prong at Reading, the iron mines of Cornwall, and the type locality of the Harrisburg peneplane; up the Susquehanna through the water gaps into a typical portion of the folded Appalachians; and finally southward past the tip of the Carlisle prong of the Blue Ridge to the Battlefield of Gettysburg, where the influence of topography upon military operations could be studied to unusual advantage. This excursion, covering a week-end in term time, was acceptable as a substitute for the required local field trips; and although the cost was more than thirty dollars per capita, forty-eight men out of a class of sixty elected to take it in the fall semester, fifty-five out of a class of seventy-five in the spring semester. So successful were the results achieved that despite the expense (registration and field expenses make for the course a total fee of $67.50) it has been decided to eliminate the local field trips and to require the New Jersey-Pennsylvania excursion of all college students wishing credit for a laboratory (or field) course in elementary geology.

The problem of handling fifty or more elementary students on a somewhat extended geological field trip, when they have studied the subject but a few weeks, presents special difficulties. A large number of wholly novel conceptions must be presented to the men in a very short space of time. To this end there has been prepared a brochure of some thirty quarto pages, containing:

(1) An explanation of topographic maps, and directions for using sets of these maps, provided for the purpose with route of the excursion marked upon them.
(2) An outline of the major events in the geological history of the northeastern United States.
(3) A brief description of the physiographic provinces crossed by the excursion.
(4) A complete itinerary of the excursion, with discussion of the detailed geological features studied en route.

Block diagrams are much employed to convey most effectively the relation of geological structure to surface form; cross-section diagrams illustrate the physical evolution of the region traversed, while photographs add an interesting element to the presentation. Special stress is laid upon major geological conceptions and principles, rather than upon technical details; for the object of the excursion is not to make a geologist out of the student (that may come later for the exceptional few) but to awaken interest in what for him is a new field of thought, and to start him thinking in new directions and in new dimensions.

A substantial contribution to this end has been secured through the courtesy of Dr. Ashley, state geologist of Pennsylvania, who has each time the party passed through Harrisburg generously taken time to meet the men and discuss with them interesting phases of Pennsylvania geology and geological work in general.

Experience seems to show that for most of the men the interest of the features observed is sufficient to secure a proper attention to the objects of the trip; but additional assurance against any tendency to turn the trip into a "joy ride" is obtained by requiring of each member a detailed written report which must conform to specifications and answer questions set forth in the booklet above mentioned. In grading the reports particular weight is given to individuality and originality of composition and illustration; and an unsatisfactory report means loss of credit for the course, in so far as fulfilling college requirements for a certain number of laboratory (or field) courses is concerned.

It is as yet too early to say how satisfactory will prove the substitution of a long and comparatively expensive field excursion as an absolute requirement in place of shorter and cheaper local trips and indoor laboratory work. It can be said, however, that the interest of the men in the science of geology appears to be greatly increased under the new arrangement; that they learn very much more during the three days spent in seeing geological features developed on a grand scale, in collecting rocks of great variety over a large area, and in making constant practical use of topographic and geologic maps, than they formerly did with six or eight short field trips and as many indoor laboratory exercises on rock specimens and maps; and that the general effect on the elementary teaching in geology has been so good as to justify temporary withdrawal of the local field and laboratory work and the substitution of the three days' excursion as a regular requirement. Whether time and events will justify the procedure remains to be seen.

DOUGLAS JOHNSON
COLUMBIA UNIVERSITY

SCIENTIFIC EVENTS

THE RECENTLY DISCOVERED GIBRALTAR SKULL

AT the Oxford meeting of the British Association the first authoritative account of the discovery by Miss D. A. E. Garrod of a human skull associated with Mousterian implements at the Devil's Tower, Gibraltar, was given in a session of the Anthropological Section.

Miss Garrod, who undertook the excavation of the site at the suggestion of the Abbé Breuil, found that

the cave contained a succession of seven deposits, which emerge from the mouth of the cave and spread fanwise in a succession of steps. All levels of the deposits contained a large number of animal bones, some broken and burned by man, some evidently the relics of an animal's lair. As the cave faces north, it was probably occupied by man in summer only and by animals in the intervals of human occupation. The animal bones included deer, wild goat, boar, and rabbit in abundance, and, rarely, horse and ox. Resting on the raised beach which formed the seventh and lowest deposit was a carpal bone of an elephant. Implements of Mousterian type were found at all levels down to the fifth, those of the second level being definitely assignable to the upper Mousterian; but no implements of a later industry and no pottery were found.

The removal by dynamite of a large block of limestone in the hard travertine of the fourth level opened up a number of fissures and led to the discovery of a human frontal bone at a depth of 15 cm. from the surface of the deposit. The left parietal was discovered half a yard away, but, whereas the frontal bone had been loosened from its matrix, the parietal was firmly embedded in the travertine and had to be brought away in a mass of that material for reduction in the laboratory. As explained by Mr. L. H. Dudley Buxton, to whom that task was entrusted, the freeing of the interior from the mass of deposit with which it was filled proved a particularly difficult and tedious operation. Implements of quartzite and flint definitely of Mousterian type, but less well made than those of the overlying levels, were found near the skull. The fact that the skull and the implements were found embedded in the travertine in a manner allowing no possibility of disturbance places the Mousterian age of the skull beyond question.

The anatomical characters of the skull were described by Mr. L. H. Dudley Buxton. Owing to the fact that the greater part of the month which had elapsed since the skull had been brought to England had been taken up by the task of freeing the fragile bone from the travertine in which it had been embedded, it was possible to put forward tentative conclusions only; but an attempt had been made to reconstruct the upper part of the skull. There is no doubt that the two fragments belong to the same skull. From various characters it would appear to be that of a very young person; but the exact age and the sex are difficult to determine. A comparison with the three skulls of Neanderthal man of immature age available—a skull of a child of five from La Ferrassie, the skeleton of a youth found at Le Moustier, and fragments of the skull of a child, perhaps of eight years of age, from La Quina—shows that it agrees with them in the characters in which they differ from those of modern skulls of corresponding age. The measurements, which, however, must at present be regarded as entirely provisional, indicate that the skull is broader in its proportions than would have been expected, nor are the eyebrow ridges and temporal fossæ developed in the manner distinctive of Neanderthal man. The most striking feature in the parietal bone is the fact that the parieto-squamous suture, which is more or less straight in the apes and the human infant and bowed in the adult man, in the Devil's Tower skull is most markedly bowed; but instead of a regular squamous suture, with a bevelled edge, the actual edge of the bone is only recessed very slightly—a condition which is to be attributed to age and not to race. On the provisional measurements which have been made the cranial index works out at 80, a high figure which further consideration may make it necessary to correct.

THE CELEBRATION OF THE TERCENTENARY OF FRANCIS BACON

THE Tercentenary of Francis Bacon was celebrated at the University of Cambridge on October 5, when, at a special congregation, the chancellor of the university (the Earl of Balfour) conferred the degree of doctor of law (*honoris causa*) on William Searle Holdsworth, K.C., D.C.L. (Oxford), Vinerian professor of English law in the University of Oxford, and the degree of doctor of science (*honoris causa*) on Sir Ernest Rutherford, O.M., M.A., of Trinity College, Cavendish professor of experimental physics, president of the Royal Society.

In introducing the recipients of the degrees the Public Orator, T. R. Glover, as reported in the London *Times*, said:

> That great man, the most illustrious of the Lord Chancellors of England, when caught at last by the cunning of his enemies, said he hoped there remained some quiet place for him in some Cambridge college where he might be at leisure for science. Accordingly, after three centuries, it is fitting for us Cambridge men to commemorate our great alumnus who has shed such honor on his Alma Mater by his name and his pursuits. Man, "the servant and interpreter of nature," lives by the laws of nature and by his own. The life of man, so long as we obey the laws of nature, flourishes. If, on the other hand, we try to live without human laws, nature refuses us her benefits. The Stoics, who teach us ever to strive to adjust our laws to the laws of nature, were filled with wonder for the inmost unity of the universe. Our Bacon was in his way the follower of the Stoics—eminent at once in civil law and natural science. So to-day we honor at once a man of law from Oxford and a student of nature from Cambridge, that it may be clear that all learning is linked with all learning, and that we serve