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SCIENCE APPLIED TO AGRICULTURE.

The following address, by Dr. Frankland, is taken from the *Transactions of the Royal North Lancashire Agricultural Society*, in England. The Doctor, we believe, is the Professor of Chemistry in Owen's College, Manchester;—an institution recently established by the princely munificence of the individual whose name it bears:—

Dr. Frankland addressed the audience to the following effect:—The subject for discussion, as most of you are aware, is "The importance of combining science with practice in farming operations." I have only this afternoon, whilst present on the field where the agricultural implements were being tried, been requested to introduce the subject to your notice. I think the *onus* of introducing the subject would possibly have better devolved upon some of the eminent agriculturists present, since in the printed announcement of the discussion, "practice" comes before "science." In fact, it appears to me that the best mode of conducting these discussions is for practical men to express their opinions on the subject to which attention is directed, and then to put questions to the scientific men present which they might not be able to answer from their own practical knowledge. However, as the *onus* of introducing the subject has devolved upon me, I will endeavour, in as few words as possible, (as the time has been so much delayed) to convey to you what in my opinion are the principal points of connexion between the science of chemistry and that of agriculture. You will perceive that the subject in the prospectus is not confined to chemistry; it is the advantage of science in general, combined with practice in farming operations. Now chemistry, I beg you to understand, is only one of many sciences which can thus be applied with advantage to agricul-

ture. We have, for instance, the science of mechanics, which is perfectly indispensable to agriculture. We have also the science of physics, which is perhaps as important as chemistry. We have also natural history, which, as you are all aware, has a most intimate connexion with the subject before us. Now I would commence by a very broad assertion—namely, that without this combination of practice with science, all farming operations are empirical and lead to no trustworthy results. This will not perhaps be admitted by many of the agriculturists present; for we usually find that farmers, and especially tenant farmers, are exceedingly averse to adopting principles which can be deduced from the laws of science in their agricultural operations. You will, however, readily see that such a combination must take place, if we wish to have universal laws in the science of agriculture. A thousand farmers may try a thousand experiments upon a thousand different fields; and one farmer may produce an amazing crop of corn by the application of a certain manure. Another farmer may try the experiment with a different result, or with the same result; if with the same, it is looked upon as a confirmation of the original experiment, and very properly so; and there is additional reason for a third farmer to try the experiment in confidence of producing the same successful result. But if this third farmer has a field in which the chemical constituents of the soil are widely different from those of the first two, he will be mortified to find that in his case the manure completely fails. This we find an every day occurrence in agriculture. We find manures that are introduced with eulogium into certain districts, entirely fail when applied in other districts. If we would ascertain the cause of these failures, we must go to the very bottom of the subject. We must ascertain the composition of the soils upon which the manure may have been tried, and we must also have plainly before us the composition and *modus operandi* of the manure which is used upon those soils.