

brage to the others, because they are as conscious of his superiority in work as the farmer himself. The services of ploughmen are required on all sorts of arable farms, from the coarse-farm to the pastoral, on which the greatest and the least extent of arable land is cultivated.

*Dairy-Maid.*—The duties of the dairy-maid are well defined. She is a domestic servant, domiciliated in the farm-house. Her principal duty is, as her name implies, to milk the cows, to manage the milk in all its stages, bring up the calves, and make into butter and cheese the milk obtained from the cows after the weaning of the calves. The other domestics generally assist her in milking the cows and feeding the calves, when there is a large number of both. Should any lambs lose their mothers, the dairy-maid brings them up with cow's milk until the time of weaning, when they are returned to the flock. At the lambing season, should any of the ewes be scant of milk, the shepherd has his bottles replenished by the dairy-maid with warm new milk to give to the hungered lambs. The dairy-maid also milks the ewes after the weaning of the lambs, and makes cheese of the ewe-milk. She attends to the poultry, feeds them, sets the brooders, gathers the eggs daily, takes charge of the broods until able to provide for themselves, and sees them safely lodged in their respective apartments every evening and, sets them abroad every morning. It is generally the dairy-maid, where there is no housekeeper, who gives out the food for the reapers, and takes charge of their articles of bedding. The dairy-maid should therefore be an active, attentive, intelligent, and skilful person.

#### *On the Branches of Science most Applicable to Agriculture*

I believe I have said enough on the best means, in existing circumstances, of acquiring a thorough knowledge of practical agriculture; it is now incumbent on me to indicate those branches of science which will most enlighten the mind of the pupil for the most ready appreciation of agricultural practice; and I may, perhaps, excite general surprise, when I state that no art bears so close a relation to so many branches of science as agriculture.

Indeed agriculture may perhaps be considered one of the experimental sciences, as its principles are no doubt demonstrable by the test of experiment, although farmers have not yet attempted to deduce principles from practice. The necessity for such a deduction is, no doubt, the less urgent, that husbandry is usually pursued as a purely practical art; and the facility of thus pursuing it successfully of course renders practical men indifferent to science, as they consider it unnecessary to burden their minds with scientific results, whilst practice is sufficient for their purpose. Could a man of practice, however supply

the man of science with a series of accurate observations on the leading operations of the farm, the principles of these might be truly evolved; but I conceive the greatest obstacle to the advancement of scientific agriculture is to be sought for in the unacquaintance of men of science with practical agriculture. Would the man of science become acquainted with practice, much greater advancement in scientific agriculture might be expected than if the practical man were to become a man of science! because men of science are best capable of conducting scientific research, and, being so qualified, could best understand the relation which their investigations bear to practice; and, until the relation betwixt principles and practice is well understood, scientific investigation, though important in itself, and interesting in its results, would tend to no practical utility in agriculture. In short, until the facts of husbandry are acquired by men of science, these will in vain endeavour to construct a satisfactory theory of agriculture on the principles of the inductive philosophy.

If the science of agriculture in its present position be thus correctly represented, it may be expected to remain in an incipient state until men of science become practical agriculturists, or, what would still prolong such a state of lethargy, until farmers acquire scientific knowledge. It is certainly remarkable that so few scientific men were for a very long period induced to subject agricultural practice to scientific investigation; though of late many, both at home and abroad, have devoted a portion of their time to such a study, and which has already afforded abundant proof, that extensive as the field of research is, it has only to be occupied by numerous observers to produce results interesting alike to the man of science and the man of practice. The long neglect of agriculture by scientific men may perhaps have arisen from the circumstance of its having so intimate a relation to almost every physical science, so that until all its relations were first investigated, no sufficient data could be obtained for a satisfactory explanation of its practice. A short review of the actual relation which the physical sciences bear to agriculture will render this suggestion the more probable.

The sciences which agriculture most immediately affects are mathematics, natural philosophy, chemistry, natural history, comparative anatomy, and veterinary science. Of mathematics, the most useful parts are geometry and trigonometry, and the application of these to the measurement of surfaces and solids. Without a knowledge of mathematics no one can understand natural philosophy; because it is they alone which can demonstrate the powers of those laws which determine the motion of matter. Of natural philosophy, the most useful branches to the agriculturalist are *mechanics*—