geological chronology its value is at present only potential. The radium method of evaluating geological time seems to offer more immediate promise.

In conclusion, it is pleasant to note how these applications of chemistry, astronomy, and meteorology, not merely to general principles of geology but to a definite geological problem, emphasise the fundamental unity of the sciences, and illustrate the powerful aid that may be rendered by one to another.

## UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

DR. H. ROY DEAN, professor of pathology in the University of Sheffield since 1912, has been appointed to the chair of pathology and pathological anatomy in the University of Manchester.

DR. ADA E. MILLER has been appointed lecturer on school hygiene by the Edinburgh Provincial Committee for the Training of Teachers, in succession to Dr. I. Douglas Cameron, who has resigned.

IT is stated in *Science* that the committee on education of the United States House of Representatives has reported favourably a Bill establishing a National University in Washington. According to the Bill an initial grant of 100,000*l.* would be made. The university would be devoted to research and graduate work and no degrees would be conferred.

A REUTER message from Delhi reports that on March 22 Sir Harcourt Butler introduced in the Imperial Legislative Council a Bill for constituting a teaching and residential university at Benares, with special facilities for instruction in the Hindu religion. He referred to the scheme as the commencement of a new era in university organisation in India.

DR. ALEX. HILL, principal of the Hartley University College, Southampton, is reported by the *Times* to have said in an address on Monday that he had recently been preparing a war-roll of the Empire universities, and had found that the average contribution in men from universities and university colleges was just above 50 per cent. He added:—"It is a surprising fact that the contribution of German universities to the forces of the German Empire in the field is less than 20 per cent." This statement as to German university students is not, however, correct, judging from the statistics we gave last week (p. 81). Seventy-five per cent. of the students of German universities are in the field, and about 80 per cent. of the students of the Technical High Schools are also on active service.

SIR PHILIP MAGNUS retires, we understand, to-day from his official connection with the City and Guilds of London Institute. It is now no fewer than thirty-five years ago since he was appointed organising director and secretary of the institute, a post which he held for eight years, during which he was responsible for the initiation of the institute's work and for the schemes of the Finsbury College and Central Technical College, which have since developed so successfully. In 1888 his activities were transferred to the examinations department, or, as it is now known, the department of technology of the institute, where they found a wider field in assisting and guiding the development of technical instruction all over the country. The ability of his organising powers is sufficiently evidenced by the manner in which the department, without any assistance from Government and without the power of the purse possessed by a department of State, has made the name of the City and Guilds of London Institute known to technical schools all over the British Isles, and, indeed, in the Dominions beyond the Seas. To the work of Sir Philip Magnus in the office which he is vacating, his careful insistence on the necessity of making technical instruction a true education in principles, his continual study of the best means of adapting courses to the needs of students and manufacturers alike, and his unceasing endeavours to raise the standard of teaching, the progress of technical education in this country is greatly indebted.

THE first annual report, for the period ended December 31, 1914, submitted by the executive committee to the trustees of the Carnegie United Kingdom Trust has now been published. Mr. Carnegie during many years prior to 1912 gave large sums to local authorities in this country for the erection of public libraries, and to churches for the acquisition of organs. As the applications for these grants increased and their administration became more difficult, Mr. Carnegie decided to place the future administration of grants under the control of a permanent body of trustees. In 1913 he placed 2,000,000*l.* in trust so that the income of about 100,000*l.* a year should be available "for the improvement of the well-being of the masses of the people of Great Britain and Ireland." The report is full of interesting particulars, but attention can be directed only to a few typical facts. Organ grants are to be discontinued for the present. Mr. Carnegie has already expended 550,000*l.* in this direction in the acquisition of some 3500 instruments. A total expenditure of nearly 2,000,000*l.* has been incurred already on the erection of public libraries in the United Kingdom. The executive committee has, we notice, intimated to the authorities of the Household and Social Science Department of King's College for Women, London, that it is prepared to meet half the cost of the erection of a library building, on certain conditions. The committee has also made an offer in the direction of endowment to the Central Bureau for the Employment of Women. The report throughout gives the impression of wise and sympathetic administration of a princely endowment.

## SOCIETIES AND ACADEMIES.

### LONDON.

**Royal Society**, March 18.—Sir William Crookes, president, in the chair.—Prof. W. H. **Bragg**: Bakerian Lecture: X-rays and crystalline structure. The atoms of crystal may be conceived—in various ways—as arranged in a series of parallel planes, each capable of reflecting a small fraction of an incident pencil of X-rays. If the spacing of the planes is $d$, the wave-length $\lambda$, and the angle between the rays and the planes is $\theta$, and if the relation $n\lambda = 2d \sin\theta$ is satisfied, where $n$ is any integer, then the various reflected pencils are in the same phase and combine to give an obvious reflection of the X-rays. If this relation is not satisfied there is no reflection. The X-ray spectrometer is designed to measure the various values of $\theta$ at which reflection occurs in a given case. The angle can easily be determined to a minute of arc. Given $d$ we can compare the wave-lengths of different X-rays. Given $\lambda$ we can compare the spacings of various sets of planes of the same or of different crystals. By certain considerations the experiments can be made absolute and not merely comparative. In this way the structures of several simple crystals have already been found, such as rock-salt, diamond, iron pyrites, and so on. The reflections for various values of $n$, the