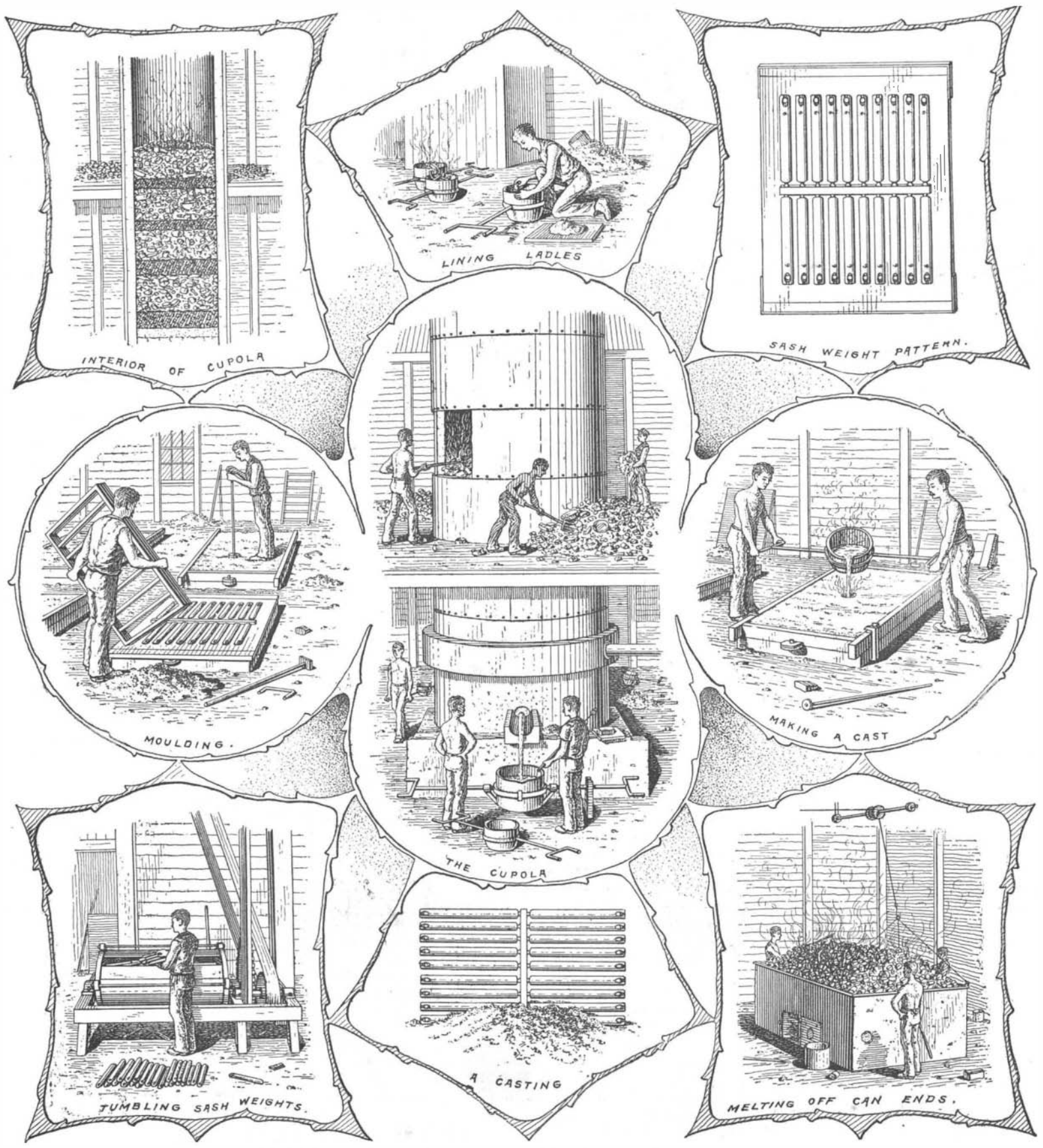
**MANUFACTURE OF SASH WEIGHTS FROM OLD TIN CANS.**

A great number of the sash weights used for windows, dumb waiters, etc., are made from old tin cans and scrap tin. The cans are gathered up by the weight manufacturers from the public dumps at very little expense. New scrap tin from stamping manufactories costs $2 to $4 per ton. The tin cans before melting have the solder extracted by heating them over a brick furnace. The cans are placed on a screen made of heavy wire, which rests on top of the oven. A quantity of crude oil, enough to wet them thoroughly, is thrown on them, and the oil set on fire, the heat of which melts off the tops and bottoms of the cans. The solder drops down on a pan below the screen and runs off into a receptacle to be moulded into bars of moulding sand, which prevents the molten metal from burning out the iron bottom. In starting the fire in the cupola, about one ton of hard coal is used, on which, thrown in from above, is about 6 feet of tin material. A layer of hard Pittsburg coke is then placed on top of the tin to the depth of about a foot, and then another layer of tin, the same operation being repeated until the cupola is filled to the door above. From 400 to 500 lb. of black or petroleum coke is thrown in occasionally to keep up the required heat. Steel forks are used for handling the tin material, it requiring the constant labor of three or four men to keep up the supply in the cupola. The black coke used is made of a mixture of soft coal dust and waste petroleum, the two ingredients being baked in pattern is removed, leaving the impression of the weight in the sand. The upper flask is then replaced and the two flasks clamped securely together ready for the cast. The pattern board is about 4 feet in length, about 2½ feet in width, and about 1 inch in thickness. From 12 to 36 weights are cast in each mould, the quantity of metal required weighing from 150 to 200 lb. The ladles used for carrying the molten metal to the moulds have to be lined with sand and burned. This is performed by covering the interior of ladle with wet sand to the depth of an inch, and baking it hard by means of a wood fire for about one hour, the object of lining being to prevent the hot metal from burning through the ladle. When the moulds are all ready, the molten material is run out of the mouth of

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again for the market. As soon as the bottoms of the cans are loose, the attendants beat them with clubs, causing the parts to separate. They are then dumped out on the floor by means of a pulley which lifts up one side of the screen, and then taken to the cupola to be melted. The cupola, in which the cans are melted, is about 75 feet in height and about 6 feet in diameter, and made of 4 foot sections of boiler iron, the interior lined with 8 inches of fire brick. The cupola stands on four iron pillars which rest on a concrete foundation. The air blast passes up through the bottom of the cupola by means of a blower, the air first passing through a 12 inch pipe and into a wind box about 19 inches in height and 10 inches in width, which encircles the lower part of the cupola. From the wind box the air passes into the furnace by means of 19 tuyere holes 4 × 4 inches square. The bottom of the cupola on the interior is coated with about a foot ovens and broken up into small chunks. The sash weight patterns are made of white pine, one-half of the weight pattern being nailed directly opposite the other on each side of what is called a cardboard. On each board from two to three sets of patterns are placed in rows about ¾ of an inch apart, a strip of wood or gate to which the ends of the weights are fastened separating the sets from each other. The weights when cast range from 13 to 30 inches in length, and from 1¼ to 2¼ inches in diameter, and weigh from 5 to 30 lb. each. A mould is formed by placing the pattern board, which has been sprinkled with parting sand, between an upper and lower flask, the moulding sand being packed or pressed first in one flask and then the other. After the flasks have been properly filled with sand and leveled off, a gate running into the mould below is formed in the top flask. By lifting off the top flask the cardboard or the cupola through a two inch hole into a large ladle holding about 1,500 lb.. from which the small ladles are filled. Each small ladle holds about 200 lb. of the hot material, which is taken away as soon as it is filled by two hands and poured into a mould, the operation taking about one minute. After cooling, the castings are turned up on end, and each weight tapped off the gate, which holds them together, with a hammer. They are then placed within an iron tumbler or cylinder about 5 feet in length and about 3 feet in diameter, for about one-half to three-quarters of an hour. About 2 tons of the weights are placed in the tumbler at a time, the revolving of which, at the rate of 60 revolutions per minute, rubs off the sand and smooths the rough edges. About 1,600 lb. of iron is secured out of every ton of tin. The sketches were taken from the plant of the United States Foundry Company, Jersey City, N. J.

### The Remora or Sucking Fish.

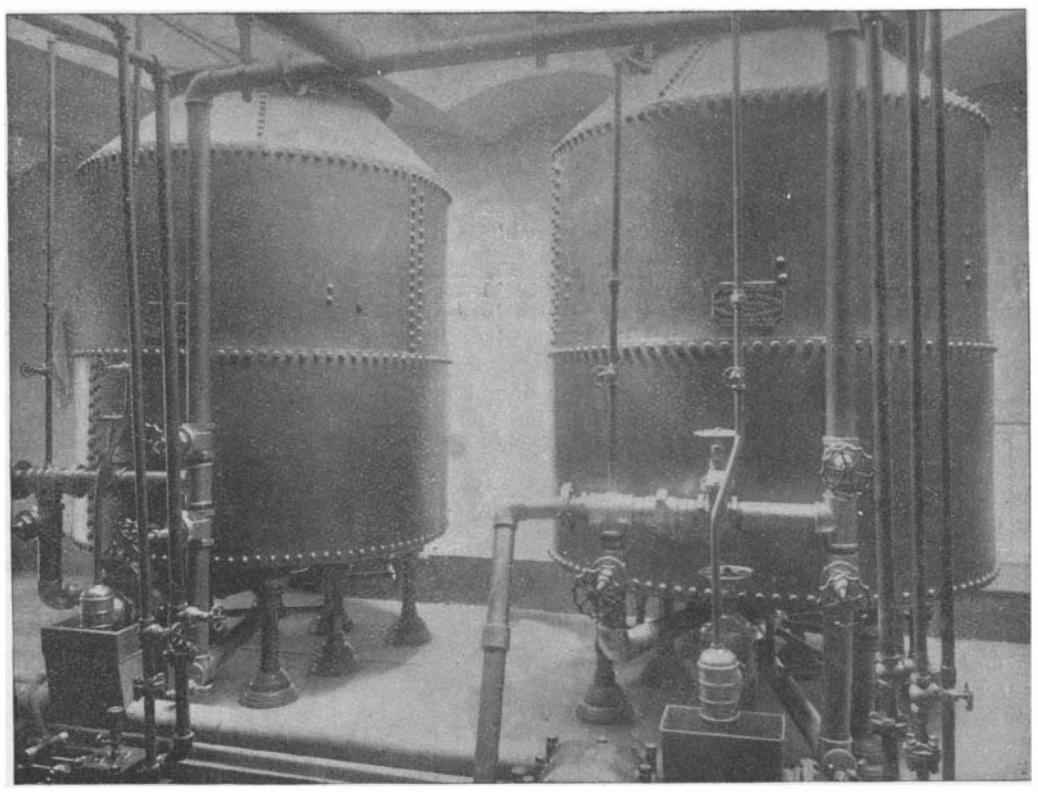
A striped remora, or sucking fish, was found recently attached to the bottom of one of the steam launches which run around Glen Island, says the New York Sun. It was transferred to one of the large tanks of the Glen Island aquarium. The fish, though not rare, is a deep sea fish, and is hard to capture. It grows to the length of twelve to eighteen inches. The flat top of its head is surmounted by a large sucking disk extending from near the tip of the upper jaw to the ends of the pectoral fins, or about one-third of the total length of the fish. The disk is made up of seventeen or eighteen pairs of bony laminæ, the edges of which are furnished with rows of minute tooth-like projections. With this disk the fish attaches itself to a shark, a turtle, or some other larger fish, and is in this manner drawn through the water without the exertion of swimming. Occasionally it will release its hold long enough to swim off and get something to eat, but immediately returns to refasten itself.

The South American Indians make use of this instinct of the fish to catch sea turtles. They fasten a ring around the remora's tail to which they attach a long line. The fish is then taken to sea, and when a large turtle is sighted the remora is thrown overboard. It unerringly swims to the turtle and makes fast. The line is then drawn in, and soon both turtle and remora are in the boat. It is necessary, however, to wait until the fish feels inclined to let go, for it is impossible to detach it from the object by force without injury.

### THE CARTER PRESSURE WATER FILTER.

This filter, patented in 1890, represents many years' labor and experience of its inventor, Mr. James Carter, and its successful introduction, within the past five years, in so many places where large quantities of filtered water are needed, affords the best possible attestation of its merit. Our illustration represents two of these filters built especially for the new aquarium at Castle Garden, New York, and said to be the only Tobin bronze filters in the world. They are non-corrosive by the action of salt sea water, and have a daily capacity of one hundred thousand gallons each. Two other Carter pressure filters, made of sheet steel, and having a daily capacity of fifty-five thousand gallons each, are used for purifying the fresh water in the aquarium and throughout the building.

These filters are built by the Field Force Pump Company, of Lockport, N. Y. The filter comprises a smaller inner and a large outer cylinder, the latter being nearly filled with a good filtering sand, and the water is taken in at the bottom and forced upward through the central cylinder, at the top of which it passes in a thin sheet over into the top of the larger surrounding cylinder, where it is evenly distributed over the filtering material without channeling and without diminishing the pressure. In the top of the filter is a chamber in which is held a coagulant, such as alum crystals, and at the bottom of the chamber, immediately over the central cylinder, is a corrugated cup adapted to deliver a small amount of the coagulant, or a larger amount may be delivered when the water is quite roily, the effect being to precipitate the impurities, so that they will be effectually arrested by the filtering materials. The water, after passing down under pressure through the filtering bed, issues through strainers into a delivery pipe, clear and sparkling, and freed from all impurities. To clean the filter, which should be done about once every twenty-four hours when water is being constantly passed through, is but a matter of a few minutes, and requires only the shutting off of two cocks and the opening of two other cocks. By this means the flow is reversed, and all the impurities that have been arrested by the filter bed are carried backward through the central cylinder and discharged into a sewer or waste pipe. The filter may be located in the basement or cellar, and connected with the street water mains, when all the water passing through the house will be automatically purified. These filters are particularly adapted for use in hotels, laundries and large buildings.

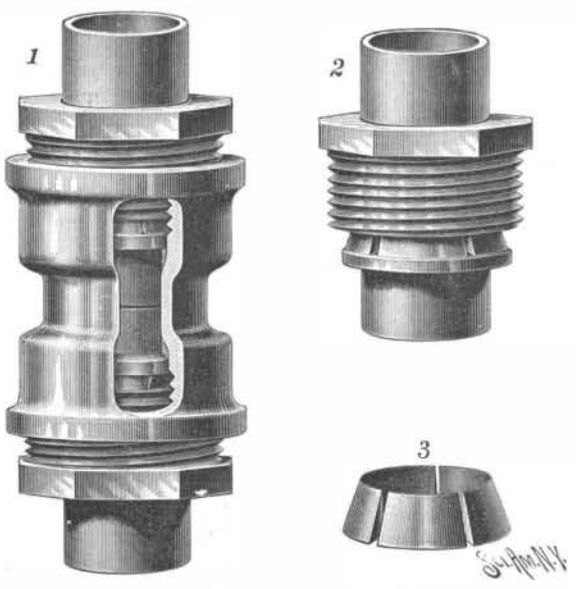


TOBIN BRONZE SALT WATER FILTERS OF THE CASTLE GARDEN AQUARIUM.

IT has been ascertained that ammonia in the air is the main cause of flowers losing their tints and colors In order to preserve them in their natural state, as nearly as possible, they should be preserved between paper that has been previously saturated in water having one per cent of oxalic acid.

### AN IMPROVED PIPE JOINT.

The illustration represents improved means of uniting pipes without threads cut on their ends, and without solder, calking or flanges. The improvement has been patented by Michael Sexton, of No. 1112 Third Avenue, New York City. As shown in Fig. 1, a sleeve, whose central portion is cut out to show its application, is placed over the abutting pipe ends, and into the internally threaded ends of the sleeve screw the




SEXTON'S PIPE JOINT.

exterior threads of collars fitting over the end of each pipe, as shown in Fig. 2. These collars are beveled at their inner edges, and engage beveled split rings, as shown in Fig. 3, the base or inner ends of the rings abutting on washers resting against packing rings seated on the beveled sides of an annular depression near the middle of the sleeve. When the collars are screwed up in the ends of the sleeve, their inner beveled ends move the rings inward against the washers and at the same time compress and fasten the rings upon the pipe surfaces, forming a friction joint, and providing a very good fluid-tight connection inside the coupling.

### Mosquitoes that Overcome Man.

Gold in plenty may be found in the sands of the Volador River—a stream of moderate volume that falls from the snow line of the Sierra de St. Martha in South America; but though the lowland region and the river bed where the precious metal abounds in fabulous quantities are easily accessible, the mosquitoes are so thick and terrible there that all attempts to rifle the sands of their gold have so far failed. Elisée Reclus, the celebrated French geographer, was the first to explore the plain about the Volador's mouth. He had thought of establishing an agricultural colony in the fertile lowlands, but found the plague of insects so unbearable that he was forced to beat a retreat and abandon his project. He was the discoverer of this wonderful stream, whose waters sweep over sands which are literally golden. He told the news to the French vice-consul at Rio Hacha, and this official obtained the concession of this Eldorado. The dangers he was to encounter he knew perfectly well. He took with him when he set out an ingeniously constructed gauze tent of large dimensions. For two days he tried to live under its shelter and watch the operations of his workmen, who toiled in the stifling heat, clothed in thick garments, and protected by heavy boots, gloves and veils. At the end of the second day both employer and employes gave up the struggle and retreated. The next who tried to wring fortune from these auriferous sands was an Italian, who obtained permission from the vice-consul. The Italian laughed at the idea of mosquitoes driving any one away from a place where gold could be picked up almost by the handful. He started out with a party of six who shared with him his belief, and so they took along no special protection against the insects. They endured for less than half an hour the awful torture, and then left. They found their way back to Rio Hacha with difficulty, for the eyes of five were so badly swollen that they were blind. Yet there are human beings who can venture with impunity into this gold mine whose guardian demons are mosquitoes, and these are some of the savage natives of the mountains from whose rocky steeps the river falls. These savages, who are mosquito proof, are rendered so by their bodies being covered with the scales of leprosy. Strange to say, the mosquitoes will not touch them. But neither gold nor the fascination of civilization will tempt them to labor. It is an old and true saying that one might as well try to get along without furs in the Arctic regions as without mosquito nets in the tropics.

### Gold Production.

The summing up of 1894 showed a total production in round figures of $180,000,000, an increase of $23,000,000 over 1893. This yield was about $30,000,000 greater than the product of any year when the placer mines of California and Australia were at their maximum. The indications now point to a yield of $200,000,000 for the calendar year 1895, another increase of $20,000,000, and an increase of $43,000,000 in the annual output in two years, and of $54,000,000 in three years. As the annual supply of gold is not used in the year, but is mostly added to the pre-existing sum, it follows that the world's stock has been increased in the three years named by the enormous sum of $537,000,000.

The consumption of gold in the arts is undoubtedly increasing generally, although there was a marked diminution of such use in the year 1894, owing to the hard times. The use of gold for purposes of adornment, which is almost its only use except as money, rises and falls according to the prosperity of the nations. It is an article of luxury. These uses in the United States, according to the calculations of the mint, were about $19,000,000 in 1893, but fell to $13,500,000 in 1894. Very likely the consumption of the present year will equal or exceed that of 1893. On the other hand, the product of the gold mines of the United States, according to the estimate for 1895, will be $46,000,000, against $39,500,000 in 1894. The South African product is estimated at the same figure as that of the United States, $46,000,000; that of Australia at $43,000,000, and that of Russia at $29,000,000. These four countries produced three-fourths of the world's annual yield.

### The Spider Plant.

Travelers who visited or passed the Cape Negro country of Africa often heard from the natives of a plant that was part spider, and that threw its legs about in continual struggles to escape. It was the good fortune of Dr. Welwitsch to discover the origin of the legend. Strolling along through a wind swept tableland country, he came upon a plant that rested low upon the ground, but had two enormous leaves that blew and twisted about in the wind like serpents; in fact it looked, as the natives had said, like a gigantic spider. Its stem was 4 feet across and but a foot high. It had but two leaves in reality, that were 6 feet or 8 feet long, and split up by the wind so that they resembled ribbons. This is probably the most extraordinary tree known. It grows for nearly if not quite a century, but never upward beyond about a foot, simply slowly expanding until it reaches the diameter given, looking in its adult state like a singular stool on the plain, from 10 feet to 18 feet in circumference.

When the wind came rushing in from the sea, lifting the curious ribbon like leaves, and tossing them about, it almost seemed to the discoverer that the strange plant had suddenly become imbued with life and was struggling to escape.