partake more of the characteristics of the Negro than Indian. Besides weaving baskets and fishing they raise patches of yams, casava, bananas and the like. A few fled to Trinidad when the volcano Sonfriere erupted.

The black Caribs, it is said, originated in this way: A slave ship was wrecked on the Island of Bequia. Those who escaped, together with other runaway slaves, captured Indian wives. Their progeny is the so-cailed "black Carib." They increased rapidly, became troublesome and finally occasioned much bloodshed. In character they were not unlike the Jamaica Maroons, the offspring of runaway slaves, who have lived for many years in the secluded valleys of that rugged island.

In October, 1776, the last Carib war was fought. Five thousand and eighty men, women and children were removed to the Island of Balliceaux from St. Vincent. The following year they were shipped to the Spanish main, but owing to revolutions, having had enough of wars and quarrels, many drifted to the coast of British Honduras to seek peace and protection under their former masters, the British.

In Balize they call themselves "Karifs." Such a name serves well to distinguish them from the Caribs of pure Indian blood.

During the past winter the writer came much in contact with the Karifs on the coast of Honduras. He left the beautiful Island of Cozumal, famous for its healthfulness and its fine-flavored tobacco, and coasted for several days along Yucutan and Honduras. The only boats passed were fruiters, fishermen carrying their catch alive in tanks to Havana, and a Norwegian bark with a load of mahogany. One looks longingly toward the site of ancient Tuloom and pictures in his mind what ruined cities may be hid in the forests of that unexplored wilderness. Although these waters are of much interest and beauty, one is menaced by constant danger, since to be cast on the reefs on one side means certain destruction, or to be washed on the sandy shore of Yucutan on the other is to fall into the hands of very hostile Indians. One draws a freer breath when he reaches the coast of Honduras. It was Christmas night when the writer arrived at Belize, the capital.

The mahogany cutters in large numbers came in from the forests, and the Karifs from the neighboring coast villages paddled into town in their light piroques. The array of color in this collection of types and rabble of merry-making people was dazzling. The moonlit streets resounded with the cries of drunken woodmen. Gaily dressed musicians marched up and down, followed by a horde of merry men and women and half-dressed children. The players rattled the loose teeth in the jaw-bone of a donkey, rubbed a piece of tin over an old cassava grater, played home-made guitars, rattled bones and beat tam-tams. Many were singing a strange melody to the tune, half humming, half pronouncing words in an unintelligible patois and keeping time by wiggling their bodies.

The festivities over, the Karifs left for their homes, and the city resumed its usual peaceful silence.

In British Honduras there are about 32,000 people; 14,000 of these constitute the Spanish element (that is, Spanish and Indian and pure Indian); there are about the same number of negroes and mulattoes; 3,000 Karifs; and 1,000 Europeans and others. The coast is mainly inhabited, the interior being mostly an unexplored wilderness.

The colored population (that is, negroes and mulattoes excluding the Karifs) are very influential citizens in Belize. Many own considerable property and marry whites. They are called Creoles, which wounds the pride of the Louisiana Creoles, since they profess to be of pure French or Spanish extraction.

The Karifs live in huts made of pimento slats covered with mud and thatched with the leaves of the Cohune palm. They hunt, fish and grow cassava, yams and maize. They also raise cocoanuts and bananas, which they sell to fruiters.

The women wear nothing but a loose, sleeveless chemise of white cotton, which reaches to their knees, and a kerchief picturesquely tied around the head. The men wear a cotton shirt, pants and straw hat.

Under the refining influence of English rule, with schools, churches, hospitals, and especially the absence of American missionaries and color prejudice, they are rapidly improving.

PROFESSOR LANGLEY ON THE INTERNAL WORK OF THE WIND.

BY C. F. AMERY, CLINTON HALL, NEW YORK CITY.

IN the current number of the *American Journal of Science* there is a paper by Professor Langley, entitled "The Internal Work of the Wind," in which he gives the results of some very interesting observations on the extreme fluctuation in the horizontal speed of the wind as recorded on a light anemometer, at intervals, not of minutes, but of a few seconds only. He finds, for instance, that a conventional twenty-mile-an-hour wind will continually range from ten to thirty-miles an hour, at intervals of twenty seconds, occasionally rising to thirty-five miles an hour, or falling to a momentary lull. From these unexpected facts the Professor argues for such a necessary turmoil in the atmosphere as appears to him to furnish the factor necessary to afford an intelligible explanation of the otherwise apparently inexplicable problem of a heavy body, like a vulture, circling for hours aloft, without wing-motion or apparent effort of any kind. Further, the Professor regards this "internal force" of the atmosphere as a factor of so much importance in aeronautics that he ventures the prediction that the aerodrome of the future, by the mere change of the inclinations or aspects which it presents to the wind, will be able to achieve long journeys, even to circumnavigate the globe, with the expenditure of no more energy than is required for the necessary adjustment of its inclinations to the changes of the medium it floats in, except during calms.

Anything published by Professor Langley as the result of his careful deliberation is entitled to respectful consideration, but in the present instance I venture the assertion that he is being led away by a fallacy from his true line of investigation of this very interesting problem. His point of departure is, I think, easily traceable to a sentence embodying the expression that it would be impossible for a bird to circle in the effortless manner exhibited by a vulture under his notice, if the winds had been mere horizontal currents. This is an unsupported, and I believe it is a mistaken assumption; but leaving this for the present, I will first deal with what I consider the mechanical heresy involved in his prediction of the capabilities of the aerodrome of the future. Direct onward flight and circling involve some differences of mechanical principle. The eagle can circle upward with rigidly extended wings, but in essaying an onward course under the same conditions he must descend.

The mechanical principle of bird-sailing, that is, of gliding down an incline, may be expressed as the translation of the force of gravity into horizontal flight, by the pressure of a column of air on the under surface of the bird or artificial aeroplane presented to it at a suitable angle. The weight, with the first fall from a state of rest, gives the impulse, and the maintenance of the due angle, the direc-

tion. If at any point of its course the bird readjusts his position so as to present the full area of his wings to the line of flight, he will shoot upward, still with motionless wings, to a height of some feet, but never to the height from which he descended. I have seen an eagle at the end of a half-mile sail, glide upward ten or fifteen feet to his objective point, and I think this is about the limit he can attain without beating his wings.

Now with the aerodrome of Professor Langley's dream, it, with an initial impulse, it could be maintained on a horizontal, forward, course by adjustments of its inclinations to the internal working of the column of air over which it is passing, its force of gravity would be immediately neutralized, and its onward flight consequently arrested. A plane body many times heavier than air cannot be sustained in direct horizontal flight through the air, except by an expenditure of internal energy sufficient to propel it with a speed proportionate to the requirements of its specific gravity, qualified by its surface area.

Professor Langley will not have failed to observe, or the mention of the fact will recall it to his recollection, that sailing-birds pursuing an onward course do not maintain a horizontal line by availing themselves of any internal motion in the air, but simply by their own unaided physical energies.

Recurring now to the less clearly apprehended problem of circling, I believe that Professor Langley's argument that the bird could not circle with motionless wings in a horizontal current, requires one important qualification—he should have added "at least not if he carries his own wings level with the horizon." This the circling bird never does. He could no more circle while he did so, than a bicyclist could circle on an upright wheel. But by holding his wings obliquely to the horizontal circle of his flight, he can utilize the wind as a lifting power for about five-eighths of his course, and for propulsion also over nearly the same length, provided the wind blows faster than he flies. This is precisely on the principle on which a perforated card or messenger screws its course up the string of a kite. The wind blows horizontally but strikes the messenger obliquely. If the bird describes an oval, facing the wind only on the short course, he may utilize the wind for driving, over three-fourths of the course or even more. There is hence at every sweep an accumulation of impulse to urge it over the difficulty of sailing against the wind. At that stage, the bird can most easily adjust his wings, so as to make the opposing air lift him; the effort is required only to force himself into the wind's eye. By gliding slightly downward over the one-half or more of the course, with the wind, he acquires an impulse from the joint action of wind and gravity, almost, or quite sufficient, to drive him over the remainder of the course, and to raise him to his original level while facing the wind. If the impulse is not strong enough, the effect will be seen, not necessarily in the bird falling to a lower level, but in his circling further and further to leeward at every sweep. In fact the aerodrome of the future, although, like the bird, it may not sail a straight horizontal course without an expenditure of energy, may nevertheless, like the bird, be maintained in circling flight, in a moderate breeze, indefinitely, with a minimal expenditure of energy, not in consequence of the "internal work" of the air, but in spite of it. But while this explanation of the mechanics of circling flight renders it conceivable that, given the initial impulse, it can be accomplished in a moderate breeze without any expenditure of energy, beyond what is required for constant readjustment of the inclination of the plane, I am by no means certain that, in the case of the bird, the tail is not an important adjunct in propulsion. This obliquity of the direction of the wings to the horizon of flight is the clue to the whole mystery of circling or soaring flight.

The clue being given, the following propositions will, I think, serve to completely unravel it:

First. A bird gliding down an inclined plane owes his forward flight to the force of gravity.

Second. To maintain himself in horizontal flight, whether in a direct line or in a circle, power is necessary, first to overcome the force of gravity, second to propel him on his course.

Third. The bird flying in a direct line provides both lifting and driving power by beating his wings, as the boatman uses his oars; the circling bird achieves the same ends by trimming his wings to the wind, as the sailor trims his sails. Professor Langley suggested the solution when he argued that the power must come from the air.

LETTERS TO THE EDITOR.

*** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

One hundred copies of the number containing his communication free to any correspondent.

The Editor will be glad to publish any queries consonant with the character of the journal.

A Curiosity in the Vegetable World.

NEAR a country roadside in Tate County, Miss., is a curiosity which is of interest to every passer-by, but is especially interesting to a student of nature.

All of us, doubtless, have observed "twin" or "double" trees, which have a common stock for some distance above ground, and which might be accounted for by the cessation of growth of the terminal bud of the trunk, and by the upward development of two branches from lateral buds. But the phenomenon I speak of is this: two large elm trees (*Ulmus Americana*) about 1/2 and 2 feet in diameter, respectively, have crossed each other, and have grown together, in this wise. The trees are about 8 feet apart at the base, and one crosses the other about 6 feet from the ground, the trees and the ground between forming a right-angled triangle; rather an obtuse-angled triangle; for the tree which is most nearly erect is inclined slightly in the direction in which the other lies. It seems that when young, or at least some years ago, one of the trees was blown up against the other, the two uniting where they crossed as solidly as if one were a branch of the other, the one growing almost upright, while the other continued its growth in a nearly horizontal direction.

The latter is, I should say, about 50 feet long, and the upper end of its trunk about 15 feet from the ground.

T. O. MABRY.

University of Mississippi, Jan. 23, 1894.

Red Ants.

A SHORT time since I read an article in *Science* concerning red ants. I wish *somebody* could tell me how to rid a building of them.

Upon our grounds are two buildings, hardly fifty rods apart, the "South Hall" being infested from garret to cellar and the "North Hall" being absolutely free from them. I can find no great difference of soil or position to account for this. Why the one building should be so infested with them and the other *not* is more than I can explain. I have tried almost every known remedy against them without success.

For weeks, even months, our rooms will be apparently clean and free from these pests. Let me bring a piece of meat on a plate into the room, set it anywhere I choose, and within twenty-four hours there will be hundreds,—if it remain over night thousands,—literally, of them covering it and the neighboring ob-