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On both of those counts engineering stood at the very top. The engineer was essential to modern civilization, and modern man was dependent upon the engineer from the cradle to the grave. But, unfortunately, cold-blooded reason no more ruled in the determination of the status of the profession than it did in other human problems. The status was only to be won by united effort, just as had been the case with the medical profession. If Governments would persist in acting as though young engineers could be adequately trained in these days by simply relying on the instruction they got in the office or field, and no inducements were offered and special study, then there was not much hope for improvement. Australian Governments were most curiously illogical. On the one hand they contributed large sums to provide efficient technical education in all States and, on the other hand, some made little or no effort to compel the cadets in their own engineering departments to take advantage of the

instruction supplied. The Government should realize firstly that inefficient and poorly paid engineers were anything but economical, and secondly, that the right stamp of young man would not be attracted into the service unless a career were offered to him that promised at least a reasonable reward. He had not the slightest idea of criticizing the present engineering departments, but to point out the road to progress. (Applause.)

A vote of thanks was accorded to Professor Chapman for his address.

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ENGINEERS IN CONFERENCE.

AN INCREASED STATUS DESIRED.

ADDRESS BY PROFESSOR CHAPMAN.

Professor Chapman pleads for a better recognition of the status of the engineering profession, which requires scientific and practical knowledge, administrative ability, and a capacity for handling men. The engineer, he says, is essential to modern civilisation.

The delegates to the Engineering Conference on Friday paid a visit of inspection to the Millbrook reservoir and the Barossa dam, and were much impressed by those undertakings. The party, numbering 128, were taken in 26 motor cars. They first viewed the outlet tunnel and the tower and embankment at Millbrook, and later the intake tunnel at the Gumeracha Bridge. In the afternoon they found much to interest them at the reinforced concrete Barossa dam, where they were amazed by the remarkable whispering effect across the dam. The excellent workmanship was also greatly admired. The visitors were shown over the reservoirs by the Hydraulic Engineer (Mr. C. A. Beyer), and the Engineer for Roads and Bridges (Mr. D. V. Fleming) explained the details of the Gorge and bridges.

The annual meeting of the Institution was held at the Institute Lecture Room, North-terrace, in the evening, when the president (Professor R. W. Chapman) occupied the chair. There was a large attendance.

The President, in his address, said the Institution had completed its third year as a Federal body. Its progress was such that they had every reason to believe they had really laid the foundation of an institution that would foster the interests of the engineering profession in Australia for years to come. They now had 2,200 members of all grades, 400 of whom had been added during the last two years, and a particularly healthy sign was that they had vigorous student sections in most of the States, giving them the best possible guarantees of a supply of virile young blood to carry on the work. The great Institution of Civil Engineers, London, was founded in 1818 with eight members, and 10 years later, when its charter was granted, it had 125. In 1836, when the first transactions were printed, the number of members was 238, but 50 years later the number had increased to 5,100. At present if they wished to consult the records for a large engineering work in Australia they most frequently found it in the

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pages of the proceedings of the Institution of Civil Engineers, London, or some of the publications of the American society. It was right that such records should be published in such a way as to make them accessible to engineers in other parts of the world, and for the sake of the reputation of the profession in Australia it was desired that this should be done. The Institution of Engineers in Australia could not become what it aimed at unless it won the confidence and support of the leaders of the profession in the Commonwealth. The objects of the Institution were to promote the science and practice of engineering, and generally to bring about a closer co-operation of engineers throughout Australia for the advancement of the profession. The engineer never reached a haven of comparative rest. All his life he was elbowed and crowded by other men who claimed a greater knowledge, and jostled him for fees. It was clear that there was no argument for making a close profession of engineering except that the men claiming to be professional engineers must be highly qualified men with a thorough training in their work. Increased rates of pay could only be legitimately demanded if the engineer was really the trained man he claimed to be. It was obvious that the first thing to aim at was building up the Institution so as to put it in a position to see that the standard of entrance was made sufficiently rigorous.

What they were hoping for was a higher status for the profession. They felt that the engineer in Australia had not attained the status that was his due, having regard to the responsibility and character of his work, and to the training required before he became competent to undertake it. Especially it would seem that their State Governments, who employed a big percentage of engineers, had in general failed to appreciate two great facts—that a highly efficient engineering staff was absolutely essential to the economic development of the country, and that it was not to be expected that this efficiency would be secured unless the engineering service of the State was made sufficiently attractive to induce brainy young men to enter it. It was obvious that the modern man who was to be a master of methods required an altogether different and more extensive equipment of knowledge and training from his older prototype. But it was precisely this difference that the general public and Governments had been so slow to recognise. The change from the old to the new had been so gradual that most people had failed to notice any difference at all, and the status of the profession had consequently remained at a lower level than it might justly claim. The demands upon the engineer had become more and more exacting in the matter of requiring a broader and deeper foundation of scientific and practical knowledge, which had commonly to be combined with administrative ability and a capacity for handling men, until to-day there was certainly no profession in which the requirements were greater. It was unfortunately true that the rewards of the engineering profession had not increased in anything like a corresponding proportion. The claim for increased status for the profession rested entirely on the fact that engineering had developed from an empirical art to an applied science. The modern engineer must have not only practice in the work of his profession, but a knowledge of the underlying scientific principles to be deduced by the great investigators of the past, and, in addition, he should be in touch with present day developments. One of the most astounding things in human history was the development of electrical engineering in the last 50 years. No longer did nations live in a mental horizon that reached only to their own boundaries, ignorant of what others were doing, for daily the great news of the world was cabled round the globe. Rapidly the great waterfalls of the earth were being harnessed to supply the power that was distributed to centres of industry miles away. The electric light was universal, electric globes were made by the million, and artificial illumination might rival daylight. Trams, trains, and other vehicles were driven by an invisible force as silent as it was powerful. By its aid they listened to and conversed with distant friends whose voices were carried by the same mysterious agent along miles of telephone wire, or, more astonishingly still by electrical waves through space.

It was the spirit of scientific research permeating the whole life of engineering that was responsible for the ever accelerating advance in invention, and the more general application of scientific principles to every sort of engineering work made the demands upon the knowledge and intelligence of the engineer greater. Considered as a matter of abstract justice, the status of a profession should depend upon two main factors—the value of the

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work done by the profession for the community, and the character of the training and mental qualifications required of its exponents. On both of these counts engineering stood at the top. The engineer was essential to modern civilisation, and modern man was dependent upon the engineer from the cradle to the grave. Status for engineers was only to be won by united effort, just as had been the case with the medical profession. If Governments would persist in acting as though young engineers could be adequately trained in these days by simply relying on the instruction they got in the office or field, and no inducements were offered for special study, there was not much hope of an improvement. Australian Governments were curiously illogical. On the one hand they, without exception, donated large sums of money to provide efficient technical education in all the States and on the other some of them made too little effort to compel the cadets in their own engineering departments to take advantage of the instruction supplied. They wanted their Governments to realise two important things, firstly, that inefficient and poorly-paid engineers were anything but economical; and secondly, that the right kind of young man would not be attracted into the service unless a career was offered that promised at least a reasonable reward. What he desired to do was not to attempt to criticise the present service, but to point out the road to progress. (Applause.)

Officers elected:—President, Professor R. W. Hawken (Brisbane University); vice-president, Senator J. D. Millen; past presidents, Professor Chapman and Mr. W. J. Newbigen; secretary, Mr. E. S. Maclean; council, Messrs. J. Bowman and H. G. Jenkinson (Adelaide division), E. F. Gilchrist, J. S. Just, and W. M. Nelson (Brisbane), A. C. MacKenzie, H. E. Coane, B. A. Smith, H. E. Morton, and E. Kernot (Melbourne), A. J. Gibson, D. N. Morrison, and H. J. Thomas (Newcastle), Professor H. E. Whitehead and Mr. C. E. Crocker (Perth), and Messrs. R. J. Boyd, J. J. C. Bradfield, D. F. J. Horricks, T. P. Kneeshaw, W. H. Myers, T. H. Houghton, R. Sinclair, G. A. Julius, and Sir Henry Barraclough (Sydney), and Mr. J. H. Butters and Senator J. D. Millen (Tasmania).

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Professor R. W. Hawker, of the Brisbane University, has been elected President for 1923-4 of the institution of Australian Engineers.

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EMPIRE FORESTRY.

From W. W. J. FALL, hon. secretary Australian Forest League:—"The cabled report of the address of the Prince of Wales, in "The Advertiser" of March 5, should do much to stimulate the growing interest in afforestation. Extensive and continuous planting now of softwoods, on up-to-date lines, will mean that in 25 years' time the State will have a very valuable asset at a very low cost. Experts seem agreed that at the present rate of consumption a timber shortage is inevitable throughout the world. The local Forestry Committee for the coming British Empire Exhibition, on which my League is represented, is fully alive to the opportunities offered, not only for bringing the many excellences of our local hardwoods under the notice of European manufacturers, but of demonstrating the rapid growth of softgoods on interior country in South Australia. My committee is convinced that our red and blue gum timber is far too valuable and beautiful to be used for fencing posts and sleepers. It should really rank with mahogany and walnut, and gain a much enhanced value, which will encourage conservation and planting. It is to be hoped that the results of over ten years' research in the Forestry School, attached to the Adelaide University, will be available at the proposed Imperial Economic Conference. The subject of forestry will be an important and welcome addition to the agenda.

Herald 10/3/23

APPLIED PSYCHOLOGY

NEED OF AN INSTRUCTOR

AT ADELAIDE UNIVERSITY.

(By A. C. Garnett, M.A.)

Few advances in knowledge at any time have promised such boons to mankind as have the recent developments in applied psychology. What the chemist and physicist have done for human industry by the discovery and application of steam power, electricity and chemical actions, and what the physiologist and bacteriologist have done for the health of the human body by their discoveries of the causes of disease and methods of its prevention and cure, that the modern psychologist and psychiatrist are beginning to find ways of doing for the health of the human mind by their recent probings into the nature of the forces within it and the method of its organisation. Already educational methods have been revolutionised by this new science; and they must undergo still further changes. Sociologists have had to re-cast their theories. Prison reformers and welfare workers have been shown new, definite and fruitful lines on which to work. The medical profession has found a wonderful new ally. The clergyman is promised a solution of some of his most difficult problems. All this happening because something definite is at last being discovered about the most important fact of life—the human mind.

—Importance of the Human Mind.—

The more that is known of the human mind the more plainly is revealed its supreme importance, as a factor in human life. It is not long since scientific thought accepted, almost "en bloc" the theory of epiphenomenalism—an ugly theory with an ugly name, teaching that all the phenomena of mind are but the ineffectual reflection of physical processes, that man is therefore only the harassed spectator of a battle that goes on in his own body and brain and in the surrounding physical world and which always end in his own defeat and annihilation. But that theory is now dead, and has been discovered to be a real and forceful entity, as real and forceful indeed, or more so, than matter itself. Energy of mind has been discovered to work according to its own laws, though whether those laws bear an exact resemblance to those which dominate matter (such as the law of the conservation of energy and the law of the uniformity of nature) is still an open question.

A Source of Wonder.

These little understood powers of mind have long been a source of wonder to mankind. They have given rise to many superstitions, have been wisely used and unwisely abused in various religious practices, and have been turned to account for the good or ill of humanity by all sorts of people. The African Dervish can point his finger at an offending tribesman and tell him that before sunset he will die, and thus literally scare the man to death. The modern faith-healer, orthodox or unorthodox, uses the power of religious faith to gather the resources of the mind to the healing of itself or of the body, and, if only he and his patients properly understand the limitations of this method of cure, does nought but good. Emile Coue, the apostle of auto-suggestion, relying upon a conviction produced by a reasoned explanation and by the effect of the positive assurances of a strong personality, produces similar remarkable results.

Phenomena of Fatigue.

The existence of these remarkable powers of mind is perhaps nowhere so clearly shown as in a study of the phenomena of fatigue. Dr. J. A. Hadfield, of the Ashhurst Neurological War Hospital, at Oxford describes two experiments to prove the mental origin of most fatigue. "A man's fatiguability is tested by tying a weight to his finger and making him flex and extend his finger until the onset of fatigue prevents him moving his finger any more. If the nerve to the finger is then immediately stimulated by a weak electric current, without giving time for the fatigue to pass off, the finger continues to flex and extend. In other words, the fatigue does not originate in nerve, nerve ending, or muscle, which are still quite active, but in the will. The mind is fatigued, whereas the body is prepared to go on—the flesh is willing, but the spirit is weak. The mind is exhausted before the body." Again she says, "I asked three men to submit themselves to the test of mental suggestion on their strength, which was measured by gripping a dynamometer. I tested them (1) in their normal waking condition; (2) after suggesting to them under hypnotism that they were "weak;" (3) after suggesting under hypnosis that they were "very strong." In each case the men were told to grip the dynamometer as tightly as they could—that is to say, to exert the will to the utmost. Under hypnosis the mind is very suggestible, and the response to the suggestions of weakness and strength gave very remarkable results. In the normal waking condition the men gave an average grip of 101 lbs. When, under hypnosis I had given the men the idea they were very weak, the average grip was only 22 lbs., one of them, a prize fighter, remarking that his arm felt "tiny, just like a baby's." My suggestions of strength produced an average grip of 142 lbs. . . . In brief, when I suggested "weakness," the full flood of energy was checked and the men were capable of only one-third of their normal strength, whereas by suggestion of "strength," latent powers were liberated and their normal strength increased by half as much again."

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