

States, Karenni, the Kachin Hills, and the Chin Hills are all administered by special officers under regulations which are suited to the primitive condition of the people.

The subject of education is also dealt with in this part. It is remarked that there is no province in India which can compare with Burma in the number of the population able to read and write. The fact that primary education is so widely diffused is due to the indigenous schools. Every monastery is a school, and there is a monastery in almost every village. Education is free, and there are no caste restrictions in Burma. There every Buddhist boy learns at least to read and write.

Part ii. concludes with a history of Burma from the earliest times. The history is as complete as it is possible to make it in 38 pages. An authentic photograph of the ex-King Thibaw and the ex-Queen Supava-Lat, who are now detained at Ratnagiri, an old Portuguese fort on the west coast of India, is given at p. 200 of the handbook.



FIG. 2.—Wa Suspension Bridge. From "Burma: a Handbook of Practical Information."

Part iii. deals with industries, the forests of Burma, mines, agriculture, trade, transports, currency, weights and measures. All these subjects are dealt with exhaustively, and this part will well repay perusal.

The subjects discussed in part iv. are archæology, architecture, art, and music. Burma is called the land of pagodas, and Sir George Scott points out that there are three distinct types of religious buildings—the solid pagoda enshrining relics, the carved and ornamented wooden monasteries, and the masonry temples. The most celebrated temples are in the ruined town of Pagan. Many pagodas are in ruins because, except where the founders have endowed them, and thus assured their preservation, it is to nobody's interest to preserve a pagoda. The merit of erecting a pagoda is great, but the merit attaches to the original builder, and not to the restorer or repairer.

The Government provides for the maintenance of

some of the most notable pagodas, and for others there are trustees, who administer the endowments and collect the offerings of the faithful, and spend the proceeds on the repair of the buildings, but ruined and deserted temples are to be seen all over the country.

Part v. is taken up with an account of the Buddhist religion which is very complete. As Sir George Scott states, there is no doubt that the original religion of Burma was animism, and that this form of religion still survives amongst the vast body of the people. Buddhism, as many consider, is not a religion at all, but a system of philosophy. What most Burmans really reverence are the spirits of the air, the mountain and the fell. Many of the hill tribes are spirit worshippers pure and simple. Serpent worship, too, still survives.

Part vi. is devoted to language and literature. We are sorry that space does not permit us to give any extracts from this part.

Part vii. concludes the handbook with some useful

hints to residents or new visitors, and the last paragraphs of this part tell the readers something about sport.

There are also three appendices. The illustrations are numerous and good. We reproduce as a sample the photograph of a Wa suspension bridge.

In conclusion, we strongly recommend every intending visitor to Burma to provide himself with a copy of this handbook, in the compilation of which Sir George Scott has shown that he has a thorough knowledge of the country, to which he has added much industry and research.

We think that the handbook, besides being indispensable to the tourist, is also well worth perusal

by members of the non-travelling public who are anxious to know all that can be told about one of the most recent, and at the same time most interesting, possessions of the British Crown.

PROF. MARCEL BERTRAND.

IT was with deep regret that English geologists learned that Prof. Marcel Bertrand, professor of geology at the French National School of Mines, died on Wednesday, February 13. Born in Paris on July 2, 1847, a member of a family of great mathematicians, he inherited a natural gift for the exact sciences, and especially for geometry, which enabled him to enter into l'Ecole Polytechnique in 1867. In 1869, owing to his brilliance as a student, he was selected by the French Government as mining engineer. For three years he attended the courses of Elie de Beaumont and others at the School of

Mines. This teaching decided the direction of his life's work along the traditional lines of the school of which he was in turn a student, an instructor, and one of the most distinguished professors from the year 1886.

It is a special feature of the French Geological Survey to avail itself of the help of outside professional geologists, such as university professors and teachers, by engaging them during the summer holidays as auxiliary collaborateurs. It is in that way that Marcel Bertrand was induced to carry out during the summer months of several years a series of field observations in the Jura mountains, with the view of publishing detailed geological maps of the region. It was quite natural that the growing interest of the young geologist was excited by the structure of this district—classical for the relative regularity of its foldings.

In 1881 Bertrand was led in the same way to investigate the geology of Provence, where a simple appearance hides extreme complexity of structure. It was there that, after several occasional visits to the Alps, he was able to bring new light to bear on the earth's anatomy. He was the first to perceive that the foldings of the pre-Alps have been altered in depth by the older horst of Maure Mountains, and have resulted in extensive overfoldings, which later on have been again obliquely plaited by more recent compression. These investigations culminated in 1887 in the publication of his "Memoire sur le Beausset (Var)," which, notwithstanding its shortness and local character, was received with keen interest by Continental geologists. It was for them the starting point for further inquiries upon new forms of disturbances, and especially upon those long recumbent folds the horizontal extension of which is so great that they are frequently spoken of as sheets.

Bertrand's great experience of the coal mines of the north of France afforded him the opportunity of detecting that overthrusts of the same amplitude had taken place at the close of the Carboniferous period. He expounded these similarities in his memoirs upon "Les Rapports de Structure des Alpes de Glaris et du Bassin Houiller du Nord," where it was suggested, for the first time, that the famous double fold of Glaris might be regarded as a single exaggerated overfold coming from the south. This explanation is now accepted by Prof. Heim himself.

In 1896 Bertrand wrote a preface to introduce to the French public a translation of Suess's "The Face of the Earth." If anyone should deny to scientific men the gift of expressing their ideas in a concise and adequate style, reference should be made to this brilliant and lucid account of the progressive development of structural geology from the first attempts of Leopold de Buch and Élie de Beaumont to the synthesis of Suess involving the whole surface of our planet, or the minute re-construction of the former orography of the Highlands by Prof. Lapworth.

In 1896 Bertrand was elected a member of the Académie des Sciences to fill the chair left vacant by the death of Pasteur. In 1900 he took a large part in the organisation of the Paris meeting of the International Geological Congress. He contributed two papers on the geology of the Western Alps, and personally directed one of the excursions in that district. It was the last gratification of his life, for shortly after he suffered great affliction by the death of his daughter, who was buried by a sand-slip when geologising with him.

It is deeply to be regretted that such a gifted man has passed away without having fulfilled his possibilities. He scattered some of his original ideas in short

papers which appeared from 1884 until 1900, chiefly in the *Comptes rendus* of the French Academy of Sciences, in the *Annales des Mines*, and in the Bulletin of the Geological Society of Paris. But he did not concentrate his abilities upon a great scientific work which might have been compared to the volumes by Prof. Suess. Our only consolation is the power he possessed to impart his spirit to his students and to the number of his disciples, such as MM. de Launay, Lugeon, Termier, Cayeux, Ritter, &c., whom he left behind fitted to carry on his work.

M. M. ALLORGE.

H. C. RUSSELL, C.M.G., F.R.S.

THE announcement of the death of Mr. H. C. Russell, who for nearly forty years was among the foremost representatives of science in the colony of New South Wales, has been received with great regret by many men of science. Since 1870 he held the post of Government astronomer and director of the Sydney Observatory, in succession to Mr. G. R. Smalley, and in that capacity rendered most important services to the colony. His first duty on appointment was to organise the resources of the colony for the observation of the transit of Venus. With small funds, little skilled assistance, and short time for preparation, he nevertheless succeeded in equipping several stations in a highly efficient manner, reflecting great credit upon the readiness of the colonists and the exertions of the observatory staff.

Thenceforward the observatory pursued a course marked by continually increasing usefulness, culminating in the acceptance of a share in the international photographic chart of the heavens. The zone allotted to this observatory extends from -52° to -64° declination, and under Mr. Russell's direction the task advanced far towards completion. But in the course of the work it was found that considerable improvement might be effected if the telescope were removed to a station remote from the town of Sydney. The director had long advocated the removal of the observatory, and the mounting of the photographic equatorial at Red Hill probably prefigures the abandonment of the Sydney site. The measurement of the plates is being prosecuted on a common plan with those taken at Melbourne, and one of the latest papers from Mr. Russell has reference to an improved form of micrometer for the measurement of these plates. Mechanical devices always had great interest for the late director, and he paid great attention to special forms of driving clocks for equatorials.

But most of all the colony is indebted to him for his organisation of the meteorological service. He had charge of a district of the climate of which little was known, and as the colony extended and the population occupied areas of unexplored country, he had to widen the range of his inquiry in order to supply the necessary information to intending settlers. The long series of observations that he published on climate factors, especially those having reference to rain, evaporation, and state of the rivers, attest to his industry, his powers of organisation, and his recognition of the requirements of a young and rising colony. He put it on record that when he assumed office there were but five rain-gauges in the colony. On his retirement there were something like two thousand. His discussion of the results has scarcely been as happy as his collection. He seems to have relied upon statistical methods rather than on physical facts, and in this way was led to suggest a theory which would make the