well known, and it is unnecessary to elaborate here upon the way in which they have applied relativity and quantum theory to enable them to trace the origin of the penetrating radiation to a creation of certain light elements from protons and electrons, except again to emphasise, with Prof. Millikan, the importance in this connexion of Dr. Aston's work with the mass-spectrograph, and of Dr. Dirac's theoretical treatment of the absorption by matter of radiation of short wave-length.

In this address, however, Prof. Millikan has dealt with two other problems raised by his own work. The first of these is the question as to where atom-building processes can proceed in the universe. His full arguments are not advanced—they are to be published in the October number of the *Physical Review*—but he states that there is excellent experimental proof that the nuclear combination which produces the cosmic rays does not take place in the stars at all, but at places of low pressure where the temperature is close to the absolute zero; in other words, in interstellar or intergalactic space. Combining this with the conclusions of Prof. Eddington and Sir James Jeans, he arrives at the picture of a continuous atom-destroying process taking place under the extreme conditions existing in the interiors of stars, and an atom-creating process taking place between the stars in the equally extreme conditions of an opposite kind obtaining there.

The second point raised, closely connected with the first, is the problem of why the primordial positive and negative electrons which go to build up the common elements have not been used up long ago. The answer which Prof. Millikan and Dr. Cameron make is "that out in the depths of space where we actually observe through the cosmic rays helium, oxygen, and silicon being continually formed out of positive and negative electrons, there too these positive and negative electrons are also being continually replenished through the conversion back into them under the conditions of zero temperatures and densities existing there, of the radiation continually pouring out into space from the stars." With the aid of this assumption, they can regard the universe as being already in a steady state, and can avoid the necessity for supposing that it must finally suffer a 'heat-death,' in contradiction to the conceptions of Sir James Jeans, who supposes that the process of conversion of mass into radiant energy is nowhere reversible (NATURE, **121**, 467; 1928), and of others who suppose that the processes are all everywhere reversible.

In his concluding remarks, Prof. Millikan discusses in a general way what sources of power are likely to be used in the future, although he suggests little that is new. Any extensive application of the energy available through the disintegration of radio-active or other atoms is dismissed, as is use of the almost unlimited energy which would be obtained if the hydrogen atoms of terrestrial water could be induced to build themselves up into atoms of other elements, since it is impossible to imitate the conditions of interstellar space under controllable conditions, and he comes ultimately to the conclusion that solar energy, in some form or another, must continue to supply most human needs.

University and Educational Intelligence.

CAMBRIDGE.—The retiring Vice-Chancellor, the Rev. G. A. Weekes, announced on Oct. 1, that the University has received an offer from the International Education Board of the Rockefeller Foundation of a gift of £700,000, of which £250,000 would be for the proposed new library and the remainder "for certain new developments in the physical and biological studies of the University." The gift is conditional on the University raising the money required to complete the whole scheme. As regards the University Library, it will be remembered that provisional plans for a new building costing £500,000 for construction and maintenance have been under consideration, and the Finance Board decided that £250,000 could be raised to enable a portion of the work to be started. The Rockefeller gift of £250,000 would make it possible to proceed with the whole building at once. The remaining £450,000 is offered towards necessary developments of physical and biological studies, the complete scheme of which will cost £679,000; the University has thus to raise a further sum of £229,000 in order to be able to accept the Rockefeller gift.

LONDON.—The following courses of free public lectures at University College are announced: "Recent Work on Vitamins," by Prof. J. C. Drummond, on Oct. 12, 19, 26, Nov. 2, 9, and 16; "Urinary Secretion," by Prof. E. B. Verney, on Oct. 15, 22, 29, Nov. 5, 12, and 19. The lecture hour will be 5 o'clock and no tickets will be required.

DURING the forthcoming Michaelmas term courses of lectures will be given at the British Institute of Philosophical Studies by Prof. L. J. Russell on "Four Great Philosophers and the Modern Outlook," and by the Director of Studies, Mr. Sydney E. Hooper, on "Contemporary Philosophy." Full syllabuses can be obtained from the temporary offices of the Institute, 88 Kingsway, London, W.C.2.

FROM the University of Colorado we have received its Annual Catalogue with announcements for 1928–29, —a volume of some 500 pages, wherein are to be found interesting illustrations of several modern American departures from the traditional idea of a university. The Summer Quarter has assumed a very prominent place among the university's activities and is an important factor in the maintenance and improvement of the standards of teaching in the schools throughout the State. The students enrolled, largely school teachers, principals, and superintendents of education, numbered in last year's summer quarter 3363, as compared with a total attendance of students during the regular academic terms of 3131. The University plant is thus kept working at full pressure almost throughout the year. The University's Extension Division, organised "to render to the State at large such public service as may lie within its power," comprises a Department of Instruction, including correspondence, class, and visual instruction, and home-reading courses, and a Department of Public Service. Among the services of this department are: industrial surveys directed towards the ascertainment of opportunities for future expansion and growth of the industries of a selected district, retail cost surveys undertaken in co-operation with retail trade associations, public utility researches, a clearing house of information for municipal officials, assistance to civic organisations by scientific investigation of stated problems and drafting bills, organising conferences and exhibitions in connexion with public health, child welfare, community recreation and juvenile delinquency, a clearing house for the newspapers of the State, maintaining contact between the editors and the organised industries, and organisation of debates in high schools. The development of correspondence study is noteworthy, the enrolment in these courses having increased steadily from 150 to 1500 in the past ten years.