ling and sorting sheep, similar works in Ireland being known to be thus associated.

(2) Mrs. E. M. Clifford's paper on prehistoric discoveries at Barnwood, Gloucester, opened up possibilities of decisive evidence as to the physical type of the native British who were living in the district when the Roman legions reached Gloucester (Glevum). The site lies by the side of the Roman road leading from Gloucester to Cirencester, It is an extensive flat field two miles distant from the Severn and 80 feet above the level of that river. The field has been excavated to a depth of 8 feet by the Gloucester Stone Company, and the discoveries reported by Mrs. Clifford were made during operations.

A section shows an upper foot of soil, then 2–3 feet of brick-earth, then bedded gravels, upper and lower. The lower gravels are rich in remains of mid-Pleistocene fauna; in the gravels and brick-earths have been found Acheulean, Mousterian, and Aurignacian stone implements. No human remains of Pleistocene date have been discovered as yet, but burials of a later date—of the early bronze age period (a beaker burial), of La Tène II.—and an extensive Roman cemetery (first and second century A.D.) have been carefully examined. In the Roman cemetery more than 100 inhumations and 50 cremations have been studied.

Sir Arthur Keith visited the site after the British Association meetings and considers it to be of great historical importance. He thinks that the evidence points to the people buried in the cemetery as being native British, thus giving a complete picture of the kind of people who lived in the west of Britain when the Romans reached Glevum. Mrs. Clifford acknowledged expert assistance received from Sir Arthur Keith, Mr. J. W. Gray, Prof. L. S. Palmer, the late Dr. C. W. Andrews, and Mr. Reginald A. Smith.

'Serialism.'

THE work entitled "An Experiment with Time", published in 1927, in which numerous remarkable instances were given of dreams that had occurred prior to the occurrence of the events corresponding to them in waking experience, will be familiar to many readers of NATURE. In order to account for these phenomena, the author of the book, Mr. J. W. Dunne, propounded in it a theory, which he designated 'serialism'; and he has recently been giving broadcast talks in further elucidation of his theory.

Mr. Dunne maintains that, so far from being a fallacy, an infinite regress is traceable not only in the nature of physical existence but also in the nature of our awareness of the physical world. The physical world is, he argues, so constituted that it can be viewed as a series of more and more fundamental worlds; and can, in fact, be understood only when examination of it is carried so far as the second term of the series. The process of scientific investigation consists, he urges, essentially of two steps—the search for the truly 'given', or compulsory, elements in our knowledge, and the description of such given knowledge as knowledge of an existing world. The awareness that some of our knowledge is compulsory is itself second-term knowledge. Thus, knowledge of a real external world and knowledge of the self are correlative—both are given in willed activity, primarily the activity of attention. The ultimate will and the ultimate physical entity that is the opposite of will belong to the realm of indefinable 'being', from which the defined fields of physical and psychical existence are to be extracted.

The second-term field of physics exhibits entities of a plainly regressive character; moreover, it does not constitute a closed physical system, but discloses gaps in its continuity, and these gaps indicate where there may be voluntary intervention. If the physical world be described in terms of matter, the regress comes to light when matter is derived from a sub-matter, called space, and this again from a sub-space, and so on.

The most striking confirmation of the theory is, however, afforded, Mr. Dunne thinks, by an analysis of the time regress. If we say of an event that it is happening 'now', we are adding something to the simple notion of a time-order; and the 'now-mark', which characterises the first-term field of physical existence, must itself travel. When, in the series of events *A B C*, *B* is now and later *C* is now, they are earlier and later in a more fundamental time, in which all that is past and future in the lesser time co-exists. In modern physics the importance of the 'now-mark' has, it is contended, become readily apparent; for the probable structure of *B* depends very largely upon *B's* position with regard to a 'now'. Many paths which a particle may take when *A* is 'now' are no longer open when *C* has become 'now'.

University and Educational Intelligence.

CAMBRIDGE.—The Adam Smith Prize has been awarded to Miss R. L. Cohen, of Newnham College, for an essay entitled "Factors affecting the Price of Potatoes in Great Britain".

At St. John's College the following have been elected into fellowships: W. D. V. Hodge, Wrangler with distinction, Part II. Mathematical Tripos 1925, Smith's Prize 1927; J. G. Semple, Wrangler with distinction, Part II. Mathematical Tripos 1927, Rayleigh Prize 1929; P. E. Vernon, Natural Sciences Tripos Part I., 1926, Class 1, Moral Sciences Tripos Part II., 1927, Class 1, Rockefeller Foundation Fellowship in Social Sciences at Yale University 1929.

The Henry Sidgwick Memorial Lecture at Newnham College will be given by Prof. A. V. Hill, professor of physiology in the University of London, on Saturday, Nov. 22, at 5 P.M. The title of the lecture is "Biology in Education".

LEEDS.—Under the will of the late Lord Brotherton, who died on Oct. 21 last, the University is to receive £100,000 for general purposes. This benefaction will be additional to the gift of the University Library, his collection of books, and an endowment for upkeep.

OXFORD.—At the meeting of Congregation on Nov. 4, a decree was passed providing that £2000 of an anonymous gift to the University of £5000 should be invested and the income used for the purchase of scientific books and periodicals. Another decree was passed giving power to the Vice-Chancellor to make provision for carrying on the duties of the Savilian professorship of astronomy during the vacancy caused by the death of Prof. H. H. Turner.

THE Prince of Wales has consented to become president of the fourth Congress of Universities of the Empire to be held in Edinburgh next summer, and, circumstances permitting, to welcome and address the delegates and representatives in London on July 3.

PROF. L. M. DENNIS, of the Department of Chemistry, Cornell University, informs us that the following have accepted appointment to the George Fisher Baker Non-Resident Lectureship in Chemistry at Cornell University for the next two years: first term, 1930–1931, Prof. G. Hevesy, Freiburg in Breisgau; second

term, 1930–1931, Dr. N. V. Sidgwick, Lincoln College, Oxford; first term, 1931–32, Prof. W. L. Bragg, Manchester; second term, 1931–32, Prof. Alfred Stock, Technische Hochschule, Karlsruhe; first term, 1932–33, Prof. Cecil H. Desch, Sheffield; second term, 1932–33, Prof. Otto Hahn, Kaiser Wilhelm Institut für Chemie, Berlin-Dahlem; first term, 1933–34, Prof. V. M. Goldschmidt, Göttingen; second term, 1933–34, Prof. Robert Robinson, Oxford.

Historic Natural Events.

Nov. 16-18, 1928. Storms over British Isles.—This was a very stormy period over the British Isles and neighbouring parts of Europe. A deep barometric depression lay north of Scotland and a series of intense secondaries crossed England and the southern North Sea, bringing winds of nearly 90 miles per hour in gusts. This storm caused much damage, especially to shipping, in Germany and Holland, with some loss of life. In Holland and Schleswig-Holstein the dykes burst in several places, with flooding.

Nov. 17, 1218. Storm Flood in North Sea.—Several parishes were overwhelmed by the sea, and many thousands of persons lost their lives. This storm broke through the West Frisian Islands, and formed the beginning of the Zuyder Zee.

Nov. 17-18, 1852. "Duke of Wellington's Flood".—During one of the highest Thames floods on record, on the occasion of the Duke of Wellington's funeral, the hearse and horses were upset in the flooded Bath Road at Maidenhead. At Putney the towing path was six feet under water, and the Great Western Railway line was flooded for four miles between Hanwell and Paddington. At Windsor part of the Home Park was four feet under water. Oxford was described as standing in a sea of water, the whole of the surrounding country being flooded, and the Evenlode Valley was for more than a week like an immense lake.

Nov. 17, 1882. Sunspot, Magnetic Storm, and Aurora.—A remarkable sunspot, visible to the naked eye, was reported on Nov. 17 and the following days. It was the largest spot hitherto photographed at Greenwich, its area being 2470 millionths of the sun's visible surface, and was exceptionally brilliant. Simultaneously both Europe and North America were visited by a violent magnetic storm, which began on Nov. 11 and reached its climax between 10 h. 30 m. on Nov. 17 and 5 h. 30 m. on Nov. 18. The magnetic declination oscillated rapidly through almost 2°, and the changes of force were correspondingly great and sudden. The whole telegraphic system was disturbed to an extent far exceeding anything previously recorded. Equally remarkable was the display of aurora on the evening of Nov. 17. As observed at the Royal Observatory, Greenwich, it commenced with a bright glow of red light extending from the north and west beyond the zenith, interspersed with pale green phosphorescent light and streamers. At 18 h. 40 m. a very brilliant streak of greenish light about 20° long appeared in the east-north-east and travelled rapidly towards the west. This streak was very widely observed over the British Isles; it passed from horizon to horizon in about six seconds, its height was of the order of 200 miles, and its velocity over a path of 200 miles about 15 miles per second. In North America the aurora was also very brilliant, and about midnight, in Michigan, all the visible heavens, to within 20° of the southern horizon, were covered by straight streamers extending from all parts of the horizon to the zenith, where they formed a boreal crown of blood-red colour.

Nov. 17, 1910. Heavy Rain in Sicily.—As a result of a violent thunderstorm and 'cloudburst', 18·3 in. of rain fell in 24 hours at Riposto, Sicily. This is the heaviest known fall in a day in Europe.

Nov. 18, 1912. Hurricane in Jamaica.—The western part of Jamaica was devastated by a hurricane of remarkable intensity, especially when the lateness of the season is considered. At Negril Point lighthouse the wind reached 120 miles per hour at 2 A.M., after which the anemometer was destroyed; the storm continued to increase in violence for four hours, but no estimate was made of the highest velocity. The rainfall was very heavy, and, where gullies opened on to the coast, many houses were washed away and a number of lives were lost; elsewhere, as at Savanna-la-Mar, the sea swept over the land and destroyed everything, wrecked ships being stranded in the streets.

Nov. 19, 1421. Storm Flood in North Sea.—An extraordinarily great storm flood in the North Sea affected the coasts of Friesland, Holland, and England. Seventy-two towns were submerged and it is said that 100,000 men were killed. As a result of this storm the Zuyder Zee finally reached its present form.

Nov. 19, 1822. Earthquake in Chile.—By this earthquake the greater part of Valparaiso was ruined, while the shock was felt over an area 1200 miles long from north to south. A large tract of the coast, it is said 100 miles in length, was permanently upraised, at Valparaiso by about 3 feet, at Quintero by about 4 feet. Three weeks later, the old bed of the sea was still bare, with beds of oysters and other shell-fish adhering to the rocks. An old wreck near Quintero that before the earthquake could not be reached was afterwards accessible from the land.

Nov. 19, 1824. Inundation at St. Petersburg.—As a result of a violent westerly wind which heaped up the waters of the Baltic in the Gulf of Finland and impeded the flow of the Neva, St. Petersburg suffered from the greatest inundation since the foundation of the city. The waters of the Neva rose 13 ft. 7 in. above the ordinary level, and the whole city except some suburbs was submerged. The damage was aggravated by a frost which followed the flood.

Nov. 19, 1928. Cloud formed by Aeroplane.—A Swiss aviator reached a height of about 33,000 feet in clear air near a thin sheet of cirrus cloud. A definite streak of cirrus formed behind the aeroplane, and persisted from 3.45 P.M. until 4.15 P.M., gradually being distorted by the wind. It was successfully photographed from the ground.

Nov. 19, 1928. High Solar Prominence.—An eruptive solar prominence, the highest on record, was observed at the Kodaikanal Solar Observatory, India, to reach the height of 20′·9 (that is, two-thirds of the sun's diameter or about 570,000 miles) above the sun's chromosphere, when cloud intervened. The brightness of the prominence at so great a height was also remarkable. Comparison of several spectroheliograms taken in calcium light gave the greatest outward velocity of the prominence as nearly 145 miles a second.

Nov. 20, 1242. Floods in England.—Miss Ormerod quotes that "there happened a marvellous tempest of thunder and lightning, and therewith followed such an exceeding rain (which continued many days together) that rivers rose on marvellous heights, and the Thames itself, which seldom riseth or is increased by land floods, passing over the banks, drowned all the country for the space of six miles about Lambeth, so that none might get into Westminster Hall, except they were set on horseback".