than the animal live and thrive without food. Hence he applies manures on such soils as have been more or less exhausted by previous crops. He thus learns a fundamental principle in agriculture—too generally violated in practice—that in order to maintain the fertility of the soil, those very ingredients, in some form or other, must be returned to it, which plants, by working them up into their own substance, have taken away. The whole theory and practice of correct artificial manuring, must therefore be based upon the fundamental laws of chemistry and vegetable physiology. The intelligent husbandman is only the servant of nature; by careful study and observation, he interprets her will, and regulates his practice in agreement with her wise and immutable laws.

The products of agriculture are in all cases *organic* substances—that is, they are either plants or animals; the raising and proper management of which constitutes the practice of husbandry. Here it will be perceived at once how important and numerous are the relations between animal and vegetable physiology and the art of culture. Not a step can the farmer take in preparing his soil for a crop, in selecting the most suitable varieties of plants for the peculiar physical conditions of that soil, or in adopting fresh methods for improving the breed and better management of his stock, without involving many considerations, facts and laws strictly scientific. The amount of this most valuable kind of knowledge which the observant farmer acquires from experience alone, is frequently very considerable.

Again, what are called the imponderable agents—heat, light and electricity—exert a potent influence over all the vital processes both of plants and animals. Thus there are points in the farmer's art that come immediately in contact with the most recondite of the experimental sciences. Of the nature of these agents, we know indeed but little or nothing; and their modes of operation, in many instances, are but imperfectly if at all understood. But by combining science with practice, the experience of the past justifies a reasonable hope for the future, that a progressively increasing light will be shed upon many natural phenomena, which now appear inexplicable.

The complex science of *meteorology* has most intimate connexion with all the pursuits of the farmer, and it is well deserving of his attentive study. Though man cannot controul the weather, yet a reasonable foresight and caution—which systematic observation imparts—will enable him to modify his operations to varying circumstances. All the elements which constitute what is usually called *climate*, ought to be carefully observed by every intelligent cultivator of the soil. Heat, moisture, elevation above the sea level, the contiguity of mountains, arid plains, forests or oceans—these, as well as mere latitude, are important conditions, giving an endless variety both to animal and vegetable forms, and constituting, with other laws, the elements of a universal system of agriculture.

The reducing of the soil to a proper condition for the growth of plants, by means of implements and machines, brings at once the art of the cultivator into immediate contact with the principles of *mechanics*, the science which determines the laws of matter and motion. Every practical farmer must be aware how important it is that the machines which he uses should be constructed upon the most correct principles, in reference to the utmost practicable diminution of the motive power that impels them, as well as the thorough efficiency of the work to be performed. Hence it becomes desirable—we might indeed say necessary—that both machinists and farmers should understand the main principles at least, of mechanical science; otherwise, the one will most probably fail in constructing the machine on the best principles, and the other will be incompetent to direct properly its practical operation. Since deep and thorough cultivation, particularly on soils reduced by frequent cropping, is now becoming universally acknowledged to be necessary to secure profitable crops; and in a country like Canada, where manual labour is always disproportionate to the price of produce, the subject of agricultural mechanics, or the improvement of our labour-saving machines, is to our farmers one of vital and pressing importance, and intimately connected with the welfare and prosperity of the country.

We have thus briefly pointed out some of the connections between agriculture and physical science. Our object has been to establish the *fact* of the connection, rather than to give lengthened illustrations in proof of it. It may be objected that even the most elementary knowledge of the sciences bearing on agriculture, is an acquisition beyond the reach of our farmers generally. This may have been the case in the past, but already an altered and improved public opinion in relation to this subject is beginning to be heard in most of the countries of the civilized world. In our Normal School, in this city, for the training of schoolmasters for Canada, the claims of agriculture have not been overlooked; and the time we believe is not far distant when this effort for connecting instruction in our industrial pursuits with a system of popular education, will be understood and appreciated by the country.—Our future progress and well being must in a great measure depend on the intelligence of the people.

Let no one however, suppose, whatever may be his age, opportunities or condition, that he is shut out from intellectual improvement. The acquisi-