most striking evidences of the growth of the University since its foundation.

THE ADELAIDE UNIVERSITY.

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The Waite Research Institute.

The work of the Waite Agricultural Research Institute was rapidly fulfilling expectations. A soil survey of the State was in progress under Professor Prescott, who had been acting as director during the absence of Professor A. E. V. Richardson. The plant diseases, "take-all" and "tomat- wilt"—the latter at the instance of t with funds provided by the Commonwe Council for Scientific and Industrial search—were being investigated by Geoffrey Samuel. Professor Richards who would return in a few weeks, had been asked to undertake research into the mineral deficiencies in Australian pas tures, by the Empire Marketing Board in London. A pound for pound subsidy towards the cost was offered by the board. Professor Osborn, who was invited to attend the Pan-Pacific Conference in Japan as one of the representatives of the Commonwealth and who would return in a few days, was carrying out observations and experiments in the regeneration of pastoral country at the Koonamore Reserve, generously set apart for the purpose by Messrs. Hamilton and Wilcox. At the Darling laboratories, Professor Robertson was continuing his researches into cell-growth and the origin of cancer. His work had been recognised in Italy by his selection as a foreign member of the Royal Academy at Rome, which was the oldest academy of science in Europe. One of its foundation members was the famous Galileo. Professor Robertson was elected in the section of biological sciences, in which only one member was appointed annually. A request had been received from the Council for scientific and industrial research that Professor Robertson might be allowed to investigate the problem of the nutrition of animals for the whole of Australia, and was under consideration. The work of anthropological research amongst the aborigines of Australia, initiated by Professor Wood Jones last year, would be extended by an expedition to the Mac Donnell Ranges during the coming vacation. Mr. E. W. Holden had generously contributed £100 towards the cost of the expedition. The resolution passed by the Legislative Council that the site occupied by the Mental Hospital at Parkside should, when available, be devoted to the purposes of residential colleges within the University was heartily welcomed. Apart from this, their most urgent needs were further land in the city, a new chemical laboratory comparable with the physics and engineering laboratory, a separate building for the library and a chair of modern languages. Their warm congratulations were offered to Sir Archibald Strong on the publication of his verse translation of Beowulf, and to Professor Hancock on his work entitled, "The Life and Times of Ricasoli." The latter had received the compliment of leading articles in the "Times" literary supplement, and the "Spectator." The vice-Chancellor returned in August after completing his Gifford lectures at the University of Aberdeen, and was now preparing the lectures for publication. During Professor Mitchell's absence, the duties of vice-Chancellor were performed by Professor Rennie. He desired to express heartfelt thanks to both of them and also to the Registrar for the assistance they had rendered to him during a very exacting year. (Applause).

Degrees Conferred.

The Dean of the Faculty of Law (Mr. W. J. Isbister, K.C.) presented the candidates for the Degree of Bachelor of Laws:—James Francis Brazel, William Donnithorne, John Scott Hardy, Roland Henderson, Geoffrey David Hollidge, Haynes Leader.

The Dean of the Faculty of Medicine (Dr. W. Ray) presented the candidates for the Degree of Doctor of Medicine:—Kenneth Stuart Hetzel, M.B., B.S., Helen Mary Mayo, M.B., B.S. Degrees of Bachelor of Medicine and Bachelor of Surgery:—Cyril Brooke Carlin, James Murray Cotton, Donald Edward Drever, Sydney Bayly Forgan, John Edward Formby, Oscar Westcott Frewin, Kevin Glastonbury, Keith Douglas Gray, Albert Walter Grote, Norman Stannus Gunning, James Estcourt Hughes, Carl Clifford Jungfer, Raymond Hanbay Kaines, Rita Margaret Mc Ananey, Alistair Campbell McEacheri (Everard scholar), Jack Moreland, Berkeley Sunter Muecke, Rupert Kirk Reeves, Douglas Munro Salter, Gemmel Tassie Rudolph Hermann von der Borch, Esmond Thomas Walsh, Geoffrey Wilson Morey (in absentia).

Ad eundem gradum:—Carl Emil Dorsch, M.B., Ch.B. (Edin.), Cedric Stanton Hicks, M.Sc., M.B., Ch.B. (Otago, N.Z.), Ph.D. (Camb.)

The Dean of the Faculty of Dentistry (Sir Joseph Verco) presented the candidates for the Degree of Doctor of Dental Science:—Cecil Boase Maddern, B.D.S., Arthur Paris Reading Moore, B.D.S., Degree of Bachelor of Dental Surgery.—John Cumming Burns, Roy Gilmore Ellis, Malcolm Stewart Joyner, Charles Leslie Phillips, Linda Lovibond Thomson.

The Dean of the Faculty of Arts (Professor J. McKellar Stewart) presented the candidates for the ordinary degree of Master of Arts:—Reginald Keith Sorby Adams, B.A., John Colville, B.A., Mary Hope St. Clair Crampton, B.A., Edna Mary Grosvenor, B.A., Adolf Oscar Kriehn, B.A., Ludwig Adolf Emanuel Leidig, B.A., Harold Merton Lushey, B.A., Jabez Percy Harold Tilbrook, B.A., Rudolph Bronner, B.A. (in absentia), George Elton Mayo, B.A. (in absentia). Honors Degree of Bachelor of Arts (classics).— Ida Margarete Dorsch, Yvonne Lois Wait. Ordinary Degree of Bachelor of Arts.—Leonard Nicholas Allen, Mary Gilbert Barwell, Marie Beatrice Child, Edith Grace Dickinson, Magdalene Hedwig Dorsch, Dorothy Mary Fyfe, Minnie Henrietta Foxwell Gartrell, John Garfield Goldsworthy, Howard Berthold Hoskins, Leonard Percy Johncock, Elizabeth Lawson McKechnie, Margarita Anna Flora Mara, Hedley Lindsay Noblett, Ena Beatrice Faith Orrock, Edward Clarence Parsons, Alec Gordon Paull, B.Sc., Irene Blanche Rogers. Ordinary Degree of Bachelor of Arts (ad eundem gradum).—Francis Aimee Stevenson, B.A. (Tasmania).

The acting-Dean of the Faculty of Science (Professor J. R. Wilton) presented the candidates for the degree of Doctor of Science.—Leonard Keith Ward, B.A., B.E. Degree of Master of Science.—Paul Samuel Hossfeld, B.Sc., Thomas Abrahare Le Messurier, M.A., B.Sc., Geoffrey Samuel, B.Sc. Honors degree of Bachelor of Science.—Chemistry—Rupert Jethro Best. Mathematics—Richard Francis Canney, M.A. Physics—Ronald Gladstone Mitton, Luther Ernest Crosby Wilson. Ordinary degree of Bachelor of Science.—Arthur John Sorby Adams, Alfred Lisle Dawson, Effie Wyllie Deland, Stephen Ernest Harvey Gibson, Gwynfred Jones, Alexander Owen McPherson, Leonard Seymour May, Sidney Moyle, M.A., Terence Brady Paltridge, John Schomburgk Walker, Alexander Herbert Crane (in absentia), Arthur John Owens (in absentia), William Frederick Claude Pohlmann (in absentia), Alan Robert Trist (in absentia). Degree of Master of Science (ad eundem gradum).—Cedric Stanton Hicks, M.Sc., M.B., Ch.B. (Otago, N.Z.). Ph.D. (Camb.); Frederick George Holdaway, M.Sc. (Queensland) (in absentia).

The Dean of the Faculty of Applied Science (Professor R. W. Chapman) presented the candidates for the degree of Master of Engineering:—Rex. Whaddon Parsons, B.E. Degree of Bachelor of Engineering.—Howard Hamlyn Forder, Robert Pringle Kay, Norman Ambrose Plunkett, Arthur Edward Sharman, Edwin Joseph Truman Symonds, Frederick William Symons, William Weston Winwood. Diploma in Applied Science.—Howard Hamlyn Forder, Robert Pringle Kay, Norman Ambrose Plunkett, Arthur Edward Sharman, Edwin Joseph Truman Symonds, William Weston Winwood.

The Dean of the Faculty of Music (Professor E. Harold Davies) presented the candidates for degrees in music:—Degree of Bachelor of Music.—Robert Dalley Scarlett (in absentia).

The Chairman of the Board of Commercial Studies (Mr. S. Russell Booth) presented the candidates for the diploma in commerce:—Alfred Victor Adamson, Alan Claude Bray, Thomas John Brazel, Leonard Sawtell Brown, John Harrold Chambers, David Lancelot Dawson, Merton Perry Hooper, Elizabeth May Jones, Percival Richard Henry Judd, Harold Trent Lloyd, William Albert Kenneth McKee, Leonard Edward James Maunder, Francis Patrick Mullins, Henry Edwin Howard Mutton, M.A., Howard Llewellyn Read, Robert Thomas Shuttleworth, Arthur Donald Stuart, Frank Elliot Trigg, Zena Vera Williams, Harold Edgar Williamson.

The External Inheritance of Man.

The Commemoration address was entitled "The External Inheritance of Man," and was delivered by Professor T. Brailsford Robertson, professor of biochemistry and general physiology. Professor Robertson said it was an essential doctrine of modern biology that acquired characteristics were not inherited—that defects or other alterations imposed upon individuals by accident, or by their environment, were not transmitted to their offspring. From that generalisation it had been hastily inferred by many laymen that since acquired physical improvements could not be inherited any more than acquired physical defects, the outlook for humanity must be hopeless, because they could by no effort of their own improve the lot of their descendants, or by altering their own environment bring about the evolution of a more ideal race, but he would attempt to show that in the particulars which were most important to them this interpretation of biological law was a mistaken one. Far from entailing a pessimistic view of the future of man, it was his opinion that a firm conviction of the truth of the doctrine of the non-inheritability of acquired characteristics was perfectly compatible with an optimistic attitude towards the efforts of man to improve himself. Many biologists, even before the time of Darwin, had observed a sequence of forms among the animals and plants now living and extinct, which suggested to them the possibility that the more complex forms of living beings might have arisen from the simpler types by the process of evolution. One of the most gifted of those investigators, Lamarck, towards the end of the eighteenth century, proposed a simple explanation, taking the giraffe as an example. It appeared to have descended from ancestors resembling itself, save that their necks were no longer, relatively to their bodies, than those of other animals. These remote ancestors, by their endeavors to browse upon leaves which lay somewhat beyond their reach, slightly elongated their necks. That elongation was transmitted to their offspring, who, in turn, continued the effort to reach the higher branches, so that elongation added to elongation, through many generations, produced at length the neck of the giraffe. From the standpoint of pure logic that argument was somewhat faulty in that it proved too much. He supposed it had been the effort of every herbivorous animal from time to time to attain to branches above its reach, yet the effect of that effort, so potent in the race of giraffes, had not elsewhere produced like results. But without resorting to subtleties of formal logic, a host of facts were even then at hand to disprove the possibility of this plausible explanation of evolution. Domestic animals had, since time immemorial, been subjected to certain mutilations in response to the utilitarian needs or the caprices of their owners. Sheep, for example, were tailed for utilitarian reasons; terriers' tails were shortened merely to satisfy an aesthetic caprice of their owners; yet sheep and terriers continued to be born in possession of tails of normal length. The failure of all of these efforts constituted a foundation of negative experimental evidence of the non-inheritability of acquired characteristics which it was very hard indeed to shake. But it was notoriously difficult to prove a negative, and a single positive case of inheritance of acquired characteristics would not only seriously upset their faith in the reliability of the negative reports of the past, but would also be so inconsistent with the modern view of the mechanisms of inheritance as to necessitate their complete revision, if any instance of inheritance of an acquired character could be firmly established by carefully controlled observation.

Acquired Inheritance Inconclusive.

There had been two or three cases in which inheritance of an acquired character had apparently been observed by investigators of experience and distinction. The most striking of these was the outcome of an experiment performed in the middle of last century by an American, Brown-Sequard, who adopted French nationality. The experiment consisted in injuring certain portions of the brains of young guinea-pigs. It was stated that these animals developed epilepsy, and not only the animals which had been operated upon, but also their descendants. An analogous experiment had been performed in quite recent years by Guyer. He had stated that if an extract prepared from the lens of the eye be injected repeatedly into animals, after some time the lens material in the eyes of the animals so treated underwent degeneration, so that they developed defects of vision. These defects were also inherited for one or two generations. In both of these cases, however, they might be dealing with special substances, formed in the tissues and circulation of the parent, which had the property of uniting with or destroying the proteins of the brain in the one case, of the lens in the other, and there was some reason to suppose that these substances might be directly handed on through the germ cells for one, or even two generations, before they became sufficiently diluted to lose their effectiveness. There were one or two phenomena in the nutrition of animals, and also in disease, which suggested that this might be a possible explanation of the positive results obtained by these observers. On the other hand, many observers who had attempted to repeat Brown-Sequard's experiments had failed to obtain the results which he described, and several investigators who had repeated Guyer's experiments upon lens destruction had met with equally negative results. So that not only were the experiments inconclusive from the point of view of genuine inheritance, but the experiments themselves were by no means irrefutible. During the last 20 years the most enthusiastic upholder of the supposition that acquired characteristics might be inherited had been Professor Kammerer, of Vienna, who had reported inheritable changes in color and minor details of structure as the result of exposing frogs to variations of temperature, light, and other conditions. Those results had been ascertained to have been based upon misapprehension, and but a few weeks ago the realisation of this fact most unhappily led Professor Kammerer to the tragic decision which terminated his life. Another alleged example of inheritance of acquired characteristics had been brought forward in the last few years by Professor Pawlow, of Petrograd, who stated that he had succeeded in educating mice to respond to the sound of a bell, which constituted the signal for feeding. He had stated that the first generation of white mice required 300 lessons—300 times it was necessary to combine the feeding of the mice with the ringing of the bell in order to accustom them to run to the feeding-place on hearing the bell ring. The second generation required for the same result 100 lessons; the third generation learnt to do it after 30 lessons; the fourth required only 10 lessons; the fifth 5. They had not heard of the further investigation, but it had been suggested to him that they would ring the bell. (Laughter.) Although the reputation of Professor Pawlow as an experimenter was of an overwhelming character, he felt himself compelled to assume that the results reported by Pawlow were like those of Kammerer—based upon misapprehension. He had never been able to perceive the slightest educability in the white mouse. That animal's capacity for education, if it existed, was extremely rudimentary, in which respect the mouse differed to a most extraordinary extent from its very near relative, the rat. He doubted whether 300 lessons would teach anything to the mice with which he had been acquainted. (Laughter.) In every direction it appeared that the results of attempts to show that acquired characteristics were inherited were negative, and that when they had appeared for some time to have been positive, the results had been shown to be fallacious. At the present moment he did not think there existed a single unchallenged experiment to demonstrate inheritance of acquired characters. Their present knowledge of the mechanisms of inheritance was totally inconsistent with the view that acquired characteristics might be inherited. A dog under given circumstances hardly ever behaved twice in precisely the same way, and as the circumstances changed it adapted its behaviour to suit them.

Development of the Nervous System.

They found in man, in comparison with the lower animals, an enormous development of the central nervous system, and particularly of the higher part of the brain, the cerebral cortex. That immense mass of nervous tissue was built up, as nervous centres in all animals were built up, of a number of units, so many in man as to be well-night innumerable. These units were the individual nerve-cells, or neurones, of which the immensely elongated processes stretched to regions far from their origin, constituting the nerve fibres of the body. The arrangement of those neurones in the central nervous system was not a haphazard one; the neurones designed to govern or facilitate particular activities of the body were localised in particular regions of the cerebral cortex, so that they could map out the surface of the brain, where the nerve cells reside, into regions to many of which they could assign the particular activities which they controlled. Thus there was a region on the parietal surface of the brain which controlled the movements of the various voluntary muscles of the body; the hand, arm, and trunk alike were represented by particular portions of that area, which could be mapped with a considerable degree of exactitude. In the occipital region of the brain was an area which was concerned with vision, the centre of which was connected with their actual perception of vision, and the region surrounding it with their interpretation of what they saw. The pre-frontal region of the brain was concerned with the finer control which found expression in the psychological attribute of judgment. In each of those areas, and in other areas of the brain of which they did not as yet so certainly know the function, they found the nerve-cells disposed in layers parallel to the surface, and extending only a short distance into the depth of the brain, the mass of material below them consisting mainly of nerve-fibres springing from the cells. The thickness of the cell-layers in different parts of the brain ran parallel with the development of plasticity and educability in the nervous system. Thus, in the pyramidal [illegible] superficial and most recently acquired layer of cells, the thickness in the dog was approximately that found in the new-born human infant. In a monkey, the Rhesus, the thickness of that layer was approximately that found in the adult imbecile among humans. As they proceeded upwards from the lower types of intelligence to the higher, they found these layers of cells, and particularly the pyramidal layer, increasing in thickness in proportion to the intelligence, that was to the educability displayed. And parallel with that they found that as development of the individual proceeded as intelligence awakened, so did the thickness of these layers increase. The increase in size of the cerebral cortical layers in the development of the individual was due, not to any increase in the number of cells they contained, but to increase in the size of the individual cells, and as the infant grew in bodily proportions, mental ability, and nervous and muscular activity, so did one cell after another awaken into activity in the brain and increase in size, and the summation of all those individual increases constituted the growth of the cerebral cortex. It has been found that in the cerebral cortex of any adult individual there was a very large proportion of undeveloped neurones—neurones, that was which [illegible]ed part of the original cerebral end[illegible] of the individual—a heritage into [illegible]ession of which he had never [illegible]. The larger proportion of neuro[illegible] almost every part of the cerebr[illegible] cortex remained permanently undeve[illegible]. They were as they were in the i[illegible] or but little larger. If an individu[illegible]as congenitally blind by reason of so[illegible] defect of the eye, the visual area in the occipital region of the cortex remained as undeveloped as it was at birth. The neurones did not grow in size, and hence the cortical layers in that region remained thin and infantile in character, yet they contained as many cells as the corresponding areas in any normal individual. All the potentialities were there, but, through a physical accident, realisation of those potentilities had never been possible. The process of education, in fact, consisted in learning to utilise neurones which had hitherto remained dormant. The difference between the learned and the unlettered was merely a difference in degree of realisation of the potentialities with which their chromosomal inheritance had endowed them. But it was furthermore ex-