PROFESSOR JOHNSTON'S EXPERIMENTAL AGRICULTURE.

We take the following review of Professor Johnston's new work from a recent number of the *Scottish Agricultural Journal*, believing that it will be interesting to our readers. We also append a list of the learned Professor's Agricultural works, with their prices and the name of the publishers, any of which may be obtained through the medium of Canadian booksellers that receive orders for English publications. Some of these works have been reprinted in the United States, and have had a very extensive circulation. There are no publications, with which we are acquainted, of equal scientific authority that will bear a comparison with those of Professor Johnston for *practical* purposes, and adaptation to the wants and comprehension of the thinking and improving portion of our farmers. They indicate deep and patient scientific research, correct and extensive observation of agricultural phenomena, and a cautious spirit of generalization, which cannot fail to lead to improvements based upon sound data. Every young farmer, imbued with the true spirit of his noble profession, ought to make himself acquainted with the facts and reasonings of these truly valuable publications.

This is, or ought to be, the work for the day. It presents a digest of practical agriculture from the most active mind engaged in the cause of improvement upon scientific principles. Opportunely as it appears, it could not nearly have come so much so, were it not the result of years of the most ample and energetic experience and enquiry. Professor Johnston's account of the volume is, that, with a view of gradually collecting a body of such data, he published his several series of "Suggestions for Experiments in Practical Agriculture," and succeeded in inducing such men as Mr. Fleming of Barrochan, to undertake field experiments, whilst the English and Scottish agricultural societies, and several local Scotch societies, of which he makes honourable mention, (viz., the Turiff and Strathmore), as well as the Guildford English Society, called forth other experiments by the offer of premiums. The transactions of the Highland and Agricultural Society have also given the results of numerous experiments with saline and other substances, applied to different crops, in soils of nearly all varieties, and upon many geological formations. Upon the records of all these experiments, Professor Johnston has performed a criticism for which no man could possibly be more competent. Worthless, conflicting and contradictory as they stood, they have resolved themselves into something valuable at his touch; for he has applied to them the philosophical discrimination required. to rectify results often incorrectly or carelessly stated—to separate the good from the bad, and weigh their worth as experimental data.

We must, however, forewarn the reader, that the Professor does not express any overweening confidence, even in the materials thus sifted and purified. He frankly admits that his examination of what has hitherto been done in the way of field culture, has led him to the conviction, that scarcely any results we have as yet obtained are to be relied upon as sure grounds for scientific opinions. "Yet," he says, "they may be considered to have cleared the path to surer results, by pointing out sources of error previously unknown, and thus indicating the precautions to be adopted in future trials."

Aided by the labours of the present Author, the agricultural student will, therefore, find even bad experiments invested with a moral value; for it is but justice to Professor Johnston to state, that he has made it, before all things, his business to discuss the art of experimenting itself.

He has first unfolded the knowledge necessary for making experiments, and then explained the way in which they ought to be made and estimated. These are the important elements of the first of the two parts into which the work before us is divided; and we regard it as embracing the consummation of the whole—as one of the most remarkable contributions ever made to scientific agriculture.

The second part, it may be as well here to mention, may be considered as of much more immediate value. It is less novel, being chiefly the digest on which the learned Professor has founded all his institutes—considerations on actual experiments with saline and mineral substances, sulphuric acid, the sulphates of potash, soda, lime, magnesia, and iron; gypsum; chlorides of pottassum, sodium (common salt), calcium and magnesium; muriatic acid; chloride of calcium; carbonates, phosphates, and silicates of potash and soda; nitrates of potash, soda, lime, and magnesia; salts of ammonia; lime; and the compounds of baryta and alumina; burned clay and shale.

To return, however, to part first,—Professor Johnston shows that the experimenter must know the substances, organic and mineral, of which the plant consists, and forthwith supplies a lucid general analysis of these constituents—the functions performed in plants by their organic and inorganic or minereal constituents, of which functions he furnishes a correct detail:—That he must know the functions of the several parts of the plant, the habits and analogies of the species on which experiments are to be made, and of their several varieties. The illustrations of this last requisite of knowledge in experimenting, are so characteristic of the way in which the Professor has adroitly contrived to supply the information for which he insists, that we cannot help citing it as a specimen of the work:—

"1. THE OAT and the red clover love a firm and stiff soil—a natural habit, which chemistry cannot hope to change. On some soils the Tartary oat yields heavy crops, while, on the same soil, the more valuable potato oat refuses a remunerative return. Where other varieties of oats grow sound. the Hopeton oat is subject to a disease called sedge or tulip root, which is gradually