the Mediterranean sixteen months ago, and met with a ready sale, and more than twenty cargoes have been sent over since that time. The *Globe* apprehends that before long the coal industry of Great Britain will have to encounter determined rivalry on the part of the United States. American coal will not be landed in England, but will be shipped to ports on the Continent which are now dependent upon supplies from the coal fields of the United Kingdom.

Astronomical Notes.

OBSERVATORY OF VASSAR COLLEGE.

The computations in the following notes are by students of Vassar College. Although only approximate, they will enable the ordinary observer to find the planets.

M. M

POSITION OF PLANETS FOR JUNE, 1879.

Mercury.

On June 1 Mercury rises at 3h. 41m. A.M., and sets at 5h. 43m. P.M. On June 30 Mercury rises at 5h. 31m. A.M., and sets at 8h. 34m. P.M.

Mercury should be looked for during the last week in June, nearly in the parallel of the point of sunset; it will be in conjunction with the new moon on the 19th.

Venus.

On June 1 Venus rises at 7h. 22m. A.M., and sets at 10h 29m. P.M. On June 30 Venus rises at 8h. 15m. A.M., and sets at 10h. 6m. P.M.

Venus passes 4° south of Pollux on June 2, and 2½° north of Regulus on June 30.

Venus will be near the crescent moon on the evening of June 23.

Saturn.

On June 1 Saturn rises at 2h. 2m. A.M., and sets at 2h. 25m. P.M.

On June 13, according to the Nautical Almanac, Saturn will be in conjunction with the moon at 5h. 31m. Washington time. The planet will therefore rise on the morning of that day, following the crescent moon.

On June 30 Mars and Saturn will rise very nearly together, at 0h. 13m., and will keep nearly the same path until they set.

Uranus.

On June 1 Uranus rises at 10h. 47m. A.M., and sets at 15m. after midnight. On June 30 Uranus rises at 8h. 58m. A.M., and sets at 10h. 23m. P.M.

Sun Spots.

The sun has been examined daily, since the first of the year, with a glass of 3 inches aperture. As late as May 8 no spot had been found. On May 9 a small spot was seen, which had developed within the previous twenty-four hours. It could not be found with the same glass on the 12th, but the large telescope showed that it had broken up into several minute sections, and was rapidly diminishing.

Mars.

On June 1 Mars rises at 1h. 20m. A.M., and sets at 51m. after noon. On June 30 Mars rises at 0h. 13m. A.M., and sets at 39m. after noon.

Mars will be near the waning moon on June 12. According to the Nautical Almanac Mars will be in conjunction with Saturn at 2 P.M. on the 30th. The two planets will therefore be seen to rise nearly together.

Jupiter.

The planets Jupiter, Saturn, and Mars are all best seen in the morning.

On June 1 Jupiter rises at 44m. after midnight.

Mars rises north of Jupiter at 1h. 20m. A.M., and Saturn rises north of Mars at 2h. 2m. A.M.

On June 30 Jupiter rises at 10h. 50m. P.M., nearly as Venus sets.

Jupiter is very brilliant. We are coming nearer to it, and its moon can be seen with very little optical aid.

The Coney Island Pier.

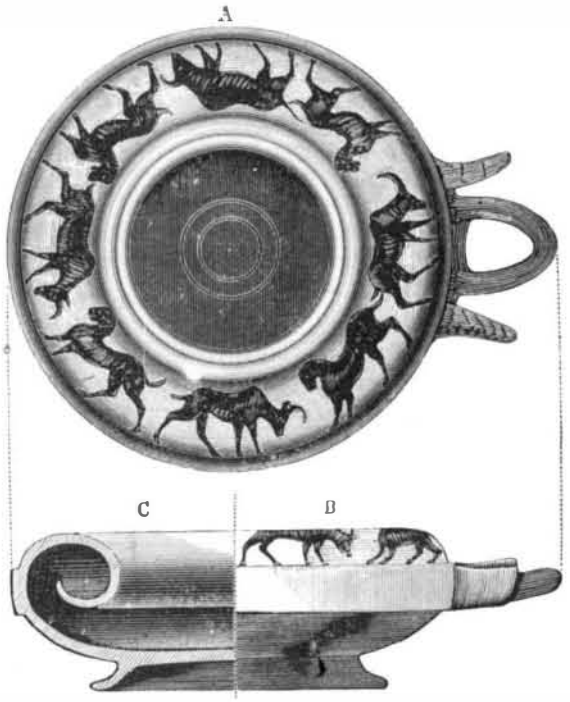
The Ocean Navigation and Pier Company, of which Mr. Jacob Lorillard is president, are erecting off West Brighton, Coney Island, an immense iron pier. The contractors are the Delaware Bridge Company, and the construction is under the supervision of Messrs. Maclay & Davies, civil engineers. The pier, when completed, is to be 1,000 feet in length, extending outward from high-water mark. Its width is to be 50 feet, with enlargements of 100 feet in width at the shore end, the center and the pier head. It is to be double-decked, with iron substructure, the whole supported by wrought-iron tubular piles 9 inches in diameter, made of one-half inch metal. These piles are arranged in rows, at distances of 20 feet longitudinally and 16 feet 8 inches laterally. Each pile has at its base a circular cast-iron disk 2½ feet in diameter, which, when sunk into the sand, acts as a supporting base, and at the depth of 15 or 20 feet insures a perfect foundation. The piles are driven by the "jet water" system.

Iron capitals are bolted to the tops of the piles, and they support 15-inch wrought-iron beams, bolted together, upon which the superstructure will rest. The entire structure is to be made more secure by being braced throughout with diagonal rods an inch and a half in diameter, and heavy horizontal struts bolted to the beams transversely. When completed, the entire structure will be supported by 260 iron pillars. The flooring of the lower deck will be well finished and inclosed in a handsome iron railing. The landing stage will be at the lower deck of the pierhead, and will be guarded by massive oak fender pieces.

More than 100 workmen are engaged in pushing forward the work. At night two electric lights, one on shore and the other on the movable derrick, are used. The first pile was driven on the 22d of April. All the material for construction is on the ground, and it is intended to have the last pile in place by the 1st of June. On the upper deck of the pier are to be spacious pavilions and saloons. The whole structure will cost more than $150,000.—*Iron Age.*

GREEK DRINKING CUP.

The engraving represents the upper face and a diametrical section of an ancient Greek drinking cup which was used



ANCIENT GREEK DRINKING CUP.

by the soldiers for dipping up the muddy water met with in their marches. The inwardly turned rim prevented the mud from following the water as it was poured from the vessel. This vase or cup is preserved in the Pourtalis collection.

NEW PROVISION SAFE.

The accompanying engraving represents a very useful household article recently patented by Mr. Samuel Inman, of 929 South Asland Ave., Chicago, Ill. It is designed for keeping bread, pastry, meats, milk, and other articles of food which require protection from insects or other vermin. The safe is made in two parts, the upper part being made air-tight, or nearly so, for containing bread and pastry, and protecting them from the influence of the atmosphere and from insects. The lower portion consists of a light frame having a door in one side, the whole being covered with wire gauze, which permits of a free circulation of air, while it prevents the entrance of rats, mice, or insects. The shelves are formed of slats of wood, secured to end cleats. This part of the safe is intended for receiving meats, butter, milk, and other articles which require a free circulation of air around them. The safe may be set upon the cellar floor or hung up by wires, as may be most convenient.

Inman's Provision Safe.

Painting Walls—Seasonable Hints.

Of course, says the *American Builder*, everybody knows, or ought to know, that walls and ceilings are finished with plaster. But everybody may not be aware that plaster has the property of absorbing moisture. This, perhaps, will not take place in rooms where a fire is kept steadily; but in rooms left, as is often the case, for weeks without a fire, the walls will take up a considerable quantity of damp. The effect will be injurious to the health of the inmates. There are few persons who have not suffered from a mysterious cold, caught they know not how, though, perhaps, damp in the plaster had something to do with it.

The extent to which damp is absorbed in a plastered wall may be discovered by noticing what so often takes place in rooms where the walls are painted and have become chilled by a season of cold weather. As soon as the temperature becomes warmer the atmosphere is condensed on the walls, and at times in such quantities as to run off in streams. Now, had it not been for the paint, the greater portion of this moisture would have been absorbed by the plastered walls. And as a consequence the quality of the plaster would have been impaired and the room made unwholesome. In view of this defect in plastered walls, it becomes a question well worth considering, whether, in finishing a house, the walls should be papered or painted. If paint is decided on, it is highly necessary that the painting be properly done and good materials employed. White lead, which is the chief ingredient of all paint used, is of late years heavily adulterated—a reason why some painters can do work so much cheaper than others. There are also dishonest painters who will lay on nothing but "whiting" and size for the first coat, and finish off with one coat of oil paint. It is not easy to detect the fraud at the time, but as such paint soon wears off the wall, and attaches itself to the garments of those who rub against it, the customer speedily finds out that he has been cheated. It takes three or four coats of good oil paint honestly laid on to make good work of painting plastered walls.

In painting walls there is ample scope for taste, and such colors may be chosen as are most suitable for each apartment, and in harmony with the furniture. Apartments lighted from the south and west, particularly in a summer residence, should be cool in their coloring; but the apartments of a town house ought all to approach toward a warm tone. In a drawing room the coloring should be characterized by vivacity, gayety, and light cheerfulness; by light tints of brilliant colors with a considerable degree of contrast and gilding—the walls being kept in due subordination to the furniture, though partaking of the general liveliness. The characteristic coloring of dining rooms should be warm, rich, and substantial, without vivid contrasts, and gilding should be avoided, unless in small quantities for the sake of relief. Parlors ought to be in a medium style, between that of a drawing room and dining room. Libraries should be solemn, grave, and quiet in color and finish, while bedchambers should be light, cleanly, and exceedingly cheerful. A greater degree of contrast between the room and its furniture may be admitted in the chamber than in any other apartment. Stairways, halls, and vestibules should be of a cool tone and simple in their style of coloring, being in that what they are in utility—a link between the exterior simplicity of a house and its interior richness and comfort.

Mr. Gary has the Last Word.

To the Editor of the Scientific American:

As your correspondent "E.," in your issue for May 17, page 304, has made some misstatements, will you allow me to correct him? In referring to a letter written by me and published by you, April 5, he says, "Mr. Gary's knowledge of history is as defective as his knowledge of magnetism and electricity," and he advises me, before I write any more history of science, to be at the pains of studying it a little more carefully.

Allow me to say that all the history I attempted in the letter referred to was the following sentence: "The law of gravitation was not discovered in a laboratory, nor was the power of steam nor electricity." This is all the history that I attempted, and the SCIENTIFIC AMERICAN, which your correspondent will acknowledge is good authority, remarked in regard to this, in the same number in which it appeared, that "everybody will agree with what our correspondent says about laboratory discoveries, Newton and the apple, Franklin and the kite string."

Your correspondent E. also holds up before your readers a list of honored and respected names as martyrs to "conceited ignorance, and mutilated and outraged history," and tries to vindicate history and himself by making other misstatements. He says: "Mr. Gary brags that he is ignorant of what others have done." I humbly acknowledge that I do not know it all, but I never brag about it. As to his assertion that Professor Henry advised me to buy $50 worth of books and study up on magnetism before wasting more time, I have to say that Professor Henry never said anything of the kind. Another eminent scientist made a similar remark before he saw my discovery, but after seeing it, he advised me to go ahead.

Let us hope your correspondent's knowledge of history and science is more accurate than his assertions in regard to current events. It is to be feared that "much learning hath made him mad."

W. W. GARY.

Boston, Mass.

Malleable Nickel and Cobalt.

Fleitmann has succeeded, by a very simple device, in obtaining cast nickel in a malleable and ductile form, even when cold, while cobalt prepared in the same manner possessed such hardness when cold that he expects it can be used for cutting instruments, while hot it is both malleable and ductile. His process consists in adding to the fused metal, through a hole in the lid of the crucibles, ⅛ per cent of metallic magnesium, which possesses a remarkable power of destroying carbonic oxide. The author is of the opinion that the porous and crystalline character of cast nickel is due to its absorption of carbonic oxide gas while in a molten state. It is not impossible, however, that owing to the great affinity of magnesium for nitrogen, its action may be due to the destruction of cyanogen in the metal.

Cobalt prepared in this manner possessed none of the reddish color attributed to it in the text-books, but actually excelled nickel in whiteness and brilliancy.

He also welded these metals on to iron and steel at a white heat, and strips thus welded were rolled out to the finest number without separating from each other.—*Berichte d. d. ch. Ges.*

SOOT FOR ROSES.—Collect some soot from a chimney or stove where wood is used for fuel, put into an old pitcher, and pour hot water upon it. When cool, use it to water your plants every few days. The effect upon plants is wonderful in producing a rapid growth of thrifty sheets, with large thick leaves and a great number of richly-tinted roses.

Plantains and Bananas.

Of all plants which are the produce of the tropics, none are superior in interest to the plantains and bananas, two closely allied species of the genus *Musa*. Of the several species of this genus, one has received the specific name of *paradisiaca*, under the supposition that it was the "tree of life," or the "tree of the knowledge of good and evil," spoken of in the Scriptures. St. Pierre observes that the violet cone at the end of a branch of plantains, with the stigmas peering through like gleaming eyes, might well have suggested to the guilty imagination of Eve the semblance of a serpent tempting her to pluck the forbidden fruit it bore, as an erect and golden crest. Though some of the species attain a height of 20 to 30 feet, they are herbaceous plants, growing up, flowering, fruiting, and then dying down to give place to other shoots from the same root. The fruit ripens in succession from the base to the apex of the flowering stem, so that on the same plant flowers and ripe fruit will be found associated. One stalk of fruit will attain three feet, and bear from 120 to 150, even 180 plantains, the entire weight of which would be from 50 to 70 lb. Dried plantains form an article of internal commerce in India, and, in a few instances, have been exported. When deprived of their skin and dried in the sun, they are reduced to meal, in great request in the West Indies for children and invalids. A recent French exchange states that efforts are being made in Venezuela to get up an export trade for meal of this sort, the supply being much greater than the home demand. Professor Johnston states that the fruit approaches most nearly in composition and nutritive value to that of the potato, and the meal to that of rice.

All the species contain a large number of spiral vessels, and afford a strong and valuable fiber, from which cloth and cordage are made. The substance called manila hemp, much employed for cordage in America and Europe, is obtained from one of the species (*Musa textilis*). Scarcely any parts of these useful plants are devoid of use to man. A limpid fluid issues from wounds in the body of the plant, which is used in medicine, as is also the root. It has been recently stated in a foreign medical journal that the property which these plants possess of keeping the surrounding soil moist (as pointed out by Boussingault) has been taken advantage of to afford shade and moisture to the coffee plant in Venezuela; and that the cultivation of the latter has therefore been greatly increased.

Still another industrial use has lately been proposed for the fruit in the latter country, this being the distillation of brandy. Banana brandy, even from the first distillation, is said to have a pleasant taste and smell, recalling that of the fruit. It contains 52 per cent of alcohol. As two hundredweight of the fruit produces about ten quarts of alcohol of 96°, banana brandy may yet be destined to play as important a part in economy as the alcohol of the sugar cane.

Ramie Fiber and its Manufacture.

This fiber, the utilization of which in textile manufactures has for many years engaged the attention of practical men, still continues to command a large amount of notice. It is undoubtedly deserving of all it receives, because if the difficulties that have hitherto stood in the way of its extensive use can be overcome, we shall have at command a fiber that will do much to emancipate manufacturers from dependence upon the American cotton, the Russian flax, and the Italian and Chinese silk crops. Besides the independent position it would take on its own merits, it possesses qualities that would enable it to be substituted, by means of a little ingenuity, for any of those fibers. If it can be produced sufficiently cheap it may even become a permanent substitute for one or more of them, and to a considerable extent displace them. Whether such an occurrence would be an advantage or otherwise time only could reveal.

During the past month we have had submitted to our notice some specimens of goods manufactured entirely from the rhea plant fiber. The raw material in its dried state, as it is taken in the first process, was shown. This is a pliant, reddish brown, straw-like substance. After passing through the first stage it yields a long, light flaxen-colored fiber, of great strength and fineness, and which appears to be divisible to an extreme degree. The next forms in which it was exhibited were in wet spun and dry spun yarns. In the former it possessed a solidity which gives it a somewhat wiry appearance and great strength; in the second it is almost as soft as wool, and may almost be mistaken for it. These yarns wrought into cloth display similar characteristics. One specimen appears very much like a good brown Hessian, and another a Belfast brown linen. A third had passed through the bleaching process, and showed its capability of being adapted for table linen, napkins, diapers, etc. It bleaches clearly and evenly, coming up of a rich pearly whiteness, with a cool, pleasant feel, but with more fiber on the face of it than a linen article would possess. In each phase of it the distinguishing features are great strength and probable durability. In another case the fiber had been reduced to its finest condition, spun into a soft, pearly-white hosiery yarn, and worked into an undershirt, possessing all the softness, luster, and beauty of a similar article in silk.

So far as the samples allowed us to discover, it would appear to be free from the distinguishing fault of China grass, from which creases cannot be removed. The inventor stated that he had numerous other fabrics woven from yarns entirely of this fiber, such as dress goods, ribbons, dyed and printed fabrics, either completed or in process, and which could be shown when necessary. The specimens exhibited formed an interesting display, the importance of which, however, depends entirely upon whether, as affirmed, they have been produced by a process and at a cost that will enable the rhea fiber to take its position in commercial markets as a practically useful article.—*Textile Manufacturer.*

THE EDIBLE MUSSEL.

The common edible mussel, *Mytilus edulis*, attracts our special attention on account of its value as an article of diet and commerce.

In the accompanying engraving, Fig. 1 shows the animal laid open to view, the left half of the triangular shell having been removed, while the brim of the mantle has been thrown back a little to allow a better inspection of the inner organs. Both parts of the shell are alike in shape and size. The hinge or lock uniting them is located in the smallest

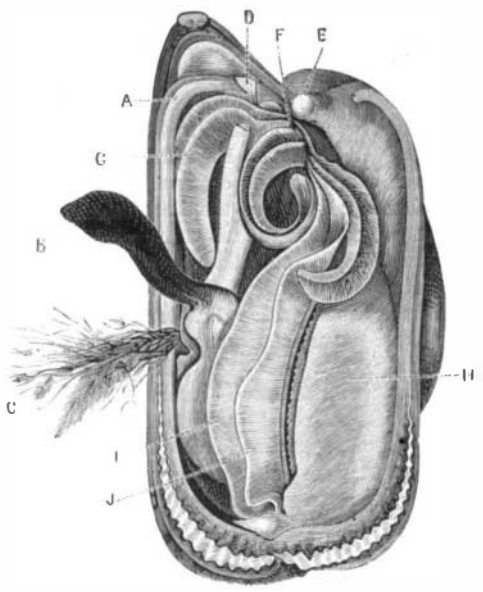


Fig. 1.—EDIBLE MUSSEL.

angle of the triangle formed by the shell, and both of the latter end at this point in short conical elevations. At the opposite end there is a small opening in the shell corresponding to the anus of the mussel; and in close proximity runs a short fringed tube connecting with the inner organs of respiration.

The peculiar digital form of the foot and the presence of a spinning gland or byssus are characteristic, and both are undoubtedly related to the stationary mode of life of the animal. The hypothenuse of the shell being the face side of the mussel, A is the brim of the mantle of the latter. On both

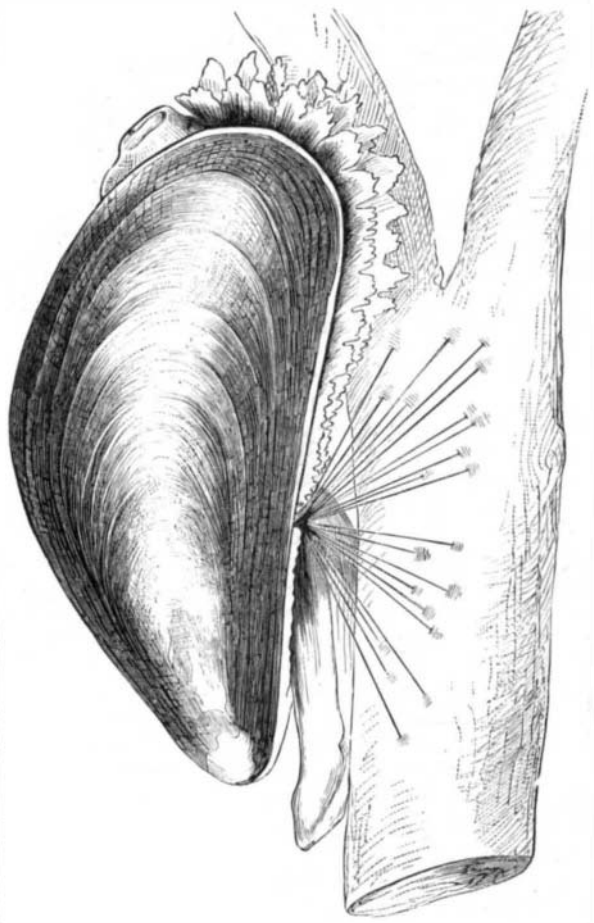


Fig. 2.—EDIBLE MUSSEL.—(*Mytilus Edulis.*)

sides of the mouth, F, will be noticed the long, narrow, folded tentacles, G; J is the exterior, I the interior respiratory muscle; E and D are muscles controlling the foot, B, under and behind the base of which is situated the byssus or spinning gland. From its cavity a groove extends along the lower side of the foot, and ends at its tip in a transverse cavity containing a small plate, perforated by seven small apertures, used for sucking.

By means of the foot and the byssean gland the animal is enabled to spin a net or barb, C, consisting of numerous thin threads, attached firmly to the surface of the rock or other object forming its abode. These threads are produced from a viscid liquid substance secreted in the byssean gland, which is sucked up into the apertures of the end of the foot and drawn out into threads, which become quite firm in a short time. Once attached to a rock or log they resist the action of the strongest current and the heaviest gale. Fig. 2 is a correct representation of the mussel as attached to a fixed object.

If the mytilus desires to change its residence it draws itself forward as far as possible, and attaches a few threads as far ahead as the foot reaches. At the same time a few of the old threads are severed. This manipulation is repeated until a suitable site is reached. Although this mode of locomotion is extremely slow, the animal nevertheless manages to traverse considerable distances in this manner.

The edible mussel inhabits, by preference, those portions of the shore which are laid dry at low tide; and in the neighborhood of the mouths of rivers, where the percentage of salt in the water is low, broad thick bands may be observed covering that particular section and marking it distinctly. Sometimes as many as 2,000 individuals have been counted on an area of one square foot.

As above mentioned, the animal prefers water containing only a little salt. It abounds, therefore, especially in those European waters cut off partly from free communication with the Atlantic, as in the German North Sea, the Baltic, and the Adriatic. They have also been acclimatized in the Caspian Sea, the water of which is not extremely salt.

In northern waters the edible mussel attains its full size in four to five years, and in the Mediterranean in one to two years. When they propagate each individual produces (they being hermaphrodites) millions of offspring.

Besides being almost indispensable as bait for certain fish, they are extensively used as an article of food. They are largely cultivated in all European waters, in so-called "parks." In the North Sea these consist of large numbers of trees, from which the smaller branches only have been cut, and which are planted in the bottom of the sea at such a distance from the shore that their upper portion is partially laid bare at low water. After four or five years they are raised, stripped, and replaced by others. In the bay of Kiel, Germany, alone about 1,000 of these trees are annually planted and about 1,000 tons of mussels are brought on the market. Bad seasons occur, however, both with respect to quality and quantity, owing to various causes. In the Adriatic the mussels are raised on ropes extended between poles rammed into the ground. The ropes are raised and stripped once in eighteen months.

American Sumac.

Dr. William McMurtrie, Chemist of the Department of Agriculture, has been making elaborate investigations as to the relative amount of tannic acid and coloring matter in American and Sicily sumac. He finds the American product, when properly gathered, to be fully equal to the foreign. Samples of Winchester, Va., sumac were collected in the months of June, July, and August respectively. Of these samples those collected in June and July were mixed varieties, and of the product collected in August we secured samples of the leaves of *Rhus glabra* and *Rhus copallina* separately.

In reporting his experiments Dr. McMurtrie states that in some of the tests the precipitates obtained by means of the solution of the June collections of Winchester mixed sumac were perfectly white and very much cleaner than any obtained with the Sicilian product. "The difference in the color of the precipitates obtained from the solution of the June collection and that obtained from solutions of the samples of later collections, was sufficiently marked to prove that the great difficulty in the way of the universal employment of the American to the exclusion of the expensive Sicilian product may be obviated by making our collections early in the season—that is, in the month of June. The percentage of tannic acid is not, it is true, quite as high as obtains in July, but it compares favorably with the Sicilian product, which, be it remembered, communicates a slightly yellowish tinge to the gelatine precipitate. The amount of coloring matter found in the July collection is sufficient to account for the difference of $50 a ton in the market values of the sumac of home and foreign growth, regardless of the proportion of tannic acid. We would therefore advise that, for the purpose of tanning white and delicately colored leather, the collection be made in June, while for tanning dark colored leathers, and for dyeing and calico printing in dark colors, where the slightly yellow color will have no injurious effect, the collections be made in July. It appears that for all purposes the sumac collected after the 1st of August is inferior in quality. In view of the facts here presented, we cannot help urging upon manufacturers the importance of encouraging the home production—of insisting that the collections be made early in the season, in order thus to bring about such a change in this matter as to prevent the annual expenditure of over $600,000 in gold for the sumac of foreign growth."

NEW AGRICULTURAL INVENTIONS.

An improved trap attachment for corn cribs, patented by Mr. Adam Harper, of Boswell, Ind., consists in combining with the raised and slatted bottom of the corn house a series of swinging side racks that rest inwardly on a subjacent floor.

Mr. James W. Rudolph, of Carmi, Ill., has devised an improved agricultural implement, that is adapted for both hoeing and digging, and is easily adjusted for either use.