THE DISCOVERIES OF 1861.

[Further Extracts from Wells's Annual of Scientific Discoveries.]

ORIGIN OF THE WESTERN PRAIRIES.

M. Leo Lesquereux, the well-known geologist, who has carefully studied the prairies of the Mississippi valley, ascribes their general formation to the agency of water. He says :

All the prairies still in a state of formation along the great lakes of the north are nothing else but marshes slowly passing to dry land by slow recession of water. When land is continually covered by low stagnant water, its only vegetation is that of the rushes and of the sedges. When the same land is alternately subjected to long inundations and then to dryness, during some months of the year, the same plants continue to cover it. By their decomposition these marshy plants produce a peculiar ground, either black, light, permeable when it is mixed with sand, as it is near the borders of the lakes, or hard, cold, impermeable when it is mixed with clay or muddy alluvium, as in some marshes underlaid by clay or shales, or along the banks of some rivers. Land continually covered with stagnant water cannot produce any trees, because the trees require for their growth, like most of the terrestrial plants, the introduction of atmospheric air to their roots. Neither do trees germinate and grow on a ground alternately covered with stagnant water and exposed to dryness for some months of the year. From these considerations, the law of the general formation of the prairies can be deduced : While a land or a part of a country is slowly passing from the state of swamp or marsh to the state of dry land, the annual alternation of stagnant water and dryness causes the vegetation of peculiar plants, which, by their decomposition, form a peculiar soil unfavorable to the growth of the trees. From this general rule of formation, which regards only the prairies of the Mississippi valley, all the different phenomena or peculiar appearances of the prairies can be easily explained.

TO CHECK THE WARPING OF PLANKS.

The face of the planks should be cut in the direction which lay from east to west as the tree stood. If this be done the planks will warp much less than in the opposite direction. The strongest side of a piece of timber is that which in its natural position faced the north.—*Dingler's Polytech. Journal.*

SKELETON LEAVES.

Mr. Edward Parish, of Philadelphia, the well-known pharmaceutist, publishes the following account of the process of producing the permanent and beautifully white preparations of the frame-work or skeleton of different vegetable structures, known as "skeletonizing." It consists in promoting the decomposition of the cellular structure of leaves, and other parts of plants, without breaking or injuring their woody fiber, and is accomplished very easily and cheaply by macerating them in water. For convenience of illustration, let us select the seed-vessels or burs of stramonium or Jamestown weed, which are in the right condition when partially open, but not at all, or very slightly, when dried or faded in color. Place these in a basin or bucket, and pour on them sufficient hot water to cover them completely, and set them aside. (Cold water will answer the purpose, but not so quickly.) After about three weeks, during which time a little fresh water may be occasionally added, these will be softened, and ready for the removal of the cellular portions. This is so accomplished by scrubbing with an old tooth-brush or shaving brush, allowing a stream of water to run over them during the process : the seeds are to be taken out, and the water allowed to run through the bur, but without removing the internal structure in which the seeds are deposited. In this way a perfect skeleton may be produced, showing all the woody portions, including the external prickles, and when bleached having the appearance of delicately carved ivory.

A variety of seed-vessels may be prepared in this way, of which the dried poppy-head is one of the prettiest. The internal membraneous portion containing the seeds requires to be removed, after the requisite maceration in water, by a small opening in the side. An offensive odor, arising from the decomposition of the cellular structure and its contents, is one of the discomforts of this process, but it is amply repaid by the beautiful resulting skeletons. In English "bouquets" of these preparations, there are some seed-vessels not often met with in this country, of which the henbane (hyosciamus) is beautiful.

The preparation of leaves affords a greater variety of forms than of any other portion of the plant.—Only the leaves of trees and shrubs, as far as I know, will furnish a skeleton ; those of annual and herbaceous plants seem to lose their structure entirely by maceration. Some of the more transparent and delicate leaves and ferns may be bleached by being put into the bleaching solution without previous maceration, but must always be previously faded. Among the best leaves for skeletonizing are those of the ivy, the linden, the elm, the poplar, the holly, the pear tree, the chestnut, the sassafras, the magnolia, the althea, and no doubt hundreds that have never been tried ; the oak would furnish a beautiful skeleton, but requires from eight to twelve months' maceration, while most of the others named are sufficiently decayed in from one to three months. The leaves should be free from insect bites or other imperfections ; in cleaning them, it is best to lay them upon a smooth board, turning them over, from time to time, and very carefully removing the decayed parts with a soft brush. It has been observed that ivy leaves are best prepared, after maceration, by tearing off the two outer layers of skin, leaving little else but the skeleton, which is then easily cleaned by careful handling under water. After obtaining the skeletons, the next step is to bleach them ; this is done by placing them, for a term varying from an hour to a whole day, in a solution of chloride of lime, made by dissolving about two ounces in a pint of water.—Poppy-heads or Jamestown burs will bear double that strength ; some delicate leaves, hydrangea flowers, &c., will bleach advantageously with a still weaker solution. The preparation is to be removed from the bleaching liquid as soon as it is thoroughly and satisfactorily bleached ; it is then to be washed, dried, and put away in a box, excluded from the light, till the collection is ready for mounting. This operation requires much skill and taste ; a common way is to make a kind of pincushion into which the bleached stems or petioles, or covered wires glued to the base of the leaves and seed-vessels, are to be stuck ; the whole may then be covered by a glass shade, which protects "the bouquet" from the dust, and renders it an exceedingly attractive household ornament.

PHYSIOLOGY OF WIDOWHOOD.

A correspondent of the London *Medical Times and Gazette* thus writes in relation to the above subject :—

For some time past my attention has been attracted to a very curious form of hereditary transmission of physical peculiarities, which I think worth while to lay before the profession, that more extensive and more accurate investigation than I can accord it may, if not exactly, at least proximately, determine its value, as an influence in the production of disease.

Lord Morton bred a hybrid from a chestnut mare and male quagga—the hybrid was quagga-like, and even the foals subsequently produced from the mare by a black Arabian sire were "much more plain barred across the legs than is even the pure quagga." Now, here is an instance of the positive transmission by the female of one species of the physical peculiarities of the male of another species, with whom she had bred, to her offspring by a subsequent union with a pure male of her own species. This in itself is not a little remarkable, and worthy of investigation, by those who have opportunity, amongst mule-breeders and others ; but, further, I have made many inquiries amongst those interested in the pure breeds of all kinds of cattle, sheep, dogs, poultry, pigeons, &c., and they universally declare that if a high-bred female once breeds with an inferior male, even of her own race, she will never produce pure offspring, though she always, subsequently, breed with males of the highest caste. Thus, if a thorough-bred mare have a colt whose sire is a half bred horse, though she subsequently breed with only thorough-bred horses, her foals will never prove thorough-bred. An instance was lately mentioned to me much in point, where a very pure-bred setter bitch produced her first litter after a cur dog, and, though subsequently put to some of the best setter dogs in the kingdom, her puppies were never pure or worth keeping. We know that the greyhound breeders cross with a bull-dog to give their greyhounds courage and tenacity of purpose, and that it does this for many generations ; but that it is effected by always breeding from the progeny with greyhounds, subsequently to the first bull-dog cross. It would be curious to inquire whether the greyhound bitch subsequently breeding with pure greyhound, her progeny would show a similar transmission of the courage of the bull-dog, as we have seen it take place in the markings of the quagga, an the worthless peculiarities of the cur.

Now, we only too well know that many diseases are capable of hereditary transmission, some more, some less ; and I cannot but think the facts I have alluded to lend some color to the thought, that even as physical peculiarities, so may diseases, be transmitted by the female, through herself and the actual father of her second progeny, as well as all their ancestors, may be free from any taint. In other words, it would seem far from improbable that if a woman married, and had a child by a man who died the subject of any well-marked hereditary disease, and she subsequently married and had children by her second husband, her first husband's disease would have a tendency to show itself in her second family, even though neither she nor her second husband, or their ancestors, were subject to the malady. I presume that one point would be necessary to this, namely, that at the time of impregnation by the first husband, he was then either absolutely suffering from or very strongly predisposed to the disease transmitted. The investigation of this very curious and interesting question would incidentally throw much more light on how far constitutional peculiarities and diseases, such as gout, tubercle, insanity, &c., may be communicated by seminal transmission to the female, and be of considerable importance in determining many medical and social questions, as the first husbands of widows, who re marry and bear children, have frequently died of the severer forms of disease well known to be capable of hereditary transmission.

Let Animals have Daily Exercise.

The *Stock Journal* says :—"Horses requ're daily exercise in the open air, and can no more be expected to exist without it than their owners. Exercise is an essential feature in stable management, and like well-opportuned food, tends alike to preserve the health of horses. Daily exercise is necessary for all horses unless they are sick ; it assists and promotes a free circulation of the blood, determines morbific matter to the surface, developes the muscular structure, creates an appetite, improves the wind, and finally invigorates the whole system. We cannot expect much of a horse that has not been habituated to sufficient daily exercise ; while such as have been daily exercised and well managed, are capable not only of great exertion and fatigue, but are ready and willing to do our bidding at any season. When an animal is overworked it renders the system very susceptible to whatever morbid influences may be present, and imparts to the disease they may labor under and unusual degree of severity. The exhaustion produced by want of rest is equally dangerous ; such horses are always among the first victims of disease, and when attacked their treatment is embarrassing and unsatisfactory."

THE Emperor of Russia, by advice of his Council, has authorized the importatian into Odessa and other Southern ports, for six years, for the purpose of trial, the following articles :—

1. Detached portions of agricultural instruments—as plowshares, coulters, teeth of harrows and cultivators, cast-iron wheels for wheelbarrows, free of duty.

2. Shovels, spades, rakes, pickaxes and steel pitchforks, at a duty of fifty kopecks per pound.

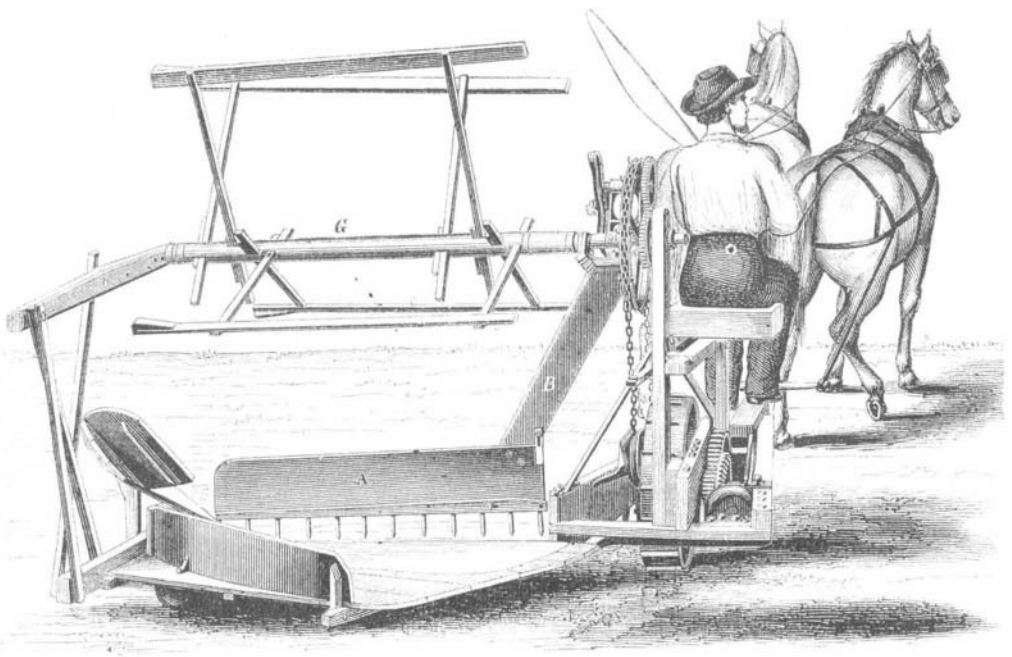
American manufacturers of Agricultural implements should take advantage of this opening for the sale of some of their productions, which are well known to be unrivalled.

ANIMALS that are permitted to roam in the salt marshes are generally the most healthy, as they consume a large amount of saline material. The antiseptic property of salt is too well known and appreciated by most husbandmen, and the farmer might as well think of entirely dispensing with food as to fail in seasoning food with salt. No animal can long exist without salt ; in the stomach it operates favorably, and has a healthy action on the liver, it also prevents the food from running into fermentation, and is death on intestinal parasites.

Improved Self-Raker for Harvesters.

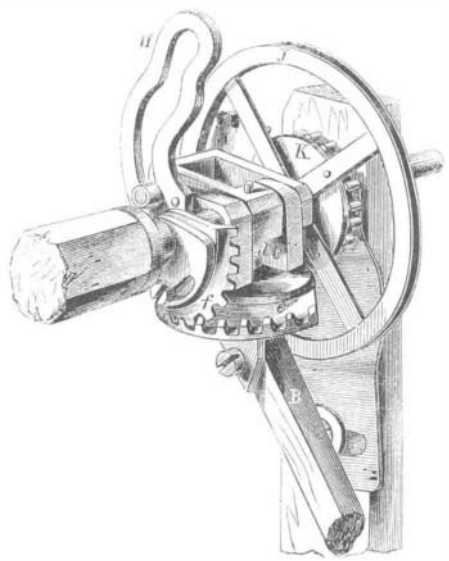
The invention here illustrated is one of the most ingenious in the agricultural line that we have examined for a long time. Ever since the introduction of reaping machines efforts have been made to devise a self-acting rake, to clear the platform of the grain, so as to dispense with the operator employed for that purpose. The motions required in this operation are very peculiar. The rake must sweep across the platform in a horizontal direction, and then be carried over the reel ready for the next sheaf. The novel mechanism by which these motions are obtained in this rake will be understood by an inspection of the engravings, of which Fig. 1 is a perspective view of a reaper, with the rake attached, and Fig. 2 is an enlarged view of the gearing.

The rake, A, is supported by a beam, B, and for the horizontal sweep this beam is attached to the loose collar, C, on the reel shaft by a vertical pivot, *d*. It is manifest that by swinging the beam around this pivot the rake will be swept horizontally over the platform of the reaper. To swing the beam around the pivot, *d*, the horizontal segment, *f*, is secured rigidly to the beam, and engages, by a beveled gear, with the vertical segment, *f*, which is fixed rigidly to the shaft of the reel, G. The reel is turned by a chain from the axle of the driving wheel of the reaper, which passes around a pulley, J, on the reel shaft.



RUSSELLS'S SELF-RAKER FOR HARVESTERS.

After the rake has passed across the platform and removed the grain, it is lifted up and carried over the reel. To effect this movement an arm, H, is fixed rigidly to the collar, C, and a slot is cut in this arm to receive the end of a crank attached to one end of the axle of the pinion, I. The journals of this axle are secured to the pulley, J, so that the pinion, I, is carried around the shaft of the reel at each of its revolutions. The pinion, I, meshes into the fixed



pinion, K, having an equal number of teeth, which causes it to revolve once on its own axis during each of its revolutions around the shaft of the reel. This imparts such motion to the crank on the end of the axle of pinion, I, as to bring this crank to the lower end of the slot in the arm, H, just as the rake has completed its passage across the platform, and then this crank, in its onward movement, carries the collar, C, and with it the rake, around the shaft of the reel.

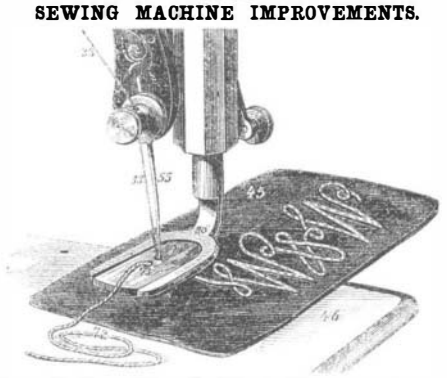
During this revolution the crank is carried to the outer end of the slot in the arm, H, and the segments, *e* and *f*, are turned back, ready to repeat their operation of sweeping the rake over the platform.

The patent for this invention was granted March 29, 1859, and further information in relation to it may be obtained by addressing the inventors, Isaac S. and Henry R. Russells, at Newmarket, Md. [See advertisement on another page.]

Surface Condensers and Boilers.

In the article on the above subject, page 245, present volume, SCIENTIFIC AMERICAN, illustrated with Sewell's condenser, it is stated that the boilers of one of our naval steamers which had a surface condenser had become honeycombed. We alluded to the *Dacotah*. Since then we have been informed on good authority that the first reports circulated respecting the boilers of this steamer were greatly exaggerated. In 1859 this vessel went on a voyage to the East Indies, having Sewell's surface condensers and tubular boilers, with brass tubes. Word was sent back to the Naval Department that her boilers were rendered almost useless going out, and upon this information orders were given to have new boilers made and ready to be put in when she returned. She arrived in New York a few months since, and was about proceeding to Boston to get in her new boilers, but, before doing so, her engines and boilers were thoroughly examined. To the surprise of many persons he found the boilers quite good, and the result is the *Dacotah* is now at sea and in active service with her old boilers. Mr. Sewell has informed us that all his condensers hereafter to be made for the U. S. steamers will have tinned tubes and iron feed pipes.

SEWING MACHINE IMPROVEMENTS.



We herewith illustrate further improvements added to the Wheeler & Wilson sewing machine, namely, the "braider," a device for sewing braid or cord upon any kind of fabric. The braid or cord is passed through the hole, 72 (see engraving), of the ordinary glass presser, 71, of the machine and stitched upon the fabric, 46, in the most elaborate designs without any previous basting. Its value is best set forth by a lady's hand as follows :—

A new improvement has lately been added to the Wheeler & Wilson machine (which, by the way, we considered long ago to be as nearly perfect as any human contrivance could be), being an attachment for sewing braid upon cloth, silk or any material. If any of our friends have been through the tedious operation of braiding children's dresses, they will realize the great relief that awaits them in this invention. The braid follows the needle with perfect accuracy, taking any curve desired, so that the most intricate pattern may be braided with great rapidity. Every lady may now possess one of those lovely chambray morning robes embroidered in vines and labyrinths of white braid, which have heretofore fallen to the lot only of the most industrious and ingenious. For summer dresses nothing can be more elegant and becoming. We hail this improvement as a confirming evidence of "a good time coming" for the ladies one and all. And we may as well include the gentlemen, for there will doubtless be an immediate harvest of elaborate smoking caps, and velvet slippers embroidered with gold braid. Long live the sewing machines!

Patent Moss Baskets.

At the spring exhibition of the Brooklyn Horticultural Society (just closed) Mr. Chamberlain exhibited some of his patent baskets, filled with the choicest plants, vines and flowers, growing in the greatest luxuriance and vigor, filled with both fruit and bloom. A black Hamburgh grape vine, with the bunches fully formed, with strong shoots and as promising as any grown in a grapery with all the care and attention that could be bestowed on them by the most experienced cultivator; two baskets containing peach trees, the fruit the size of walnuts, were also shown, in small wire baskets of eight inches diameter; a basket containing an azalia in full bloom, roses, carnations, pansies, fuchsias, variegated-leaved plants, ferns and mosses, all exhibiting a state of growth never attained in pot culture.

For this novelty (which it truly is), the patent for which was obtained through the Scientific American Patent Agency, the Society awarded Mr. Chamberlain a special premium. At the summer and fall exhibitions he proposes to exhibit the fruit fully matured, which will settle beyond any doubt the value of his invention.

Our readers will find an illustration of this new method of cultivating fruit in No. 22, Vol. V. (new series) SCIENTIFIC AMERICAN.

Artificial Acetilene.

M. Berthelot, of Paris, has succeeded in a most interesting chemical experiment, resulting in nothing less than the direct combination of hydrogen and carbon. Having for a long time been convinced that by placing hydrogen in contact with carbon, at an extremely elevated temperature, they would combine with each other, he tried the experiment at all temperatures, but, at first, without obtaining the desired result. Finally, the extremely simple and happy idea occurred to him of making a current of hydrogen pass between the two carbon points of the electric light excited by Bunsen's battery of 60 elements, and then his efforts were crowned with success. At this extreme temperature the hydrogen combines with the carbon, and the product of the combination is carbide of hydrogen, discovered some years ago by M. Berthelot, to which he gave the name of acetilene. He has been able to collect sufficient of the product to submit it to numerous experiments, and he finds that it possesses all the properties of acetilene derived from organic sources. M. Berthelot had previously succeeded in—firstly, forming by means of mineral compounds, and by a purely chemical method, the principal carbides of hydrogen; secondly, in transforming these carbides into alcoholic compounds; but this was neither a carbide nor an alcohol resulting from the direct combination of two mineral principles—from carbon and hydrogen. This, however, is only a philosophical production of alcohol, not yet available for manufacturing purposes; though, as a scientific fact, it is both curious and important.