News. 7/12/28.

LAW RESULTS

Applicants for Admission to Bar

Included in Faculty of Law examination results are the names of four students who have completed their course and have applied for admission to the Bar of the Supreme Court of South Australia on Saturday, December 15.

Among those who have qualified is Miss Alice Mary Cummins, of 104 Osmond terrace, Norwood, who is articled in the office of Messrs. F. Villeneuve Smith, Kelly, Hague, & Travers. Her completion of the course included second-class pass in

MISS A. M. CUMMINS

law of wrongs, and third-class passes in law of evidence and procedure, and private international law.

Adv. 17/12/28.

VETERINARY RE-SEARCH.

GRANT TO SOUTH AFRICA.

CAPE TOWN, December 14.

The Minister of Agriculture states that a grant of £10,000, with £1,000 a year for maintenance, has been received from the Empire Marketing Board for the development of veterinary research at Pretoria, as a link in the chain of central research stations throughout the Empire. The library of the institution will be extended, and the Minister hopes to appoint to the staff several scientists with outstanding qualifications for research work.

MR. J. N. McEWIN

Mr. McEwin attained his majority in July. He is the only son of Mr. George McEwin, solicitor, of Adelaide. He was educated at St. Peter's College before proceeding to St. Mark's, the residential college of the University of Adelaide. Here he remained for three years, having begun both his articles and university course in 1925, when he was articled to Mr. P. E. Johnstone, of Messrs. Johnstone, Olsson, and Kriewaldt. He was a prefect at St. Peter's College, secretary in 1927 of the Law Students' Society, and is a member of the University Students' Union Building Committee. Golf and rowing are his two chief athletic pastimes.

MR. J. R. CORNISH

Mr. Cornish, who is 23 years of age, is a son of Mr. C. P. Cornish, of the Education Department. He was educated at St. Peter's College before beginning his University course.

Successful at tennis and lacrosse, he played in intervarsity matches of the latter sport. He is a member of the Law Students' Society and of the University Sports Association. He was for some time engaged in a commercial house before entering the University, and was articled to Mr. O. Hunter, of Messrs. Hunter, Boucaut, Martin, and Ashton.

MR. P. B. ANGAS PARSONS

Mr. Angas Parsons, who is 25 years of age, is the elder son of Mr. Justice Angas Parsons. He was educated at St. Peter's College before entering the University in 1923. In 1924 he went to England for a trip and resumed his University studies upon returning at the end of that year.

He spent 1926 at St. Mark's University Residential College during the absence of his father in England. He began his articles early in 1924 with Mr. George McEwin, solicitor, of Adelaide. Mr. Parsons was a keen prefect at St. Peter's College, a member of a college debating society of the University Sports Association, and of the Law Students' Debating Society for last year. Tennis and golf are his favorite athletic sports.

Adv. 29/1/29

The Adver

ADELAIDE: TUESD
JANUARY 29, 1929.

EINSTEIN'S NEW DISCOVER

Probably "the three momentous pages" which, according to a cable message published yesterday, represents ten years' work by Professor Einstein, and which, we are told, he is now expounding, are filled with algebraic equations. He will, doubtless, do his best to explain them, and show how he has found that the forces of gravitation and electro-magnetism are inter-related, and can be united in a single formula, but it is likely that only mathematicians, or a few physicists who have made a deep study of the theory of relativity, will be able to understand them. That will not be Einstein's fault, for relativity is essentially a mathematical conception, and it is quite impossible to visualise the four-dimensional space-time universe which he substitutes for the geometry of Euclid and the sense of time which we ordinarily keep separate from that of space. Hundreds of books have been written in the hope of elucidating this difficult subject for "the man in the street," or even for well-educated persons who unfortunately are unversed in mathematics, but it can hardly be claimed that any of the writers have succeeded. Few "popularisers" of relativity, indeed, attempt much more than an exposition of the "restricted" theory, which, with a little responsive effort on the reader's part, can be made intelligible.

Anyone with experience and arithmetic to help may satisfy himself that it takes a swimmer a longer time to swim a hundred yards with the current, and the same distance back against it, than to swim an equal distance across the stream and back. Light being treated as a swimmer through the ocean of ether which surrounds and interpenetrates the earth, it was natural to suppose that its velocity would vary according to whether it was travelling with or against the ether current. It would make no difference whether the earth were considered stationary and the ether moving, or vice versa; if the earth is moving through the ether, it is relatively the same as though the ether were streaming past the earth. The celebrated Michelson-Morley experiment, however, contradicted the assumption that the velocity of light must vary when the direction is changed. Whether the beam of light was reflected backward and forward along the course of the ether stream, or across it, the result was always a dead-heat. To explain this negative result the "Fitzgerald contraction" was invoked; that is, it was assumed that moving bodies of matter become shorter in the direction of their motion, though the shortening cannot be detected because all material measures that may be applied undergo similar contraction. According to this theory, the great slab of stone on which the mirrors were fixed in the Michelson-Morley experiment shrank longitudinally, so that the beam of light sent backward and forward in that direction had a shorter distance to go than the transverse beam. The "Fitzgerald contraction" appeared to be a gratuitous assumption until the famous Dutch physicist, H. A. Lorentz, showed, from the electric theory of matter, that it is what might be expected to occur. The form and size of a material body are maintained by molecular cohesion. The molecules cohere as the consequence of electric forces operating between them. These forces have the ether as their medium, and, as Eddington says in "Space, Time, and Gravitation," "it will not be a matter of indifference to these forces how the electric medium is flowing with respect to the molecules. When the flow changes there will be a re-adjustment of cohesive forces, and we must expect the body to take a new shape and size." In view of the Michelson-Morley experiment, repeated and verified, the "restricted" theory of relativity appears in the declaration that it is impossible by any experiment to detect uniform motion relative to the ether. Without our knowing it the whole visible universe of which the solar system forms a part may be rushing through space at any velocity below that of light. If, says Eddington, a person were to assert that he was travelling upwards through space at the rate of 161,000 miles a second, he could neither prove himself right nor be proved wrong. If he were right the "Fitzgerald contraction" of the length of his body would be just one-half. Apparently, say, six feet tall, he would be really only three feet, except when he lay down and recovered his full length. All yard measures as a test are ruled out, since they undergo the same change in length according to the direction of motion.

But when we come to Einstein's "general" theory of relativity the Fitzgerald contraction and even the ether, as being no longer necessary, drop out of sight. This theory, which has displaced or modified the Newtonian law of gravitation, cannot be satisfactorily explained without mathematics. It requires us to think of the universe in terms of a new geometry which substitutes for homogeneous space in three dimensions a space-time "continuum" which has the peculiar property of becoming warped or curved in the presence of large quantities of matter. It is this warping or curvature which gives rise to the phenomenon of gravitation hitherto attributed to mysterious forces of attraction inherent in every particle of matter. We have to picture, if we can, the space-time in the gravitational field surrounding the earth as a kind of pucker, or hummock, or warp. In this curved space-time moving bodies, taking the easiest path, go round and not over the hummocks, and using the ordinary language of gravitation, we say they are "attracted." To most people, as to Sir Oliver Lodge, a warp in empty space is meaningless; how much, more so a warp in that "mathematically invented composite, space-time? As Sir Oliver

[continued] observes, we could understand material bodies affecting the ether in such a way as to determine their observed paths, but the "curving" of abstractions like space or space-time baffles the ordinary intelligence. But the "general" theory of relativity claims more than a theoretical validity: In three ways it has stood the scientific test of giving results in exact accordance with its formulae. Observations taken in the solar eclipses of 1919 and 1922 testify to the exact amount of deflection of a beam of light passing the sun that the theory requires. Relativity solves, where Newton's law failed, the problem known to astronomers as the advance of the perihelion of Mercury. And not long ago it was announced that the predicted displacement of the lines in the solar spectrum had been verified. It appears likely that Einstein's new formula, in which the forces of gravitation and electromagnetism are included in a single comprehensive generalisation, makes use of the curvature of space-time to explain the behavior of atoms and molecules.

Professor Kerr Grant
Search for
Radium Needle
Reg. 7/3/29

With Special Apparatus Professor Joins in Hunt for Radium Needle: 10 Others Found

PROFESSOR Kerr Grant, lecturer in physics at Adelaide University, joined in the search yesterday for the radium needle which disappeared at Adelaide Hospital on Saturday.

With an electroscope he made specially for the job he examined parts of the floor in Torrens Ward, from which the needle was lost, and made tests of ashes, dust, and rubbish removed from there.

He said afterwards that he found only where the needle was not.

The electroscope used has a piece of gold leaf mounted on a brass rod insulated by sulphur. With this electrified, the leaf stands on end. If it is brought within a radius of four or five feet of one milligram of radium, it immediately collapses.

"The cost of making it was practically
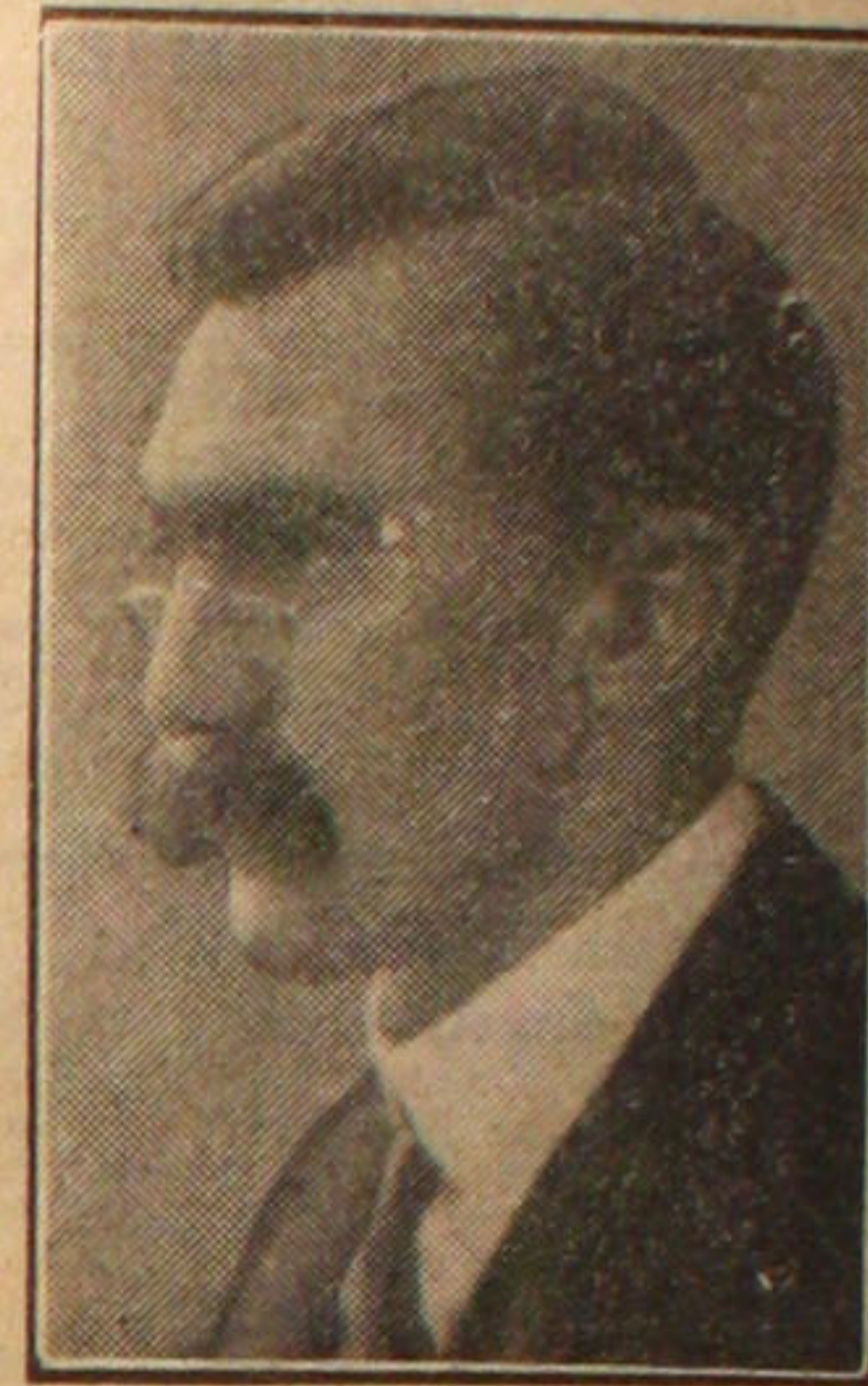
[continued] nothing," said the professor. "It was very simple, and meant just a few hours in the workshop."

Ten other needles, each worth £15, were missed on Sunday, when the hunt began; but they were found soon afterwards.

The missing needle contains one milligram of radium salts. Altogether 17 needles had been used for the treatment of a malignant growth in the cheek of an elderly patient on Saturday.

It is thought that the 11 needles must have been unconsciously ejected from his mouth.

Extensive X-raying showed he had not swallowed the one which is still missing. ("Rufus" tells an amusing radium story on page 6.)

Professor Kerr Grant