magazine article in vindication of the **old, wild, thorny varieties** of cactus. The thorns can be, at much trouble and expense, partially burned off by fire thus making a somewhat dangerous but otherwise good fodder, especially for dry seasons.

"Every old-timer in Texas has distinct recollections of the years of famine when cattle were kept alive on "prickly pear." He knows that "it is sure good feed," that on several occasions it has been the salvation

of thousands of cattle and that over a large area of territory today twice as many cattle are raised as would be possible were it not for prickly pear growing spontaneously. But in spite of the fact that it has been

proven to be a profitable thing to utilize when growing wild, the idea of planting and cultivating it, or actually growing it intentionally, is yet a rather novel one."

"The plant has a bad reputation. It looks anything but promising as a stock food."

"The plants will nearly meet (when planted eight feet apart) in two season's growth, when it will be impossible to get animals and machinery through them in cultivating. The forage, however, need not be gathered unless needed for several years longer, but simply allowed to grow until the time when it is wanted. It will be fully as good feed, and, according to some, better five years later."

"The response of this plant to cultivation is phenomenal. We know of no parallel in the history of cultivated crops. The cacti in general are considered plants of slow growth

and the pear of Southern Texas is no exception to the general rule. While it might take it five or six years to grow large enough to pay to harvest in the native pastures, it makes a big crop in two years when cultivated. By actual test it grows eight times as fast with good cultivation as it does without cultivation in grassy pastures."

"It produces tremendous tonnage; it requires no irrigation; it is an excellent dairy roughage, good roughage for any cattle, and can be used for hogs, chickens, sheep and goats. It can be fed in a green succulent condition all the year. It has no serious insect or fungous enemies. One planting is good for repeated cuttings. It does not deteriorate with age but can be fed when five or six years old to even better advantage than when young. It is a certain crop under conditions which cause other crops to be a failure."

## ECONOMIC VALUES OF THESE NEW BURBANK OPUNTIAS

First: The leaves or slabs as food for all kinds of stock including poultry. The whole plant, both leaves and fruit, almost without exception finds immediate favor with all herbivorous animals. Cattle prefer it to almost any other food and it makes a superior quality of beef and exceedingly rich milk, which is not surprising as cactus is one of the very richest foods known in sodium, potash and magnesia, the principal salts found in milk. These valuable organic salts are found in the cactus more abundantly than in any other fodder. And there is the further consideration that the cactus supplies the animal almost all the water it needs. In Hawaii and Mexico cattle have been known to subsist for six months on a cactus diet without a drop of water. The often observed fact that animals when fed on cactus improved in condition more than could be accounted for by the usual chemical analyses for food values had been a matter of much study by chemists until it was discovered by actual experiment that these organic mineral salts aided in the digestion of food which would not otherwise have been utilized.

Second: The fresh fruit of these improved varieties is unique in form and color, exceedingly handsome, unusually wholesome, (the large amount of vegetable salts they contain being regarded as very beneficial) and far superior to the banana in flavor. It is usually sold at the same price per box as oranges and can be produced at less than one-tenth the expense of producing oranges, apricots, grapes, plums or peaches. There is never a failure in the crop which can be shipped as safely as the other deciduous fruits. The fruit can be gathered and stored like apples and will keep in excellent condition from four to five months. Samples packed in ordinary packing boxes without ice, were shipped to Chicago, New York, Boston and Washington this past season and kept in perfect condition.

Third: Most delicious jams, jellies, syrups, etc., are made from the fruits alone or in combination with other fruits, besides various foods and confections, such as Tuna honey (Miel de Tuna), Tuna butter (Melcocha) and Tuna cheese (Queso).

Opuntias have been used (even the thorny ones) for making confectionery by the Mexicans and others for a long time. Some of the finest candies of Mexico are candied cactus of various forms.

Fourth: The fat young leaves are sometimes used for pickles, and are a fairly good and wholesome food when fried like egg-plant. They are also boiled and used as greens and are prepared with sugar producing a sweetmeat similar to preserved citron, which may be flavored with ginger or other spices.

Fifth: The abundant mucilaginous juice from the leaves is extracted for mixing with whitewash to make it lasting when exposed to the weather. For the purpose of obtaining this mucilage the leaves are simply cut in thin slices or crushed and placed in water. A leaf or two will make a gallon of good, thick, transparent mucilage of superior tenacity. When this substance dries slowly, it produces a gum which is hard, brittle, generally white or of a pearly color, and not readily dissolved in water. It should also make a valuable addition for giving more tenacity to some of the compounds used in spraying trees and plants for parasites.

Sixth: The leaves are extensively used and most admirably adapted for poultices and as a substitute for hot water bags (the new Burbank absolutely spineless kinds of course preferred).

Seventh: The juice from the fruits of the crimson varieties is used for coloring ices, jelly and confectionery; no more beautiful colors can be imagined.

Eighth: The fruits and leaves are sometimes served in various other forms for food by those who are familiar with them.

Ninth: The cactus also gives great promise as a producer of alcohol and paper pulp, and in Australia is now said to be a thorough success in these respects. It is planted at Alexandria, Egypt, to prevent the drifting of sand.

Tenth: Even if the cactus yielded no product of direct utility, yet it would, on account of its great growth and rapidity of increase, perform a very distinct function in preventing the rain from carrying away superficial layers of soil from barren slopes which the rain waters would surely carry to the sea where would be wasted uselessly this most precious portion of the earth's crust, the portion most rich in elements of fertility. Moreover the cactus facilitates the penetration of the earth by waters which reappear below in the form of springs. It is impossible to repeat too often that, in such countries as Tunis and Algiers, where frequently torrential rains are separated by long seasons of drouth, too great effort cannot be made to retain in the ground as much as possible of this water which ordinarily trickles away without benefit to agriculture over the numerous barren slopes. It is not necessary to wait until it forms into rivulets before trying to catch it. It is much sooner than this, when the water has as yet formed merely liquid threads which the tiniest obstacle can divert, that the effort should be made to make it penetrate the soil. The cactus planted on cleared strips, worked out according to the contour of the surface, may be advantageously employed to this end.

In Europe, where cactus has been set out by hand labor, the cost is estimated to be about \$10.00 per hectare, (equal to about two American acres). It would not be more than that per acre in this country and it is the opinion of Mr. Chas. J. Welch, a man with some experience in these matters, that in a country where traction engines could be used and large tracts set out, the cost would not exceed \$5.00 per acre. The initial cost of land in any case need not be more than \$50.00 per acre and a great deal of land suitable for the purpose could be secured at a very much cheaper figure.

After the first year no cultivation is required. In all \$60.00 would amply cover all expenses, except the cost of cactus plants, until the third year when the plantation would be in full bearing.

"On ordinary land at Santa Rosa the Burbank cactus produces close to 100 tons to the acre. On land under cultivation near Los Banos, California, it produces fully twice as much and there is some land there that will grow cactus that should produce much more. Cactus as forage alone should be worth \$4.00 per ton at any time, and in years of drought it might well bring as high as \$20.00 per ton. In other words, on land at \$50.00 per acre cactus should produce a crop worth nearly or quite \$400.00 per acre on the third and every succeeding year, thereby ranking it among the very best agricultural propositions before the American farmer today. Because of these possibilities single slabs of the true Burbank variety are now selling for \$5.00 each (more or less according to the variety)."

Cactus plants do not necessarily require rich land. The land need not be either fruit or agricultural land. Such land as is commonly purchased in the valleys of California at \$50.00 per acre should be very satisfactory and even land at \$5.00 per acre is feasible. Cactus will probably stand as much white alkali as any plant which grows.

Fruit land could not be secured and fruit trees set out and cared for until bearing for less than four times as much (\$60.00); the initial cost for the first year is commonly estimated at \$203.00 per acre; and it would be necessary to cultivate it for five or six years

before any return could be expected. In this connection it would be well to remember that from twelve to twenty years of bearing is the average length of life of most fruit orchards, whereas the cactus plant will thrive indefinitely. It might also be well to note that whereas a fruit orchard suffers great deterioration if it is not cultivated, pruned and harvested every year, a cactus plantation can grow on for any number of years without the slightest care or even harvesting, and suffer no injury, so that in years of depression, if there should be no satisfactory price for cactus produce or products, a man need not spend one cent on his plantation.

"About eight or ten inches of rainfall is required for the best cactus culture, although cactus will do very well on six inches. It is not necessary that the rainfall should be regular, but the precipitation of rain once in four, or even as infrequent as once in ten years is sufficient."

Alfalfa and all other fodders produce thread-like stems while the cactus plant yields big, luscious slabs weighing from one to seven pounds each, which can be cut at any time, summer or winter whenever needed.

Cactus can be grown close in along the coast of the United States from the Puget Sound country south to San Diego, in the great valleys of California, in a considerable part of Southern Arizona, southern New Mexico, Southern Texas, Southern Louisiana and all along the Gulf and Atlantic Coast of the United States well up to South Carolina for about one hundred miles inland, more or less, according to elevation and other factors. In a general way, this is the part of the United States best adapted for cactus culture.

"The Burbank Spineless Cactus will prove especially valuable in feeding dairy cattle as it will furnish a succulent feed throughout the entire year, so that an even flow of milk can be obtained. When fed with a little cotton-seed meal or other concentrated food or used with about fifteen pounds of good alfalfa hay, it will prove the ideal feed by which dairymen may obtain the same quantity and quality of milk in January as in June. Even now, the best butter is being made from dairy herds fed on spined wild cactus with only three or four pounds of cotton-seed meal per day or its equivalent; while some of the best beef cattle have been fattened on the same rations and sheep, hogs and calves are being prepared for the market on an exclusive cactus diet."

As cattle always follow feed there should be an ever present market for cactus forage wherever it is grown. Besides, as the different varieties of cactus mature fruit from September to March, they enjoy a season of exceptional shipping advantages.

"It is said that wood alcohol can be produced in great quantities by the distillation of both the cactus slabs and fruit and the productive capacity of the fruits is in some cases over 196,000 lbs. to the acre. But besides all this, paper stock can be made from the refuse, which some experts from the great manufacturing establishments pronounce the very finest quality for certain expensive papers. This fibre is almost absent in the leaves when they are young and in the best condition for feeding stock, but as the plant grows older the woody fibre increases towards the base which becomes practically solid material. Every part from the tip of the plant to the tip of the longest root is available for this purpose. The fibrous paper stock comes out very clean and white with little trouble in preparation. Celluloid is also a promising product of this remarkable fibre."

"Luther Burbank, the greatest originator of new and valuable forms of plant life of this or any other age."—Dr. David Starr Jordan, President Leland Stanford, Jr. University.

"It is an honor to California that Luther Burbank is its citizen. He is all that he has ever been said to be and more."—Dr. L. H. Bailey, Cornell University, N. Y.

"He stands easily at the head of the world's greatest experimentalists in plant life."—W. Atlee Burpee, Philadelphia, Pa.

"Mr Burbank is a man who does things that are of much benefit to mankind and we should do all in our power to help him."—Theodore Roosevelt.

"I look to great practical results from Burbank's work among plants."—Thomas A. Edison

"No other man has given to horticulture so many valuable things as has Luther Burbank."—Prof. E. J. Wickson, Dean of Agriculture, University of California.



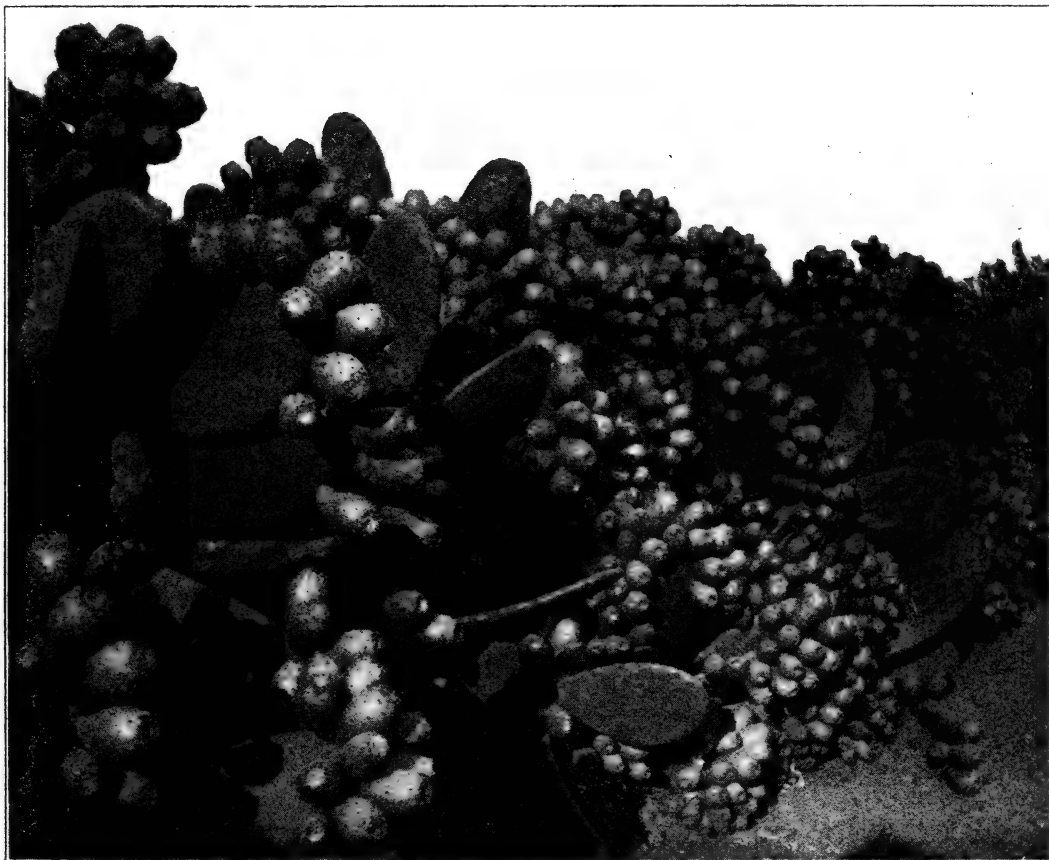
PART TWO

DESCRIPTIONS OF

**THE NEW BURBANK OPUNTIAS**

THE KINDS TO CULTIVATE

FOR FRUIT and as Food for FARM ANIMALS and POULTRY



**BURBANK'S SPINELESS CACTUS**

**One Hundred and Ninety Six Thousand Pounds of Delicious Fruit Per Acre  
on this Field**

The best of these improved Spineless Opuntias when grown under favorable conditions on good soil in a warm climate may confidently be expected to produce an average of nearly or quite one hundred tons of feed per acre when once established, each season.

I have no time and no desire to introduce these or any other Opuntias, and would gladly leave the matter to some one else but so much has been written about them and so many are deceived with the old cheap, half-wild varieties which are so often offered as "Burbank's" or "just as good as Burbank's," that it seems necessary to have them distributed direct from

my own grounds and under my own descriptions so as to avoid as much as possible any misunderstandings, exaggerations or misstatements such as heretofore have been carelessly, ignorantly or wilfully made. Utterly spurious "Burbank's Thornless Cactus" has been offered for sale by dishonest parties for five years or more, not only in America, but also in Europe, Africa and Australia.

In producing these new Opuntias more than fifteen years and much thought, labor and capital have been expended, thousands of crosses have been made and many hundred thousand seedlings and crossbred seedlings raised. The finished product is receiving a royal welcome everywhere by those who know.

Few of the cacti are of any economic value except the Opuntias; of these there are more than one hundred and fifty species and innumerable varieties; all probably originally natives of the Western Hemisphere and were cultivated by the Indians long before Columbus discovered America. No class of plants are more easily grown, soil is not of much importance and cultivation almost or quite unnecessary.

For the old fruiting Opuntias or Prickly Pears, eighteen thousand pounds of fruit per acre is found to be a common crop on the poorest soils, while on good soils the best Burbank fruiting varieties will and have produced more than one hundred and fifty thousand pounds of delicious fruit per acre. The fruits differ in various ways like apples, plums or peaches. By analysis they are found to contain from six to fourteen per cent sugar besides a small amount of protein and fat, also aromas and flavors. Some contain more of these, some less; all desirable qualities are greatly increased by scientific breeding and selection for this purpose, as with the apple, peach, sugar beet and other fruits, grains and vegetables.

Some of the earlier varieties ripen in June and July, the later ones in August, September, October and November and through the winter; Most of them commence bearing about the third year from cuttings.

The general practice to prepare the fruit for use is by brushing with a whisk broom or rubbing with a coarse cloth, then cutting a thin slice from each end through the skin, then slitting from end to end when the skin may be readily removed, leaving the solid flesh ready for use.



SAMPLE FRUITS

## FOR EXTENSIVE PLANTATIONS

The leaves of these new Giant cactus varieties should be shrunken slightly or wilted at least, (except in absolutely dry deserts or in very warm summer weather). Meantime an earlier and more rapid growth will be secured by plowing and harrowing the land as for any other crop. The cuttings may then be easily and rapidly planted one-third their length under ground, either with spade or plow, in deserts slanting towards the position of the two o'clock P. M. sun; or they may simply be thrown on the ground and left to themselves; in either case they will grow, but in the end it is probably better to plant as above. Three to eight feet apart is the best distance for permanent plantations, either for fruit or forage, but they may be planted at half these distances and later, three-fourths of the plants removed.

People who are not acquainted with the cactus often mistake the numerous pointed leaflets on the undeveloped slabs for spines. These, having no function to perform soon drop off. They are as different from spines as blossoms are from leaves.



### — ROBUSTA (Forage and Fruit for Feed)

A new crossbred cactus which originated on my own grounds six years ago. The cut conveys only the slightest idea of its heavy, smooth, compact growth. The slabs are packed together so closely as to resemble a solid bale of leaves. Not a leaf has ever shown a trace of injury from sunburn, disease, or damage by frost, even when the mercury went down to fourteen degrees above zero.

The thick, heavy, pale green slabs or leaves of **Robusta** are smooth, medium size, two to five pounds each. Fruit medium size, abundantly produced, slightly bristly, thick pulpy skin.

good, but best suited for stock and poultry feeding. Productive of feed beyond human imagination, except by the aid of actual, ocular demonstration. The most productive, compact growing and most valuable cactus for feed so far produced.



### ELDORADO (Fruit)

The old half-spineless "White Fruit" with several similar half-spineless (so-called "spineless") varieties introduced by John Rock of San Jose some forty years ago and quite generally distributed throughout California and Florida, was one of the best of these old, so-called "spineless" varieties. Eldorado originated here on my grounds from this old well-known stock; the new variety is almost, but not absolutely free from spines, yet far ahead of those ancient varieties in this respect, a very strong grower, hardy and extremely productive; but best of all it produces unusually large, very thin skinned **fruit of the very best quality**. The skin, which peels most readily from the fruit is olive green, beautifully shaded with lemon yellow and rose pink. The flesh is of the palest semi-transparent straw yellow color, firm and with a rich melon-like flavor and **almost seedless**. The fruit, which is of an unusually pleasing form and even size, keeps well, both when left on the plant or picked for use of shipping. Nothing better so far known for general home use, market or shipping. The cut quite accurately shows the form and size of the fruit which usually weighs from seven ounces to half a pound each.

### SPECIAL (Forage)

**Special** is of the Tapuna section with round, silvery leaves or slabs, a true "Spineless" cactus, not like the ancient "expert" so-called "spineless" ones. No gloves are required to handle this kind. The slabs of this variety also are about as smooth as watermelons. The long, broad, heavy rows of plants have never shown the trace of a spine, hundreds of people have fondled them, rubbing the leaves over hands and face without any discomfort whatever. The silver green slabs average from three to five pounds each. **Special** also has never shown a trace of leaf injury from any cause. The fruits (rarely produced) are nearly globular in form, very slightly bristly, and only fitted for the use of domestic animals.

The plants grow in handsome round topped style in the form of small haystacks and side by side produce far more than ten times as much feed as the ordinary wild kinds. A cactus plantation of these new "Burbank" types produces a surprising growth in animals and a production of rich, creamy milk, far beyond the comprehension of those yet ignorant of their value.

### **TITANIA (Forage)**

One of the most remarkable of all known hybrid spineless opuntias. Leaves or slabs, light grass green often three to nearly four feet long, eighteen inches wide and one and one-half to three inches thick. These giant leaves first appear as little knobs and in a few weeks attain this enormous size a single leaf being abundant feed for a sheep for a day or two. Nothing like Titania has ever been produced before.

### **BANANA (Fruit)**

Same origin as Eldorado; great grower; remarkably resistant to adverse conditions of all kinds. Early and abundant bearer of very large handsome lemon yellow fruit with crimson blush, flesh banana color, firm, sweet, unusually good, seeds not abundant; not absolutely spineless but far superior to the best plants of the parent type. One of the most profitable of all for fruit.

### **ROYAL (Both Fruit and Forage)**

The old well known so-called "spineless" Anacantha has probably given the best satisfaction of any of these ancient, well known kinds: it has, no doubt, been grown for ages in all cactus countries. Years ago during my early experiments it was received with others from almost every quarter of the globe. The fruit while of the sweetest, was very sparingly produced and late in the season. Royal is the best hybrid seedling of those which can at this time be offered from a lot of more than one hundred thousand. Royal has large, broad, thick, dark green leaves or slabs much larger and broader than its parent, and far less spiny, in fact would be a wonder in this respect if absolutely spineless ones had not lately been produced. The fruit of the Royal is very handsome in form, compact, with exceedingly smooth, thin, pale yellow skin, mostly covered with a crimson blush. Flesh yellow, very few tomato-like seeds, sweet and of most superior quality. The thin skin is easily removed and unlike most others of this class, is not subject to cracking. Royal is the best of this class in existence at the present time, and superior both for fruit and fodder.

### **VERTEX (Forage)**

Another new cactus hybrid which has a great future, one selected from among millions of hybrids. A tree-like stout, upright grower, with bluish green, thick, heavy, oval leaves, one and a half to two feet long and seven to ten inches wide; smooth, wholly free from spines or spicules and uninjured by frost, insects, rain, sun, wind, drought or poor soil.

### **ARBITER (Forage)**

Remarkable for its vigor of growth and the size and smoothness of its slabs. Sheet iron gloves are not required to handle its great smooth flat leaves or slabs. One of the very best for fodder and will greatly please those who have been obliged to handle the common kinds heretofore generally known as "Spineless Cactus."

## COMPETENT (Forage)

A second generation, smooth hybrid seedling, absolutely free from either spines or spicules. The leaves which are generally two to three feet long by six to eight inches wide and often three inches thick are curiously warty and corrugated when young and as smooth as an apple when grown. It has been most amusing during the past three years to observe investigators take out their high power magnifiers in the always vain search for something in some way resembling a spine. No smooth cactus on my farms has been more admired or desired than this one.

## SIGNAL (Forage)

Another most remarkable cactus from my crossbred seedlings. Leaves long, thick and when young with deep corrugations or knobs, later becoming as smooth as a nectarine and attaining in some cases a length of more than four feet and a weight of ten to twenty pounds each. Impossible yet to estimate the value of this new spineless variety when it becomes known and generally grown.

## OPALINE (Forage and Fruit)

**Opaline** produces abundantly large, oval, pale green slabs fifteen to eighteen inches long by five to eight inches wide, averaging in weight about three to five pounds each, no thorns, no bristles. The fruit is of medium size, pale yellow and of fine quality, ripens at the usual time, September, October and November, but remains in good condition here on the plants through the winter until the next year in May. It can be easily handled without any brushing; no other good "Tuna" fruit so far known can be.

## BUSTER (Forage)

Very similar to "Competent" and "Signal." Enormous long, warty or corrugated, pale green slabs which are **absolutely spineless**. No gasoline burners, iron boots or pitchforks are needed to handle Buster.

## ACTUAL (Fruit)

A happy cross of the old Standards, "Anacantha" and "Smith." Belongs to the upright growing section and is especially fine. Great producer of large, smooth, thick, light green slabs and a profusion of almost seedless fruits which are of good medium size, pale yellow, flushed crimson. Flesh white, sweet, rich and delicious.

## MARKET (Fruit)

For fruit alone, if one is not disturbed with spines, "Market" a seedling of the old well known Smith will greatly please growers. Like the old so-called spineless Smith, the plants are unusually robust growers with large, pale green slabs which are annually loaded down with brilliant, crimson six to seven ounce fruits of a pleasing compact form and very thin easily removed skin; flesh violet crimson, sweet and in every way far in advance of any of this fine class except for the short spines such as the "Department" prehistoric, so-called "spineless" varieties carry. The fruit also has the same old seeds but is produced so freely that it can be recommended as one of the very best of all the half spiny class.

## NIAGARA (Fruit)

Seedling of the old "Smith," a so-called spineless cactus introduced to California some twenty years ago. The plant and fruit are both somewhat bristly, but not nearly as much so as the parent. Niagara never fails to bear at least four to six times as much fruit as the Smith. The fruit, which is of the brightest crimson color is smoother and more compact, larger, with a thinner peel and of far superior quality, flesh crimson throughout. Seeds somewhat abundant, but its enormous producing ability can and will give it a place even though in other respects resembling the prehistoric so-called "spineless" kinds.

## QUILLOTA (Fruit)

Cross of Anacantha and white fruit. Large plants with thick oval, light green leaves. Fruit large, handsome, yellow with crimson blush; thin skin which is readily removed; firm, pale greenish, almost white flesh; seeds medium to small; flesh sweet, rich, most excellent. Unlike other Opuntias it drops at once like apples when just ripe, thus saving the trouble of picking. Fruit ripens from September to April.

# TWO NEW HARDY NORTHERN SPINELESS CACTUS

Two plants which required nine years of scientific selection and manipulation to bring them to their present condition of a spineless, fast-growing, heavy fruiting condition. Both of the new ones are a combination and selection from the little thorny *Opuntia vulgaris* of New England which is fairly hardy in Alaska, and *O. Rafinesquii*, of the western plains, both as hardy as oak trees. Therefore both these kinds may be most confidently expected to be hardy all over the United States, at least. Both literally cover themselves with clear deep yellow flowers in summer and the next spring are covered and loaded down with brilliant scarlet fruits, one to one and one-half inches long and about three-fourths of an inch thick, which when ripe (weeks before strawberries) are very good to eat, far superior to the little thorny fruits of the common kind children are so glad to get in the early spring. The leaves are deepest green, four to six inches long, three inches wide and half an inch thick. These two kinds, besides bearing great quantities of good fruit are also (both leaves and fruit) highly relished by poultry and stock, but do not yield one-tenth as much fodder as the poorest of the tender giant kinds, yet owing to the constant demand for a hardy cactus, have decided to offer them to those who live in climates where the giant kinds cannot be grown.

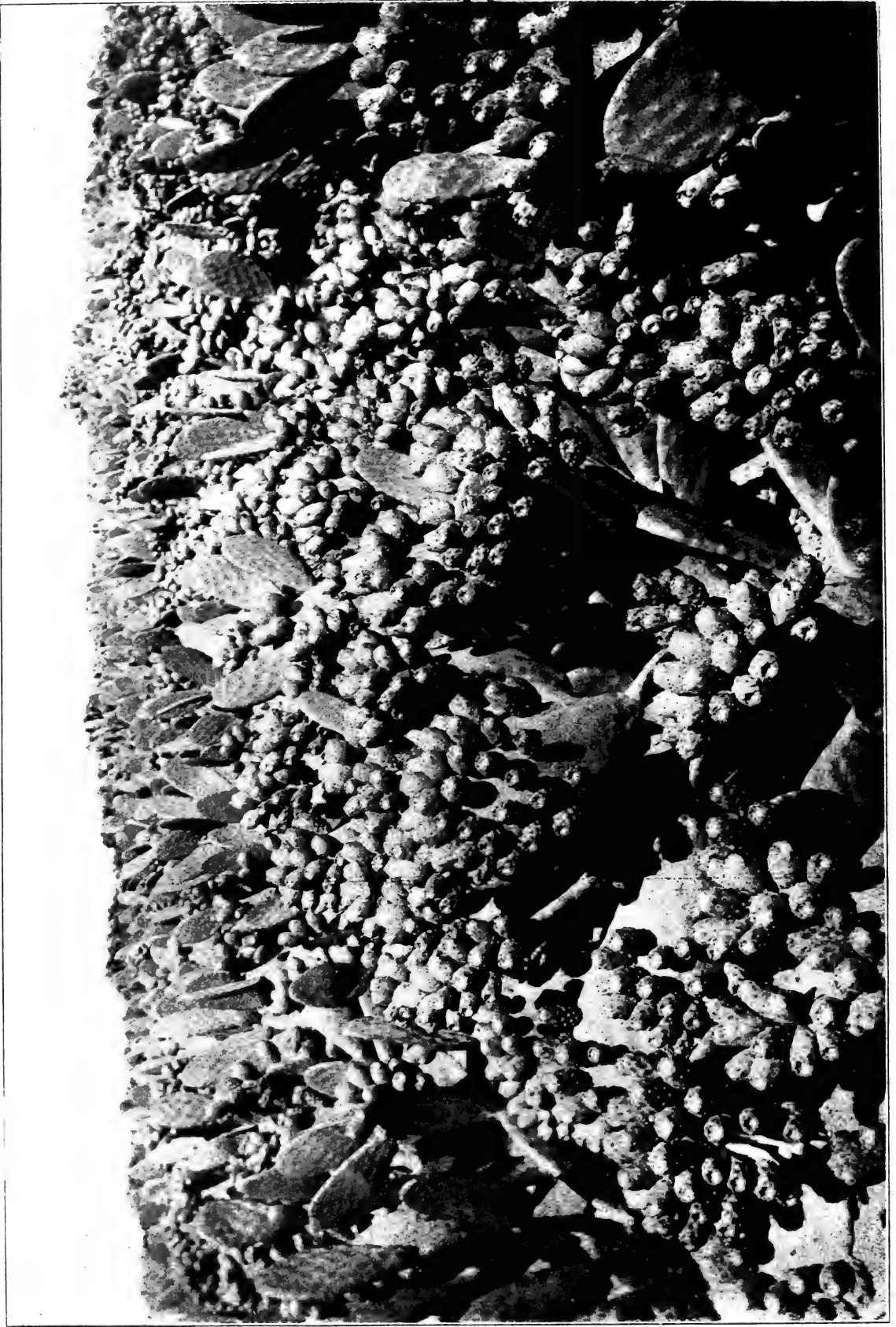
## ELEGANT

This variety bears the largest leaves and fruit. Elegant "forgets itself" sometimes and produces one or two long spines on about every four hundredth leaf; the other three hundred and ninety-nine are spineless.

## BIJOU

**Bijou**, smaller, otherwise the same, except in form and flavor of its fruit, which is fully as good as that of Elegant





PARTIAL VIEW OF THREE ACRES OF THE NEW BURBANK CACTUS WITH CROP OF NEARLY HALF GROWN FRUIT

# OTHER ODD AND CURIOUS FORMS TO BE GROWN FOR ORNAMENTAL FOLIAGE, FLOWERS OR FRUIT

## WOOLY

A curious *Opuntia* with wooly leaves, height about four feet, almost wholly spineless, probably not hardy except in mild climates

## OPUNTIA BASILARIS

Handsome deep crimson flowers, height twelve to fifteen inches

## "QUISCO" (*Echinocactus Chilensis*)

This is the native name of a South American corrugated, handsome, tall, barrel shaped cactus, something like "Visnaga" in appearance, having long handsome, but not vicious spines. Blossoms of various colors, said to bear good fruit.

## THE FAVORITE (*Echinopsis Mulleri*)

Large, beautiful, delicate, rose-pink flowers in profusion even on small plants. The last three easily grown cactus are as hardy as orange or fig trees

## CEREUS PITAJAYA

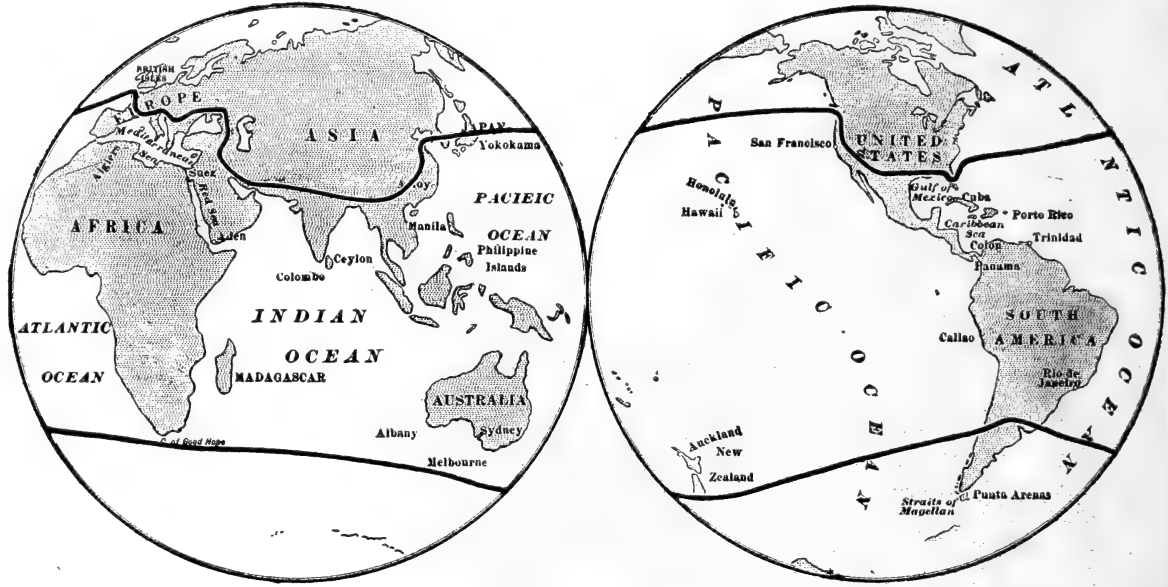
**Pitajaya**, (*Cereus variabilis*) or sometimes classified as *Cereus pernambucensis*. There are numerous forms of the Pitajaya cactus both in flower and fruit. The variety offered has white flowers nearly eight inches long and like the others blooms in the night; the plants are not quite hardy even in most parts of California. The variety here offered bears a most delicious fruit which is greatly prized by all who know it.

## COMPARATIVE VALUE OF CACTUS

The following table shows the comparative value of the average cacti, alfalfa hay and gamma, a typical range grass, according to analysis made by the University of Arizona, Agricultural Experiment Station.

Description	In water-free substance				Ether extract
	Ash	Protein	Fiber	Nitrogen free extract	
Cactus without fruit .....	19.91	6.48	10.22	61.48	1.83
Alfalfa hay .....	5.67	12.74	39.04	41.06	1.49
Gamma grass .....	15.11	6.99	30.31	45.63	1.96

# WHERE THE CACTUS CAN BE SUCCESSFULLY GROWN



Maps of the Globe with cross lines indicating the northern and southern limits for the successful cultivation of the new Giant Burbank Cactus plants for fruit and forage: it will be observed that the whole continents of Africa and Australia, most of South America and the southern part of North America, Southern Europe and Asia and most of the thousands of islands of the seas are included in the territory where they can be grown; even this great territory including more than three-fourths of the inhabitable land of the earth is being somewhat extended by the production of hardier varieties. This work is progressing slowly but very surely. Some slow growing but much hardier varieties are here offered which can be profitably grown for poultry feeding; these can be generally grown from two to five hundred miles farther north and south of the cross lines on the maps, no other Thornless Cactus of any name or kind can be until further very extensive experiments have been made. These new hardy thornless kinds also produce small brilliant scarlet fruits, of very good quality when well ripened, far superior to any of those before known, and in the greatest profusion.

# Samples from Sunny Lands Beyond the Seas

Professor J. P. Leotsakos says in regard to the Cactus:

"The old somewhat thorny fruiting cactus is in my native country one of the principal foods for both opulence and poverty during three months of the year when it is abundant. These pear fruits are delicious, exceedingly nutritious and healthful. I would rather by far have half a dozen of them for breakfast than the best beefsteak or any other food. The fruit of these perfected Cacti is the best fruit food for man or beast and Mr. Burbank is a great benefactor in perfecting the Cactus. If he lived in Greece a monument would be erected to him in every city. I have never seen in all the

world such an astounding crop of fruit as I saw on Burbank's new varieties of truly spineless cactus at Santa Rosa, California."

"Prof. J. P. Leotsakos is a graduate of the Royal Classical College at Athens and a teleiofoitos of the Law Department of the University of Athens, and belongs to one of the best known families of contemporary Greece. His father was the commander of the revolutionary army that brought about the deposition of King Otho in 1862, afterwards an aide-de-camp to the present King George, and finally Senator from Lakonia in the Greek Parliament at Athens."

—D. N. Botassi, Consul General of Greece.

## FROM INDIA

की खेती करके उसके पाकमे  
खांड बढाने की और पाकमेसे खांड बनाने की युक्तिको  
ज्ञाननेकी मुजे जिज्ञासा है इस लीये यही बातको  
विस्तारसे प्रतिपादन करके भाप मुजे ज्ञान (वाकेफ)  
करोगा ऐसा मुजे विश्वास है पत्र भेजने का ठिकाना नी  
चे लीखा हुआ है ली आपका भन्वहरका पत्र बनने  
की इच्छा वाले काननी मूलजी

Alexandria, Egypt, April 23rd, 1908.

"The Opuntias growing in this country bear very few large thorns but the small ones, embedded bundlewise in the flesh of the leaves are very numerous and cattle as well as camels are not allowed to feed on these plants. We want to have quite thornless plants as a food for cattle and bearing fruits with a large percentage of sugar.

Please be kind enough to send us offer for one or more varieties of plants and the amount of money we will have to send to you for posting a lot of leaves to Egypt.

His highness the Khedive is keenly interested in the question of your Opuntias and will be glad to see a success of our future experiments."

—Charles Chevalier de Blumeneron.

Yomiuri, Shimbun, Ginza, Kiobashiku, Tokio, Japan.

"Allow me to present you with the copies of 'Yomiuri Shimbun' published at our office, by the present mail. \* \* \*

I feel it a great honor and pleasure to inform you that your invaluable achievements in the discovery of the new process of agricultural science is highly appreciated by our people in Japan as being one of the most marvelous discoveries of the present century and conferring immense boon upon humanity for the augmentation of the food supply of the whole world."

—J. Motono, per Director of the Yomiuri Shimbun.

#### UNE PLANTE NUISIBLE DEVENUE BIENFAISANTE

"Tout le monde connait le cactus, aux fibres ligneuses, aux spicules aigus. A la surface du globe, des millions d'hectares de terres arides ne laissent pas croître autre chose que cette plante fatale aux animaux. Or, apres dix annees de recherches, Burbank a transforme le cactus si radicalement qu'il est presque impossible de le reconnaître.

D'abord le cactus de Burbank n'a plus d'épines; ensuite il peut vivre sous tous les climats et en toutes terres; enfin il est comestible. Cette plante paria, a lage de trois ans, peut fournir maintenant 600 livres d'une nourriture delicieuse et substantielle, alors qu'aparavant ses epines et ses fibres etaient une assurance de mort pour l'animal qui se risquait a la manger. On voit toutes les consequences que peut entrainer une parielle decouverte!

Et non seulement le fruit en est savoureux, d'un parfum nouveau et etrange qui rappelle en les combinant, ceux d'une demidouzaine de fruits connus, mais la tige elle-meme est bonne a manger. Le cactus meprisable est devenu tout entier un reservoir d'aliments. —"Lectures Pour Tous," Paris, France, April, 1909.

#### BURBANK'S THORNLESS CACTUS AT KIAMUKI

"Burbank's thornless cactus is now being cultivated at Kiamuki, and plants are being taken from there and sent to the other islands. This new form of cactus is growing well and there are hopes that it will grow rapidly on the other islands, especially in the cattle districts.

As a food product the cactus appeals to cattle as one of the most attractive foods found in the pasture lands. Even the thorny cactus is eaten by them."

—"Commercial Advertiser," Honolulu, T. H.

Dem Botaniker Burbank ist es gelungen, eine stachelfreie Cactusart zu ziehen. Damit were ein mittel gewonnen, die odensteppen des westens, die von irrigation nicht erreicht werden konnen, zu kultivieren. Fleisch und saft der pflanze werden von pferden, maueseln und rindvieh gern genossen, nur die spissigen stacheln hindern das. Wenn der in den wuesten einheimische Cactus durch die neue art verdrangt werden kann, wurde mansche strecke nach und nach unter cultur gebracht werden.

International Headquarters Salvation Army Service, London, E. C.

"I am so glad to know that you will so kindly supply us with your latest varieties of absolutely spineless cactus, as I am sure this will be most valuable to India. Next to human beings the cattle in India suffer terribly at the time of famine and scarcity; in fact, during two or three months every year they are reduced to the point of starvation during the extremely hot weather, wandering about in search of food. Hence I feel sure your cactus would be a great boon to them; for cactus, as you know, grows freely in all parts of India, only it is of the thorny kind.

Wishing you every success in your work believe me,

Yours very sincerely,

F. Booth Tucker."

Consulado General de Mexico,  
San Francisco, Cal.

Hon. Luther Burbank, Santa Rosa Cal.

Honored Sir: I beg to offer you my profound acknowledgements for your kindest authorization to have your announcement of the spineless cacti translated into Spanish by Professor Luis A. Beauregard, Director General of Public Instruction of Campeche, Mexico.

I have sent to the professor a textual copy of your honored letter.

I have sir the honor to be

Your most obedient servant,

P. Ornelas.

Imperial Russian Consulate,  
San Francisco, Cal.

Luther Burbank, Esq., Santa Rosa, Cal.

Dear Sir: It is generally known that scientific societies, both public and private, as well as the world at large, are greatly interested in your work of research. Lately the Imperial Russian Department of Agriculture has turned its attention to your cultivation of the Thornless Cactus.

I have the honor to be

Your truly,

K.

Haleakala Ranch,

Makawao, Maui, T. H., April 17, 1905  
Editor Butchers' and Stock Growers' Journal:

I read with much interest in your issue of the 30th ultimo the article on "Cactus Fed Beef."

On this ranch we have one paddock of twelve hundred acres, covered very thickly with cactus or prickly pear; there is also a slight growth of Bermuda grass growing. In this paddock are pastured all the year round, four hundred head of cattle and about seven hundred hogs. The cattle only get water when it rains, that is, during the months of December and January; the other ten months they subsist entirely and solely on the fruit and young leaves of the cactus which they help themselves to. It is a remarkable fact that during the dry months of the year, we get more fat cattle per cent from that paddock than from any of the others.

I consider cattle fed on cactus like these are, to have as fine flavored beef as any I have tasted in San Francisco or New Zealand.



### AN AUSTRALIAN VIEW

Feeding Sheep on Cactus Where Severe Droughts Have Caused the Death of Many Millions of Sheep and Other Stock



PARTIAL VIEW OF A BED OF YOUNG SEEDLING BURBANK OPUNTIAS  
More than One Million Plants Are Growing in the Seed Beds for Trial

Though the wild cactus is generally prepared for stock by singeing the thorns with fire, yet this never destroys the numerous bundles of innumerable needles imbedded in the leaves and cannot always remove all of the larger thorns even. Those who have fed the wild cactus extensively acknowledge that cattle are often seen with blood dripping from their mouths, and that their throats and tongues become at last inflamed, very painful and hard like a piece of sole leather. How would you enjoy being fed on needles, fish-hooks, toothpicks, barbed wire fence, nettles and chestnut burrs? The wild, thorny cactus is and always must be more or less of a pest. Millions of cattle, sheep, goats, hogs, ostriches and other animals have been destroyed by it. **The new thornless ones will withstand flood, drought, heat, wind and poor soil better than the wild ones and will produce one hundred tons of good food where the average wild ones will produce ten tons of pure food.**

## CLIMATIC CONDITIONS AND GEOGRAPHICAL DISTRIBUTION

These *Opuntias* differ astonishingly in hardiness. Some strains of the common prickly pear (*Opuntia vulgaris*) will grow readily in Alaska and several of the thorny species will endure forty degrees below zero without injury. The best agricultural and horticultural species and varieties are not quite as hardy as the fig, yet are more so than the orange, lemon, or lime. Old plants are very much hardier than the young, soft ones. The Tapuna strain seem to be almost as hardy as the fig and will withstand moisture better than most of the others.

## OF EASY CULTURE AND RAPID GROWTH ALWAYS GROWN FROM CUTTINGS, NEVER BY SEEDS

Everybody knows that Baldwin apples, Bartlett pears and our favorite peaches, plums and cherries cannot be raised from seeds; just the same laws hold true with the improved *Opuntias*, but fortunately they can be raised from cuttings in any quantity with the utmost ease—more truly they raise themselves, for when broken from the parent plant, the cuttings attend to rooting without further attention, whether planted right end up, bottom up, sideways or not at all. Best results are generally secured by planting the lower half of the cuttings below the surface of well prepared soil.

## WHERE TO PLANT

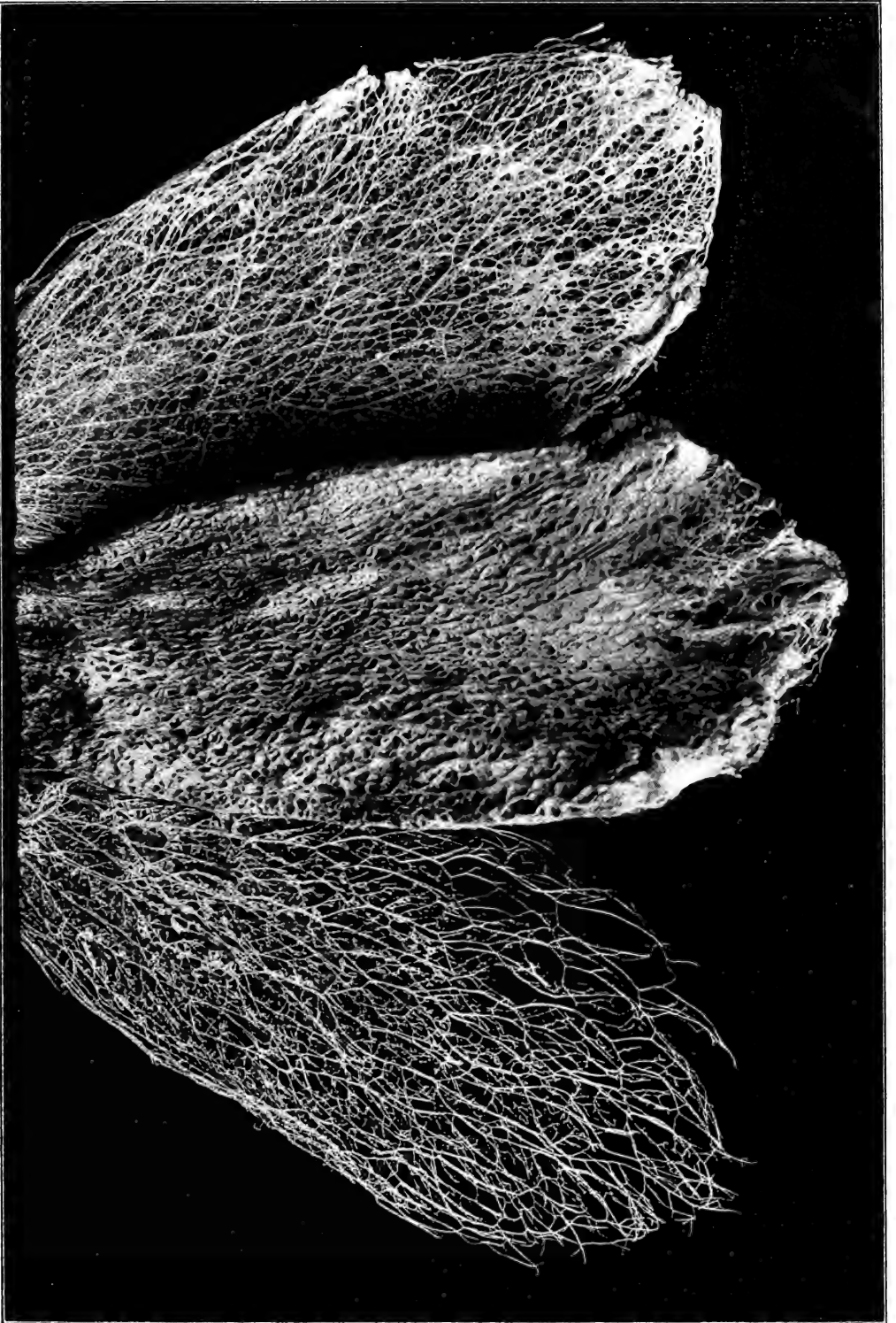
Plant wherever you wish to have them grow, on rich level land or the steepest poorest rocky hillsides, old river beds or rock piles, but their growth and succulence are greatly increased by good soil, some culture and in very dry soils by one or two light irrigations each summer. By such treatment the fruit is greatly increased in size and quality, and the slabs for feeding are doubled in weight and succulence. Nothing responds more promptly to fairly good treatment. They will flourish almost anywhere except where it is too wet for anything else to grow.

## WHEN TO PLANT

Unlike other plants *Opuntias* root best during the heat of summer, and this is the time also to transplant them. They should not be moved at other seasons. No one who is familiar with them would undertake to root or transplant them during cold damp weather such as would be best for other trees and plants. During May, June, July, August and September they will thrive under almost any treatment; the leaves, blossoms, buds, half-grown fruits or any part of the plant will make roots and grow, often even under the most trying circumstances.



CLEAN WHITE FIBRE FROM THE CACTUS LEAVES FOR CELLULOSE, PAPER, AND VARIOUS OTHER USES



# Significant Words, New Uses, Etc.

## THE GENTLE REMINDER BY THE ROADSIDE

No one could be more pleased to welcome the general public to my experiment grounds but over six thousand visitors were received during the year 1904. All the important experimental work was delayed beyond recall, grounds overrun with crowds from daylight to ten o'clock at night, no rest even on Sundays or holidays; business destroyed, rare plants died from want of care; attention constantly drawn from legitimate matters, letters neglected, telegrams delayed; meals taken standing, sleep disturbed, health at the point of destruction visitors calling at all hours without regard to my own convenience, each one being under the fixed and unalterable impression that he or she was the one particular one who should be admitted. It has been found to be necessary to place this notice at every gate:

### POSITIVELY NO VISITORS ALLOWED

The general public has no moral, legal or other right to invade my grounds, home, private office or laboratories.

"Luther Burbank is so interesting a subject to the general public that his personal friends have had to take active measures to save him from his admirers. Not only do people flood him with questions by mail, but a large proportion of the visitors to the Pacific Coast do not think their duty done

without stopping off at Santa Rosa to have a chat with the originator of the spineless cactus. As a result, Mr. Burbank is not 'at home' to the public, and his approaches are guarded rather more effectually, if anything, than those to the President of the United States."—"Washington (D.C.) Herald."

### NEW USES FOR CACTUS

"While a distinguished citizen of Santa Rosa has made over the cactus into a valuable edible plant, an Englishman in South Africa has found several new uses to which the old-fashioned cactus may be put without dehorning. This man is British Consul Garrels, who represents King Edward's government at Zanzibar in East Africa, which has as much cactus as the American desert. At his suggestion after his own experiments, paper manufacturers in Port Elizabeth have undertaken to turn the cactus fibre into paper, and their success is said to be unqualified. If this account is correct, there need be no more uneasiness about the world's paper supply; there is enough prickly pear and other cactus growing now to run all the newspapers in the world for several decades, and before the visible supply is exhausted many times that much more can be grown if it is needed.

"But Mr. Garrels goes even further than the paper mill when he takes his cactus to market. What the paper mill does not want he will put to other uses. He says the cactus is suitable for the production of soap, of alcohol, linoleum, sugar, unbreakable utensils such as baskets, pails, basins and the like, and last but not least important, for the making of a suitable substitute for leather, which is as good as the real leather.

"There appears to be no reason to disbelieve the Englishman's hopeful prophecies. And in this connection it may be remarked

that the present generation is using many things that our ancestors regarded as useless. Tomatoes were long believed to be poisonous. For several centuries, men handled oysters but could find no better use for them than to burn them for the sake of the lime in the shells. And going back a century or two, we learn that the first man who burned coal in England was laughed at and called a liar and a fool, when he told his neighbors he had found "black rocks that would burn."—"Press Democrat." Santa Rosa, Cal.

### NEW USE FOR SPINELESS CACTUS

"Paper of fine quality can be made from the fibre inside leaf of the Burbank Spineless Cactus. While little has been said about this fact, it has nevertheless received, and is receiving the attention of some of the large paper manufacturers of the country, a number of whom have been in communication with Mr. Burbank on the subject."—"Courier." Petaluma, Calif.

### EXTERMINATION OF MOSQUITOES BY CACTUS PASTE

"Consul William Henry Bishop of Palermo, Italy, transmits the following information relative to experiments made by the chief of the sanitary service at Gaboon, French Africa, with the cactus as a substitute for petroleum for the extermination of mosquitoes in warm climates.

"The thick pulpy leaves of the cactus, cut up in pieces, are thrown into water and macerated until a sticky paste is formed. This paste is spread upon the surface of stagnant water, and forms an isolating layer which prevents the larvae of the mosquitoes from coming to the top to breathe and destroys them through asphyxiation. It is true that petroleum can do the same service, but in warm climates petroleum evaporates too quickly and is thus of little avail. The mucilaginous cactus paste, on the contrary, can hold its place indefinitely, lasting weeks, months, or even an entire year; and the period of development of the larvae being but about a fortnight it has the most thorough effect."—"Scientific American."

#### CACTUS ALCOHOL

"It is not yet determined by experimenters if all the 10 per cent carbohydrates in cactus are available for making into alcohol, but it is ascertained that in the vicinity of San Antonio, Tex., cactus can be harvested every three years, giving about 73,000 pounds per acre—and California can do quite as well—and if all of the carbohydrates in this amount were fermentable, it would give 360 pounds or about 521 gallons of alcohol, which at 40 cents a gallon would be worth \$238.40 as against \$32.25 the sum that can be obtained from corn. Cut this in one half and it would be a marked advance over the production of corn. Then if the spineless cactus were used the handling would be so much more agreeable and the yield under cultivation much in excess of the wild as given in the figures above as computed by R. E. Hare of the Mexican Experimental Station."

"According to official analysis," said Dr. Houghton yesterday, speaking of the commercial possibilities of the cacti, "the spineless varieties show a percentage of nutriment next to alfalfa. You will be surprised to learn this fact, as were also the officials of the railroad. If the millions of acres of desert in the Southwest, now considered as so much waste for want of water could be made to raise alfalfa, of course nobody would hesitate a moment about getting busy in that direction, for it would mean millions of dollars to the railroads of this part of America and millions of dollars to the producers."—Riverside (Cal.) Press.

"That the Chamber of Commerce of the City of San Diego does most heartily endorse the efforts to spread the new Burbank fodder, thornless Cactus, throughout the Southwest, thereby rendering highly productive vast areas of arid and semi-arid lands, and thus still further demonstrating the agricultural importance of this section of the country."—Resolution adopted by San Diego Chamber of Commerce.

#### CACTUS FIBER FOR BRAKE LINING TESTED

"During the past year J. D. Maxwell has tested various brake-lining materials and he now states that cactus fiber is not only the equal of asbestos but possesses a num-

ber of qualities which makes it highly desirable for the new purpose."—"Chicago Motor Age."

#### BURBANK CACTUS IS A GOOD FODDER:

"Berkeley, Feb. 8.—Experiments just completed by M. E. Jaffa, head of the department of nutrition and foods at the University show that the new species of thornless cactus has properties as fodder for cattle which will equal many of the desert grasses. The tests were made at the request of Luther Burbank, the originator of the new species of plant, and have proved to the full the great importance of the new plant as a fodder for cattle in the waste lands. Professor Jaffa's report on the experiment has just been completed and will be forwarded to Burbank in a few days.

"A short time ago five species of the plant were sent to the agricultural station here to determine the food value. The series of experiments carried on by Prof. Jaffa show that the new plant carries nutritive powers which equal three-quarters of that of alfalfa."—"The Berkeley (Cal.) Independent."

"The demand for Ethyl alcohol for industrial uses is expected to be very large, now that the heavy internal revenue tax has been removed on that product when made unfit for drinking purposes by the addition of a little methyl or wood alcohol and benzine. This denatured alcohol, as it is termed, may be used for fuel purposes and for lighting, as in Europe. It serves to run automobiles and engines of all kinds, and in the manufactures has a hundred uses. The extent to which it may be employed in this country will depend largely on the cost of making it as compared with gasoline, and estimates are current that under the requirements imposed by Congress it can scarcely be retailed at less than 40 cents a gallon.

Ethyl alcohol may be made from many substances, and one of them is the common cactus of the deserts. A bulletin issued by the New Mexico Agricultural Experiment Station gives some interesting particulars in this regard. It relates the experience of a man in New Mexico who cultivated cactus for a number of years, to see what results could be had. He estimated that if the plant were cultivated on 1000 acres without harvesting for three years, 100 tons could be obtained indefinitely from that area every day in the year, making 73,000 pounds per acre annually.

"That the millions of acres of desert land overgrown with cactus may be made a source of large revenue seems almost incredible, but stranger things have happened. Unless Burbank be badly mistaken the spineless cactus is destined to become one of the most useful of plants, furnishing abundance of food for man and beast in regions which have been regarded as too sterile and desolate for any form of stock-raising or farming. And the profitable conversion of the common form of the plant into alcohol seems even better assured."—"The Sacramento (Cal.) Bee."

## SUGAR FROM PRICKLY PEAR

At the instance of the Queensland Government experiments have been made with prickly pear for the extraction of sugar, and it is claimed that two tons of prickly pear yield as much sugar as three tons of sugar cane and of an equally good quality.—American Review of Tropical Agriculture, Mexico City, Mexico.

We believe that Americans will acquire a liking for this fruit more readily than they do for tropical and sub-tropical fruits in general.—From Bulletin Agricultural Experiment Station, New Mexico.

"An effort was made, however, to give the cattle all the pear they would eat. As nearly as can be estimated, therefore, 80 acres of excellent pear furnished a full ration for an average of 800 head of cattle for a period of six months."

## NEW PLANT FOR FORAGE

**That Spineless Cactus is a Success Has  
Been Proven at Yuma**

The growing of Spineless Cactus is no longer a desert dream, or the figment of the imagination. This desert wonder is being grown in the desert lands adjacent to Yuma

and some surprisingly good results are being obtained.—"Times," Bouse, Arizona.

Is man also to redeem the desert for civilization? The French will test Burbanks' spineless cactus on Sahara and the desert island of Mayotte, off Madagascar, and the English and Germans will try its virtues in their South African possessions. Burbank's creation is declared to be palatable not only to cattle, but to man, and it thrives on areas that are hopelessly arid, provided there be plenty of heat and light. It would be an almost crowning achievement if, by his genius, man, after these thousands of years were able to announce the doom of the desert.—"Journal," Portland, Ore.

## RESTORING THE LAND

There is every prospect that before the life's work of Luther Burbank has ended he will have seen thousands of square miles of desert lands of the world trained to a profitable condition of fertility through the medium of his spineless cactus. The British government is considering the feasibility of introducing Mr. Burbank's hybrid plant in the Sahara desert, with a view of eventually forcing the most unprolific district in the world to support life.—"Register-Leader," Des Moines, Iowa.



## STILL ON DECK

**This Is Only the First Chapter in the History of the Spineless Cactus**



...of these new magical fruiting cactus is as important to the world as the discovery of penicillin. — *Orange Star, Los Angeles, Cal.*

...of these new magical fruiting cactus.

...and without fear of contradiction that the prophecies of Luther Burbank ... is now being fully realized—and that it is now taking its place at the ... as a stock and dairy feed in our Western arid and semi-arid States, as well ... a delicious fruit for our tables second to none."

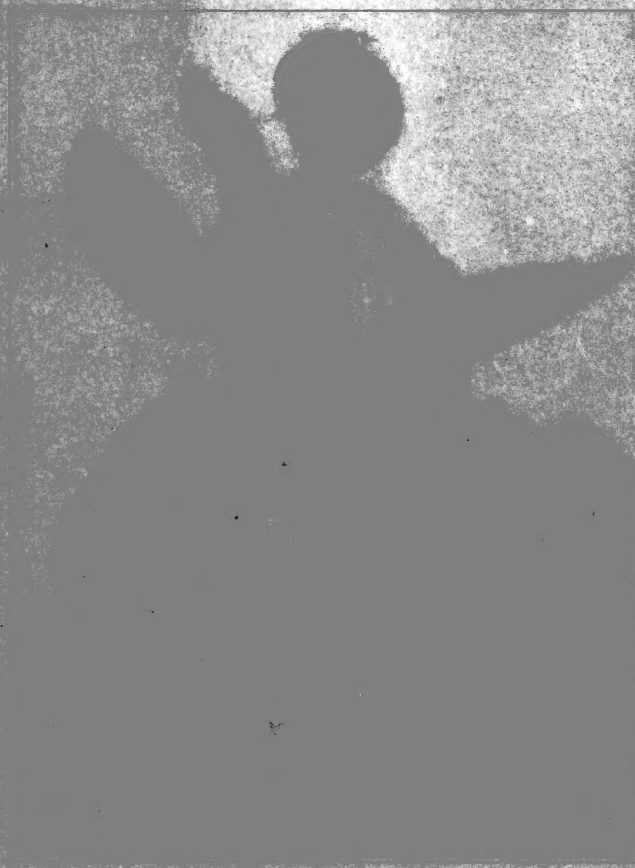
...grown in quite large plantings now—one near San Francisco, that is claimed to pay ... for the fruit alone. The fruit commands 10c per lb. wholesale, and produces more ... than any apple or peach orchard ever will."

... food is unsurpassed. Poultry will leave alfalfa, lettuce and other green food ...

... and lovers of fruit are missing a golden opportunity if you do not ... of these

... Burbank's discovery indicates the last act in the drama which is to entirely transform ... as a source of clean energy." — *"Star," Pasadena, Cal.*

... Burbank has done the higher work in the cause of humanity than his experiments with ... and a great world rests on those who would take up the propagation, with the hope ... as hard as finding the task as the silent wizard was in performing the heaviest duty. — *"Portland Oregonian."*



... OF LUTHER BURBANK IN THE LEGS IN FLORIDA  
... of Agricultural ... Will Grow  
... in Best Tropical Climates

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