

they are put aside. Were farmers acquainted with the principles of mechanics, their discrimination would form a barrier against the spread of implements of questionable utility, and only those find circulation which were obviously simple, strong, and efficient. It is not easy to invent implements possessing all those desirable qualities; but, as they are always exposed to the weather, and the soil is ponderous and uncouth, it is necessary they should be of simple construction. Simplicity of construction, however, has its useful limits. Most farm operations being of themselves simple, they should be performed by simple implements; and all the *primary* operations, which are simple, requiring considerable power, the simple implements should also be *strong*; but complicated operations, though stationary, require to be performed with comparatively complicated machinery. Operations that are both complicated and locomotive should be performed with implements producing complicated action by simple means, in order to avoid derangement of their constituent parts. The solution of this last is a difficult, if not impossible problem, in practical mechanics. The common plough approaches more nearly to its practical solution than any other implement; yet that wonderful implement, executing difficult work by simple means, should yet be so modified in construction, as to give the ploughman a greater command over its motions. These considerations tend to show, that the form and construction of implements, and the circumstances in which they may be used, are still subjects affording scope for mechanical contrivance.

In viewing the construction of all machines, an important circumstance to be considered by the pupil is, the resistance among moving parts which arises from *friction*; and in solid structures, generally, the forms and positions of parts have to be adjusted to the *strength of materials*, and the strain which the parts have to bear. This consideration should lead the pupil to become acquainted with the strength of materials; and, as a farmer, he will have much need to put such knowledge in practice when he comes to receive the work executed by the carpenter and smith.

On considering machines, he should also avoid the common error of supposing that any combination of machinery ever can increase the quantity of power applied. "What an infinity of vain schemes—yet some of them displaying great ingenuity—for perpetual motion, and new mechanical engines of power, &c.," exclaims Dr. Arnott with reason, in his *Elements of Physics*, "would have been checked at once, had the great truth been generally understood, that no form or combination of machinery ever did, or ever can increase, in the slightest degree, the quantity of power applied. Ignorance of this is the hinge on which most of the dreams of

mechanical projectors have turned. No year passes, even now, in which many patents are not taken out for such supposed discoveries, and the deluded individuals, after selling, perhaps, their household necessaries to obtain the means of securing the expected advantages, often sink into despair, when their attempts, instead of bringing riches and happiness to their families, end in disappointment and ruin. The frequency, eagerness, and obstinacy, with which even talented individuals, owing to their imperfect knowledge of the fundamental truths of mechanics, have engaged in such undertakings, is a remarkable phenomenon in human nature."

TO TAKE HONEY FROM BEES.

SIR—As I read in one of your late papers a query respecting the way to take honey from bees, without smothering them, and as I think that a successful way of doing so is very easy for every bee fancier to undertake, I wish to let you know the plan which I always adopt, and which if you think worth a place in your paper, you are very welcome to.

The simplest way, and the one by which I invariably take the honey away, is, I provide, in the proper season, a kind of fungus, which grows in old grass lands (we call them puff-balls,) and having carefully dried them in an oven, I put them in a paper bag over a fireplace, to keep them dry until wanted. I also have a tin box, five inches square, with a very close-fitting cover; and soldered to each end of this box, I have a small tube about six inches long; when I wish to take the honey away, I place my hive on a board or flag, and having lit four or five of the puff-balls, I put them in my tin box, and cover it close. I then insert the end of one of the tubes that are fixed to the box, under the rim of the hive, about two inches in. I place them in a damp cloth round the bottom of the hive, to keep in all the smoke, I then blow gently through the other tube. The smoke of the puff-balls will, by this means, be driven from the tin box, through the other tube, into the hive; in a short time the bees will become quite intoxicated, and fall from all parts of the hive on the board or flag on which the hive is resting; I have ready at hand another hive properly dressed with sweet cream, which I place over them after I remove the full hive; they will, in a short time, recover, and ascend to the top of the hive. I then remove them to their permanent stand. I have tried other, but it is so very difficult to ascertain the quantity of ether to administer, or the time to withdraw the vapour, before a number of the bees are destroyed, that I have invariably used the puff-ball in all my experiments.

By the use of the puff-ball I can join two weak stocks, and make *one strong one*, which is of more value than a dozen weak ones; the way I do so, I will at a future time be very happy to communicate to you, but at present I fear I have