being, and at the same time cultivate to the greaest degree his will power, reason, appreciation of beauty, morals, etc. He must be prepared to make a living while he develops a life.

The present topic is mainly interested in two branches of study — Mathematics and Science.

Mathematics may be described as the science of the calculation and expression of quantities, and of all the head-aches and heart-aches and weariness of spirit due to failure to understand and use, mathematics perhaps holds first place, due partly to its peculiar demands on the reasoning faculties, but more to the fact that the mind like the body endeavors to eliminate what it cannot use and so much is continually forgotten if not used. With all due respect for the learning of our forefathers, they began well and meant well, but they have only partly finished the task by providing us with facts and figures, with the necessary accumulation of theories, which after all are only general statements of laws governing certain actions. But they have provided very little means for their use. The means of education has been the end in a great many cases. Even to-day, when examples of use of these rules, little better than puzzles, have been replaced by problems as we find them in ordinary life, we fall far short of teaching mathematics in a way that it can be assimilated and made of use by the student. A few examples may illustrate my point. An 8th Grade boy should know the tables of measurement. Ask him to use a rule to lay off several measurements in line, and in the majority of cases he will be wrong. Ask a 9th Grade boy to cut off a piece of iron to make a certain link, and it will be too long or too short. The Primary Technical course consists mainly of mensuration, and building construction and actual building problems are used. They get the book work very well, but in order to emphasize it I had this year's class construct a section of a house. The mistakes they made were wonderful, the majority of them being wrong measurement. When they came to the rafters I gave them the material and told them to mark off rafters made to a certain pitch. Out of a class of 14 only 2 were correct, although had I given them the same problem in the class room probably 12 out of the 14 would have been correct. They had the knowledge, but could not put it to practical use, and to that extent the teaching was largely a failure. When their mistakes in actual work were pointed out and an additional method of using a steel square was shown, they had some knowledge they will probably always remember.

The other group of studies in theory being the most important should receive considerable reference, but a few points must suffice. Science, i.e., the parent study of physics and the specialized studies of botany and chemistry, deals entirely with the forces and laws of nature. Not a thought or a body in motion or at rest but is acting in response to one or more forces Bearing in mind that the aim of education is the development of the powers of the mind and body by the use of knowledge, let us see how our teaching works out.

The importance of the study is only partially recognized by placing it on the list of studies, but by leaving it optional. Facts and figures, laws and theories are provided in a book and the mistake is again largely made in emphasizing the knowledge dormant in the mind instead of the knowledge applied. The department requires that the student memorize from page 57 to page 210, with regard to certain laws and forces as illustrated by such and such experiments in the laboratory. The result is that the student endeavors to mentally soak up the information from 57 to 210 and has only a hazy idea what it all is for or whether it is any good at all. He is taught a little about heat and light and chemical action. Why not make that knowledge become part of his being by actually showing him that the whole forging trade depends on it. Why not actually show him that by supplying the oxygen of the air to coal under certain conditions we have chemical union of such force as to produce vibrations called heat, that these vibrations may be transferred to iron, breaking down the cohesive force between the molecules of iron and allowing them to get farther apart, producing expansion in the iron; that more oxygen produces more intense vibration, which become visible to the eye as light, that more heat still further weakens the molecular attraction until the particles can be moved about by blows of a hammer; that still more heat almost destroys cohesion and the iron flows in a liquid that if more oxygen is supplied than the fuel can use it is seized on by the white hot iron in chemical union and the iron is burned. Let him realize the mighty force of expansion and contraction due to heat by shrinking a band on a broken casting.

Adhesion and cohesion: why not explain the actual use of glue whose adhesive properties are much greater than its cohesive force to hold itself together, so that it must be liquified by heat and the application of water in order that it may be placed on all the surface of the wood and the surplus forced out by pressure so that the particles of wood touch and the adhesive force acts so strongly that the joint is as strong or stronger than the original wood, showing also that if surplus glue is left in the joint its cohesive force breaks down much sooner, giving a weaker joint.

Forces acting on an inclined plane; why not point the student to the roofs of Winnipeg, built with due regard to those forces, whether through calculation or experience.

Expansion of liquids into gases; why not show him a steam engine instead of diagram.

Every law or force in the book could be dealt with in a similar way so as to be of practical value to the student. Unfortunately department regulations are strict and the original practical teacher who departs from