deep coloured that the bed has been ground and used for paint. The origin of this colour, whether due to original deposition, or subsequently derived by segregation from the bed below, is a point of interest.

Above the Red Chalk succeeds another chalk bed about one foot thick, supposed to be equivalent to the Malm rock of Sussex, containing many branched sponges as *Spongia paradoxica*, with *Avicula gryphæoides*, *Kingena lima*, and other species; this is covered by other beds of Chalk, of which the lowest, about two feet six inches thick, is remarkable for the abundance of fragments of *Inocerami* dispersed throughout it (with other fossils, as *Ter. gracilis*, *T. semiglobosa*, and *Holaster planus*), and which give it a very irregular surface when weathered. By the inclination of the strata before noticed, these latter beds come to the shore at the north end of the cliff. The trend of the coast, partly modified by an angular projection, does not exactly coincide with the direction of the dip, which is very slight towards the north-east. It is to this arrangement, (due to some original movement and subsequent denudation), that the strata successively crop out in a south-easterly direction, and the general form of the country has been produced. The face of the cliff varies continually, owing to the falls which frequently take place, a considerable one having lately occurred, so that during the last fifty or sixty years many acres have been removed, owing to the action of the sea against the cliff, together with the effects of rain and frost on the adjacent surface of the land.

Altogether this section is interesting to the geological student, not only as showing the nature of these old sea-beds, their mode of accumulation, the effects of currents, and the difference of condition, when compared with other areas of contemporary deposition, but the modifications they have subsequently undergone by chemical and other agencies, and the general effects of the later operations in producing the surface features of the country.

OBITUARY.

THE LATE PROFESSOR J. BEETE JUKES, M.A., F.R.S., ETC.—It is our melancholy task to record the death of one of the most distinguished students of Natural History—a pioneer in Geological Science—an undaunted investigator of the truths of Nature. We can recall the massive form, the penetrating glance, and sturdy step of our late friend, as many years ago we accompanied him amongst the mountains of North Wales, and had the advantage of his instruction when attempting to unravel the intricate structure of their rocks. How hard it is to realise that that head is now laid at rest in a quiet churchyard of central England! As a last tribute of respect to his memory, and in grateful remembrance of many acts of kindness, we venture to place on record the following short account of the late Mr. Jukes' eventful life.

J. Beete Jukes was born near Birmingham on the 10th of October, 1811, and educated at King Edwards' School in that town, whence

he proceeded to St. John's College, Cambridge, where he took his degree of B.A. in 1836. It was here, we believe, that, under the teaching of Professor Sedgwick (whom he ever regarded with feelings of veneration, and with whom he was a favourite pupil), he imbibed a love for his chosen science, which he soon after applied in a Geological Survey of Charnwood Forest, in Leicestershire, and the surrounding country.

Early in 1839 he was appointed Geological Surveyor of the Colony of Newfoundland, and has recorded the results of his labours in a work on the Geology of that country, accompanied by a map and illustrations. Shortly after his return to England in 1841, Mr. Jukes was appointed by the Admiralty to the post of Naturalist on board H. M. Ship "Fly," commanded by Captain E. P. Blackwood, R.N., for the Survey of the Coast of Australia and New Guinea, and had opportunities, which he turned to good account in after life, of becoming acquainted with the nature and mode of formation of Coral Reefs, and their relations to the limestones of former Geological periods. The results of this exploration are detailed in "The Voyage of H. M. Ship Fly." The good ship returned to England in June, 1846, and in September of that year Mr. Jukes was appointed to the staff of the Geological Survey of Great Britain, of which Professor A. C. Ramsay was Director, and Sir H. T. De la Beche, Director-General. At that time the Survey was being carried on in North Wales, and Mr. Jukes was associated with Ramsay, Aveline, and the late Mr. Salter, as Palæontologist, in the production of those maps and sections which have justly drawn forth the admiration of all who have studied them, for the minuteness and fidelity with which they illustrate the structure of a broken and mountainous country, complicated by numerous flexures, the outflow of trap-rocks, and often traversed by enormous dislocations. On the completion of the Survey in Wales, Mr. Jukes undertook that of the South Staffordshire Coal-field and the adjacent country. His memoir on the Geology of the South Staffordshire Coal-field is one of the most valuable contributions to the literature of the Carboniferous Rocks of England. In 1850 he was appointed by Sir R. I. Murchison to the post of Director of the Geological Survey of Ireland, vacant on the appointment of Professor Oldham to the Survey of India; and in 1854 to the Lectureship of Geology in the Royal College of Science in Dublin, under Sir Robert Kane.

In his capacity of Director, Mr. Jukes applied himself with all his energies to the duties before him; and with the assistance of (till recently) a small staff of Surveyors—of whom the lamented Mr. Du Noyer and Messrs. G. H. Kinahan, F. J. Foot, J. O'Kelly, R. G. Symes, and W. H. Baily, as Palæontologist, were the principal—he completed the Survey of about one-half the superficial area of Ireland, together with the editing and partial authorship of about 42 explanatory Memoirs on the Geology of the country.

During this period Mr. Jukes did not neglect investigations of a more private character, tending to elucidate the structure and the relations of the rocks of England and Ireland. His researches in

Devonshire, and his attempts, in spite of much difficulty, to answer the question "how far is it correct to call any Old Red Sandstone by the name of Devonian, or to consider any part of it as contemporaneous with the rocks containing marine fossils, to which that designation is fairly applicable,"[1] will long be remembered; and has a melancholy interest, as there is some reason to think that the overstraining of his mental powers in consequence of this and other labours engaged in at this period, tended to accelerate the progress of the disease to which he subsequently succumbed.

One of the most valuable works which Professor Jukes completed, was the publication of "The Students Manual of Geology," which was soon followed in 1862 by a second and enlarged Edition. We venture to think that all who have had occasion to use it will readily admit that this is a most useful work of reference. The author was engaged at the time of his death in the preparation of a new Edition, and it is to be hoped that some trustworthy hand will carry out his intentions, and render the pages of this manual in accordance with the ever varying progress of our Science.

One of the last public acts of Mr. Jukes was to accept an appointment on the Royal Coal Commission, instituted by Parliament with the object of determining the possible resources of our Coal-fields and kindred questions. Mr. Jukes' knowledge of the structure of some of the central portions of England was here brought into requisition, but his researches into the resources of the Irish Coal-fields seem to have been terminated by failing health. This, however, is less to be regretted, as we are well aware that the productive Coal-fields of this country are altogether unimportant as bearing on the general question.

While the career of the late Professor Jukes should be an example and encouragement to students in Science, it should also have the effect of making them guard against the tendency of this impetuous age—to overtask the brain. This impulse permeates more or less all society, but especially men of letters, and cultivators of Science. It is only given to a privileged few, of great intellect and all-enduring brain, to withstand the wear and tear of an intellectual course. The result in most cases may be a rapid rise to distinction, and the acquisition of a vast amount of knowledge; but it is dearly bought if it curtails, by even a few short years, a life endeared to friendship, and useful to society. E. H.

We regret that we have also to record the death of one of the ablest Palæontologists of the present age—Mr. JOHN WILLIAM SALTER, A.L.S., F.G.S. (late Palæontologist to the Geological Survey of Great Britain), whose life of active labour in this department of Science was sadly terminated on 2nd August, 1869. We hope to give a suitable notice of his labours in our October number.—EDIT.

[1] "On the Carboniferous Slate (or Devonian Rocks) and the Old Red Sandstone of South Ireland and North Devon." Quart. Journ. Geol. Soc. 1866, Vol. xxii. p. 320. "*Additional Notes on the Grouping of Rocks in North Devon and West Somerset.*" (Printed and published separately.) Dublin, 1867. And "Notes on Parts of South Devon and Cornwall," etc. etc. (Published separately for the author.) Dublin, 1868.