

THE ROYAL PALMS OF CUBA.

Not only is the climate of Cuba favorable to the planting of crops whenever the farmer chooses to plant them, and the lands so rich that no fertilization is ever required, but Nature seems to have, with a beneficent hand, reared many strange trees and plants to supply the wants of man without the necessity of his planting them himself. First among these are the palms, some twenty-six varieties of which adorn the fields of Cuba, giving shade, food, and life. At the head of these stands the royal palm.

Since the time when Columbus discovered America the regal or "royal" palms have been admired by all that have chanced to view them. Their designation of "regal," however, obtains to two different species, viz., the *Oreodoxa regia* and *O. oleracea*, the first being rather more sparingly distributed than the second, though both range within limits from 40° north to 35° south latitude.

O. regia as named by Humboldt and Kunth, the *Oenocarpus regia* of Sprengel, and the "palma real de la Havana," is one of the most common palms in Cuba, where it is frequently employed for the making of avenues, a purpose to which it is admirably adapted; it has also been introduced into Teneriffe. It is the extent, regularity, and unrivaled beauty of this species that have rendered famous the long avenue in the Botanical Gardens of Rio de Janeiro. Here they form a colonnade of natural Corinthian columns whose graceful, bright green capitals reach forty yards above the ground.

The royal palm consists of a tall, straight trunk of a very fibrous nature and supports a cluster of tennated leaves like a bunch of plumes on a long stick. The leaves are large and leathery. These leaves continue to grow from the center to a great length. When the leaves cannot grow any more, they drop to the ground from the bottom of the cluster, thus making room for the new ones which are always coming out of the center.

It also yields in the proper season yellow flowers which are somewhat singular in that they possess both stamens and pistils, the majority of the palms being unisexual. The fruit cannot be eaten. The stem of the long leaves is peculiar. It is semicircular, and embraces the trunk of the tree and holds the leaf in place until it withers and drops to the ground. It resembles a thin board and is often of great size, and it has a number of uses. The trunk of the tree is without any bark and its center is very porous, increasing in density toward the outer surface. From the hard outer shell of the trunk canes are made. The bud or root of the center spire from which the leaves grow consists of a tender substance buried deep down within the cluster of the green leaves, and forms a very palatable food either in the raw state or cooked as a vegetable. It is also made into a preserve with sugar. The royal palm is one of the most common of all the trees in Cuba. It is met with everywhere, and in the center of the broad pasture lands it often stands alone. Bordering the cultivated fields of rich planters, it forms shade avenues which lead to the dwellings.

The "cabbage" palm (*O. oleracea*), equally straight-stemmed, rises to even greater heights; some seen by Seeman measured 170 feet, and but little less are the giants that form a magnificent avenue on "the Savannah" in Cayenne, French Guiana. It certainly is one of the loftiest of the family; and a variety denominated *O. frigida* is remarkable for the high elevation of its habitat above the sea, and was altogether unknown prior to the time of Humboldt's and Bonpland's travels in equinoctial Ame-

rica. The title, "cabbage," seems to be derived from the fact that the heart is often boiled, after the manner of this garden vegetable, and served upon the table; sometimes is made into pickles. It is possessed of many other economic values also. When the lower

Garden in Havana; but it is dark, and soon wearies the eye with its monotony of color. No such beautiful shades are seen as accrue to the maples, elms, and hickories of the North. But then everything is on so gigantic a scale, even to the creeping and running plants. Palm leaves ten, fifteen, even twenty feet in length are by no means uncommon; the leaves of other trees even exceed thirty feet, and the fact may not be generally known that it is the condensation of moisture upon the enormous foliage of the forest growth on the top of the Corcovado Mountain that supplies the city of Rio de Janeiro with potable water; from the leaves it drips into collecting basins, thence is carried to the consumers through the great aqueduct of Alcantara.



TYPICAL AVENUE OF THE ROYAL PALMS OF CUBA.

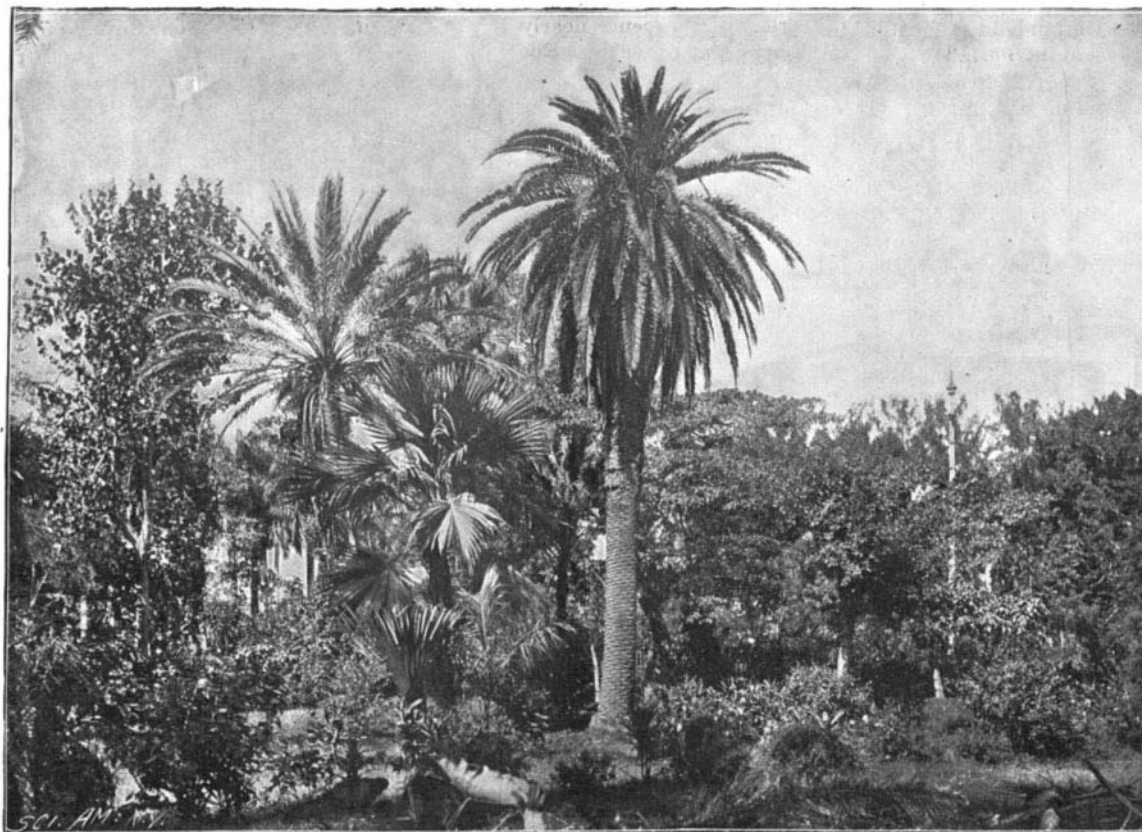
leaves drop, the broad part of the foot stalk forms a hollow trough, frequently utilized as a cradle for their offspring by negro mothers; when cut up it makes excellent splints for the treatment of fractures; the inside of the green leaves, stripped off and dried, affords an excellent substitute for vellum, and the tender pellicle on the inside of the foot stalks answers the purposes of writing paper; the pith makes a variety of sago. Finally, the wood of the trunk, which is very close and hard, split longitudinally, is extensively employed for gutters, but is too thin for any other purpose save, perhaps, the manufacture of canes.

Tropical foliage is always luxurious and rich, an ever increasing wonder to those living in temperate climates, as witness the scene taken from the Botanical

lemens. There is no question that if labor leaders could once be educated so as to give them correct ideas of the great laws which make up political economy, they would be qualified to so lead the laboring men that there would be less misunderstanding and friction and the results would be highly beneficial, for in nearly every case it is the laboring man who suffers by disputes.

The Subway Explosion Verdict.

The first of the suits caused by the explosion in the Boston Subway, at the corner of Boylston and Tremont Streets, on March 4, 1897, was decided in the Superior Court of Boston on December 31, and it resulted in a verdict of \$3,000 against the Boston Gas Company. The case began on November 9, and has occupied every court day from that time to the time of the decision, and is the longest trial on record in Boston. The amount involved was only \$10,000, but the suit is regarded as quite important on account of the large number of other cases which are pending. There are more than seventy suits, in which damages aggregating probably \$1,000,000 are claimed on account of deaths and injuries sustained in the explosion. We were fortunately able to obtain photographs taken in a very few minutes after the explosion, and these photographs are published in the SCIENTIFIC AMERICAN for March 20, 1897.

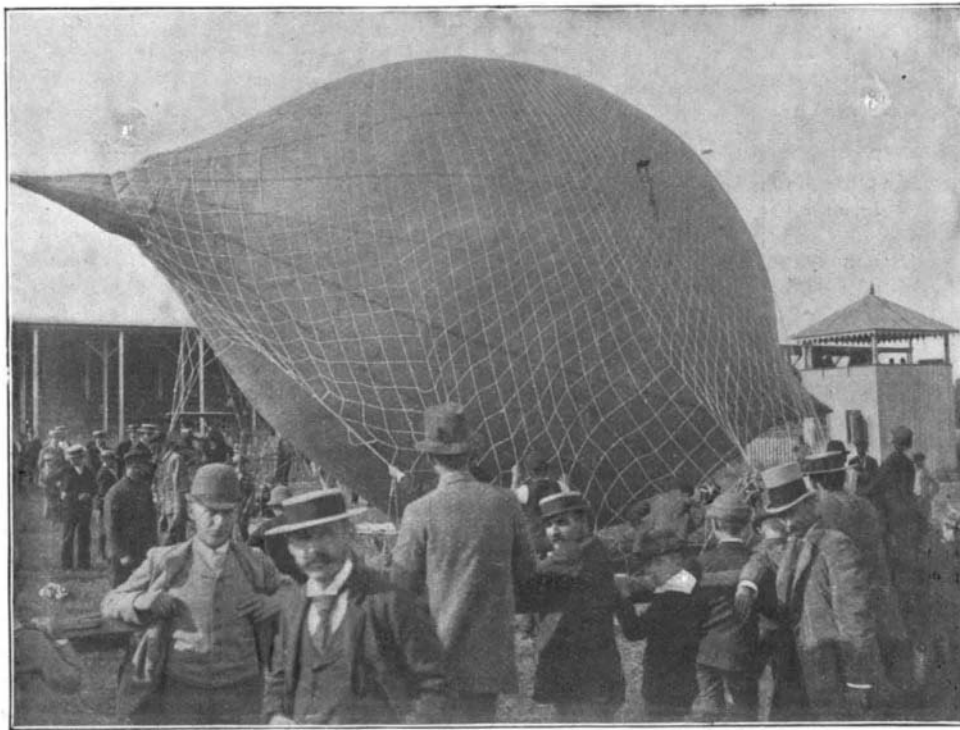


TROPICAL GROWTH IN THE BOTANICAL GARDEN, HAVANA.

PROF. O. C. MARSH, of Yale University, one of the leading scientific men in America, has been honored by election as correspondent of the Academy of Sciences, at Paris.

Taste and Smell.

While the physics of the senses of sight and hearing have attracted the attention of many philosophers, and have been elucidated by numerous ingeniously contrived experiments, those of taste and smell have been comparatively neglected. The very phraseology by which we are accustomed to describe the impressions which we receive through these portals of sense is indefinite, obscure, and uncertain. There are, indeed, several terms which would call up corresponding sensations in regard to the sense of taste, such as sweet, acid, alkaline, oily, and mawkish, but our vocabulary is small in calling up sensations of smell, and is almost limited to such general terms as pleasant and unpleasant, pungent and aromatic, fetid and fresh, which have none of the definiteness or precision that the terms blue or green possess in ordinary conversation or that the expression treble G gives to the musician. Our memory of odors is in general very imperfect. Attempts have been made, but not very successfully, to establish a gamut of odors, and it is difficult in many instances to dissociate the senses of smell and taste. Cuvier observed that these two senses are nearly allied to common sensation. In those animals which are only capable of breathing through the nose, like the horse, the extent of surface ministering to the sense



READY FOR THE ASCENT.

AIR SHIP EXPERIMENTS.
To the Editor of the SCIENTIFIC AMERICAN:

Interest excited by illustrations of Dr. Danilewsky's dirigible flying machine in SCIENTIFIC AMERICAN, December 31, 1898, may be increased by acquaintance with my experience with kindred apparatus extending over ten years in time and a large portion of the United States in space, the air vessel used being originally known as the gas kite and later as the "skycycle." The gas kite was a boat-shaped gas bag, inverted, as shown, while inflating, and floating with its flat deck surface acting as a kite drawn forward by a screw propeller, as shown in two other views.

The mechanism is shown in annexed engraving and consists of a bicycle seat, below which are foot cranks or pedals which connect by shaft and gearing with hand cranks, replacing the ordinary steering bar of a bicycle, so that the whole effective muscular effort of the rider may be conveyed to the screw shaft projecting forward to revolve a "screw sail" 15 feet in diameter.

To permit of swifter revolution and avoid accidents in landing, this screw sail was later reduced to about 8 feet diameter. The gas vessel was next made more symmetrical by uniting two such vessels, deck to deck, forming a spindle, as in perspective view, showing the aerial torpedo about to be launched.



OPERATOR'S SEAT AND PROPELLING MECHANISM.

which has no smell to man, can be perceived by some animals at considerable distances. Sexual odors appear to be peculiarly expansive. Scarpa found that if he plunged his hand into water after handling a female toad, the males were attracted to him. Insects, and especially those of nocturnal habits, are guided to each other by their emanations. Judging from the actions of animals, the odors of plants are only in rare instances, as in the case of valerian by the cat, perceived or at least enjoyed by the carnivora. Putrid meat is devoured by the vulture and jackal, though it is not touched by many flesh-eating animals that feed on living prey, while it produces a kind of convulsion in many horses and madness in the bull.—Lancet.

The Growth of Our Public Libraries.

The phenomenal increase in the growth of public libraries in the United States, which began some thirty years ago, continues to excite the surprise and interest of European students and statesmen, who regard such libraries an important adjunct to the American system of public education. Consul-General Du Bois, St. Gall, Switzerland, says that the United States is now teaching many useful things to the old world in the way of educational advancement and commercial progress, and now we are no longer regarded as a nation whose chief aim is the making of money, but are recognized as a potent element in the higher civilization.

The Swiss press frequently contains intelligent articles on our public school systems, colleges, universities, libraries, charitable institutions, etc. Albert Schinz writes in the Lausanne Bibliothèque Universelle et Revue Suisse that not only does the United States publicly contribute five times as much annually for public library purposes as does any other nation in the world, but it spends nearly as much annually for educational purposes as do England, France and Germany combined.



SPIRAL DESCENT OF THE "SKYCYCLE," SHOWING POSITION OF SCREW, SAIL, AND PLANES.

of smell is immense as compared with that of man. A large area of the nasal cavities is covered with mucous membrane which is thick in both, studded with numerous acinous glands, covered with stratified ciliated epithelium, supplied by the fifth pair of nerves, and is probably dedicated to other functions than those of smell, as, for example, the warming and moistening of the air, and its purification from dust before entry into the lungs, and a large portion also of the upper region seems merely to act as a periosteum to the frontal and ethmoidal cells, and to possess but a small share of special sensibility. The turbinal bone, on the other hand, the volutes of the ethmoid, and a considerable area of the septum between the nostrils, is covered with a thin, yellowish-red membrane, the epithelium of which is unprovided with cilia, to which the branches of the olfactory nerves are distributed, the ultimate fibrils being traceable to the very surface, covered only by a thin layer of fluid and being well placed therefore for the perception of delicate impressions. Common observation shows that while man is capable of perceiving a great variety of odors, many animals surpass him in the acuteness of their perceptions. The nature of these emanations probably varies considerably. Water,



THE "SKYCYCLE" AT THE HEIGHT OF A QUARTER OF A MILE.