

both in town and country; and the labourers of the present day are not such bad characters as they were some time ago, or when bothies first began to be the common plan.

Application of Chemistry to Agriculture.

[TRANSLATED FROM THE FRENCH]

The application of chemistry to agriculture has been attended with results unquestionably beneficial to that science. True, there have been some disappointments, but they proceeded chiefly from expecting too much of the science, or from a wrong interpretation of its laws. In making use of figures which result from analysis as correct indications, when they ought not to be taken in their absolute terms; in taking account of the multiple circumstances which tend to modify the principles of chemical reactions when they pass from laboratories into the heart of arable land, owing their effects to contact with the roots of plants, we throw great light on agricultural operations, and, in the end, reach a production more economical and abundant. For this reason the names of Bossingault, Payen, Lawes, Gilbert, Way, Anderson, and many others have become popular amongst the cultivators of France and England; but in Germany another chemist has gained by his labours and writings great fame, and has retained it throughout the whole of Europe. A little adventurous, and apt occasionally to be carried away by his imagination, M. Liebig—now one of the eight foreign members of the Academy of Science of the Institute of France,—has upon several occasions, given to agriculturists advice which does not appear to bear the stamp of prudence. In chemical agriculture experiments out to be conducted with wise deliberation. It costs too much to leave unrestrained a new system; but setting aside some too-determined efforts, which have only ended in disappointment, M. Liebig has written many good works, so that one ought to listen to him with respect; besides, one may learn much, by reading his numerous writings, beyond what is attached to the subject, from the lively and masterly manner in which it is treated. M. Liebig published for the first time about 1846, a series of about twenty-six letters on chemistry, as applied to manufactures, physiology, and agriculture. In 1851 he added eleven new letters to the preceding ones. This second series was translated into French by a chemist who died young, but who left a name illustrious and regretted—Gerhardt. We have now received a series of fourteen letters upon modern agriculture, of which Dr. Swartz, professor of chemistry to the University of Ghent, has given a good translation. We find in them many excellent principles, but also some points very disputable: thus a strong pleading in favour of mixed manures, and against the exaggerated use of simple manures, is worthy of all approbation;

but the absolute condemnation of the commercial culture of tobacco and the vine appears to us far from the limits of truth. But however this may be, the theories of M. Liebig ought to be considered by agriculturists; for this reason we recommend them to read his new letters (volume of 264 pages, price three shillings). In addition we think it would be useful to publish two lectures, delivered the year after, at Munich, and an estimate of his doctrines, which were received from our contributor, M. Adam Muller, deputy to the Diet of Bavaria, and connected with the illustrious chemist of Munich.

In the first lecture will be found a very interesting note on the school founded by Thénard from Moeglin; but also a critique, rather too severe, upon agricultural instructions—such at least as have been given in some places. Liebig cannot combine, in the same institute practice with theory. He says the two institutions ought to follow one another, and that it is necessary to be well versed in the theory before commencing the practice. We reciprocate this opinion. The Agricultural Institute of Versailles would have been perpetuated if it had not been annexed to it. The pupils, leaving the institute mere theorists, would have been with advantage sent on to good farms, this country or others, to complete their instruction afterwards as the pupils of the Polytechnic School, in the schools of application, and, above all, in the great public works, where they continue their studies before becoming masters.

M. Fouville translated the first lecture, and our learned contributor, M. Villeroy, very ably translated the second, which is entirely devoted to the methods introduced by chemistry into agricultural science. It contains an excellent discussion upon the means of keeping the fertility of the soil, on the importance of artificial and commercial manure, and the absurdity of losing the cleanings of towns. In this article M. Adam Muller gives a summary of the thoughts of M. Liebig, such as occurred to him in a long attendance on the course of the learned chemist.

J. A. BARRAL

LECTURE I.*

BY BARON JUSTUS VON LIEBIG.

We celebrate the day on which, 102 years ago, the Elector Maximilian Joseph III. signed the constitutional patent of our academy. This event took place in that age so memorable in the history of sciences, when the foundation of the major part of the academies of Europe—those of Berlin, St. Petersburg, Copenhagen, Lisbon, and Dublin—showed the effect which a strong impulse had produced on the development of European mind.

* Delivered at the session of the 26th March 1861, for the celebration of the 102nd anniversary of the foundation of the Academy of Sciences in Munich.