

under his observation during that period, and from which he infers the existence of a steady connexion between the prevailing winds of this region and the movements of the barometer, and enters into an inquiry into the mode in which that instrument is affected by them. The extensive valley of the St. Lawrence is bounded at its lower part, for a distance of nearly 500 miles, by ranges of hills, rising on each side to a considerable elevation. Within this space the ordinary winds follow the course of the river; and in almost every instance where they approach from windward, the barometer rises with them; and when, on the other hand, the wind approaches from leeward, the barometer not only falls before the arrival of the wind, but continues to fall until it has subsided. An appendix is subjoined, containing extracts from the tabular register of the barometer and winds at various points in the valley of the St. Lawrence, during the years 1834 and 1835, accompanied by remarks on different points deserving notice in particular cases.

'On the Elliptic Polarization of Light by Reflexion from Metallic Surfaces,' by the Rev. Baden Powell. — In a former paper, published in the Philosophical Transactions for 1843, the author gave an account of the observations he had made on the phenomena of elliptic polarization by reflexion from certain metallic surfaces, but with reference only to one class of comparative results. He has since pursued the inquiry into other relations besides those at first contemplated; and the present paper is devoted to the details of these new observations, obtained by varying the inclination of the incident rays and the position of the plane of analyzation, and by employing different metals as the reflecting surfaces. By the application of the undulatory theory of light to the circumstances of the experiments and the resulting phenomena, the law of metallic retardation is made the subject of analytic investigation. A polariscope of peculiar construction, of which a description is given at the conclusion of the paper, was employed in the experiments; and tables are subjoined of the numerical results of the observations.

GEOGRAPHICAL SOCIETY.—June 23.—Lord Colchester, President, in the chair.—Six new members were elected.—The paper read was 'Considerations against the supposed Existence of a great Sea in the Interior of Australia,' by E. J. Eyre, Esq.—"An opinion," says Mr. Eyre, "very generally prevails, that the continent of Australia is, comparatively speaking, little more than a narrow crust or barrier intervening between an outer and an inner sea. This opinion originated with Capt. Flinders, and is still entertained by Capt. Sturt, Mr. Windsor Earl and others. Mr. Eyre admits that the non-existence, at least as far as we know, of any large river, with the exception of the Murray, discharging itself into the sea, on the eastern, western, or southern coasts, to the southward of a line drawn from Moreton Bay to Shark's Bay, is the strongest argument in favour of the theory of an inland sea; nevertheless other and weighty considerations militate against this idea; and Mr. Eyre has come to the conclusion that the interior of New Holland will be found generally to be of a very low level, to consist of arid sands alternating with many basins of dried up salt lakes or such as are covered only by shallow salt water or mud, as in the case of Lake Torrens; that there may be many detached and even high ranges, as the Gawler Range, interspersed among the arid wastes, and that in the midst of these ranges there may be rich and fertile spots. As far as Mr. Eyre's own personal observation goes, it supports the suggestion thrown out by Capt. Sturt, that Australia was formerly an archipelago of islands, and that their emergence from the sea is a comparative modern event. Be this as it may, Mr. Eyre founds his opinion against the existence of an inland sea, upon the following three circumstances: first, the hot winds, which in South Australia blow constantly from the north, or centre of the continent, and which he compares to the fiery and withering blasts from a heated furnace, and the little probability that such winds have been wafted over a large expanse of water; secondly, the accounts of the natives inhabiting the outskirts of the interior, who have no knowledge of any large body of water inland, either fresh or salt; thirdly, the coincidence observable in the physical appearance, customs, character and pur-

suits of the aborigines at opposite points of the continent, while no such coincidence exists along the intervening line of coast, connecting these points. The development of all the facts contained under three heads, and the mention of others, such as the arrival of parrots from the interior, &c., constituted the mass of Mr. Eyre's paper; but as mere abstracts would break the chain of reasoning adopted by the author, we must content ourselves with saying that, however plausible that reasoning may be, and it certainly has great weight, nothing short of an actual examination of the interior can satisfy us as to the nature of that peculiar country.—It was stated at the meeting that Lieut. Ruxton had arrived safely and in good health at Walwich Bay; that he had hired Hottentots and cattle, and was about to proceed on his exploration to the interior, intending to return by the Cape.

The President announced that the next meeting would be held on the 10th of November.

ASIATIC SOCIETY.—June 21.—Sir G. T. Staunton, Bart., M.P., in the chair.—R. Alcock, Esq., was elected a Corresponding Member.

Mr. A. Bettington, of the Bombay Civil Service, read a paper on certain fossils procured by himself on the Island of Perim, in the Gulf of Cambay; more particularly on a gigantic ruminant, having some affinities to the Sivatherium and the Giraffe. After adverting to former notices of fossils obtained on this island, the writer described its situation in the midst of the gulf stream of Cambay, which separates it from the main land, and deposits large quantities of alluvium brought down by the rivers emptying themselves into it. These rivers, in the present day, in the freshes, transport into the Gulf large trees, and the bodies of oxen, deer, bears, and other animals; and in the great floods of past ages are considered to have brought down and deposited, as now discovered, the remains of ruminants and pachydermata, some extinct and unheard of, others having, in the present day, their living co-geners in the Indian rivers. The bed from which the writer obtained the fossil specimens exhibited is below the usual water mark, and inaccessible except at the ebb of spring tides. A portion only of those obtained were brought to England, the remainder were left in India. The most remarkable of those in this country was a large skull, which is now, by competent judges, pronounced to be the first specimen of a new genus. The mass of conglomerate which contained it weighed about 170lb., and the separation of the skull from near 100lb. of matrix occupied Mr. Bettington many weeks. The skull, on the whole, is well preserved, though a portion has suffered from the action of water. The lines of teeth on the two sides of the palate are unconformable; and it has been conjectured that the head must, at this part, have suffered from violence, but there is no appearance of fracture. For the purposes of comparison, Mr. Bettington had made a close measurement of every part of the Perim fossil, of the sivatherium, and of the skull of the adult giraffe in the British Museum; from all which it appeared that the Perim fossil is the smaller. The teeth are similar in number and character to those of the sivatherium, and are somewhat smaller, as the comparative size of the heads would lead us to expect. A marked distinction between the two is found in the excess in width of the cranium at the vertex, being in the sivatherium 22 inches, and in the Perim fossil little more than 11 inches, in which character the latter approaches nearer to the giraffe. But the greatest point of difference is in the form and position of the horns. In the sivatherium the horns bear somewhat the same relation to each other as in the four-horned antelope; whereas, in the fossil under consideration, the anterior horns rise from a confluent base measuring twenty-five inches; the horns above the line of division measuring eighteen inches. This formation the writer considers to be without precedent in the animal kingdom, fossil or recent. The general character, cancellar structure, and extensive development of the protuberance at the lower edge of the transverse ridge of the occiput, compel the conviction that it was a posterior horn, "reflected" as in the common Indian buffalo, and must have produced an appearance truly monstrous. The whole formation indicates great force and power. Among the other fossils, there were some identical with those of the Sevalic hills, and

others peculiar, as yet, to Perim. Among the latter was a new crocodilean. There were specimens of three species of mastodon, gariols, and rhinoceros; and the heads, horns, and teeth of stags, antelopes, oxen, &c. The writer concluded with the observation that there was still a rich field of research remaining at this deposit, and that he had sent to India, not only for some of the specimens before referred to, but was also making arrangements for prosecuting further research.—Dr. Mantell, who was present by invitation, remarked that the specimens afforded additional confirmation of the fact, first pointed out by Captain Cautley and Dr. Falconer, that in the tertiary formations of India were collocated the remains of several species of reptiles and mammalia, with those of extinct species and genera belonging to the most ancient European deposits of the same geological group (the *eocone*); as, for example, the teeth and bones of the chiropotamus, and other pachyderms of the Paris Basin, with those of the existing gariol of India. Dr. Mantell then offered some observations on the analogy which the specimens from Perim, as well as those from Ava, and from the Sevalic hills, presented in their mineralogical condition, and the mechanical action to which they had been subjected, with those more ancient fossil bones and teeth that abound in the Wealden deposits of the south-east of England; particularly with those obtained from the conglomerate and grits of Tilgate Forest. The Indian and the British fossils are alike mineralized by iron, and have an investment of indurated, ferruginous sand, interspersed with quartz, pebbles, and rolled fragments of other rocks; and the bones are, for the most part, mutilated, and much water-worn, proving that previously to their mineralization they had been exposed to abrasion from streams and rivers, and were transported from a great distance by currents. Dr. Mantell dwelt on the discrepancy between the Faunas of the two epochs, although that of the Wealden was as decidedly of a tropical character as that of the tertiary strata of India; but in the latter large mammalia prevailed, while in the far more ancient secondary formation of England mammalia were absent, and the place of the gigantic ruminants and pachyderms was occupied by herbivorous reptiles of appalling magnitude.

The Society adjourned till November.

INSTITUTE OF BRITISH ARCHITECTS.—June 23.—W. Tite, V.P., in the chair. J. Dobson, of Newcastle-upon-Tyne, was elected a Fellow. A paper was read by C. Parker, 'On the Proportions of the Beams used by Ancient and Modern Architects.'—The paper commenced by comparing the strength of the square and the strongest beam that could be cut out of a round tree, and contrasting the proportions with the usual forms which ancient and modern architects adopt in beams, the former making the breadth, and the latter the depth, the element of strength. It then traced the views that different nations have held and practised in their constructive operations. It stated that the Egyptians preferred the square form of bearing beam, which proportion was used in Solomon's palace, and that the Greeks and Romans used the rectangle placed horizontally. It then remarked that in all the timber buildings erected before and after the Norman conquest, the breadth of a beam was placed to resist an opposing force, and so continued to be used in the rebuilding of London after the fire in 1666. Prior to this date, the system of double framing was introduced on the Continent, and changing the proportion of timbers, made the depth preferred to the breadth, which view is now thought correct. The diversity of opinions thus shown, induced the following experiments, which were made with iron, from the difficulty of obtaining specimens in wood of equal strength. The object was to ascertain the effect of increasing two, three, or more times the breadth of a beam—also of increasing the like number of times the depth of a beam, and the comparative strength of two separate and one compact beam of equal weights. The result showed that every addition made to the breadth, was attended by a decrease of the bearing power in the ratio of $\frac{1}{4}$ to $\frac{3}{4}$ as the case might be, whilst a contrary effect attended the enlargement of the depth; also that two separate beams were much weaker than one compact beam.

A paper was likewise read descriptive of 'A Series