

**SCIENTIFIC TRAINING.**

*The following paper was read to the members of the Engineering Society by the Hon. Pres. Prof. J. C. Gwillim, at the last meeting:—*

**I**N the matter of education and training one must recognize the fact, that as civilized people, we can never be limited to the clearly practical studies. Art, poetry and philosophy were amongst the earliest forms of intellectual attainment. They are an expression of thoughts which are as old as the human race, and we shall never grow out of them. It seems strange that these attainments should, for so long, have *preceded* enquiry into the natural laws of the universe. Knowledge of the natural world and the forces operating in it has grown very slowly, while poetry and philosophy seem to have appeared in a highly advanced state very early in history. Time and racial temperament have brought about many changes. Whatever may be our mental capacity in comparison with ancient peoples, we are tolerably sure that we know more of the truth than any age in the past.

Truth is truth, capable in the scientific world of demonstration to all sane men of whatever race. And a scientific *fact* is true, and holds good in any part of the world, just as surely as a crystal form is followed in the rocks without reference to geography. All human beings as a part of nature come within the operation of natural laws. All are painfully alike in the hands of Mother Nature. But in the human mind and temperament we must recognize great differences. This accounts for the many different attitudes towards abstract things

which we meet with and, it is only on scientific grounds that we can all meet, and, if we possess reason, demonstrate and acknowledge a truth.

A distinguished Japanese, Baron Hayashi, said recently: "For centuries upon centuries we have had our artists, painters, sculptors, and philosophers—were we then barbarians? To-day we have added torpedoes, battleships and cannon. All the power and all the skill to destroy human life, and you occidentals say to us, "You have won your rank, you have civilized yourselves."

For hundreds of years and in many countries, languages, literature, mathematics, history and philosophy have been taught without any special effort to apply them to material benefit or to making a living out of them. These were the Light of Knowledge kept burning through the wars and ignorance of the dark ages. These were the offspring of the human mind without much aid from observation and analysis in the operations of the natural world. Since those days the human mind has been freed from many human restraints and with less prejudice we now look more clearly upon ourselves and our surroundings. Education of the scholarly kind is becoming to a man for its own sake, and in many countries, and at different periods, is as necessary for certain stations in life as a proper spirit if one wishes to have something in common with one's fellow men. It is sometimes the reproach of scientific training that it leaves a man crude, narrow and mercenary. But as I take it, a scientific training never ceases while a man possesses his perceptive faculties, and however unripe the