of the expedition in question, and am fully prepared to enter into all the particulars of it, even more fully than I have done on a previous occasion, or in my work on "British New Guinea."

For many years before the arrival of Sir Wm. MacGregor in New Guinea, several attempts had been made to explore the Alpine region of the Owen Stanley Range. For various reasons, no one had been able to accomplish it. These attempts, by Captain Armit, Messrs. Chalmers, Goldie, Morrison, Hartman, Hunter, Cuthbertson and Forbes, resulted in signal failure, neither of the explorers reaching even the foot of the great range. In a letter published in the *Proceedings* of the Royal Geographical Society, London, September 1890, Mr. H. O. Forbes stated that his "nearest approach to Mount Victoria, by my own map, is between eight and nine miles," and that it was only necessary for him to descend to and cross the Warume River below him to obtain access to several leading spurs running directly to the summit of Mount Victoria. He believed that the road traced by his eye from the hills in the Sogeri region on his first arrival in New Guinea was more eminently feasible than the one followed by Sir Wm. MacGregor in the latter's journey to the summit of Mount Victoria. Against this statement it may be pointed out that there seems no doubt whatever that Mr. Forbes did not see the highest crest of the mountain from his nearest approach to it, and it is almost certain that he could not have obtained access to the crown of Mount Victoria along the south-easterly spur of it. Concerning this accessible spur which Mr. Forbes purposed ascending, Sir Wm. MacGregor says, it is a mighty precipitous buttress exceeding 12,000 feet in height "bristling with peaks and pinnacle-like rocks, and contains hundreds of inaccessible crags and precipices."

Sir Wm. MacGregor's route lay for some distance up and along the Vanapa River, and apparently he has followed his old track very closely from the crown of the Owen Stanley Range to the South Coast in his recent journey across New Guinea. The important bearing which the successful accomplishment of this remarkable journey must necessarily have upon the development of the country will be fully apparent to all who have watched the progress of British enterprise in the possession since its establishment some ten years ago. Apart from the increase to our knowledge of the geographical conditions of the interior of the south-eastern portion of the island itself—an increase that cannot fail to be of the very greatest interest and importance—the advantage of having a practicable trade route across the British Territory is one that can scarcely be overestimated. It is almost impossible to give an accurate forecast of its bearing upon the opening up and settlement of the country and the development of its mineral resources. That valuable minerals occur in the high ranges of the interior has been clearly enough shown by the alluvial gold obtained in the upper reaches of the Mambare River, and the auriferous character of Mount Scratchley, to which special mention is made in Sir Wm. MacGregor's telegraphic message to the Governor of Queensland. There is little doubt, too, that mineral deposits will also be found on the southern slopes, or near the base of the Owen Stanley Range, and this region will soon be rendered accessible along the overland trade route passing the western spurs of the range in question.

The Mambare River (the Clyde of the Admiralty Charts) debouches into Traitors Bay on the north-east coast of the possession. The mouth of this interesting river is only about two miles inside the Anglo-German boundary, on the 8th parallel. It is navigable for an ordinary-sized steam launch for about forty miles up, and on the lower reaches are extensive areas of good alluvial land interspersed with remarkably fine fields of sago palms. The district is famous for its very lofty forest trees and fine climate. The river was explored for the first time by Sir Wm. MacGregor in 1894, and recently he again ascended it on his journey across the island. There is no doubt but that it affords easy access to the mineral areas of the interior, and especially to the bracing highland zones of the Owen Stanley Range, Mount Albert Edward, Mount Scratchley, and other neighbouring ranges, that were hitherto regarded as inaccessible. It forms an easy section of the great overland trade route now discovered, and for the first time opened up by the Lieutenant Governor, and it is almost certain that the Mambare district will ere long become one of the most important in British New Guinea.

Excellent relations have been established with the natives of the interior, and indeed all along the overland route the natives met with have been very friendly, a prevailing condition that will have an important bearing upon the future development of the country by British enterprise.

Not the least important geographical results of Sir Wm. MacGregor's recent journey is the discovery of a connecting chain between Mount Albert Edward and Mount Scratchley, and the practicability of ascending the Owen Stanley Range to its highest summit on Mount Victoria from the north-east as well as from the opposite side.

J. P. THOMSON.

JOHAN AUGUST HUGO GYLDÉN.

THE ranks of astronomers have suffered severely of late, and it is with deep regret that we are compelled to record that the Royal Observatory of Stockholm has now lost its renowned Director. Prof. Hugo Gyldén could ill be spared, especially at such an early age as fifty-five. On November 9 last he was seized with paralysis of the heart, and died during the afternoon at the Observatory. The following particulars of his life and work have been gathered from the obituary notices contributed to the *Astronomische Nachrichten* by Herr Karl Bohlin, and to the *Comptes rendus* by M. Callandreau.

Hugo Gyldén was born at Helsingfors in the year 1841 (on May 29), his father, Nils Abraham Gyldén, being a professor of Greek at the University. At the age of sixteen he went to the University of that town; after first studying chemistry, and, at a later date, mathematical astronomy, he gained in 1860 the title of "Magister der Philosophie." To make his studies more complete he went abroad, and during the years 1861–62 he was found at Gotha and Leipzig, having come in contact with Hansen, Le Verrier, and Delaunay. In December of 1862 he was elected a Teacher of Astronomy, and in the following year a Doctor of Philosophy.

Pulkowa saw him first in 1862, and after a year's work there he was made an "Adjunct Astronom," being promoted in 1865 to "Älteren Astronomen." The following year he received the title of "Hofrath."

About this time his investigations related to the constitution of the atmosphere and refraction, which form now the basis of the refraction-tables at Pulkowa. At the same time, also, he was busy with elliptic functions in their relation to the "mécanique céleste," the first results of which appeared in the *Studien auf dem Gebiete der Störungstheorie*, I., 1871.

The important service he thus rendered to astronomical science led the Royal Academy of Sciences of Stockholm to offer him the vacant place of Astronomer of the Academy and Director of the Observatory in Stockholm. This he accepted and retained until his death.

His activity, while holding this office, was displayed not only in the development of pure scientific works, but in drawing around him a number of students, among which may be mentioned O. Backlund, A. Donner, P. Harzer,

A. Shdanow, E. v. Haerdtl, M. Wolf, M. Brendel, V. Wellman, and H. Masal.

Such was his renown on the continent, that pupils came from all countries to study under him and hear his lectures. He was one of the few who knew how to communicate to his hearers the noble passion for the science which animated him. His enthusiasm raised the expectations of his pupils, while, at the same time, their spirits were benefited by the rich ideas of their master. Gyldén was a true teacher whose noble character obtained respect, while his simple and cordial nature inspired affection.

Astronomers know that to Gyldén a great advancement of the astronomy of precision is due; his admirable series of observations with the meridian circle hold a high place of honour.

He wrote his celebrated historical representation of astronomy, which appeared later (1877) in the German language as "Die Grundlehren der Astronomie." He was also the founder and publisher of the observatory publication "Iakttagelser och undersökningar anställda på Stockholms observatorium," which contained not only the results of the observations with the meridian circle, but theoretical investigations carried out by him and, to some extent, by his pupils.

Gyldén, is above all, known in the world of science by his works that he pursued since the death of Le Verrier, on the general theory of perturbations. In proceeding to a revision of the methods of approximation in the "mécanique celeste," he has rendered the most eminent service to this branch of science.

Having completed the main points of his investigations on the intermediate and absolute orbits of the heavenly bodies in a series of publications, "Undersökningar af theorien för himlakropparnas rörelser," I.–III., 1881–1882, he was able in 1884, by means of a grant of money from his Government, to make considerable progress in the application of his theory to the solar system. It was his intention to bring together all the results in one work entitled "Traité analytique des orbites absolues des huit planètes principales," but only the first part, containing the analytical developments of the absolute orbits, has as yet appeared. Gyldén, unlike Tisserand, did not have the satisfaction of leaving behind him a complete work.

Unfortunately he was denied the labour of completing the necessary numerical calculations. On the other hand it was a great pleasure for him to see his last great work, consisting of tables giving the coefficients, in the expressions of the perturbations, dependent on the proportion of the half-major axes, in a nearly completely printed condition. This was brought about by the generous assistance of Miss Bruce, who supplied the necessary means.

In the year 1884 he was called by the University of Göttingen to fill the post of Professor of Astronomy there; but, following the expressed wish of the Stockholm Academy of Sciences, he remained, receiving, through the generosity of the King, means to deliver lectures at the University. Since 1888 he was an active teacher of astronomy at the High School in Stockholm.

The results of Gyldén's many and varied scientific studies on stellar parallaxes, proper motion of stars, explanation of certain variable stars, application of partial anomalies, conveyance of perturbation developments, cosmical questions, &c., have appeared in a series of large and small treatises, in the *Acta der Akademie der Wissenschaften*, and the *Acta Mathematica*.

Besides being a member of several foreign Societies, he was President of the Astronomischen Gesellschaft from 1889 to 1896.

Gyldén has left behind him a widow, two sons and two daughters, besides numerous friends, scattered in different parts of the world, who lament deeply the loss of a kind friend and sympathetic fellow-worker.

NOTES.

THE final entombment of M. Pasteur is to take place on the 26th of this month, at the Pasteur Institute. The reason why so inconvenient a day for English people has been fixed is that the 27th is the anniversary of Pasteur's birth, and as that day falls on a Sunday this year, the Saturday previous was chosen as more suitable. The ceremony is to be semi-official and *semi intime*. The members of the family and a few intimate friends will attend a short religious service at Notre Dame, where Pasteur's remains have in the meantime been deposited, and members of the Institute of the Academy, the representatives of the Government, and delegates from learned societies and foreign countries will meet the cortège on its arrival at the Pasteur Institute at 9.45 a.m. It is expected that Sir Joseph Lister will represent the Royal Society, Sir John Evans the British Association, Sir William Priestley the University of Edinburgh, and Sir Dyce Duckworth the Royal College of Physicians. The mausoleum in which the remains of the great investigator will find their last resting-place, is a fitting memorial which has taken more than a year to complete, and will be decorated with various designs indicative of Pasteur's work and of the benefits he has conferred on humanity and the several industries.

DR. BEHRING, the discoverer of the anti-diphtheritic serum, has had the Grand Cordon of the Crown of Italy conferred upon him

THE German Emperor has conferred upon Dr. Roux, of the Pasteur Institute in Paris, the Royal Order of the Prussian Crown of the second class.

LADY PRESTWICH has given to the Geological Department of the British Museum the collection of fossils formed by her husband, the late Sir Joseph Prestwich.

IT is reported that Dr. Thorne-Thorne, chief medical officer of the Local Government Board, has arrived at Brussels, accompanied by a colleague, to study the vaccination system in Belgium and the laws and regulations bearing upon the subject.

THE death is announced of M. Alfred Nobel, whose name is well known in connection with the invention of dynamite and similar high explosives.

Globus (vol. lxix. No. 24) announces that the waters of Lake Titicaca continue to subside with astonishing rapidity. A large area of land has been exposed on the northern shore.

LIEUT. HOURST, whose explorations in the Niger region were referred to last week (p. 133), arrived in Paris on Sunday last. The *Times* correspondent says he was welcomed at the railway station by representatives of the Colonial Office, the French Africa Committee, the Egypt Committee, the Paris Geographical Society, and the Explorers' Society. He has made a splendid collection of sketches and photographs.

MR. J. E. S. MOORE, of the Royal College of Science, London, who has been investigating the African Lake Fauna, has this week notified his safe return to Zanzibar. In a letter, dated August 10, he reported himself about to start on his last dredging trip. He has made extensive zoological and geological collections; and in the correspondence which he has sent home, he announces, among other things, the discovery of an apparent dimorphism in the Tanganyika medusa, with active budding in both forms.

IT is reported that the bubonic plague shows no abatement at Bombay. So far, eight hundred deaths have been reported; but the actual number is believed to be much larger. The *British Medical Journal* has drawn attention to the serum prepared by Dr. Yersin at the Pasteur Institute in Saigon for the