

THE WORK OF LUTHER BURBANK.

BY CHARLES J. WOODBURY.

I KNOW nothing in nature more depressing than a Sequoia grove. The absence of water causes an undisturbed lifelessness. No living thing is perceptible. Not even an insect's hum can be heard; the earth is covered with a pale vegetation which the sun never finds; the sky is unseen; the silence oppresses; and the immense unnatural trees here and there open their huge, diseased interiors and breathe out their decaying breath.

It was from these monuments of a dead and historic past that I first saw Luther Burbank's home, and the very approach to it was like a resurrection from a tomb. The avenue is lined with a magnificent row of strange majestic trees, probably the greatest achievement in silviculture known. They are Mr. Burbank's hybrid of the California walnut (*Julsans Californica*) with the black walnut (*J. nigra*). A survival of the latter parent is seen across the highway, a diminutive shrub-like tree; but old when these were planted sixteen years ago. One will rarely see shade trees that will compare with them; trunk over 3 feet through, height 75 feet, limb-spread 80 feet. The bark is smooth, grayish with white marblings not unlike the eastern sugar-maple, the foliage is luxuriant. A faint odor exhales from the leaves resembling that of June apples. It is rude to speak of commercial value in the presence of such things of beauty, but the wood has all the valuable qualities of the eastern walnut so rapidly disappearing—compact, hard, with a lustrous, satiny grain, easy of polish. The trees are children yet. They are increasing $1\frac{1}{2}$ inches in diameter and from 3 to 8 feet in height every year. What will be their size and timber-value when they have attained their growth? Like all of Mr. Burbank's products, they are not provincial. They are growing well over the Pacific coast states and territories, and throughout the Southwest. The Gulf and Southern Atlantic states know them; and only the



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former habitat of the black walnut determines their geographical limit on the north. Altogether, they present an inviting greeting to the visitor, intimating the other things that count behind the gate.

The home grounds at Santa Rosa are limited—only about nine acres—the main experimental farms are at Sebastopol, eight miles distant on one of the old channels of Russian River. All of these have been called “wonder gardens”. But they are not homes of beauty; they are rather places where beautiful things are *made*. They are scenes of activity; on an average, 26 laborers are constantly at work among long rows of fruit trees and strange flaring blooms from Japan, South Africa, New Zealand, Australia, Europe and our own land and their unrecognizable cross-bred progenies. Tons of hybrid plants, some of them ideals for ordinary nurserymen, are heaped one side to be burned. Here and there are reserves bearing the little white-rag streamers of approval. The scentless snow of the great daisies meets the dark green masses of forage-plants; and, scattered about with no eye to conventional arrangement, are fields of flowers, an indeterminate profusion; every combination of hues, every color revealed by the spectroscope, hardly two without distinctive promise of difference.

These several rooms of his labor represent the results of 36 years. Mr. Burbank is now 61 years old (born March 7, 1849). When 25, he completed his habit of taking the premiums at the county fairs held in the vicinity of Lunenburg (Mass.), where he was born, by answering the demand for a good potato which would yield 200 bushels to the acre with his famous seedling from the “Early Rose”, which at once gave a yield of 435 bushels and has since attained a yield of 525 bushels. It is now known all over the agricultural world; one of the few potatoes that have successfully resisted the blight in Ireland. As the “Salinas Burbank” it to-day commands the highest price in the western market, and an approximate estimate of its value to the commonwealth made by high authority is \$20,000,000. This was the beginning of his career, but its conception was long before. Even as a babe, his aged mother has told me his cries could at anytime be stilled with a flower. He would rearrange the flower-pots in the window before he could hardly reach them. His first pet (like his last success) was a cactus. He sold his potato for eastern introduction to Mr. J. H. Gregory of Marblehead for \$150, and October 1, 1875, he arrived in Santa Rosa, California, with \$125 and ten visiting cards (his precious potatoes) in his satchel. They were not received. No one would believe in him. His resources gradually were ex-

hausted. For three years he suffered poverty's shame and, in his exposures, cutting shingles, trimming hedges, sleeping in chicken-coops, he contracted disease which well-nigh proved fatal. But the story of those years need not be told, nor of his success; his establishment of the best nursery west of the Mississippi, his dis-



NEW SILENUS BURBANKS.

posing of it (in 1889) when it was yielding a profit of \$10,000 per annum, to address himself to the one thing on which he had all along been focused, plant-amelioration.

In June, 1893, appeared, not for public distribution, a remarkable pamphlet of some 50 pages, "New Creations in Fruits and Flowers." The epithet was criticised. It is justified in Professor Bailey's noble sentence: "Intelligent selection having in mind ideal form is man's nearest approach to the Creator in his dealings with the organic world." Combination should have been conjoined with selection; for, in practical field-work, it is necessary to combine before selections can be of any value. The catalogue and its after-issued supplements (1901 and 1903) have long been out of print. Like the strange, new fruits and flowers they describe, they are themselves a hybrid of history and sales catalogue; and, in their

way, classics. They were appreciated by the husbandmen throughout the country, sought for as text-books by Cornell University and half a dozen agricultural colleges. Prince Anatole Gagazine, of the Russian Imperial Pomological Society, sent a request for 20 of them to be used in the Siberian College of Agriculture at St. Petersburg. In 1902, the plants they described and named had more than justified the claim of the producer that they would become "standards of excellence"; for they were household words. Turning the pages today, one seems yet Orientalized with the pictures and descriptions. But how familiar have they become with the later horticultural triumphs! The evolution of the plum and prune; various forms and fruits, one for one variety and utility, one with contrasting qualities for another; the plum-apricot or plumcot (as it has come to be called); the plum-cherry; the peach; other deciduous fruits such as the persimmon, medlar, pomegranate, etc.; apples, quinces, pears and similar orchard and garden fruits; nuts, the "Paradox" and "Royal" for shade and nuts, timber and forestry, the early-bearing chestnut, etc.; berries; the civilizing of the cactus; and grasses; fodder plants; grains; clovers; the garden vegetable evolutions; the flowers, the bulbous and tuberous plants brought to perfection; roses and allied plants; the poppy family; miscellaneous productions; ornamental trees and plants; the kindergarten of wild flowers and weeds made beautiful; climbing vines; the Shasta Daisy with its congeners, the "Alaska", "California", "Westralia" and other *Chrysanthemum* Daisies, etc., etc.;—and, among them all, no oddities that are not utilities; no achievements that cannot be reproduced in all zones clement to vegetable life. Enumeration is not possible here. Their evolution is notable. These distinct new races have come, many of them, from such sources as the little, hard, acid, indigestible coast-plum; the diminutive and noxious wild peach; and worthless, tasteless dingy yellow berries from Japan. Here are lily-fields, masses of scarlet and gold from native plants hidden in the ravines and foot-hills of our coast land from British America to Southern California.

Indeed, like the taming of the cactus, much of Mr. Burbank's work has been among the wild things, the vagrants and vagabonds. "They are weeds," he says, "only because of struggle." He frees them from the limitations of their environment. He gives one species the advantage of another from which it is geographically too far separated to benefit without human help. And so his collectors from all over the world are instructed to send in not garden plants but wild ones. And these shy plants are exposed to new and

friendly latitudes. They come in, obscure bulbs, the Wake Robin, Lady-Slippers, Trythenus from the swamps; and lower forms, the Stickle-Pod and Rag-Weed, Dog-Fennel and thistles and Devil's Claws; and he unites and crosses them; frees them from offensive odors; joins the hardiness of one to the brilliance of another; with cultivation and selection gives them strength so they will not wilt; and refined perfume. So these large, coarse, rank-smelling, sometimes poisonous plants, are redeemed. One of these prostrate weeds was a progenitor of the great Shasta Daisy. Ten years ago when it first appeared in the window of a San Francisco florist, it was stared at by crowds as a floral mystery. Since then it has become



FRUIT OF THE SPINELESS CACTUS—BURBANK.

famous wherever flowers are scientifically recognized. Of its great white and gold blooms one British collector writes: "It has four times as much blossom as any other variety"; and another says: "It takes the Premier honors." Think of this immense chrysanthemum, more than a foot in circumference, fluted, frilled, crested, lanced and with varying tints of color, grown in Cape Town and Sydney, in the United States and Canada, wherever an oak tree will grow, alike in the tropical South and where the snows of heaven mingle with its own, having for one of its parents the rowdy, way-side weeds, with their big yellow centers and inch of petal with

which as boys we weighted the tails of our kites! The wonder-garden burns with color; hyacinths, dahlias, carnations, gladioli, and dozens of others double and treble the ordinary size. The lily-field is lustrous with its new types of Amaryllis, among them the Jacobean Martinique; and hundreds of callas, "Giant," "Fragrance," "Lemon". It is impossible to suggest the commingled bloods. The town of Santa Rosa itself is full and fragrant of the new rose with the bloods of the Hermosa and the Bon Silene in its veins. But these are patrician. More characteristic of the master are the marshalled rows of honest little poppies in the rear grounds, carrying the new and unusual shades of color he has given them. In the same manner of work is his ennobling of the beach plum. All along the bleak coast-lands from South Carolina to Maine are scattered dwarf, scrubby, bush-like trees that produce stems of a small, dull-colored, bitter berry-like fruit, named the beach plum (*Prunus maritima*). Using this savage but hardy pioneer for a base, he has produced a fruit eighty times the size of the *maritima* with delicious flesh. One likes these calls from the wild. So he takes a tree, impoverished on account of a defective and inadequate root system, or with foliage so scanty that the sun blackens its blooms the day they ripen; or, again, sensitive to blight and drought, and, rescuing it from these infirmities, giving it the advantages of agencies it has long asked for in vain, makes it valuable. All his vacations are little excursions among the ravines and chaparral of our low mountain sides, whence he returns home loaded with wild seeds and material. From their native fields, ravaged by wind and storm and preyed upon by insect life, the plants go to the Burbank college for a liberal education. He makes fruit trees hardier and more prolific with better fruit. He has prolonged the California fruit season a month or more by producing early and late-bearing varieties. His achievements with such refractory problems as the rhubarbs, the grasses and the prunes are stories by themselves, but of his specific productions and creations volumes could be written. He has placed California foremost of any state horticulturally; transforming arid districts; making half-barren lands more valuable. The extent of his work has not been understood. *He has pioneered horticulture into the dignity of a science.* He has destroyed the frontiers of species, creating by hand species apparently as fixed as those which date back to the beginnings of vegetable life. He has broken down the arbitrary definitions of genera and species. His discoveries have been adopted as the laws of new botanies. This change of view is amusing. Before him the botanists believed and taught in

their text-books that species were complete and absolute. Then they lapsed into considering species as merely convenient classifications for differentiated types. Now they are taught as interchangeable, even as non-existent. It is not a revolution perhaps; but, cer-

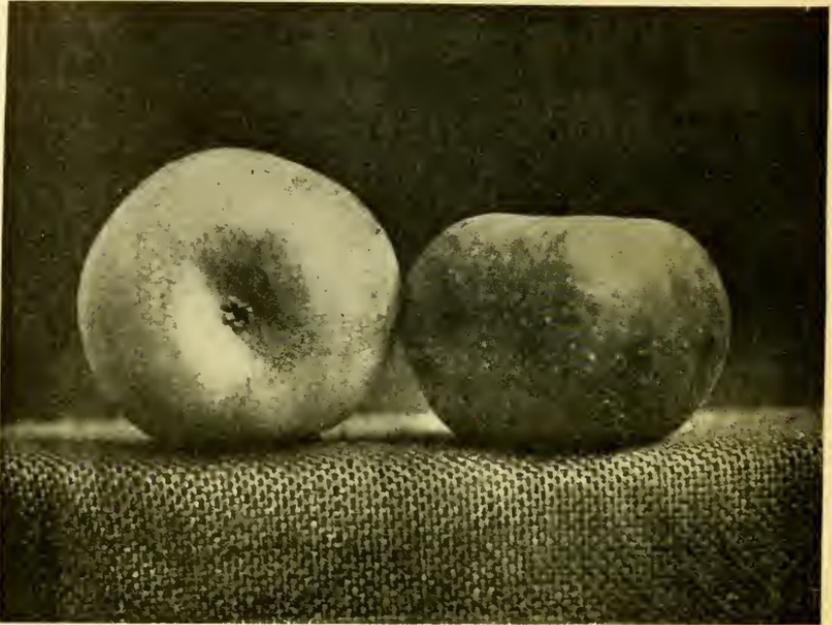


THE WONDER BERRY—BURBANK.

tainly, a revelation. We now know that the characters of plants must be distinguished in a different way. By his exposure of intermediate links, he has demonstrated a wider interval between varieties than was heretofore taught to exist between species. The *muraille* between varieties and species had to be abandoned; also the theory of a special creative act for different species. He is the original entryman of a new class-book. Observing the canon that varieties are the production of law, never of chance, his endeavor has been to search out the laws and employ the forces which create *increments of change* that create and transmit variations.. In their natural habitat, the energy of plants is expended merely to live as they are. New species are only produced when variations have been forced under pressure of contiguous dangerous competition, causing natural crosses and hybrids. When the same plants are domesticated and cultivated, the struggle for life is removed, and unforeseen variations become immediately possible. Thus the external resemblances and the declared tendencies which had been taken to

determine the classifications into species instead of being permanent, he has shown to be fragile.

As to the processes, the methods of combination, crossing and selection which Mr. Burbank employs, but little has been given to the world; this not from any intention of concealment on his part, but simply because he is a doer rather than sayer or writer. He has published few papers, given few addresses. His lecture before



THE NEWTON PIPPIN—BURBANK.

the American Pomological Society, some years ago, was instructive. His most valuable published work (if it may be so termed) is his "Fundamental Principles of Plant Breeding," now out of print. He is a thorough disciple of Darwin, substituting in his method for Darwin's natural selection his own theory of special selection. By modifying the inner nutritive and evolutive mediums, his practice is to change the organic expression. To use his own words, "There is no barrier to obtaining fruits of any size, form or flavor desired, and none to producing plants and flowers of any form, color or fragrance: all that is needed is a knowledge to guide our efforts in the right direction, undeviating patience and cultivated eyes to detect variations of value."

Practically, however, artificial plant evolution is a long ordeal.

The experimenter is continually escorted by difficulties, uncertainties, even tragedies, from the first ingathering of material and pollenizing to the last seed-selection. There is a constant confronting of ancestral dynamics in the bringing of other forces to bear against the enormous force that has caused the present form;—to disturb its cohesion and unite foreign matter. The inspection of the multitude sent in from remote explorations for the few growths that offer promise; the delicate pollenizing; the constant watchfulness to detect the controlling force in the confusion and collision of influences; the arousal of divergent impulses in the plant; the recognition of any proneness to new forms and guiding from wayward or outlaw tendencies; persuading into the right direction; removing obstacles, thwarting or encouraging congenialities, freeing from the tyrannies of habit induced by old competition; often, the opening out of the plant into disappointing avenues—these experiences are taxing. Then, when once the persistent type is ruptured, unforeseen latent tendencies are liberated; reverberating echoes of varieties long since passed away, the blood of atavism still in the plant. These echoes or revivals, "sports" as they are technically termed, may be themselves sources of combinations offering unexpected values or disappointments. Of the mass which give no definite or hopeful perturbations, there is a massacre. Perhaps half a score are chosen for farther attention. The field is cleared of all the rest, and, at seed time, pollenizing again; and the seeds are culled until the result sought for is obtained. All this goes on and on through generations of plant life. As for the results? There is no adequate law protecting the producer. For instance, the Shasta Daisy cost 8 years of cultivation on a large scale, \$200 spent for advertising. The entire amount realized did not pay for publication and postage. And now in England the new flower is sent out as if organized and owned there! One of the great plums that have revolutionized home and foreign markets cost in cash without reckoning time \$4,500. The receipts were \$5,000. The nurseryman should be relied on for propagation and distribution; the savants, to study these fruits and flowers, some of which will be historic, as an entity, determine their relation to others, their characteristics, and scientific position; and their author left to continue to secure as he has secured in the past for himself, maintenance of way. "All I have, all I am," he said to me once after refusing another of the many public financial endowments offered him, "I will give and give freely, but can receive nothing that will impair my power to give." He instinctively avoids what he calls "the incubus of institutional-

ism." He declined the Carnegie fund five years ago, and, finally, after being relieved of some of the conditions with which the grant was accompanied, he accepted it with misgivings. Now the connection is dissolved. The Carnegie Foundation retires in the possession of a great store of valuable facts, well tabulated, constituting a systematizing in exact record of data that have been heretofore indi-



THE AUSTRALIAN STAR FLOWER—BURBANK.

vidual and incommunicable. The ventilation of these should be more beneficial to the public than the ulcerated reports of traveling correspondents. But sometime a nature-book will be printed, presenting all the creations and introductions with pictures in color, the author telling the story in his own way. It will be interesting to learn from his own speech how this solitary genius in a new land contrasts the achievements of all the horticulturists in the older, highly-specialized civilizations.

For this is what he is, a genius of horticulture. I hesitate to use the word because it has been conferred so indiscriminately. So many wear its favor who never received the accolade. It has to do with the way of working, rather than with results. Audacity, adventure, a new trail blazed, abandonment of landmarks, short cuts, the diameter across the circle—these are some of its characteristics. Add to them an extraordinary impulsion, an obsession which compels, from the first, movement in only one way; initiative, the power to reach results by unprecedented paths; emancipation from dogma and tradition—these are among the singularities that individualize the great Californian. His life is a series of renunciations, of fortunes attained and dissipated in the furtherance of a self-chosen mission, to which wife, home, friends, everything is subordinate or subsidiary. For it, the making of money, even the getting of a

living, have been repeatedly sacrificed without hesitation. His career illustrates all the traits of genius except its vices. And then there has always been something bewildering about his exploits, which have often been written about as if there were sorcery in the gardens. As one beholder said to me: "There is something uncanny here. The flowers are unreal, ethereal." And for how many years has he been called "wizard," "mystic," "necromancer"; and the mystery of his work been compared to that of the genii in Oriental tales! But his only resemblance to the slave of the lamp is his reserve and his work without respite.

In his basic distinctions between Religion and Science, the editor of *The Open Court* says (Feb., 1910): "Evolution not long ago was considered an impious heresy, and is now becoming an integral part of our world-conception." The sentence recalls the earlier days in the wisteria-hidden cottage at Santa Rosa. Darwin had exhibited creation by evolution, natural selections. The religious organizations found the formula hard to accept. They yielded reluctantly. Then here came one who dared to interfere in processes peculiar provinces of the Creator; to override the barriers created by the Almighty, and who even called his irreverent works "new creations." It was the unpardonable sin. Outraged religion assailed the audacious Californian in its periodicals. Letters by the hundred and even visitors sometimes voiced their disapproval. Who now does not love fruit and flower better because of the new wealth he has given them?