

observe those due proportions which should exist between the various parts of the educational structure. In earlier days, when the programme was comparatively short, it was much easier to observe this law of symmetry, and to make some attempt at cultivating the tastes as well as strengthening the reasoning powers. In one school at least, both drawing and music were then taught without any injury to progress in other directions. A feeble but honest attempt, in fact, was made to combine in due proportions the so-called ornamental and useful branches of education. On looking back to those early days I can of course see that there was room, as there is at all times, for many improvements; but I can just as clearly perceive that my early instructor possessed a true idea of the essential requisites of a rudimentary education. Since those days, whilst Art, in one sense, has been stationary, Science has been advancing with enormous strides; and there is a danger in a new country like this that she may wholly displace her more gentle sister. The example of other countries more advanced in the Arts and Sciences than we are, ought, however, to shew us the expediency of preserving a proper balance between the useful and ornamental sides of education. In France and Belgium the exhibitions of drawing by school children are so far above our own attempts that a Canadian is apt to conclude that they must be all born artists there. Such a contrast should not be without its lesson to us. It should at any rate lead us to consider if our own system is not capable of producing equally satisfactory results. It should not be forgotten that the so-called ornamental branches are in many respects the most useful in after life, and their cultivation exerts in many ways a most important influence on the material interests of a country.

It is equally important to remember that in order to educate the hand, to train the eye, to cultivate the ear, the proper exercises should be commenced at an early age. To learn even the rudiments of drawing or violin-playing is no easy matter to a grown-up man—to excel in either is simply impossible. Leaving aside the question of ultimate advantage, however, there is an additional reason for not allowing the *useful* branches to engross the attention of the pupil. His is of necessity the treadmill age of education, and it is wise to mingle with his severer tasks some studies that are better calculated to captivate him. His progress in grammar and arithmetic will not be retarded by his taking a lively interest in music and drawing.

These preliminary remarks have been suggested to my mind mainly by the nature of the subject on which I have chosen to address you; for in no department of knowledge is the advantage of this blending together of Science and Art so well exemplified as in that of acoustics. To thoroughly apprehend its phenomena and understand its laws, the acoustician must combine the knowledge of the mathematician, the physiologist, and the psychologist, on the one hand, and possess the trained ear of the musician on the other. Amongst the mechanical problems of the subject may be mentioned the inquiry into the vibrations of elastic bodies, such as plates, bars, rods, wires, strings, the air. Then there is the mechanism of the ear to be studied in order to explain the mode of communication of the vibrations of the air to the auditory nerve. And finally one has to engage in the work of analysing the sensations produced. It is in this last office that one finds the advantage of possessing a well-trained ear. By that I do not mean to imply that the acoustician should be either a musician or a musical critic (although it is