Scientific Museum.

Cultivation of Cinnamon.

The Island of Ceylon is the great country for Cinnamon. This island is about 900 miles in circumference, and lies at the entrance of the Bay of Bengal. The first Europeans who settled there were the Portugese. The Dutch in 1551 took the island from the Portugese. In 1795 it was conquered by the British, in whose possession it has since remained. The natives are pleased with the government, and there is ample protection for all classes. There is an American Mission Station there, which has had success.

The cinnamon for which Ceylon has been famous, and which is well known to us all, is the inner bark of the *Laurus Cinnamonia*, a beautiful tree, attaining the size, and something the appearance of a moderately large pear-tree. To produce fine bark—such as is required for purposes of commerce—the tree must be felled, and the root forced to grow in shoots, straight and smooth. These being cut when eighteen months or two years old, a fresh supply of young sticks rapidly appears after the first rains.

The English Government possess five cinnamon plantations in Ceylon, containing in the aggregate about twelve thousand acres. These have nearly all been sold to private individuals, some of whom allow their estates to be very much neglected; others keep them in a a state of high cultivation.

The whole of the Ceylon coast is low and sandy, and generally favorable for the growth of cinnamon, which flourishes in a hot and damp atmosphere, such as is there found.

In former days, the cultivation, as well as the after preparation of the spice was exclusively carried on by one particular caste of Cingalese, called "Chalias," who had headmen, or petty chiefs, of various grades placed over them, belonging to their own body. This system is now partly changed, and the preparation is alone carried on by the "Chalias." This being their hereditary occupation, they are, as might be expected, very expert in their operations.

The "Chalias" are assembled at break of day in gangs of thirty, with a "Canghan," or native overseer of field work, over each. All are armed with a sharp, light bill hook, and a stout cord to tie up the sticks when cut. The European superintendant, having seen each gang properly equipped, accompanies them to the spot appointed for the day's cutting, to which they march in good order; each party is then placed, and, at a signal from the superintendent, the men, to the number perhaps of two hundred, rush among the bushes with loud shouts and cheers, and the work of destruction commences in good earnest. The peelers are paid according to the quantity of spice they prepare, and it may therefore be imagined how anxious each one is to secure a good bundle of sticks. By ten or eleven o'clock the peelers have cut sufficient cinnamon to occupy them in the barking process for the remainder of the day; and having collected all their sticks in bundles, they proceed to the "peeling house." They seat themselves cross-legged on a rush mat; and with a curiously-shaped little knife, strip the tender bark. It is scarcely to be believed how rapidly barking is performed. The little knife is first run down the stick on two opposite sides, from end to end, and then, by inserting the instrument at the thick part, between the bark and the stick, and running it quickly along, with a twisting motion, the long slip of fine bark falls off without a slit or blemish, an object very desirable if the quality be in other respects fine. When the sticks are all striped they are of no further use.

On the morning of the second day the wives and children of the peelers flock to the peeling-house; and seated in rows, commence scraping off the green cuticle from the heaps of bark slips, which are brought to them by the younger children, who also remove the scraped spice to the men. These begin by assorting them into three qualities, according to thinness of bark and brightness of color; the shorter pieces of each kind are set aside, to be placed in the interior of the pipe, while the longest are placed outside. The piping, or quilling, then commences, and by dexterous management, the peeler so selects his bark, that very little cutting at the ends is required to form them into their proper length. The quills are made into uniform lengths of three feet and a half, and three layers of the bark, or quill, inside each other. The greatest vigilance of the superintendant and his native assistants, is needed in this stage of the process; for much of the value of the spice depends upon the proper divisions into qualities, and, not less, upon the rejection of very coarse pieces; for it is to the interest of the peelers—who are paid by the weight—that as much as possible of the thick be placed in the quills; but the master's interest requires that as little as possible should be so hidden.

The bark having a natural tendency to curl up, requires but little rolling; and when made upon the second day, the pipes are laid out singly upon cords stretched across the upper part of the building. There they remain for two days, when they undergo a little more rolling up, or "handling," and are placed on stands outside, exposed to the action of the hot air, but carefully sheltered by cocoanut leaves from the rays of the sun.

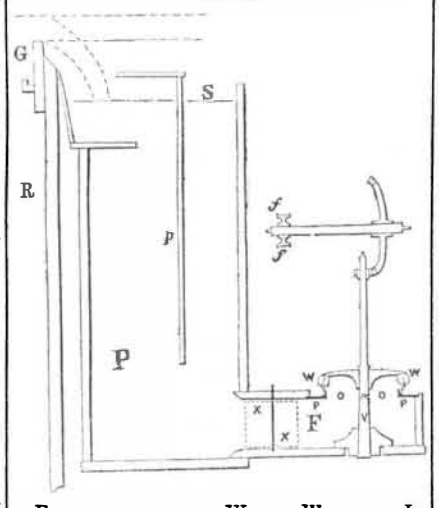
Three or four days of this open-air drying will generally suffice. The pipes are then piled upon light stands of wood for a week or two, when they are paid for. Each party of "Chalias" keep their cuttings separate; and a good deal of emulation often rises amongst them as to who shall turn out the greatest quantity of the finest kind, called "first sort."

For the Scientific American.

Hydraulics.

(Continued from page 264.)

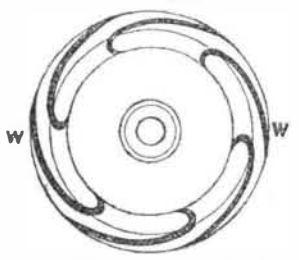
FIG. 47.



EXPERIMENTS WITH WATER WHEELS.—In 1844, a number of experiments were made by Z. Parker, of Ohio, upon wheels of various forms, and especially to test the advantage of introducing the water to the wheel with a circular motion in the direction of the motion of the wheel. We have selected two views from these experiments, one (fig. 47) is a vertical section of wheel, reservoir, and draught box; R is the reservoir; G is the guage; P is the penstock; F the flume conducting the water to the wheel; W is the wheel; O is a cylinder opening into the wheel; V is a pivot; X X are guides in the flume to direct the water to the right or left; *p* is a partition in the penstock to prevent agitation at the surface, S; there is a cast-iron plate, covering the end of the flume, through which are openings to the wheel; *f* is a friction pulley for a dynometer.

Fig. 48 is a section of the improved wheel, W W, across the axis, showing the forms of the curves and apertures. The wheels were of a fair size to test the qualities of the same, as a sufficient data for practical working in large works. The wheel represented was made of iron, and of good workmanship. The experiments were conducted with much care, and repeated and re-repeated with nearly uniform results. The power was measured by "Prony's Friction Brake," placed on a horizontal shaft propelled with bevel gearing by the vertical shaft of the wheel. The intensity of the force of the friction was measured by a hydrostatic balance, with a scale of weight measure, by which the variation of the 50th part of a pound was instantly detected. The water was drawn from a deep quiet reservoir over an open space gauge of 4 inches deep, and the discharge was proportioned to the length of the notch opened. The discharge was estimated by the formula Q=0·385, discharge per minute of cubic feet, ×D, depth of gauge notch in inches, ×L, length of gauge notch in inches. The head of water was 2,694 feet=32½ inches, counting the vertical height of the surface above the middle of the discharging apertures of the wheel.

FIG. 48.



This wheel, fig. 48, was 10 inches in diameter, had six discharging apertures of 9 square inches aggregate transverse section. The water entered upward though a concentric cylindrical opening, 9½ inches in diameter without circular motion. When running free it made 520 revolutions, and used 54·86 cubic feet of water in one minute. When resisted so as to make 340 revolutions in one minute, the weight raised 1 foot high in one minute, was 4,148 lbs., the discharge of water was 49·08 cubic feet. This was an experiment without the water having any circular motion when entering the wheel; the next shows the difference in the same wheel by the water conducted by a helical channel giving it a circular motion, coinciding with the motion of the wheel. The gate was drawn to admit 10½ square inches, and the discharge was 40 cubic feet per minute without wheel. When the wheel was resisted to make 300 revolutions per minute, it discharged 30·56 cubic feet per minute and lifted 3,600 lbs. one foot high. The co-efficient of this is 699; of the former, 497, a great difference. By letting on the water to the same wheel through the helical channel, but in a contrary direction to that of the wheel, the co-efficient was only ·019, discharging 26·75 cubic feet of water in one minute. The advantage of giving the water a previous circular motion was thus set forth in a clear unequivocal manner.

Geological Explorations in North Carolina.

The Salem "People's Press" contains two communications from Mr, S. W. Dewey, giving an account of his explorations in the counties of Forsyth, Surry, and Stokes, accompanied by specimens, for the Salem Museum, of jasper, alum stone, porphyretic and quartz crystals, (or mountain diamond) iron pyrites, lead ore, limpil, or crystal jasper, (a rare gem in the mineral kingdom, and chorl or black tommaline. The range of porphyry extends, he says, nearly twenty miles through Stokes and Surry, in which range lead and silver ore have been found, particularly on the lands of Chief Justice Ruffin, where two shafts, fifty feet deep, have been sunk within six months past.

Mr. Dewey says there is a most excellent mineral spring in the midst of this interesting region at the foot of Steel's mountain, in Stokes, at a place commanding a fine view of the whole chain of the Sauratown mountains, the Pilot or Mount Ararat, and other interesting points, the sight of which would well repay the expense and trouble of half a dozen voyages across the Atlantic in our bird-like steamships.

Adulterations in Food.

The London Lancet has done the British public some service by pointing out the adulterations in flour and other things used for domestic purposes. About mustard it says, 'out of 42 samples purchased indiscriminately, the whole were adulterated with immense quantities of wheaten flour, highly colored with turmeric, the specimens in tinfoil packages, and labelled "Fine Durham mustard," or "double superfine," containing with the exception of much husk, scarcely anything else. In connection with bread and flour, the conclusions arrived at were unexpected. Out of 44 samples of wheat flour (including several of French and American) purchased in all quarters of the metropolis, not a single instance was detected of admixture with any other farina, or of the presence of spurious matters of any kind. It is admitted, therefore, that millers and corn dealers are somewhat maligned. As respects bread, however, the results were not so favorable. Although its adulteration with alum is an offence liable to a penalty of £20, this material was found in every one of the samples examined, the object for which it is used being to give bad flour the white appearance of the best, and to enable the bread made from it to retain a larger proportion of water, so as to gain in weight. The number of samples was 24, and in 10 of these the quantity was very considerable.

LITERARY NOTICES.

BYRNE'S MECHANIC'S POCKET COMPANION.—Dewitt & Davenport, publishers, New York. This is a very handsome pocket compendium for mechanics and engineers; edited by Oliver Eyrne, C. E., and published by the above firm. It is a most creditable production; in fact, we believe it is the best of the kind that has ever been published. It has three very excellent engravings of Steam Engines, viz., Locomotive, Steamboat, and Stationary, with a description of their parts. It contains a description of mechanical powers, the use of logarithms, wheelwork, how to measure superfices and solids, &c.; in fact it is full of everything useful. It has a Universal Thermometer scale at the end, which makes it exceedingly valuable to almost every person. The price is $1; it is well bound, gilt edge, and has a pocket lap. It can be had at this office.

HARPER'S NEW MONTHLY MAGAZINE, for May, is a superb number, containing several beautiful illustrations of the Novelty Works, this city; besides this feature, the literary contents are of the highest order. The publishers are determined to spare no pains or expense in making it the first journal of literature extant; up to this time it has no superior.

THE INTERNATIONAL MAGAZINE, for May, contains finely executed likenesses of Geo. Wilkins Kendall, chief editor of the New Orleans Picayune, and Nathaniel Hawthorne, author of the "Scarlet Letter," etc. Among other illustrations we notice "The Washington Monument," "Washington's Tomb," "Hogarth's House and Tomb," besides others of interest. The literary papers are of the first class. Each number of this magazine contains 144 pages and is furnished for $3 per annum. Stringer & Townsend publishers, 222 Broadway, N. Y.

THE DOLLAR MAGAZINE, published by E.A. & G. L. Duyckinck, 109 Nassau st., has appeared for May. It is conducted with consummate tact and should be well patronized. There are many families in this country who do not feel able to pay out $3 for a magazine, to all such we say, that "The Dollar Magazine" is just the work to meet your wants.