Iguanodon probably was shaped, excepting for the long huge tail, which, as Professor Owen long ago pointed out, is shaped like that of a crocodile, being a powerful swimming organ, somewhat like a duck. In accordance with the birdlike modification of the pelvis a large mass of the viscera were post-acetabular in position, as in a greater degree in birds, thus tending to aid the long tail to erect the head and fore part of the body by depressing the hinder region of the spinal column on the acetabular axis as a fulcrum. Like the head the body was very much compressed laterally, so that its transverse section was somewhat as represented in the diagram, *X*. The neck of the Iguanodon was comparatively slender, and is found to be capable of very free movements. The necks of the fossilised specimens are found to be twisted without dislocation into most varied attitudes. The skin, as already mentioned, was in *I. Mantelli* and *I. Bernissartensis* smooth or covered only with epidermic scales.

Several observers have concluded from the examination of the footprints that a slight web was present between the toes. Judging from observations made on the crocodile and Amblyrhynchus of the Galapagos Islands, the animal when in the water, in which it spent a considerable part of its time, when swimming slowly, used for the purpose both its fore and hind limbs and tail, but when going fast fixed its fore limbs close beside its body and drove itself along with its hind limbs and tail only.

M. Dollo suggests that one of the principal advantages gained by the Iguanodons by their erect posture on land was their being enabled thereby to discern at great distances amongst the vegetation the large carnivorous animals of their age to which as herbivora they must have formed a prey. Possibly when attacked they seized their aggressor in their short arms and made use of their thumb spurs as daggers.

M. Dollo is in every way to be congratulated on the results of his investigations, so far as they have yet gone, and his final monograph may be looked forward to as a work of the utmost value and interest, but with the completion of the Iguanodons the working up of the Bernissart find will be anything but exhausted. With the Dinosaurians were found crocodiles and turtles, and a vast quantity of fishes, of which piles upon piles of specimens await his energies in the future. He has already discovered two most interesting new genera of crocodiles, and an equally interesting new genus of Chelonians amongst this material. Every naturalist who has an opportunity should certainly find his way to Brussels to see the skeleton here figured. It is proposed in process of time, when the Iguanodon skeletons are all prepared from the matrix and mounted as far as necessary, to build a new museum of natural history at Brussels in the Parc Leopold, formerly the zoological garden, and in this museum to construct a special gallery to contain all the Bernissart fossils, a rotunda of twenty-five metres in diameter.

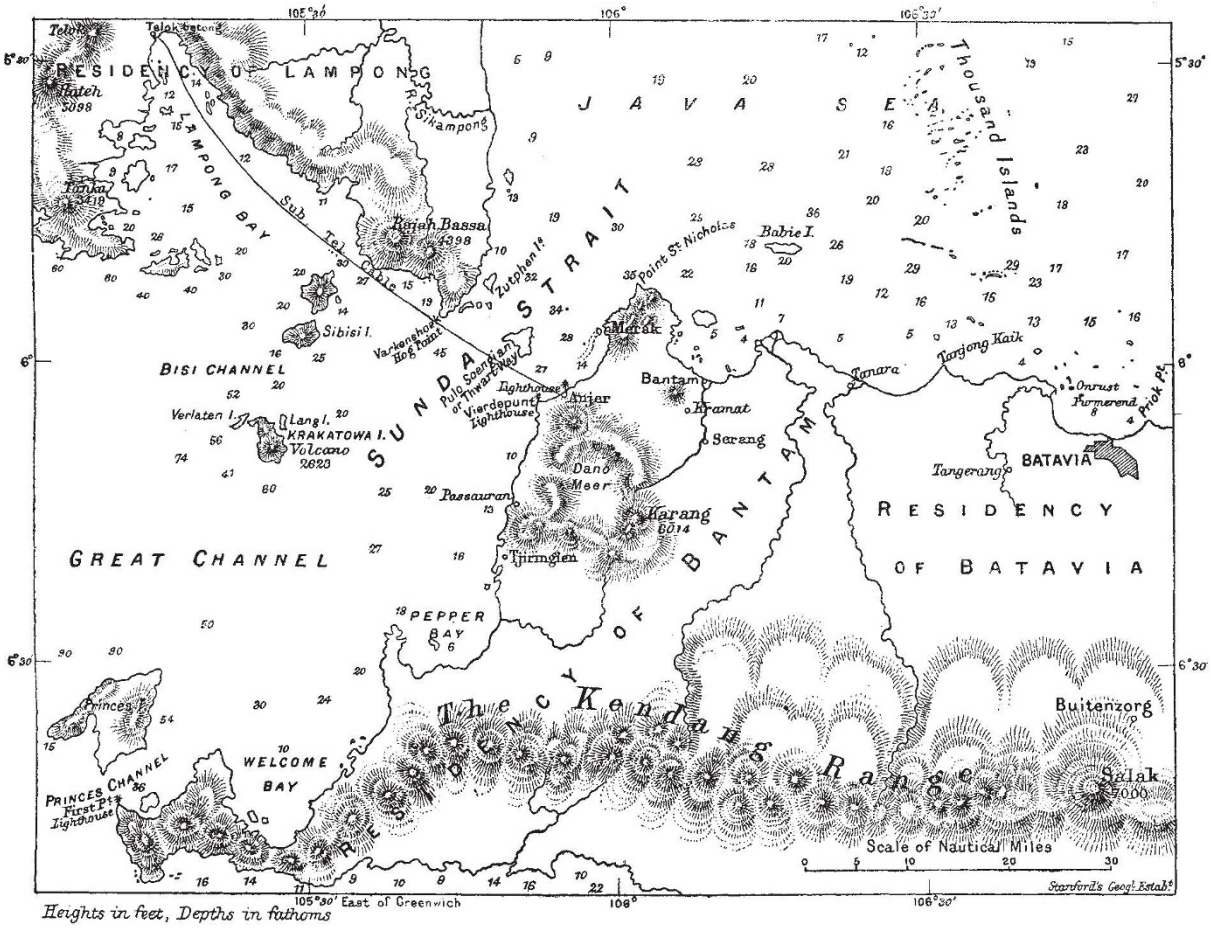
H. N. MOSELEY

THE JAVA UPHEAVAL

THE details which have reached us during the past week of the terrible seismical manifestation at Java prove it to be one of the most disastrous on record; probably, moreover, it is the greatest phenomenon in physical geography which has occurred during at least the historical period, in the same space of time. The accompanying sketch-map will afford some idea of the extent and nature of the change which has taken place, and the character of the sea bed and the land in the region affected. Next week we shall attempt to show what light science can shed on the occurrence; meantime we shall content ourselves with gathering together the facts that have come to hand.

The volcanic Island of Krakatoa lies about the middle of the north part of the passage between Java and Sumatra, a passage which has formed an important commercial route. The strait is about seventy miles long and sixty broad at the south-west end, narrowing to thirteen miles at the nort-east end. The island, seven miles long by five broad, lay about thirty miles from the coast of Java, and northwards the strait contracts like a funnel, the two coasts in that direction approaching very near to each other. A few weeks ago, as we intimated at the time, the volcano on the island began to manifest renewed activity. The whole region is volcanic, Java itself having at least sixteen active volcanoes, while many others can only be regarded as quiescent, not extinct. Various parts of the island have been frequently devastated by volcanic outburts, one of the most disastrous of these having proceeded from a volcano which was regarded as having been long extinct. The present outburst in Krakatoa seems to have reached a crisis on the night of August 26. The detonations were heard as far as Soerakarta, and ashes fell at Cheribon, about 250 miles eastwards on the north coast of Java. The whole sky over western Java was darkened with ashes, and when investigation became possible it was found that the most widespread disaster had occurred. The greater part of the district of North Bantam has been destroyed, partly by the ashes which fell, and partly by an enormous wave generated by the widespread volcanic disturbance in the bed of the strait. The town of Anjer and other towns on the coast have been overwhelmed and swept away, and the loss of life is estimated at 100,000 The Island of Krakatoa itself, estimated to contain eight thousand million cubic yards of material, seems to have been shattered and sunk beneath the waters, while sixteen volcanic craters have appeared above the sea between the site of that island and Sibisi Island, where the sea is comparatively shallow. The Soengepan Volcano has split into five, and it is stated that an extensive plain of "volcanic stone" has been formed in the sea near Lampong, Sumatra, probably at a part of the coast dotted with small islands. A vessel near the site of the eruption had its deck covered with ashes 18 inches deep, and passed masses of pumice-stone 7 feet in depth. The wave reached the coast of Java on the morning of the 27th, and, 30 metres high, swept the coast between Merak and Tjiringin, totally destroying Anjer, Merak, and Tjiringin. Five miles of the coast of Sumatra seem to have been swept by the wave, and many lives lost. At Taujong Priok, fifty-eight miles distant from Krakatoa, a sea seven feet and a half higher than the ordinary highest level suddenly rushed in and overwhelmed the place. Immediately afterwards it as suddenly sank ten feet and a half below the high-water mark, the effect being most destructive. We shall probably hear more of this wave, as doubtless it was a branch of it which made its way across the Pacific, and that with such rapidity that on the 27th it reached San Francisco Harbour, and continued to come in at intervals of twenty minutes, rising to a height of one foot for several days. The great wave generated on May 10, 1877, by the earthquake at Iquique, on the coast of Peru, spread over the Pacific as far north as the Sandwich Islands, and south to New Zealand and Australia; while that at Arica, on August 13-14, 1869, extended right across the Pacific to Yokohama (NATURE, vol. i. p. 54). It is misleading to speak of such waves as tidal; they are evidently due to powerful, extensive, and sudden disturbances of the ocean bed, and are frequently felt in the Pacific when no earthquake has been experienced anywhere, though doubtless due to commotions somewhere in the depths of ocean. So far these are all the facts that are known in connection with this last stupendous outburst of volcanic energy. It has altered the entire physical geography of the region and the con

dition of the ocean bed. The existing charts of the strait with their careful soundings are useless for purposes of navigation, and when quiescence is restored a new series of soundings will be necessary. Doubtless the results of



Heights in feet, Depths in fathoms

the outbreak will receive minute attention at the hands of the Dutch Government, and when all the data are collected they will form valuable material for the study of the physical geographer.

NOTES

THE next meeting of the American Association for the Advancement of Science will be held in Philadelphia, probably during the first week in September, 1884. At the session in Minneapolis the following persons were chosen as officers for the Philadelphia meeting:—President, Dr. J. P. Leslie, of Philadelphia; Vice-Presidents: Section A (Mathematics and Astronomy), Prof. H. T. Eddy, of Cincinnati; B (Physics), Prof. John Trowbridge, of Cambridge; C (Chemistry), Prof. J. W. Langley, of Ann Arbour; D (Mechanical Science), Prof. R. H. Thurston, of Hoboken; E (Geology and Geography), Prof. N. H. Winchell, of Minneapolis; F (Biology), Prof. E. D. Cope, of Philadelphia; G (Histology and Microscopy), Prof. T. G. Wormley, of Philadelphia; H (Anthropology), Prof. E. S. Morse, of Salem; I (Economic Science and Statistics), Hon. John Eaton, of Washington; permanent secretary, Mr. F. W. Putnam, of Cambridge; general secretary, Dr. Alfred Springer, of Cincinnati; assistant general secretary, Prof. E. S. Holden, of Madison.

M. JANSSEN, who has returned from Caroline Island, was present at the meeting of the Academy of Sciences of September 3. He read the first part of the documents he brings with him, viz. the reports drawn up by Palisa, Tacchini, and himself, while Trouvelot read his own account. The reading was long and interesting, and will be continued next week. M. Janssen stated that he believed the region around the sun was full of material almost corpuscular, and reflecting the light from the sun. He was received enthusiastically, and M. Blanchard, the president, spoke in praise of his merits and efforts for the promotion of science. M. Janssen returned thanks, acknowledging that great efforts must be made by him to be worthy of such a reception.

WE regret to announce the death of Mr. Cromwell Fleetwood Varley, F.R.S., M.I.C.E., &c., on Sunday night last, at his residence at Bexley Heath, Kent. He was born in Kentish Town, April 6, 1828. He devoted himself to the engineering branch of telegraphy, and devised a method of locating distant faults in land wires which attracted the special attention of engineers and electricians. Distinguishing himself by one discovery after another, Mr. Varley finally became chief engineer and electrician to the Electric and International Telegraph Company, and held this office until the taking over of the telegraphs by the Government. His inventions were very numerous. Prominent among his early inventions was an apparatus for transmitting electrical signals, which so much increased the