

**CASSON'S SAW BENCH.**

We give herewith a perspective view of a circular saw bench made by Messrs. Oliver & Co. (Limited), of Chesterfield, England, which we take from *Engineering*. The chief features in this machine are that it is fitted with Mr. John Casson's patent feed gear and apparatus for steadying the saws. This feeding arrangement has now been in use some years, and has been fitted to a very large number of circular saw benches. This being the case, and the arrangement being very clearly shown by our engraving, it will be unnecessary for us to describe it in detail here.

The saw-steadying apparatus, with which the saw bench we illustrate is fitted, is a novel arrangement, recently patented by Mr. Casson; in the present case it is applied to two saws.

The steadying arrangement consists of accurately fitted sliding jaws mounted on the arms of a forked support, so that they can be moved and adjusted only by fine threaded screws, the jaws having their surfaces next the saws, accurately parallel with the plane of the collar of the saw spindle; these jaws, A, are fixed when the adjusting screws are at rest, and they are faced with strips of greenheart or other suitable timber, secured by countersunk screw bolts, these faces forming a perfectly true guide for the saw blades.

For a single saw the guides just described would suffice; but for two or more saws the outside guides must be supplemented by others between the saw blades.

It will be noticed that the support, F, carrying the guiding jaws, has a square stem sliding through the head of a suitable standard, and it can be readily fixed at any desired height by means of the set screw.

The arrangement we have been describing is well carried out, and there can be no doubt that it will do good service, and enable

thin saws to be efficiently used with a heavy feed. We have received very satisfactory reports of its performance.

**A Bait for Inventors.**

I will give \$200 for a machine that will bale hay in the field. Rake and press combined would be preferable, but would not object to its taking the hay in the windrow. The machine must be expeditious, executing as fast as a mower is able to cut. Must have sufficient power to make a bale suitable for commercial uses; shape of the bale immaterial; a round one preferred. Must be of light draught; one team is generally all that is available for any machine on the farm. These, with the other qualifications demanded of every machine, simplicity, durability, easy to manage, etc. If such an invention could be produced it would make a revolution in the hay field almost equal to that which the mower has made.

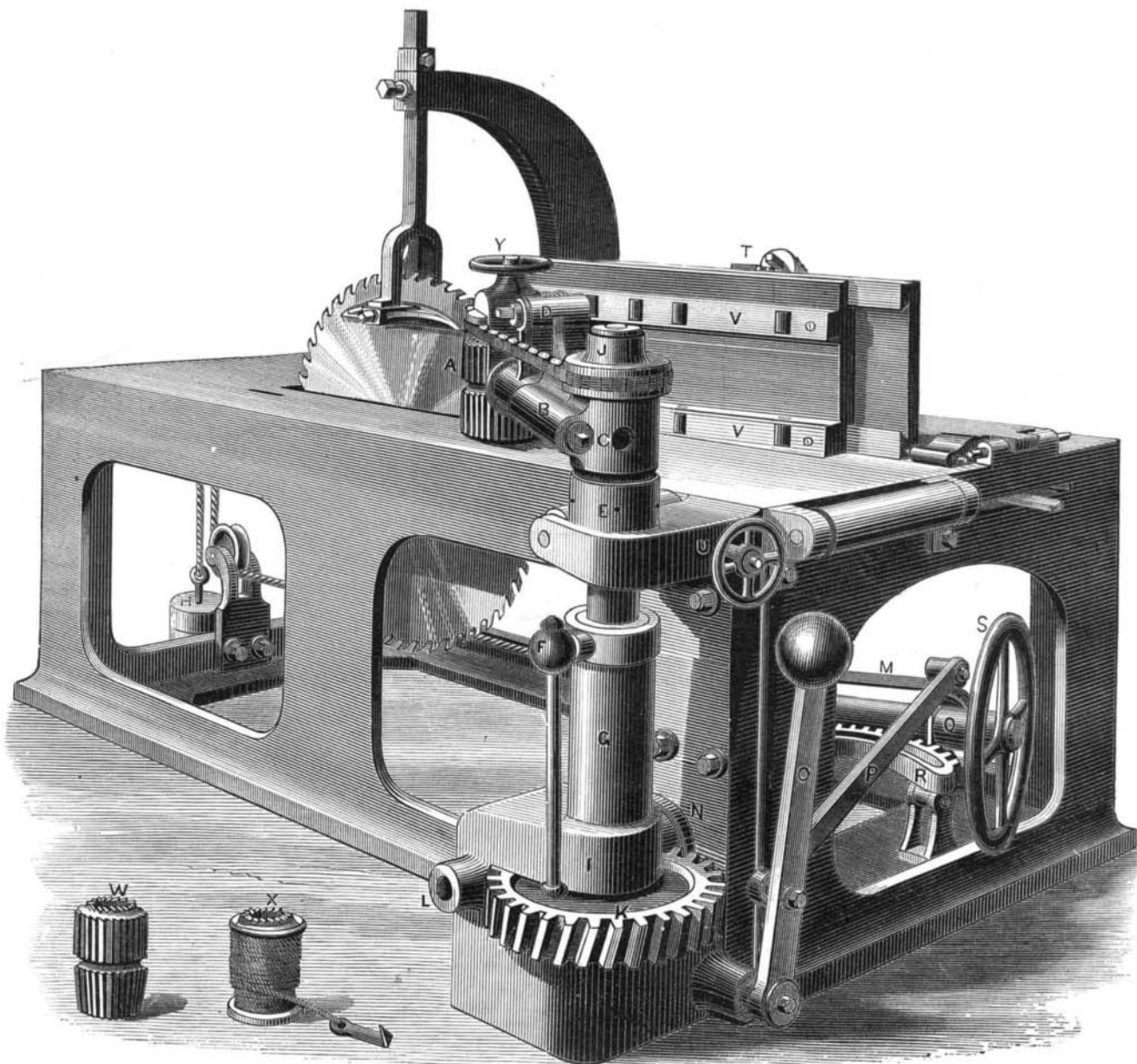
What an awkward, ungainly spectacle a man presents, struggling at one end of a six foot pole, with a ten pound lock of hay at the other end, endeavoring with all his might and main to elevate it 12 or 15 feet on top of a load! It is an insult to human intelligence. A load of loose hay is an uncertain quantity. You are never sure of getting it into the barn. Top heavy, one sided, too wide or too high for the doors; and even with the best of luck, a good percentage has drizzled in the wake of the wagon over the lot to the barn. A 100 or 200 lb. bale, with an inclined plane, or a pulley on side or aft of a good strong rack, and all this barbarism has succumbed to civilization.

At the barn comes a worse servitude. (I don't mean the horse fork; that is a grand lift to civilization. I hope to modify it shortly to throw bales.) There a man struggles with sheer desperation to press by his own avoirdupois 20 tons of hay into a place that won't hold 10. Tramp, tramp,

tramp, leg-weary, panting like an overheated dog, every fiber of his clothing saturated with perspiration, a subject worthy of a better immortality than the Greek slave. O Edison! don't fritter away your genius on sounding brass and tinkling cymbal. Elevate the laborer. Liberate our overworked people. Make us a chariot to press our hay.—*Edmund Adams, North Manlius, N. Y., to the New York Tribune.*

**A Silver Mill in the Clouds.**

The largest and most complete silver mill ever constructed, says the *San Francisco Stock Report*, has recently been built by Messrs. Rankin, Brayton & Co., of the Pacific Iron Works of that city, for the Cerro de Pasco Mining Company, of Peru, and shipped for Callao, the port of destination. This enormous mill consists of 80 stamps, 900 lbs.

**SAW BENCH WITH SAW-STEADYING APPARATUS.**

each, 44 five foot amalgamating pans, 22 nine foot settlers, and all the accessories of a first-class modern mill. It is to be erected upon the above named mines, which are situated in the heart of the Andes, some 150 miles east of the city of Lima, at an elevation of more than 14,000 feet. To admit of mule transportation a portion of the way up this tremendous ascent, the mill had to be made in sections, no piece weighing more than 500 lbs. Some idea of the magnitude of this work may be inferred from the fact that the mill, as thus constructed, consisted of more than 17,000 pieces, and weighed upward of 600 tons. This enormous amount of machinery was constructed by the above firm and put on board a ship 50 days from date of contract.

The Cerro de Pasco mines have been the richest and most famous in the world's history. They have been worked by the old arastra process for the past 200 years, and have produced, according to the most authentic records, more than \$500,000,000. With such improved machinery the product of these mines will undoubtedly attract the attention of the world, and so reflect great credit upon the capacity, ingenuity, and skill of our mechanical establishments.

**Poultices.**

The common practice in making poultices of mixing the linseed meal with hot water, and applying them directly to the skin, is quite wrong, because, if we do not wish to burn the patient, we must wait until a great portion of the heat has been lost. The proper method is to take a flannel bag (the size of the poultice required), to fill this with the linseed poultice as hot as it can possibly be made, and to put between this and the skin a second piece of flannel, so that there shall be at least two thicknesses of flannel between the skin and the poultice itself. Above the poultice should be placed more flannel, or a piece of cotton wool, to prevent it

from getting cold. By this method we are able to apply the linseed meal boiling hot, without burning the patient, and the heat, gradually diffusing through the flannel, affords a grateful sense of relief which cannot be obtained by other means. There are few ways in which such marked relief is given to abdominal pain as by the application of a poultice in this manner.—*Dr. T. Lauder Brunton, in Brain.*

**New Mechanical Inventions.**

Mr. Joseph Adams, of Washington, D. C., has patented an improved Gas Regulator, designed either to cut off the gas entirely or to let on a larger amount of gas than its automatic action would ordinarily permit, or to allow the regulator to operate with an automatic action, as usual.

Mr. Jean A. Hitter, Jr., of St. Martinsville, La., has patented an improved Type Writer, of simple and compact construction, that may be readily used for printing on paper and for other purposes, being small enough to be carried conveniently in the pocket, if desired, and readily operated with little practice.

Messrs. Edwin N. Boynton, Geo. M. Coburn, and Thos. F. Carver, of Worcester, Mass., have patented an improved Hand Drilling Machine, by which a fast or slow motion can be readily obtained, at the will of the operator, the slower motion being especially advantageous in drilling large holes, as more power is obtained, and the holes are drilled with greater ease.

Mr. Reuben R. James, of rising Sun, Ind., has devised an improved Adding Machine of simple and comparatively inexpensive construction. The chief feature of the machine is a series of toothed revolving counting wheels, which are inscribed on their peripheries with the nine digits and cipher, and mounted loosely on a common axis, and each having four lateral inclines or cams, which cause, at the proper time,

a weighted pawl lever to engage the next counting wheel on the left, so as to carry ten when the numbers added on the wheel on the right exceed ten. The adding is effected by successively drawing down to a stop on the finger board the teeth of the counting wheels which are opposite the numbers to be added, and the numerical result will be seen on the wheels in a series of slots or apertures in the case of the machine.

Mr. Jacob Croft, of Scipio, Utah Ter., has devised an improved Turbine Water Wheel, which is constructed to prevent back pressure by the water against the casing as it escapes from the buckets. Sand and other substances in the water are prevented from entering around the shaft and cutting or wearing it.

An improvement in Sweeping Machines has been patented by Mr. Isaac A. Chomel, of Brooklyn, N. Y. This invention relates to apparatus for sweeping up and collecting dirt, dust, and other refuse from floors, carpets, streets, and other places. The dust box is to be rolled over the floor and the brush revolved by a winch. The speed of the brush is independent of the motion of the machine along the floor.

Mr. D. A. Ferris, of Tioga Center, N. Y., has patented an improved Implement for Forcing Flooring Planks together when laying floors. It is simple, convenient, and powerful.

**Effect of Quinine on the Hearing.**

It is a well known fact to medical men that there exists a great prejudice among a large number of people against taking quinine, the idea being very prevalent that a prolonged use of it not only affects the hearing, but (to use the common expression) that it "gets into the bones." As regards the former belief, Dr. Roosa, of New York, has recently been collecting and examining the evidence as far as possible, and has come to the conclusion that in some cases

there really is a permanent nervous affection of the ear produced which justifies the opinion held by the laity. Hitherto physicians have generally disbelieved this, and ascribed the notion to prejudice.

**The Microphone as a Thief Catcher.**

The microphone as a thief catcher has proved very useful to an English resident in India, who found his store of oil rapidly and mysteriously diminishing. He fixed a microphone to the oil cans, carried the wire up to his bedroom, and, after the house had been closed for the night, sat up to await the result. Very shortly he heard the clinking of bottles, followed by the gurgling sound of liquid being poured out, and running downstairs he caught his bearer in the act of filling small bottles with oil for easy conveyance from the premises.

**The Tallest Tree in the World.**

The tallest accurately measured *Sequoia* standing in the Calaveras Grove, near Stockton, California, measures 325 feet, and there is no positive evidence that any trees of this genus ever exceeded that height. Of late years, explorations in Gippsland, Victoria, have brought to light some marvelous specimens of *Eucalyptus*, and the State Surveyor of Forests measured a fallen tree on the banks of the Watts River, and found it to be 435 feet from the roots to the top of the trunk. The crest of this tree was broken off, but the trunk at the fracture was 9 feet in circumference, and the height of the tree when growing was estimated to have been more than 500 feet. This tree, however, was dead, though there is no doubt that it was far loftier than the tallest *Sequoia*. Near Fernshaw, in the Daudenong district, Victoria, there has recently been discovered a specimen of the "Almond Leaf Gum" (*Eucalyptus amygdalensis*), measuring 380 feet from the ground to the first branch, and 450 feet to the topmost twig. This tree would overtop the tallest living *Sequoia* by 125 feet. Its girth is 80 feet, which is less than that of many *Sequoias*, but as far as height is concerned it must be considered the tallest living tree in the world.

**THE ARGONAUT, OR PAPER NAUTILUS.**

This mollusk received the first title in allusion to the pretty fable which was formerly narrated of its sailing powers, and the latter title is given on account of the extreme thinness and fragility of the shell. It is remarkable that the shell of the argonaut is, during the life of its owner, elastic and yielding, almost as if it were made of thin horn.

The two arms of the argonaut are greatly dilated at their extremities; and it was formerly asserted, and generally believed, that the creature was accustomed to employ these arms as sails, raising them high above the shell, and allowing itself to be driven over the surface by the breeze, while it directed its course by the remaining arms, which were suffered to hang over the edge of the shell into the water and acted like so many oars. In consequence of this belief the creature was named the argonaut, in allusion to the old classical fable of the ship *Argo* and her golden freight.

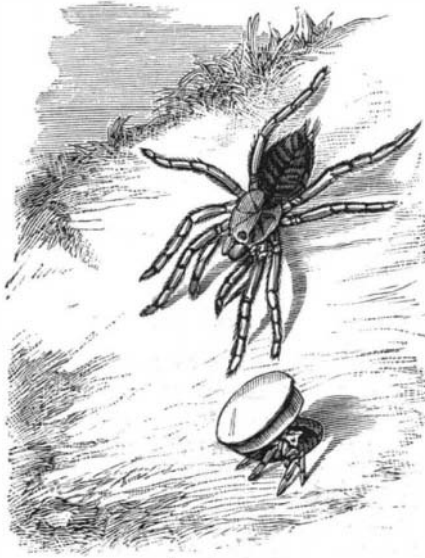
The animal, or "poult," as it is technically called, is a lovely creature despite its unattractive form. It is a mass of silver with a cloud of spots of the most beautiful rose color, and a fine dotting of the same, which heighten its beauty. A large membrane, which is the expanded velation of the arms, covers all. It has been definitely proved that the use of the expanded arms which cover the exterior of the shell is to build up its delicate texture, and to repair damages, the substance being secreted by these arms, and by their broad expansions moulded into shape. The larger figure in the engraving represents the argonaut while thus within its shell.

While crawling the creature turns itself so as to rest on its head, withdraws its body as far as possible into its shell, and, using its arms like legs, creeps slowly but securely along the ground, sometimes affixing its disks to stones or projecting points of rocks for the purpose of hauling itself along. When, however, it wishes to attain greater speed, and to pass through the waters, it makes use of a totally different principle.

Respiration is achieved by the passage of water over double gills or branchiæ; the water, after it has completed its purpose, being ejected through a moderately long tube, technically called a siphon. The orifice of the siphon is directed toward the head of the animal, and it is by means of this simple apparatus that progression is effected. When the creature desires to dart rapidly through the water, it gathers its six arms into a straight line, so as to afford little resistance to the water, keeps its velated arms stretched tightly over the shell, and then, by violently ejecting the water from the siphon, drives itself by reaction in the opposite direction. The uppermost figure shows the argonaut in the act of swimming.

**THE TRAP DOOR SPIDER OF JAMAICA.**

This spider digs a burrow in the earth and lines it with a silken web. The burrow is closed by a trap door, having a hinge that permits it to be opened and closed with admirable accuracy. The door is circular, and is made of alternate layers of earth and web, and is hinged to the lining of the tube that leads to the burrow by a band of the same silken secretion. The door exactly fits the entrance to the burrow, and when closed, so precisely corresponds with the surrounding earth that it can hardly be distinguished, even when its position is known. It is a strange sight to see the earth open, a little lid raised, some hairy legs protrude, and gradually the whole form of the spider show itself.



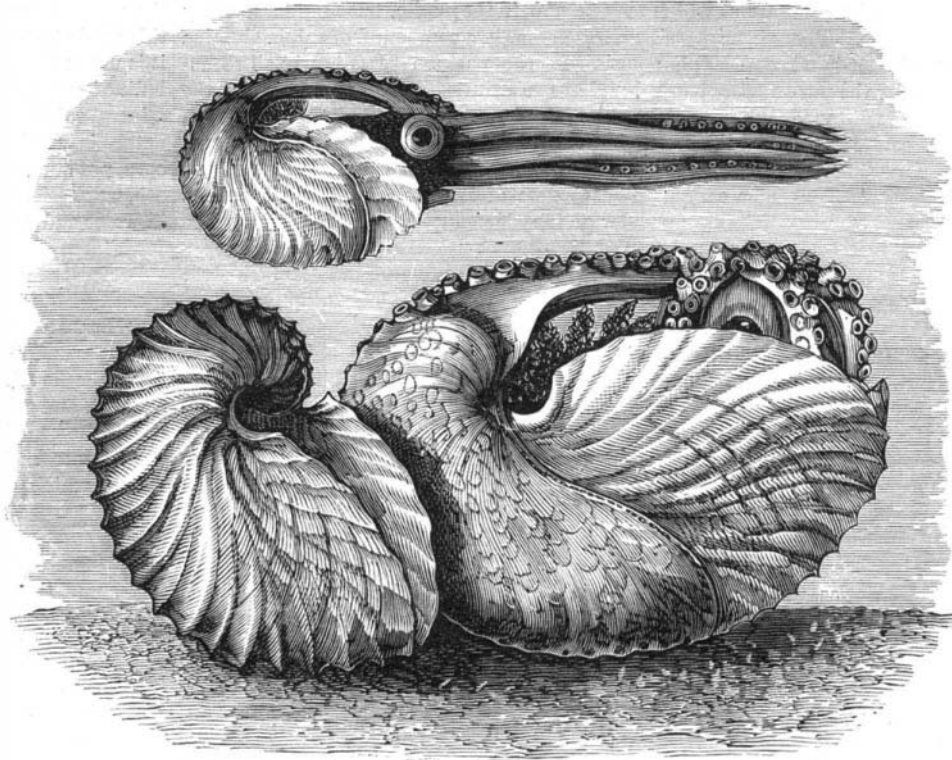
TRAP DOOR SPIDER.

The mode in which these spiders procure food seems to be by hunting at night, and in some cases by catching insects that are entangled in the threads that the creature spins by the side of its house.

In the day time they are very chary of opening the door of their domicile, and if the trap be raised from the outside, they run to the spot, hitch the claws of their fore feet in the silken webbing of the door, and those of the hind feet in the lining of the burrow, and so resist with all their might. The strength of the spider is wonderfully great in proportion to its size.

**To Make a Hole in Glass.**

*New Remedies* describes the following easy method of making a hole in plate glass: Make a circle of clay or



ARGONAUT, OR PAPER NAUTILUS.

cement rather larger than the intended hole; pour some kerosene into the cell thus made, ignite it, place the plate upon a moderately hard support, and with a stick rather smaller than the hole required, and a hammer, strike a rather smart blow. This will leave a rough-edged hole, which may be smoothed with a file. Cold water is said to answer even better than a blow.

**The Preservation of Eggs.**

As science advances, the processes proposed for the preservation of organic substances are being brought to greater and greater perfection. No subject perhaps in this connection has received greater attention, and been the subject of more processes, patent and otherwise, than that of the preservation of eggs. In fact this is a question of considerable

importance, not only from a culinary, but also from an industrial standpoint—that of the manufacture of albumen for photographic purposes. In the *Moniteur de la Photographie* Dr. Phipson calls attention to a new process, which may be briefly stated as follows:

On taking the eggs from the nest they are covered over, by means of a bit of wool, with butter in which has been dissolved 2 or 3 per cent of salicylic acid. Each egg, after receiving this coat, is placed in a box filled with very fine and absolutely dry saw dust. If care be taken that the eggs do not touch each other, and that they be perfectly covered with the saw dust, they will keep fresh for several months—perhaps for more than a year. Dr. Phipson states that he has experimented with this process for two years, with most excellent results. So much for the preservation of the entire egg; but there is also a process for the preservation of the albumen of the egg for photographic uses, due to M. Berg. In this process, the white, separated from the yolk, is evaporated in zinc pans or porcelain cups, at a temperature of 45° C. The solidified albumen thus obtained is pulverized by means of a mill. The yolk, by means of machinery, is whipped up into a light mass, and then spread out on zinc plates and evaporated to dryness at a temperature of 80°, and finally powdered. The powders thus obtained keep for a long time. The white of eggs, so prepared, is used for the purposes to which albumen is applied in the industrial arts, while the powdered yolks are used for domestic purposes.

**Characteristics of American Sheep Husbandry.**

Dr. Hayes, in his recent address before the National Agricultural Congress, remarking that a very inadequate idea is given of a nation's resources by the number of sheep raised—the character of the animals being of the first consideration—proceeds to show some of the characteristics of American sheep husbandry. He states that the sheep of the United States consist, first, of what are called native sheep; second, descendants from improved English races; third, the Mexican sheep found in Texas, New Mexico, Colorado, and California; fourth, the merino sheep, and crosses of that breed with the three preceding races. The merinos constitute the principal and characteristic race of the United States; and this is the most important fact in the enumeration of our resources for sheep husbandry and the wool manufacture. England has no merinos, except in her colonies; Russia has but 12,000,000 merinos; France, but 9,000,000. The merinos and grades in the United States exceed 25,000,000. Merino wool is for clothing what wheat is for food; it is the chief material for cloth at the present day, the coarsest as well as the finest. While the softest, it is the strongest of all fibers. From its fulling and spinning qualities, it is the best adhesive for the cheap fabrics—coarser wool, cotton, or shoddy; the mixture of merino wool increasing indefinitely the material for cheap clothing.

An abundance of merino wool is the greatest boon the world has received from the animal kingdom in the last century. It is, in fact, in its extended culture the product of the last century. A century ago all the merinos in the world, confined exclusively to Spain, did not number 1,000,000. 1765 marks the epoch of the first exportation of the merinos to Saxony; 1786, to France; 1833, to Australia; 1802, the introduction of the first merino sheep to this country; and to Gen. Humphreys, of Connecticut, and to the introduction to his farm of twenty-one rams and seventy ewes, may be directly traced the most celebrated breeds of the American merino; producing individuals actually sold for \$5,000 each, others for \$2,000 to \$3,000, and one for which \$10,000 was refused. The fiber of the merino sheep is not the only excellence of the animal; when properly bred, this race has a hardness surpassing all other high-bred races. The "yolk," provided by nature to assist in the growth of the wool, abounding in this race more than in any other, causes the tips of the fleece to be cemented, and to become impenetrable to rains and snows. A lighter pasture suffices for their maintenance than

would support the mutton races. This race is fitted, above all others, for the remote pastoral lands and for culture on a large scale.

Our breeders, in aiming to increase the weight of their fleece, have developed the length of the staple, and have unconsciously created a merino combing wool—a wool in special demand through modern improvements in machinery and changes in the fashion of goods. Mr. Ferneau, an eminent Belgian wool manufacturer, who has thoroughly studied our wool resources and manufactures, says that three quarters of the American wool is "combing wool," and will be ultimately employed for this purpose. The bulk of American merino wools is of strong, sound, and healthy staple, having few weak spots in them. Those from the other States of the West are free from burrs. Those from California have