

their tubers, as the potatoe and Jerusalem artichoke; of plants cultivated for their juicy fusiform roots, as the parsnip, the carrot, the beet. The crops of this class, from the modes of culture which they admit of and require, are eminently conducive to the cleaning and pulverizing of the ground, to the eradication of weeds, and to the fitting of the soil for bearing an extended rotation of other crops. They require a large supply of manures, but the manure can be applied to them with greater benefit than at any other period of the course; for, while a direct supply of putrescent manures, frequently injures the gramineous and leguminous plants, cultivated for their seeds, by causing them to produce straw rather than grain, it never injures the fallow crops, in whatever quantity it is applied, while the abundant supply of the substance, prepares the land for the subsequent crops which it has to produce. Further, those plants, when consumed upon the farm, adds to its fertility, by the large quantity of manure which the consumption of them affords. The fallow crops, therefore, are at once cleaning and enriching, and afford one of the most important of the means at our command, of maintaining or increasing the fertility of the farm. But there are cases in which, from the state of the ground and other causes, this class of crops cannot be raised. The resource in this case, is to substitute the summer fallow, which is equally or more efficient in the clearing of the ground, and in producing the decomposition of organic matters in the soil. The summer fallow, however, adds nothing directly in the form of manures to the farm, though it does so indirectly by increasing the productiveness of the soil. The employment of the summer fallow is also frequently connected with a more economical division of the labours of the farm throughout the season, and on this account, is often beneficially substituted for fallow crops.—Whether, in any case, the summer fallow, or a fallow crop, is to be introduced into the rotation, a rule of good husbandry is, that one or the other shall be adopted along with exhausting crops, and introduced at such intervals of time, as shall be required for maintaining or improving the condition of the soil.

6. The last class of plants to be referred to, consists of those cultivated for forage and herbage. The plants cultivated for forage, are mown and used in a green state for the food of animals. They either consist of a single species, as lucern, sainfoin, or vetch; or, they consist of a mixture of several species, as the clover and grasses. These plants being removed from the ground, when in a green and young state, they exhaust, though not excessively, the soil on which they grow; but when consumed upon the farm, they add to it a more than corresponding quantity of manure. They may, therefore, be termed ameliorating or enriching crops, with respect to the entire farm, but exhausting with respect to the ground which produces them. If therefore, repeated crops of this kind are taken from any piece of ground, the waste must be replaced by manures applied to the ground which produce them. But, often the crops of this class are made into hay. In this case, they are suffered to form, and often to ripen their seeds, and then they necessarily exhaust the soil more than if they had been consumed in their younger state. A hay crop is therefore an exhausting one, with respect to the ground that produces it, and if repeated crops of hay are taken, the waste must be supplied by manures; but a hay crop does not exhaust the general farms, if all its produce is consumed upon it. But, plants of the kinds referred to, and espe-

cially that mixture of leguminous plants and grasses, usually termed the artificial or sown grasses, may be depastured, and thus consumed upon the place where they grow. In this case, they do not exhaust either the soil which produces them, or the general farm. Land, therefore, bearing herbage plants, is not in the condition of that which is producing crops, whose produce is carried away. It is in a state rather of restoration than of exhaustion, and requires no means to preserve it from deterioration or waste.

This is well understood in the practice of Agriculturists, when the productive powers of a soil have been exhausted by cultivation, and the carrying away of its produce from the surface, it is laid down to herbage, in which state the future vegetation which it produces tends, by its decomposition upon the surface, to restore the productive powers of the soil. Land in this state is said to rest.

When land, however, has been impoverished by successive crops, and has become full of weeds, the laying it down to rest in that state, is attended with less beneficial consequences than when the soil has been previously cleaned of injurious weeds, and fertilized by good culture. In the former case, the process of improvement is slow, if perceptible at all; the useless plants increasing, and not those which are beneficial and afford food to pasturing animals. Land, when properly laid down to grass, therefore, tends to recover its wasted powers of production. Land not properly laid down, has less of this healing property, and may be more full of weeds and little richer when ploughed up again after a time, than when first laid down. Under good management, however, the laying down of cultivated land to grass and other herbage plants to be consumed upon the ground, is a means of resting the soil, and renovating its powers of production; and this mode of recruiting an exhausted soil being always at the command of the farmer, its application is important in practice. It is to be observed also that the poorer soils require this species of rest and renovation more than those which are naturally productive. Having the principles referred to in view, certain rules may be deduced from them for the order in which crops of plants may succeed to one another on the same ground.

1st.—Crops consisting of plants of the same or nearly allied species, shall not follow in succession, but shall return at distant intervals, as the case will allow.

2nd.—Crops consisting of plants, whose modes of growth or cultivation favour the production of weeds, shall not follow in succession.

3rd.—Crops whose culture admits of and requires an efficient tillage of the ground, shall alternate with crops which admit of a more practical tillage, and the summer fallow shall be substituted when such crops cannot be raised. And further, crops whose consumption returns to the soil a large quantity of manure, shall be cultivated, when circumstances admit of their being raised, at intervals sufficient to maintain or increase the fertility of the farm.

4th.—When land is laid to grass, this shall be done when the land is fertile and clean. Thus, when devising a rotation, we have to cause the restorative and cleaning crops, so to alternate with the exhausting ones, as that the land shall be preserved in good condition; and when we find that land cannot be sufficiently cleaned or tilled by means of fallow crops, we must make use of the summer fallow. And again, when we find that land requires rest, we may lay it down to grass for a longer or shorter time, taking care, when this is