

PRIZES PROPOSED BY THE PARIS ACADEMY OF SCIENCES FOR 1900.

THE Grand Prix des Sciences Mathématiques will be awarded in 1900 for an improvement, in any important point, of our knowledge of the number of classes of quadratic forms of two unknowns with entire coefficients; the Bordin Prize (3000 francs), for the development and improvement of the theory of surfaces applicable to the paraboloid of revolution; the Francœur Prize (1000 francs), for discoveries useful to the progress of pure or applied mathematics; the Poncelet Prize (2000 francs), for any similar work published during the last ten years.

In Mechanics: the Extraordinary Prize of 6000 francs will be given for any work increasing the efficiency of the French navy; the Montyon Prize (700 francs), for the invention or improvement of instruments useful to the progress of agriculture, the mechanical arts or sciences; the Plumey Prize (2500 francs), for improvements in steam engines or any invention contributing most to the progress of steam navigation.

In Astronomy: the Lalande Prize (540 francs) is offered for the most interesting observations, or work most useful to the progress of astronomy; the Damoiseau Prize (1500 francs), for a memoir on the theory of one of the periodic comets of which several returns have been observed; the Valz Prize, for the author of the most interesting astronomical observation made during the year; the Janssen Prize (a gold medal), for the most important discovery in physical astronomy; and an anonymous prize of 1500 francs, as an encouragement to the calculators of the minor planets, especially those discovered in the Nice Observatory.

In Statistics: a Montyon Prize of 500 francs, for a memoir on questions bearing on French statistics.

In Chemistry: the Jecker Prize (10,000 francs), for organic chemistry, and the Wilde Prize (4000 francs).

In Mineralogy and Geology: the Vaillant Prize (4000 francs) will be awarded in 1900 for a rigorous determination of one or more atomic weights, or for the study of alloys.

In Botany: the Barbier Prize (2000 francs) is intended to recompense whoever makes a valuable discovery in the medical, surgical, or pharmaceutical sciences, or in botany, in relation to the art of healing; the Desmazières Prize (1600 francs), for a memoir on the cryptogams: the Montagne Prizes (1000 francs and 500 francs), for work on the anatomy, physiology, development, or description of the lower cryptogams; and the Thore Prize (200 francs) to the author of the best memoir on the cellular cryptogams of Europe (algæ, mosses, lichens, or fungi), or on the anatomy of any species of European insect.

In Anatomy and Zoology: the Savigny Prize (975 francs), in aid of young travelling zoologists not receiving Government aid, more especially those occupying themselves with the invertebrates of Egypt and Syria; the Da Gama Machado Prize (1200 francs), for the best memoir on the coloured parts of the tegumentary system of animals.

In Medicine and Surgery: a Montyon Prize, for any discovery useful in the art of healing; the Bréant Prize (100,000 francs), for a specific antidote against Asiatic cholera, or for such a discovery of the causes of Asiatic cholera that those causes may be suppressed and the disease stamped out. The interest on the capital sum will be awarded for a rigorous demonstration of the existence in the atmosphere of materials capable of propagating epidemic diseases; the Godard Prize (1000 francs), for the best memoir on the anatomy, physiology, and pathology of the genito-urinary organs; the Parkin Prize (3400 francs), as a recompense for researches upon either the curative effects of carbon and carbon dioxide, or for the effects of volcanic action upon the spreading of epidemic diseases; the Bellion Prize (1400 francs), for works or discoveries especially profitable to the health of man; the Mège Prize, for a study of the causes which have favoured or retarded the progress of medicine; the Dugate Prize, for the best work on the diagnosis of death, and on the means of preventing premature burial; the Lallemand Prize (1800 francs), for work on the nervous system; and the Baron Larrey Prize (1000 francs), for the best work treating of military medicine, surgery, or hygiene.

In Physiology: a Montyon Prize of 750 francs is offered annually; the Pomat Prize (1400 francs), for a determination of the principal anthropometric data; the Martin-Damourette Prize (1400 francs) and the Philipeaux Prize (890 francs), for work in experimental physiology. In Physical Geography, the Gay Prize (2500 francs), for the application to a portion of

France, or a portion of the Alpine Chain, of the analysis of the geological circumstances which have determined the actual conditions of relief and hydrography.

Of the General Prizes, the following may be awarded in 1900: the Arago Medal, the Montyon Prize (unhealthy trades), the Cuvier Prize (1500 francs), the Tremont Prize (1100 francs), the Gegner Prize (4000 francs), the Delalande-Guérineau Prize (1000 francs), the Jérôme Ponti Prize (3500 francs), the Tchihatchef Prize (3000 francs), the Boileau Prize (1300 francs), the Houlléville Prize (5000 francs), the Cahours Prize (3000 francs), and the Saintour Prize (3000 francs).

GEOLOGY OF JAMAICA.¹

THIRTY years have elapsed since the publication of the "Reports on the Geology of Jamaica," by James G. Sawkins and others, with an appendix by Robert Etheridge; a work published as one of the "Memoirs of the Geological Survey." In the work before us Mr. Robert T. Hill deals anew with the subject, his observations being based upon surveys made for Alexander Agassiz; and he has evidently spared no pains to investigate the geology and physical geography of the island in a thorough manner in accordance with modern knowledge. It is interesting to find him referring to the early paper written by De la Beche for the Geological Society in 1828 as "more in harmony with the conclusions to be presented by us than the subsequent and more extensive reports of the official surveys which supplanted them."

Mr. Hill considers that Jamaica presents a more favourable opportunity for detailed geologic investigation than any other tropical area. Highways, bridle-paths, and railways intersect the land in various directions, to say nothing of the coast-cliffs. Hence there is no lack of geological sections, and the author has had great advantages over those who preceded him. He remarks that the earlier researches "failed to solve the essential problems of the succession and age of the strata," and that the literature of no other region, especially that relating to paleontology, "presents so many erroneous conclusions." Curiously enough the author attributes this stratigraphic confusion, not to incompetence, but "to an act of Providence." It is well known that the original Director of the Jamaican Geological Survey, Lucas Barrett, was drowned in a diving-dress, and it is pointed out that the endeavours to interpret his opinions were the chief sources of subsequent erroneous conclusions. The stratigraphical errors were largely those of correlation, for it is admitted that otherwise the official reports were full of valuable data.

The author now starts afresh in naming and classifying the formations, using geographical terms, rather than those of a lithological or paleontological nature. The island is made up of Cretaceous, Eocene, Oligocene, Pliocene, and younger deposits, together with intrusive rocks. In adopting geographical names it would have been well, if possible, to have avoided the use of those names which are not original to the island, but are familiar elsewhere; to speak of the Jerusalem, Richmond, and Falmouth beds of Jamaica is at least unfortunate. So far as they go the Yallahs, Catadupa, and Manchioneal beds sound more appropriate, and the same may be said of the Bogue Island formation.

Evidence is given to show that locally the Cretaceous, Eocene and Oligocene formations were stratigraphically continuous, and we have a succession upwards from detrital to oceanic deposits. The higher Eocene beds contain *Cerithium*, *Lucina*, and Rudistes.

The white limestones of the Jamaican series are shown to represent several distinct ages, from Cretaceous to Recent, but the main mass belongs to the Oligocene. This mass forms the large plateau region which is really a dissected plain, rising in places to 3000 feet. It is known as "the cock-pit country," on account of the numerous swallow-holes, which vary from shallow circular basins to sink-holes 500 feet in depth. They are characterised by a bright red clayey soil, a residue from the dissolution of the limestone. Dykes of diorite and granitic rock penetrate Cretaceous, Eocene and Oligocene strata. The coastal deposits include various gravels, marls, and reef-beds of later Tertiary and Recent ages.

¹ "The Geology and Physical Geography of Jamaica: Study of a Type of Antillean Development." By Robert T. Hill, *Bull. Museum Comp. Zool. Harvard Coll.*, vol. xxxiv., 1899, pp. 256; with 41 plates. (Cambridge Mass.)