

similar to a common barn roof, inclined on both sides. There are door-ways on each side about ten feet apart, sufficiently large for the sheep to pass in and out through them. There is a passage or alley three feet wide communicating with the barn, and extending through the middle of this shed; this alley is broader upon both sides about three feet, with the exception of a space near the bottom, through which the sheep can put their heads, but not wide enough for them to enter. In foddering, a forkful of hay is carried from the barn through this passage, and is placed in the furthest part of it; and so the hay is placed throughout the whole length of the alley. Meanwhile the sheep are entering through the doors, and filling up the space on both sides, where they can reach the hay; while they are unable to trample upon it, or crowd each other over it, and they are also completely out of the way of the person who is foddering them.

## DO THE RACE OF PLANTS WEAR OUT?

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(From the *London Gardener's Chronicle*.)

Is it true that when a tree or other perennial plant becomes unhealthy from old age all the offspring previous, obtained from it by cuttings in all parts of the world become unhealthy too? Is such a doctrine a reasonable inference from known facts? or is it forced upon us by evidence although not deducible from mere reason? This is an important question to a labored advocacy of which pamphlets and newspapers have been lately abundantly brought into requisition. We have ourselves adverted to it incidentally, and on the present occasion propose to consider it in its various aspects.

1. No one pretends that the species of plants disappear. It is alleged on the contrary, that seeds renew the languid vigor of species as often as they are sown; and that if an unhealthy plant is multiplied from seeds the immediate offspring becomes healthy. It is also said that multiplication by seed is the only natural mode of propagation known among plants, and that all other kinds of increase are artificial and lead to debility.

It would, we think, be difficult to find an hypothesis more entirely at variance with notorious facts. That propagation by seed is a natural method of multiplication is doubtless true; but to say that no other natural means exist is absurd. The Sugar-cane is rarely propagated by seeds; its natural mode of propagation is by the stem, which when blown down by the storm emits roots at every joint. Of this natural property man has availed himself as a means of artificially extending the plant. The Tiger Lily naturally propagates itself by bulbs, formed in the bosom of its leaves; we never saw it form a seed. The Jerusalem Artichoke naturally multiplies itself by its tubers, which are bodies of the same nature as the so-called root of a Potato; no one ever saw it produce seed in this country. Every gardener knows that his Achimenes are principally multiplied by little scaly bodies resembling tubers, and that these are formed in such abundance as to render seed unnecessary. In short we have not space for other instances of this, the denial of which could only arise from an entire unacquaintance with common facts. These examples sufficiently show that Nature does provide other means of propagating plants than seeds, and that tubers are one of those means.

As to the assertion that all other means than multiplication by seeds lead to debility, we must ask for the proof. The wild Strawberry has been more propagated by its runners than by its seeds; and where do we find any sign of debility there? The Jerusalem Artichoke was introduced before the year 1617; for nearly two centuries and a half it has increased itself entirely by tubers, and never by seed. Does any one find debility in that plant? Couch Grass increases chiefly by its creeping roots: would we could adduce, at least, that one instance of failing vigor in a plant whose seeds are but little yielded. It, therefore, is not true that plants multiplied much or wholly, by other means than seeds become on that account unhealthy.

Seeds, however, are said, in all instances, to produce healthy plants. But this, like the previous assertions, will not bear exact investigation. The health of seedling depends entirely upon that of the seed. Under no circumstances will unhealthy seeds yield vigorous offspring; this is proved every day by what comes from grain debilitated by age. And there cannot be found a gardener, of any large experience, who does not know that seedlings will exhibit every diversity of constitution from health to decrepitude. Of the latter, Myatt's Pine Strawberry is a modern and striking instance.

We, therefore, regard the whole string of propositions now examined as entirely destitute of all foundation in fact.

2. What are called the varieties of plants are said to wear out. It is maintained that vegetable, like animal life, has its fixed periods of duration, and that there is a time beyond which the debility incident to old age cannot be warded off. The inference from this is, that all the cultivated races of plants require to be incessantly renewed by seed, in the absence of which precocity they gradually become unhealthy, and unfit for cultivation.

The first person who proposed this theory was the late Mr. Knight, who, in the latter part of the last century, finding that the orchards of Herefordshire no longer contained healthy trees of certain varieties of Apple, which were said to have flourished 50 years before, and failing in his attempt to restore health to such varieties by grafting, assumed that old age had overtaken them, and that they were incurable. Thence he extended the theory to all other plants; and here and there writers on vegetable physiology, rather out of respect to Mr. Knight's great name than from any correct examination of the facts for themselves, have blindly adopted his views. But reason and evidence are alike opposed to the conclusion, which seemed to have sprung out of a mistaken application of the laws of animal life to that of vegetables, and a desire to push analogy beyond its proper limits.

All who understand the nature of plants, and the manner in which they grow, and have witnessed that incessant renewal of their vitality with which Providence has so wonderfully endowed them, would hesitate to adopt Mr. Knight's views except in the presence of facts capable of no other possible interpretation. No physiologist can separate the nature of what gardeners call varieties (of course males are not here included,) from that of a wild race. In their intrinsic qualities they are the same. It can make no difference in the nature of a plant whether it is sown by a gardener, or by winds, birds, animals, or other agents. The oak which springs up in a forest is not in the smallest physiological particular different from that which rises from the bed of a nurseryman. The Cabbages which load the waggons of a market gardener are in their essence the same as those which sprout forth from the sea-beaten cliffs of the ocean. They may be greener, or redder, more succulent and larger; but they are physiologically the same. We therefore must dismiss from our argument the word variety, which only leads to a confusion of ideas. Now, with perennial plants, whether woody or herbaceous, whether forming a trunk or a mere permanent root, have never yet been shown by any trustworthy evidence to be subject to decrepitude, arising from old age. On the contrary, every new annual growth is an absolute renewal of their vitality, in the absence of disturbing causes. Hence the enormous age at which trees arrive. A thousand years is still youth to a forest tree which no accident has injured: and there is no intelligible reason why they should not grow to eternity. It is very true that plants do in reality perish commonly without attaining any such longevity; and that constitutional feebleness is notoriously one of the accompaniments of advancing age. But this arises from external, not intrinsic, causes. The soil which surrounds them is exhausted, their roots wander into uncongenial land, water in unnatural excess is introduced, the food they require is withheld, violence rends them, men mutilate them, severe cold disorganizes them, and these and other causes produce disease, which may end in death. But this is very