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school teachers, who shall have been educated at the University, will be the natural "channels" through which the highest forms of culture will flow from that centre of learning to the outermost boundaries of settlement. But even when the new system of training pupil teachers shall have produced its full effect upon the primary schools there will still be ample scope for university extension lectures to supplement and extend the ordinary school course. The instruction which average boys or girls can acquire during the five or six years which they spend in the classes is only the key which will enable them in later years to unlock the vast storehouse which contains the wisdom of the ages. The true function of the university extension lecturer should be to show those who are unable to pass into the higher scholastic institutions how to utilize the elementary knowledge they possess to the best advantage.

The improvement of our national system of education should enhance rather than diminish the value of popular courses of lectures delivered by men who have devoted their lives to the study of science or literature. One of the most perplexing problems that educationists have to grapple with at present is the tendency on the part of a large percentage of the young people who have passed through the primary schools to regard the acquisition of an "exemption certificate" as the goal of learning. In spite of the facilities which institutes and other circulating libraries afford for obtaining an abundance of good literature there are large numbers of young men and women who never think of devoting any portion of their leisure to serious study. Others who desire to improve their minds often waste much precious time in desultory reading, which is of comparatively little permanent value, owing to the fact that their studies lack definiteness. Men whose mental faculties have been disciplined by systematic study may profitably browse at large in a well-stocked library, because they instinctively select books that would be likely to supplement their store of knowledge and improve their intellectual equipment; but novices require the assistance of a guiding as well as of a restraining hand until they have acquired a taste for good literature. It is in this connection that the university extension movement supplies a felt need in practically every community. By creating an interest in subjects that are calculated to expand the mind and enrich the lives of men and women who are engaged in prosaic avocations much may be done to cultivate studious habits among sections of the people who have hitherto neglected to appreciate the privileges that lie within their reach. Invaluable, too, is the judicious advice which lecturers who are familiar with the pitfalls that beset the path of inexperienced students are able to give regarding the best means of attaining the end in view. It has been suggested that something might be done to form a connecting link between the University and country institutes. At present the facilities which the latter organizations afford for self-culture do not appear to be fully realized by residents in rural districts; but if some scheme could be devised that would combine the lofty purposes and ideals of the University with the social aspects of the institutes permanent good would result. In this relation it is satisfactory to find that this year applications have been received from three country districts for lecturers.

The programme arranged for the series of extension lectures which will be inaugurated by Professor Bragg this evening leaves little to be desired. Care has been taken to cater for diverse tastes without unduly widening the scope of the subjects to be discussed. Professor Bragg's decision to continue and enlarge the course of lectures he delivered last year on "The electron and the atom," by giving a series of addresses on "The electron and the atom," will be appreciated by those who have followed the trend of recent scientific thought. Chemists and physicists assume the existence of the atom and its affinities, and base their work upon that assumption, but beyond this theory lies the great inductive problems—"What is the nature of the atoms and what are the causes of their affinities?" Until recently it was generally thought that the atom was indivisible, but the phenomena of radio activity have, apparently, rendered that proposition untenable. The dis-

covery of the electron and the revelations made by the spectroscopy opened up a new field of study, and Professor Bragg will devote three lectures to an attempt to explain the methods by which the problem has been attacked and the nature of the results attained. Scientists admit that they have only caught glimpses of the wonders that will probably be unfolded by later research; but the little that is already known regarding this fundamental problem is intensely interesting, apart from its practical value. Professor Henderson has again chosen three great historical personages to supply

material for his discourses. Last winter he dealt with a trio of the leaders of human thought and activity in the middle ages; and this year he proposes to study the characters and achievements of three of the most conspicuous men of the Puritan epoch. Following his own precedent he has included in the course a man of affairs, a religious idealist, and a man who endeavoured to combine the aspirations of a religious enthusiast with the rigorous practical necessities of statecraft and war. The age upon which the Earl of Strafford, Oliver Cromwell, and John Milton stamped the impress of their diverse personalities was essentially a heroic period, and one which will repay careful study. "Our own history of England," said Carlyle, "you will find beyond all others worthy of your study, for indeed I believe that the British nation produced a finer set of men than any you will find it possible to get anywhere else in the world." That observation is particularly applicable to the citizen soldier who became dictator of a kingdom, and whom Carlyle himself is said to have discovered, and to the poet who enriched our literature with one of the finest allegorical epics ever penned. In August the Rev. John Reid will begin a course of six studies entitled "Select comedies of Shakspeare." Mr. Reid is a scholarly and enthusiastic student of the Bard of Avon, and his utterances regarding the branch of English literature which he has made his own are always worthy of his great theme. An intelligent application of the scientific, historical, and literary subjects included within the range of the three courses referred to would in itself constitute a liberal education, and it is a matter for congratulation that South Australia possesses the means for giving effect to such a splendid conception of "popular instruction."

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UNIVERSITY EXTENSION LECTURES.  
On Monday evening, at the Jagoes Street Hall, Semaphore, Professor Henderson dealt with the second character in his course of lectures on "Leaders of the Middle Ages"—Francis, of Assisi. There was a capital attendance. The lecturer discoursed for over an hour on the life and work of the idealist, and at the conclusion several views bearing on the subject were thrown on a screen. On June 27 Professor Henderson will lecture on Louis IX., King of France. A course of three lectures on "The tragedies of Shakspeare," by the Rev. John Reid, M.A., will then be given.

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RADIUM FOR THE UNIVERSITY.  
At the conclusion of his lecture on "The electron and the atom" at the Adelaide University on Tuesday evening, Professor Bragg stated that he was pleased to be able to announce that he had that day received from England £20 worth of radium, which he hoped to utilize for the purpose of illustrating some phases of a subsequent lecture on radio activity. The piece of this rare and precious metal which the professor now possesses represents less than half a grain, but it is the largest quantity that has been imported into this state. It has arrived at an opportune time, as the extension lectures will afford large numbers of persons who do not attend the regular science classes opportunities to gain an insight into the peculiar properties of the substance.

"THE ELECTRON AND THE ATOM."  
UNIVERSITY EXTENSION LECTURE.

Professor Bragg, M.A., lectured at the Prince of Wales Buildings, University of Adelaide, on Tuesday evening, on "The electron and the atom." This was the first of three addresses in continuation of the series delivered in 1903 on "The electron." His Excellency the Governor (Sir George Le Hunte) and the Vice-Chancellor of the University (Dr. Barlow) were present. Professor Bragg, in introducing his subject, said that it was just 100 years ago since Dalton communicated his atomic theory to Professor Thomas Thomson, of Glasgow. The professor at once utilized the conception in his lectures, and in 1807 he published a text book in which the theory was given to the world. The atomic theory had during the century been fully established, and all the growth of science had but served to give it a stronger hold. The atomic theory supposed that matter was composed of an aggregation of atoms, the hydrogen atoms being, for instance, all alike, but different from the atoms of another substance—oxygen, for example. With the idea of atoms came necessarily the conception that they were always in motion. That was exemplified by the diffusion of gases into one another, and even of metals into one another. Robert Austen pressed a piece of lead on a piece of gold, the faces of contact being carefully prepared, and he found after a lapse of four years that the surface layers of lead had been penetrated by so much gold that on assay they gave over 1 oz. to the ton. Heat was a mode of motion, and as a body became hotter its atoms moved about more quickly. All chemical and physical actions depended on the affinities of atoms for atoms. The chemist and physicist assumed the existence of those affinities, and on them built their work. But it was possible to enquire how the atom was built up and what were the nature of the affinities of atom for atom. That was what he proposed to do in the course of the three lectures. It had long been supposed that the atom was indivisible, as its very name implied, but the discovery of radio-activity, together with the revelations of the spectroscopy, had made it clear that the atom was a complicated structure. A few main principles respecting the external characteristics of atoms must be stated before the main subject could be proceeded with. In the gaseous state matter consisted of atoms moving about with great speed, colliding against one another, but otherwise free from one another's influence. In a cubic centimetre of gas (about a thimbleful) the number of molecules at ordinary pressures and temperatures was 40,000,000,000,000,000. Each one on the average moved about 4-millionths of an inch before it hit another, but its diameter was 100 or 200-millionths of an inch. As to its weight, an ounce would contain, of hydrogen atoms, a number expressed by the figure 1 and 25 cyphers. The average speed of a molecule in air was about one-third of a mile in a second. The spectroscopy method of getting at the nature of an atom consisted in an examination of the vibrations of the electric charges which it contained. That gave waves of light. The problem might have its analogue in the case of sound. If any one heard an instrument and tried to gather from the nature of its sound what the instrument was like, then the problem would be somewhat similar, except that one must be supposed whilst making the investigation to be quite ignorant of what a musical instrument was like. The lecturer explained that the charges in the atoms were set in vibration by extremely rapid collisions between one another, whose speed was in all probability largely due to electric attraction. He showed various spectra upon a screen, and compared the revelations there made with the effects given by musical instruments, using the organ and zither to illustrate some of the points. He told his audience how the complicated systems of lines in a spectrum had been analysed into series of lines which were related to one another somewhat as were the overtones of a musical string. He described how the spectrum changed with temperature, how that could be further illustrated by the spectra of the stars, and how in that way the stars might be arranged in order of their temperature. Thus it was apparent that the sun was one of the cooler stars, Sirius a much hotter one, and Gamma Argus still much hotter. Other stars were given much cooler than the sun. All the statements he made served to point out that an atom contained systems of electric charges, named electrons, in rapid motion within the boundaries of the atom. At the conclusion Professor Bragg promised to show at his next lecture what was to be gathered from the recently discovered phenomena of radio-activity.

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RHODES SCHOLARSHIP.  
The election committee for the Rhodes Scholarship has received information that the scholar elected may, if he desires, take advantage of the statute relating to the recognition by the University of Oxford of work previously done in Melbourne. A student who has passed through a course of two years at the Melbourne University, and passed the examinations connected with it, will be allowed to enter Oxford without passing responsive, and take rank as a student of the second year, but he must pass in Greek before taking the final examination.