the first puff the flame rose as a brilliant mushroom-shaped mass, which immediately changed its form to a straight jet of fire that must have risen to a height of at least 1,000 feet. No noise whatever preceding or accompanying the fire was to be heard from Brighton, which is across the low hills within fourteen miles of the place where the new island was formed. The fire disappeared below the horizon in about five minutes, leaving a cloud of smoke that drifted away. No light was to be seen in the sky the rest of the evening, which makes it certain that the flame either became reduced to a very small size or died out entirely.

The point at which this new gas volcano burst from beneath the sea is about two miles off the south coast of Trinidad. The water is shallow and banks are shown in the vicinity on some maps. On one of these banks asphalt is reported to exist. It is likely that gas springs and mud cones have previously existed on the sea floor in the vicinity. The vent lies along the eastward extension of an east-west line of active gas volcanoes and oil springs that traverses the southeastern tip of Trinidad. This line is mapped by Mr. Cunningham Craig, formerly government geologist of Trinidad, as an anticline. Another assumption that may be considered equally tenable is that the gas volcanoes and asphalt cones may follow a zone of faulting. The strata are highly tilted and contorted and afford little definite evidence as to the character of the structural line. The Columbia volcano, the largest of the gas volcanoes in this belt, has formed a broad mound many acres in extent and 50 or 70 feet in height. An explosion had occurred there just a few days before my visit, in the latter part of October, and thrown up a mass of mud around the crater that increased the height of the summit several feet. The sides of this cone as well as of some others in Trinidad, notably the one called "The Devil's Woodpile," are strewn with pebbles and rock fragments that have been ejected from a great depth.

A point of unusual interest regarding the late eruption is that the gas took fire. The reports so far received give no details bearing on this point, but it seems unlikely that the original ignition took place through human agency. If it did not the phenomenon is one which has seldom if ever been recorded before. Two ways suggest themselves in which the gas might conceivably have become ignited through natural causes. One way is that sparks might have been produced by the friction of boulders against each other as they were shot out with the gas. Cases have been reported to me by oil men in which sparks were formed by boulders, projected under great gas pressure from wells, striking the casing and tools, but I have heard of no case in which the gas was lighted. Another supposition is that electric sparks might have been generated similar to those observed in the vapor clouds emanating from Mount Pelée at the time of its great eruption.

ROBERT ANDERSON

THE FUTURE OF THE LONDON ZOOLOGICAL GARDENS

FROM time to time suggestions have been made respecting the transference of the menagerie of the Zoological Society of London to a more suitable site; and naturally when the fate of the Crystal Palace has been engaging the attention of the public, it has been urged that to make it the headquarters of the Zoo would solve the difficulties of both institutions. Certainly the clay soil at Regent's Park is not specially suitable for animals, although it is not as serious a disadvantage as is sometimes supposed.

A chief difficulty with animals in confinement is that the ground on which they are placed rapidly becomes contaminated with organic refuse, and so forms a suitable nidus for harmful bacteria. Whatever the soil may be, it is necessary, in a majority of cases, unless an enormous area is available, to cover it with an impermeable surface; and this treatment is at least as urgent in the case of sand and gravel as in that of clay. The present area of the gardens in Regent's Park is about

34 acres, and more space would make many improvements possible.

A very large increase of space, however, is not necessary. If the government departments concerned would allow the society to use another 20 or 30 acres of the park on lines similar to those suggested in the columns of *The Times* in July last, there would be ample space for the exhibition of animals on the most modern lines. It is impossible to combine satisfactorily an exhibition ground with a place for the breeding or recuperation of animals. For the convenience of visitors, and children especially, the total area of a zoological garden should not be too great; and, if animals are to be seen satisfactorily, they must not be placed in enclosures large enough to let them retreat from the public gaze. On the other hand, for breeding, acclimatization and the recuperation of animals at all out of health, large secluded areas away from the smoke and fumes of a great city are necessary. An ideal menagerie, whether placed in Regent's Park or at the Crystal Palace, should have also a much larger station in the country where visitors are not allowed.

The cost of installing the Zoological Gardens on a new site would be very great. Even if the provisions of the London Building Act could be got over, and the designs for new Zoological Gardens made simple and suitable with regard to structure and material, the total cost of installation, apart from the cost of the animals and the cost of the ground, would reach at least a quarter of a million pounds. Then there is the question of revenue. Regent's Park, it is true, has been rather passed by in the recent changes that have taken place in London passenger traffic; but even with this disadvantage the average annual gate-money now exceeds £20,000, while the income from the subscriptions of fellows approaches £10,000, and is increasing yearly. Access to the Crystal Palace has certainly been much improved, but it is still difficult to get there by rail, while the roads leading to it are among the most congested in London.

Finally, neither the proprietors of the Crystal Palace nor the Zoological Society of London can consider the finances entirely from the point of view of a public menagerie. The Crystal Palace would require a large income to meet interest on capital and various expenses, and it would look for assistance from the revenue earned by the menagerie. In the case of the Zoological Society, the maintenance of a popular collection of living animals, although the chief source of revenue, is only a part of the duty of the society. The introduction of animals of interest only to maturalists, the encouragement and direct assistance of zoological exploration throughout the world, the maintenance of a magnificent zoological library, and holding of meetings for the discussion of technical zoological subjects, and the publication of memoirs containing the results of zoological investigation are an essential part of the operations of the society, and one very difficult to combine with a place of general popular entertainment.—London *Times*.

SCIENTIFIC NOTES AND NEWS

Sir Joseph Dalton Hooker, the great English botanist, has died in his ninety-fifth year.

Dr. George Davidson, eminent for his contributions to geodesy, geography and astronomy, emeritus professor in the University of California, has died at the age of eighty-six years.

Funeral services of the late Surgeon-General Walter Wyman, U. S. Public Health and Marine Hospital Service, were held in St. Louis in the First Presbyterian Church on November 24. On December 3, there were memorial exercises in San Francisco. A special memorial number of the *Weekly Bulletin of the St. Louis Medical Society* is to be issued in memory of Dr. Wyman.

The Nobel prizes were awarded by the King of Sweden on November 10. The three recipients in the sciences, Mme. Marie Curie, of the University of Paris; Professor Wilhelm Wien, of the University of Würzburg and Professor Allvar Gullstrand, of the University of Upsala, were present to receive them.

Professor John Henry Comstock, head of