New York. His study reveals no evidence for any observable effect that can be attributed to rotation of the earth. The steeper right-hand banks of streams on Long Island, which have been regarded as evidence for this effect, he explains by the action of winds. My purpose in this note is to point out in a somewhat different way the kind and amount of the effect which I should expect the rotation of the earth to have on a river.

The force in question is that which is usually connected with the name of the French mathematician Coriolis. When a body moves freely over the surface of the earth in the northern hemisphere the Coriolis force leads to a deflection of its path toward the right. In the case of a river this force acts on all the water in the river, just as gravity does. In the northern hemisphere the result is that the right-hand part of the river is a trifle higher than the left. Any possible greater erosion of the right bank is to be connected with this greater depth of the water, and it does not depend on whether the river is straight or meandering.

It is not difficult to obtain numerical values for the difference in level to be expected on the two sides of the river. When a body is moving north or south the magnitude of the Coriolis force is $2mv\omega \sin \lambda$, where m stands for the mass of the moving body, v for the speed with which it is traveling over the earth, ω for the angular speed of the earth, and λ for the latitude. If the body is moving in any other horizontal direction the force is somewhat greater. When the body moves east or west the sin λ in the above expression is to be replaced by unity. For a river which flows north or south at five miles an hour in latitude 42° the deflective force turns out to be about 0.000,0223 of the weight of the water. If the river flows east or west the force is about 0.000,0334 of the weight.[1]

From a simple composition-of-forces diagram it is easy to see that this same quantity gives the ratio of the difference in levels on the two sides of the river to the width of the river. For instance, if the river is flowing south at five miles an hour and is a hundred feet wide, the difference in levels at the two banks would be less than 0.03 inch, and if the river is half a mile wide the difference would be about 0.7 inch. Any difference in erosion caused by such slight differences in level would doubtless be masked by other agents, so that the results which Professor Fairchild finds are to be expected.

ARTHUR TABER JONES

SMITH COLLEGE

[1] Professor Fairchild quotes Gilbert as quoting Bertrand in saying that for a river running at three meters per second in latitude 45° the force is 1/63,539 of its weight. This value is half what it should be, and was probably obtained by neglecting the factor 2 in the expression for the Coriolis force.

AN ODD OCCURRENCE FOLLOWING A TROPICAL STORM[1]

FOLLOWING the recent hurricane in Puerto Rico a peculiar phenomenon became evident in and about San Juan. The paint of many buildings began to show irregular patches of discoloration, and the intensity of this staining increased with time. The darkened areas were more frequently in positions where contact with water had been prolonged, and had the appearance of being caused by hydrogen sulfide. There were also many reports of the blackening of silver and copper articles in the homes of the city and its suburbs. The same conditions, though to a less extent, occurred in the San Felipe storm of 1928.

The Department of Health believed the results to be due to the action of hydrogen sulfide and offered the suggestion that the gas might have come from a tidal mangrove swamp located just south of the city. In order to test this hypothesis the writers collected several samples of mud from this mangrove swamp. In examining the area, the odor of hydrogen sulfide was noticeable, and 20 liters of air drawn through a glass tube, containing a filtering plug of cotton and then a second cotton plug moistened with lead acetate, gave a positive test by the darkening of the moistened cotton. Lead acetate solution, dropped into the salt water draining from the swamp, showed the characteristic formation of black lead sulfide.

The mud samples, collected over a distance of five miles, gave from 0.09 to 0.35 mgs of free H_2S and from 0.07 to 0.67 mgs of combined sulfides per gram of mud. In one case 380 grams of mud yielded 296 cc of gas calculated to standard conditions. The only conclusion possible is that due to the presence of sewage entering at various parts of the tidal stream that cuts through the swamp, large amounts of hydrogen sulfide are being produced. The hurricane undoubtedly helped to distribute sewage over a wide area and stirred up the mud by swaying the mangrove trees. Possibly the low barometric pressure helped in liberating some gas. The storm was followed by several warm, quiet days with faint land breezes at night that blew from the swamp over the city.

It is, of course, well known that sewage produces appreciable amounts of hydrogen sulfide, but it seems unusual to find a case with such a wide distribution and high concentration in the air as to affect paint and metal objects in a city that extends over six miles in length.

D. H. COOK

CARLOS CINTRÓN

SCHOOL OF TROPICAL MEDICINE

SAN JUAN, PUERTO RICO

[1] From the Department of Chemistry of the School of Tropical Medicine of the University of Puerto Rico under the auspices of Columbia University.