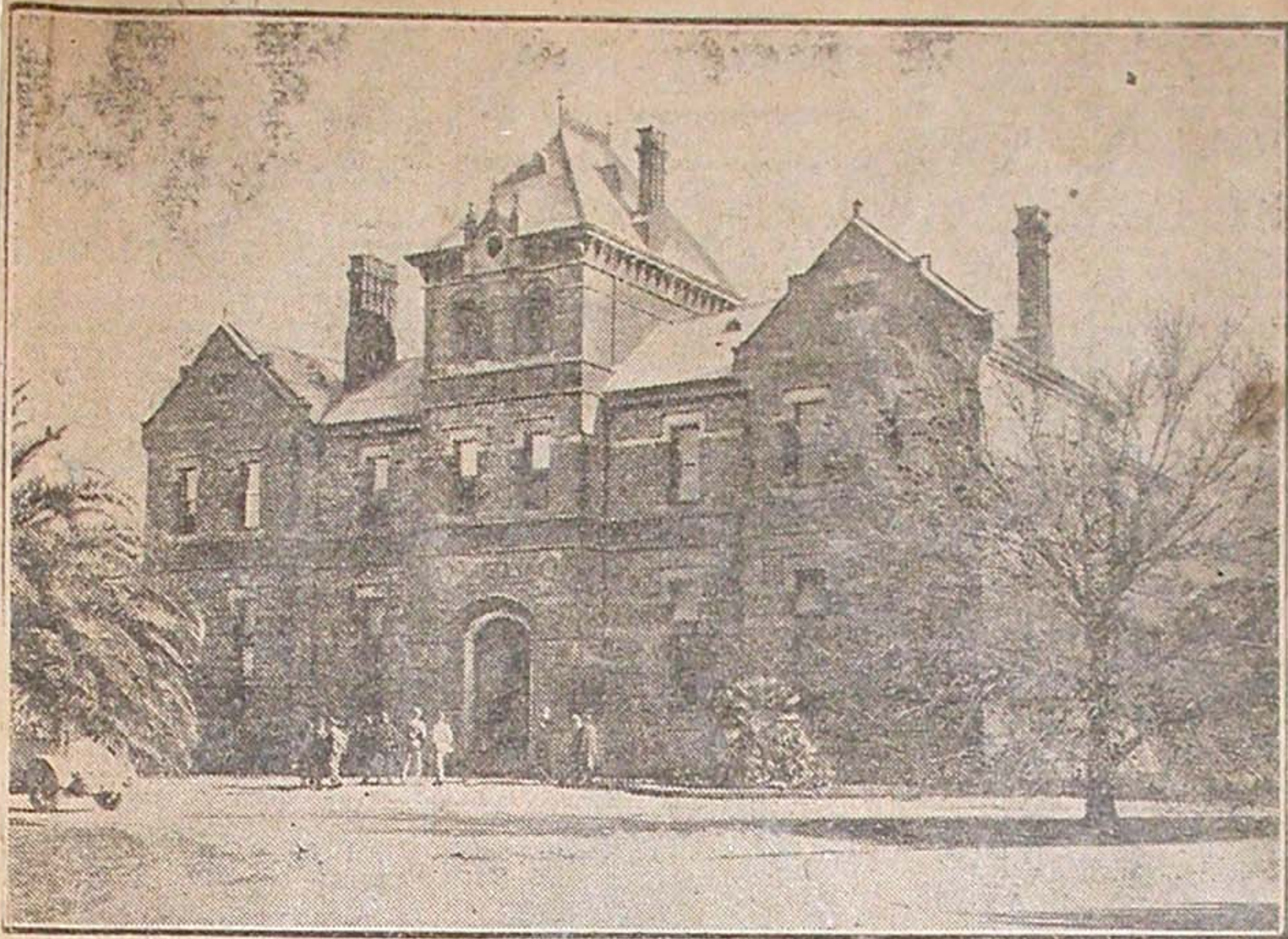


ROSEWORTHY AGRICULTURAL COLLEGE.



THE MAIN BUILDING.

Wayland, Photo.

PROPERTIES OF SOIL.

LECTURE BY PROFESSOR PRESCOTT.

"The Physical Properties of Soil" was the subject of a lecture delivered by Professor J. A. Prescott at the University on Tuesday night. The chemical and biological points of view will be dealt with on later occasions. Professor Darnley Naylor presided.

Professor Prescott first dealt with the origin of soil. He said the simplest soil conception was that which had been derived from rocks broken down by the agencies of weather, geological conditions, time, glaciers, and so on. There was, however, another conception developed by the Russian school of soil workers. It owed a great deal to the climate in which it had been developed. Some soil might produce different properties under wet or dry conditions. He gave the following examples of Russian classification:—Desert, glaciers, dry steppe, Canadian and Russian prairies, temperate forest soils, and the tundras or Arctic prairies. Soil could also be classified according to its texture. For the purposes of physical composition soil might be regarded as being composed of different fractions, such as sand, silt, clay, humus, and so on. An important thing in cultivation was to have the soil so packed that there was sufficient air space and water contents to enable the plants to grow comfortably, and particularly to enable seeds to germinate. The next important thing in connection with physical properties was the capillary rise of water—that was the power water had of being pulled through fine pores. The average capillary rise of clay was calculated at more than 150 feet, but in practice that never happened. The actual capillary pull of soil was never more than a few feet. The relationship between soil and its water contents was the next feature that had to be considered. There was a point where the amount of water was not quite sufficient to keep the plants from wilting. That was the minimum amount of water to be contained in soil. Saturated soil—ground with too much water—was not to be desired, as it excluded air, which was detrimental to growing plants. In between those were other points which had been defined for the convenience of the soil workers, such as hygroscopic water, which had been picked from the air. There was also the moisture holding capacity, which was the amount of water held by the saturated soil after it had been allowed to drain off. The correct moisture content for plant growth was usually just below that point. One thing of importance about soils was the fact that some of the particles were so small that the amount of surface exposed by the particles themselves reached comparatively high figures. He made calculations for soil in the Georgetown district, and found that in 13 lb. of soil the surface exposed by the particles was roughly one acre. That explained why the heavy soils held so much water. The physical properties of soil such as those

composed of sand, could be entirely changed if the soil contained a black substance called humus, which accumulated under swampy conditions. There were a number of cases in South Australia where the properties were derived from humus and not from the mineral fractions they contained. The Lower Murray and South-Eastern swamps were typical.

Regarding the properties of the soil fractions, Professor Prescott said clay was the finest fraction. To it was due the plasticity of the soil, its retention of water, and its shrinking powers. It was known as a colloid. The soil that had a great shrinkage and swelling was known to Adelaide residents as "Bay of Biscay" soil. Another interesting feature about colloidal particles, of which clay was composed, was that they moved in an electric field. That had recently been put into semi-practical use. It had been shown that by passing an electric current through two sheets of metal in the soil, one of the sheets was lubricated, and so could be moved through the soil more easily. The importance of that application to agriculture could not as yet be fully appreciated. By passing an electric current through the metal parts of a plough, and so lubricating the shares, it could be moved through the ground more easily. The lecturer described the properties of fine sand, and said the most interesting point about it was that soil containing more than 40 per cent. of fine sand set hard after rain. Many South Australian soils possessed that peculiarity, and it was probably due entirely to the high percentage of fine sand contained in them. Coarse sand had no value in itself, but it helped to keep soil open and friable. Dealing with the cultivation of the soil, Professor Prescott said the question of conservation of moisture in fallowing was too well known to need emphasizing. The main purposes of fallowing were to preserve the moisture, and to leave the soil in a suitable condition to act as a bed for young seed plants. They were beginning to learn more. They knew that it was better to cultivate soil when it was moistened after a dry spell, rather than when it was drying off after being wet. Science had only recently found a reasonable explanation. In cultivation two forces had to be overcome. The first was cohesion, and the second was the friction of the soil against the implement. That increased as the soil became wetter, but fell away as the soil got too wet. The ground was then useless for cultivation. An important discovery was that an area of ground could be covered much faster without any appreciable increase in the draw-bar pull of an implement. That explained why implements in Australia were now being drawn by ten or more horses. However, it would probably be necessary to redesign some of the tractors and implements to enable them to be worked faster. The temperature of the soil varied with the depth. There was not such a great variation at a depth of eight feet as there was just below the surface. Temperature was also an important consideration in planting seeds. Recent experiments had shown that germination varied according to the temperature. Professor Prescott illustrated his lecture with lantern slides and experiments.

LEAGUE OF NATIONS.

Composition of Council.

An illuminating review of the latest developments in connection with the Council of the League of Nations was given by Professor H. Darnley Naylor, at the weekly luncheon of the South Australian branch of the League of Nations Union, at the Regal Cafe, Grenfell street, Adelaide, on Tuesday. The address was entitled, "The Composition of the League." Mr. J. Howard Vaughan presided. It was announced that the membership of the branch had increased by 200 since the beginning of the year, and now stood at 2,700. It was desired to secure 3,000 members before Professor Naylor left for England.

"Dignified Reticence of Germany." It was just four months, remarked the speaker, since the League passed through the most serious crisis in its brief life. Upon whom the blame should be laid was a question for the historian. Their business was to prevent a recurrence of the disease. Those who loved the League would always look forward. The weather was too threatening, and time was too precious. The harvest must be got in. Later there would be spare hours for reflection and, it might be, for regrets; but not for vain regrets. No man with his face to the sun, had time for those. At least they might be thankful for the courageous stand of Sweden; for the generosity of Czecho-Slovakia, and for the dignified reticence of Germany. Despite the vexatious failure, the Council kept a stiff upper lip. It immediately appointed a committee to consider and report upon the composition of the Council. That committee met at Geneva on May 10. It comprised representatives of all the States on the Council, and also of Germany, the Argentine, Poland, China, and Switzerland. M. Motta (Switzerland) was appointed Chairman, and M. Lobreton (Argentine) Vice-Chairman. Viscount Cecil represented Great Britain. Important progress was made, and the spirit shown was very different from that of March. And why? The reason was simple. With a single exception, every meeting of the committee took place in public. That procedure was due to the advocacy of Viscount Cecil, and, without doubt, the secret tea parties of March had taught a salutary lesson. M. Motta, at the conclusion of the proceedings, commented upon the fact that such delicate negotiations had been conducted with complete candour at public sessions.

Power of the Assembly.

The work of the committee, proceeded Professor Naylor, was to consider all claims for seats on the Council, and to make suggestions with reference to its composition. All members of the League had been asked to express their views. Only seven troubled to do so, but among the seven was Australia. Viscount Cecil first put forward a scheme which was confined to the number and method of election of non-permanent members of the Council. The trip

number... was accepted. Sweden, Switzerland, Italy, and Germany were, however, very reluctant, taking the view that the Council would be too large. Indeed, Sweden agreed only on condition that the proposed increase ultimately received unanimous approval. The final suggestion appeared to be that non-permanent members should be elected for a term of three years, assuming office immediately on their election. Retiring members might not be re-elected until after a lapse of three years, unless the Assembly decides by a majority of two-thirds that they were re-eligible. The numbers of members thus declared re-eligible must not exceed one-third of the total of non-permanent members. There was a further and most important provision, namely, that the Assembly might, at any time, by a two-thirds majority, proceed to a new election of all the non-permanent members of the Council, in accordance with Article 4 of the Covenant. That

it was possible for the Assembly to retain the services of any particular State whose prolonged membership of the Council was thought necessary or advisable. Moreover, the increase in non-permanent seats would enable the Assembly to work out some scheme of geographical distribution of seats. The committee was unanimously of the opinion that three out of nine seats should be attributed to Latin America; and that adequate representation should be given to Asia.

Permanent Seats.

Apart from those States which had filed a claim for new permanent seats, said the professor, opinion was unanimous that no new permanent seats should be created beyond Germany's. France adopted that view, and Poland accepted it. China and Persia would be satisfied if Germany alone was admitted to a permanent seat. The Argentine and Uruguay made it clear to Brazil that they did not desire to see Brazil a permanent member. Viscount Cecil gave it to be understood that British policy was opposed to any further permanent seats, after the admission of Germany. Spain, however, received a hint that, subject to the Assembly's two-third's vote, she would be certain of re-election at the end of her three years' period. There was, however, one serious difficulty which might arise. At the Assembly of 1921, an amendment to Article 4 of the Covenant was proposed, establishing the competence of the Assembly to adopt binding rules concerning the election and non-re-eligibility of non-permanent members. All members of the Council but Spain had ratified that amendment, and the majority of League States ratified it three years ago. Thus Spain, by refusing to ratify or by successfully employing her old methods of bargaining, might cause another vexatious postponement, and the postponement would be one of 15 months, for, under the present practice, Spain held office until the end of 1926—not the end of the Assembly sittings. It was satisfactory to notice that Australia had taken a clear stand with Great Britain on that important question; and they, as a League of Nations, might well express to Mr. Bruce and his Government their gratification at his having laid before the Federal Parliament the policy which Mr. Latham and his colleagues were to pursue in September. That policy meant that there should be no increase in the number of permanent members beyond the addition of Germany, and preferably no increase in the number of non-permanent members, but if any increase were made, it should be as small as possible. It might be said with confidence that Mr. Bruce had not ceased to believe in the great possibilities of a saner world which the League of Nations sought to create for mankind. If more were needed, it might be found in his statesmanlike utterances of July 9.

The University of Wales, our London correspondent advises, has conferred an



Sir Edgeworth David.

honorary degree on Professor Sir T. Edgeworth David, "as one of the eminent of living scientists."