

must be supplemented, as far as possible, by the use of machinery, by applying the labor more directly to meet the ends to be arrived at. To illustrate, a farmer has fifty acres of grass land to get up, has a mowing machine, horse-rake, hay-tedder, barn arranged for using a horse-fork; suppose the total cost to be, say four hundred dollars, or twenty-five dollars per annum, wear and tear will bring it up to thirty dollars; now it is almost needless to point out how comparatively he would be independent of labor, or what enormous per centage his investment in machinery must pay. The first part of this article was written nearly two years ago, and would have been consigned to the flames had it not been for the remarks of Mr. Dickson about mortgaging a farm for draining. The writer has often given advice both personally and by letter on the subject of drainage, but felt that the practical carrying out of drainage, compared with the great question of where are the funds to come from, or in other words "on the application of Farm Capital," which was originally intended to be the heading of this article, was a small affair; and the time seemed unsuitable for bringing the much more important subject before the public.

With regard to the mortgaging a farm for the purpose of drainage, or in other words utilizing the capital of others and placing it under your own control, it is certainly advisable whenever the farmer can assure himself of a larger per centage than he has to pay for the accommodation, whether by drainage, manuring, feeding-cake, or even buildings for the better accommodation of stock. The whole practice of British Farming is based on this principle, and this no doubt accounts for what astonishes Americans, that an English Farmer can pay enormous rents, and then live more comfortably than an American Farmer with the same means; and the same principle must apply, and will rapidly, to American Farmers, but, perhaps not exactly in the same way, Government Grants, may be, being substituted for English Landlords. As the relative position of the English Landlord and Tenant may not be understood, I will make the following explanations. Few Landlords, when repairs, &c., are taken out, realize more than three per cent. on their holdings, tenants from nothing to twenty or even thirty per cent., as in the case of Mr. Prout; now why this great discrepancy in the returns of land. Simply that the Landlord's can be looked on simply as an investment of capital. He is either too ignorant of agriculture, or engaged in something more attractive, while the tenant brings the whole of his time, skill and attention, to supervise his own capital, consequently the more tenants capital he can use as a tenant, avoiding being his own landlord, the more

ten per cent. he can make instead of three. Let us give another illustration which may be more easily understood: two young men, each take a large farm of comparatively run out land, say one hundred acres apiece, clay land, one thousand pounds, interest on permanent investment ten per cent., \$400, plowing, harrowing, &c., \$400, superphosphate \$10 per acre—\$1000; extras \$200—total \$2000; returns say thirty bushels of barley at 80 cents, \$2400. Now this is putting the lowest possible returns, and making everything unfavorable to the farmer. We allow ten per cent. for draining, and charge whole of the superphosphate to one year, while it is utterly impossible that so poor a crop could assimilate so much, again, what the two hundred dollars as extra are for I do not know myself. The writer laid down the College Cricket ground, and from that his data is mostly taken; the drainage cost fifty dollars, guano ten dollars; the returns as nearly as I could estimate would be thirty-five bushels of barley, had the cattle let it alone. The extra ten dollars in draining can be accounted for by there being a main drain, and this was not a fair criterion, as, being laid down for a cricket ground, the barley was sown very thin and the grass very thick. This had originally been as nasty a piece of land as one would wish to handle, no one could ever get anything off it. The account would stand thus, draining permanent at ten per cent. \$5, ploughing, &c. \$10, superphosphate and guano \$10, total \$25; 35 bushels first class barley, \$31.50 leaving \$6 on the investment of \$20, or about thirty per cent. on tenants capital, charging all superphosphate to one year. In England the returns would be made in this way: total rent for drained lands, say \$12 per acre, land being in superior condition to College land, charge only one half superphosphate \$5, ploughing, &c. \$7, total \$24, leaving about the same profit. Of course these figures are only approximate, and are only meant to illustrate the principle. The above estimate shows the miserable return of four hundred dollars over working expenses and ten per cent. on permanent investment, but, bad as this is, let us see how it would be with the other young man, who takes a hundred acre farm in the same state. I forgot to mention before that each is supposed to possess a certain amount of capital, say eight thousand dollars; the one pays the whole amount and has his farm clear of mortgage, the other mortgages for one thousand pounds, to carry on the improvement as specified above; the \$100 balance shown would pay the interest of mortgage, leaving something to spare, and a fair remuneration for wages, has been charged. Now, what would be the position of the one who preferred having a clear farm? Of course

to make a comparison we must suppose that the land would be cultivated in the same style, or rather the crops would be the same; judging from my own experience, I should say that, on undrained clay without superphosphate one half would be a fair allowance, while in at least three seasons out of ten the barley would be a total failure. As some may object to the estimate being unfair they must recollect that the following data can be thoroughly relied on, that if the estimate for the undrained undressed land is too low it is also too low for the other land, as the quantity of superphosphate is annually charged, and is more than the requirement for the difference in the crops; this of course is supposing the superphosphate is good. Now how will the comparison stand? the working expenses would be as great if not greater, and returns 100 acres inferior barley 20 bushels at 80c.—\$1600, deduct labor \$400, balance left \$1200; no interest to be paid would make up \$1600, and this is representing the case as the worst that could possibly happen to the good farmer, and the best to the poor. How would the whole thing stand the next year; one farmer having drained his land has the natural resources of the soil to draw on to any depth that he can get a subsoil plough, which is pretty deep in these days of machinery; if the soil is not naturally good, our comparison will not hold as we make the poor farmer entirely depending on the resources of his soil. Of course to estimate the state of crops afterward would be to a certain extent problematical, but, from what experience I have had, I should put them about as follows: Barley 40 bushels per acre, the drainage becoming more effective. Superphosphate \$5 per acre, working expenses \$100, total \$900, interest on mortgage \$240, total \$1140; 40 bushels of barley at 80 cents \$3200, balance \$2100. poor farm, 16 bushels of barley at 80 cents \$1280, deduct \$100, no interest to pay, total \$900, leaving \$1200 in favor of the mortgaged farm. As many may say that that this is simply cooking figures and that in that way they can be made to prove anything, it is meant to illustrate the principle, and I believe the estimate to be more in favor of the poor than the good farmer, for recollect that one is drawing on what he puts into the soil, the other on what may only exist there in his imagination, and one bad year might result in a total failure. Any one following this up can easily see the one would soon be in a position to clear his farm, the other would soon be compelled to mortgage it, not to improve, but to pay off accumulated debts. But, I may be asked, do crops ever fail on drained lands? Yes, they do occasionally, but the risk of failure is reduced to a minimum, the barley on my farm this