food, especially Wheat. This tradition is the more remarkable because several naturalists have made the observation that corn does not grow wild in any part of the world. I do not know whether by a process of improvement our garden fruits can be derived from wild fruit; *it is well known, however, that the noble Vine Grapes grow wild in Colchis.* Whence, then, does corn come? My opinion is that God made direct provision for man; something was given to all, real Wheat to the Asiatics, and Maize to the Americans."

Can any scholar among our readers throw light upon the sentences printed in italics? They well deserve a commentary.

New Plants.

126. Zebrina pendula. *Decaisne in Revue Horticole, 4 ser., vol. 4, p. 141, t. 8.*

This is the common trailing Tradescantia-like plant so much cultivated in our greenhouses for the sake of its foliage, stained with purple beneath and striped with broad bands of white on the upper side. It was described in the *Journal of the Horticultural Society* in 1850, under the name of *Cyanotis vittata*, from which genus we see no sufficient reason for excluding it.

127. Taxus adpressa. *Carrière in Revue Horticole, ser. 4, vol. 18, p. 96, i.e. aliàs* Cephalotaxus adpressa *of Gardens.*

M. Carrière has shown that this beautiful hardy plant is a true Yew, and by no means a Cephalotaxus, as has been supposed. It has long been known that the species before us will not stand when worked upon the latter genus, although it does perfectly well on the common Yew, and it now appears that its fruit is precisely that of a Taxus.

VEGETABLE PATHOLOGY.—No. LXXIII.

316. Chlorosis 7. (*Accidental and Functional.*) Yellowness.—The form of Chlorosis which now comes under consideration is that to which the name of Icterus has been given by some authors, from the dull yellow green which is assumed by a large portion of the plant. It arises from various causes, or rather from conditions unfavourable to health, as from stagnant water, depressed temperature, especially when accompanied by deficiency of light, from deficiency of light itself, or from want of proper nutritious matter in the soil. The vital powers of the plant are depressed, but more especially those of the particular parts affected, insomuch that more favourable circumstances seldom produce a more healthy tint in the older plants, but only enable the plant to produce more healthy organs, by which the general end for which it is cultivated may be at length effected. Where there is mere absence of colour, as in bleaching, without any derangement of general health, exposure to light, if it be not too abrupt or accompanied by unfavourable conditions of dryness, whether of the soil or surrounding air, will soon remedy the evil, but in Chlorosis the tissues of the organs already formed are so affected that they are seldom in a condition to assume fresh energy. One of the most familiar examples is that of yellowness in Wheat crops, which in some seasons is so prevalent, and unless it be alleviated in good time is so prejudicial to the general produce. Other things being equal, want of strength in the soil, whether original or from defect of manure, is a most important circumstance in connection with the disease. A season like the present, of unusual cold and dryness, has afforded many opportunities of examining the circumstances under which the plant has suffered most, and it has been impossible to glance over two or three contiguous crops without observing that its intensity is in direct proportion to the natural deficiency of the soil or the negligence of the cultivator.* In wet seasons, accompanied by a constant prevalence of north-east winds, the effect is still more striking and more universal. In every case the only hope of a good harvest depends upon an amendment of the conditions which have induced the malady. If the soil is really in good heart, warm showers or an increase of temperature will ultimately remedy the evil, but if the sickly tint has arisen from poverty of soil, it can scarcely be expected that better weather will entirely mend the evil. In such cases the only practicable remedy is to apply some top-dressing, as soot or pigeon-dung properly mixed, which may be rapidly absorbed by the foliage itself or by the roots. Even where the plant has grown well at first and looked healthy, in consequence of no unfavourable conditions of climate, if the staple of the land is not good or there has been a deficiency of proper manure, the crop is sure to fall off just before the flower stem is produced, even under the most favourable external conditions.

317. Where plants are cultivated in pots it is often very difficult to secure a proper drainage, and much more frequently no due attention is paid to the subject. The surface of the soil, too, becomes compressed, so that the air does not penetrate into the pores, its original texture is not good, or algæ grow upon the surface, which are inconsistent with health; where the pots are very bibulous, evaporation is going on rapidly from the surface of the pot, and the temperature in consequence of that part which is in contact with the most active roots is depressed, where the pot is not sunk into the soil. Under such conditions many plants, as Calceolarias, Pelargoniums, Fuchsias, &c., are very apt to acquire a yellow hue, which is sometimes very difficult to remedy, and which renders such plants very unfit for propagation. The first point towards their recovery is to repot them with greater care as regards drainage and the texture of the soil; and if there is reason to believe that the evil has at all arisen from poverty, guano can be administered cautiously, or a little old and very rotted cow-dung may be mixed with the soil. The very best effect is also produced in some cases by the insertion of two or three small crystals of sulphate of iron in the soil, which gradually dissolve, and act probably as a tonic. Fuchsias which were apparently past all hope of recovery will sometimes revive rapidly under this treatment. *M. J. B.*

* Close to the place where I am writing are three contiguous fields, the first of which has not been fallowed for nine years, nor was the ground manured for Wheat; the second of inferior staple, with a Wheat crop following Oats; the third of much the same quality as the second, but manured with the refuse of skins used by hat-makers, with an intermediate patch under common cultivation. The difference is very striking. The manured crop is most luxuriant, the unfallowed land of rich staple covered with an excellent plant of a very healthy aspect; the patch under ordinary cultivation is yellow, and that succeeding Oats on poor land extremely yellow with little hope of recovery.

BEDDING PLANTS AND BOTTOM-HEAT.

The remark recently made by the writer of the Calendar relative to the propriety of planting out strong plants in June rather than weak plants in May is very judicious in a season like the present, when the ground temperature is excessively low, and when, too, in many instances from the losses of the winter, plants are not so strong as they are wont to be in more favourable seasons. I have frequently, both privately and publicly, pointed out the impropriety of early planting, that is before the 20th of May, and, except in very rare situations and in the case of unusually forward springs, I am quite convinced that there is not a day gained by planting before the first week in June. I have had several thousands of Geraniums and other plants bedded out since the middle of April, but they are standing on sheltered south and west borders, and have been nightly, and sometimes during the day too, covered with Spruce branches and mats, to protect them from the severity of the weather. These plants look well, are making root, have healthy green foliage, and have quite recovered the check they experienced at the time of putting out; but had they been planted in the flower garden at the same time, their safe protection would have been far more difficult, and the nuisance of the protecting material in a dressed garden quite intolerable. The advantages of this system of bedding out all established plants are very great; for you not only get a plant with an improved constitution, but one-third of the pots necessary under other circumstances will be found quite sufficient. The trouble of planting and transplanting will of course be urged as an argument against the plan by the advocates of the old system; and though I admit there is a good bit of trouble and time occupied, the saving in watering more than counterbalances it, while the rapid progress the plants make is another decided advantage. Cold as the weather has been, these plants I find are making root into an inch or two of leafy dung which was placed under them, and I have no doubt that they will remove to the flower-beds almost without sustaining any check, and will be in bloom in a week or two without presenting any of that rusty appearance so general in newly-planted things.

But independently of the risk we run in planting out before we have settled mild-growing weather, it is also of great import in a season like the present, that the ground should attain its natural heat before tender plants are committed to its fostering care. A week or two back we were told that Nettle seed would not vegetate at the same temperature as Groundsel, and that the generality of exotic seeds would not vegetate in a temperature below 46°. I have just been testing the temperature of the soil in the flower garden here, and I find it range from 44° to 46° at from 9 to 12 inches deep, according to the exposure and the time the beds were last digged, the highest temperature, that of 46°, only being found in a bed that was dug on a sunny day a fortnight back. Now, the mean temperature of the earth at 1 foot deep, as explained by an important table in Dr. Lindley's "Theory of Horticulture" just published, is April 46°, May 53°, and June 60°. The lowest temperature for May was in 1845, viz., 50°, the highest for the same month in 1848 56°; the lowest temperature for June is 56° in 1852, the highest 64° in 1846. Thus it will be seen that the ground at the present time is 4° colder than it has been known since 1844, and 10° below the highest temperature during the same period. Need we then be surprised if plants make slow progress? It is physically impossible that they could do otherwise until the earth attains something like its natural temperature, and the more plants are watered under such circumstances, except with water very considerably warmer than the soil in which they are growing, the greater the injury they must receive. To drench plants with cold water at the present time is labour worse than lost. But what is to be done? To plant even now until the earth has attained a temperature of 55° will not be a wise proceeding, yet plant we must. Fifteen years back, in my treatise on Cucumbers in pots, I recommended the "digging in" of solar heat for ridge Cucumbers, and I should now advise the same process to be observed with all flower-beds that are not stocked with plants. By forking the beds over after 4 o'clock every sunny afternoon for a few days, making or raking the surface of the ground tolerably fine, its temperature may be raised from 6° to 10° in a very short time, and it is I think quite unnecessary for me to explain that an increase of bottom-heat at the time of planting to that amount is a matter of much greater importance than hurrying the roots of plants into the ground the first fine day, just because the sun is shining or the air overhead is a little genial. What I am recommending is just what I have practised for many years, and if those who do not happen to think on this matter as I do will please to make the experiment, I know they will be satisfied with the result. Let them get heat into the soil, then plant and give a sufficient watering with warm water, and when it has soaked in leave the surface of the soil loose, fine, and smooth, and little after-watering, unless the weather is very dry, will be found necessary. Daily dribblings of water may be all very well to occupy the leisure hours of amateurs "who have nothing else to do;" but gardeners, and those under them, may spend their time far more profitably. *W. P. Ayres, Whittlebury Lodge, May 22.*

DOES SEA-WATER KILL SEEDS?

As you have done me the honour to notice favourably my wish to ascertain experimentally the power of resistance in seeds to the injurious action of sea-water, you may perhaps like to have a report. As such experiments might naturally appear childish to many, I may be permitted to premise that they have a direct bearing on a very interesting problem, which has lately, especially in America, attracted much attention, namely, whether the same organic being has been created at one point or on several on the face of our globe. As geologist I feel a special interest on the possibility of plants being transported by sea to distant islands, owing to the great influence which it is very obvious the views of the late ever-lamented Edward Forbes have had on the subsequent writings of botanists and zoologists. Forbes, as is well known, boldly supposed that the north coast of Spain had formerly been directly continuous with Ireland, and he extended the continent of Europe as far as and beyond the Azores. To imagine such enormous geological changes within the period of the existence of now living beings, on no other ground but to account for their distribution, seems to me, in our present state of ignorance on the means of transportal, an almost retrograde step in science—it cuts the knot instead of untying it. Weighty objections might, I think, be urged against Forbes' hypothesis as applied in the above and many other cases, but this is not the proper place to discuss such a question. As I had not the least notion when I began, whether or not the seeds would be all killed by a single week's immersion, I at first took only a few, selecting them almost by chance from the different great natural families; but I am now trying a set chosen on philosophical principles by the kindness of Dr. Hooker.

The sea-water has been made artificially with salt procured from Mr. Bolton, 146, Holborn Bars, which has been tested by better chemists than men, namely, by numerous sea animals and algæ having lived in it for more than a year. The seeds were placed in separate bottles, holding from 2 to 4 oz. each, out of doors in the shade: the mean temperature has during the period been about 44°, rising during one week to a mean of nearly 48°. Most of the seeds swelled in the water, and some of them slightly coloured it, and each kind gave to it its own peculiar and strong odour. The water in which the Cabbage and Radish seeds were placed became putrid, and smelt offensively in a quite extraordinary degree; and it is surprising that any seeds, as was the case with the Radish, could have resisted so contaminating an influence; as the water became putrid before I had thought of this contingency, it was not, and has never been, renewed. I also placed seeds in a quart bottle in a tank filled with snow and water, to ascertain whether the seeds kept at the temperature of 32° would better resist the salt water; this water, like that in the small bottles, to my surprise became turbid and smelt rather offensively. In the following list I have no reason to suppose, except in the cases where so stated, that the seeds have endured their full time.

(1) Seeds of common Cress (Lepidium sativum) have germinated well after 42 days' immersion; they give out a surprising quantity of slime so as to cohere in a mass. (2) Radishes have germinated less well after the same period. (3) Cabbage seed: after 14 days' immersion only one seed out of many came up; I think this is rather strange considering that the Cabbage is a sea-side plant; in the ice-cold salt water, however, several have come up after 30 days' immersion. (4) Lettuce seed has grown well after 42 days; (5) of Onion seed only a few have germinated after the same period; (6) Carrot and (7) Celery seed well after the 42 days; (8) Borago officinalis, (9) Capsicum, (10) Cucurbita ovifera, have germinated well after 28 days' immersion; the two latter, rather tender kinds, were also tried in the ice-cold water, and have germinated after 30 days' immersion. (11) Savory, or Satureja, has grown somewhat less well after 28 days. (12) Linum usitatissimum: only one seed out of a mass of seeds (which gave out much slime) came up after the 28 days, and the same thing happened after 14 days; and only three seeds came up after the first seven days' immersion, yet the seed was very good. (13) Rhubarb, (14) Beet, (15) Oracle, or Atriplex, (16) Oats, (17) Barley, (18) Phalaris canariensis, have all germinated excellently after 28 days; likewise these six latter after 30 days in the ice-cold water. (19) Beans and (20) Furze, or Ulex: of these a few survived with difficulty 14 days; the Beans were all killed by 30 days in the ice-cold water. (21) Peas germinated after seven

days, but were all dead after 14 days' immersion out of doors, and likewise after 30 days in the ice-cold water. (22) Trifolium incarnatum is the only plant of which every seed has been killed by seven days' immersion; nor did it withstand 30 days in the ice-cold salt water. (23) Kidney Beans have been tried only in the latter water, and all were dead after the 30 days.

As out of these 23 kinds of seed, selected almost at hap-hazard, the five Leguminosæ alone have as yet been killed (with the exception of the Cabbage seed, and these have survived in the ice-cold water), one is tempted to infer that the seeds of this family must generally withstand salt water much worse than the seeds of the other great natural families; yet from remarks in botanical works, I had expected that these would have survived longest. It has been really curious to observe how uniform, even to a day, the germination has been in almost every kind of seed, when taken week after week out of the salt water, and likewise when compared with the same seeds not salted—all of course having been grown under the same circumstances, namely, in glasses on my chimney-piece, so that the seeds from the day of being planted have been always under my eye. The germination of the Rhubarb and Celery alone has been in a marked degree altered, having been accelerated. With respect to Convolvulus tricolor, not included in the above list, I may mention that many of the seeds germinated and came out of their husks, whilst still in the salt water, after six or seven days' immersion.

To return to the subject of transportal, I may state that in "Johnston's Physical Atlas" the rates of 10 distinct currents in the Atlantic (excluding drift currents) are given, and the average of them is 33 nautical miles per diem; hence in 42 days, which length of immersion seven out of the eight kinds of seed as yet tested have already stood, a seed might be readily carried between 1300 and 1400 miles.

I will conclude this too lengthy communication by observing that all the 40—50 seeds which I have as yet tried sink in sea-water: this seems at first a fatal obstacle to the dissemination of plants by sea currents; but it may be doubted whether most seeds (with the exception of the winged kinds), when once shed, are so likely to get washed into the sea as are whole or nearly whole plants with their fruit by being carried down rivers during floods, by water-spouts, whirlwinds, slips of river-cliffs, &c., continued during the long lapse of geologically modern ages. It should be borne in mind how beautifully pods, capsules, &c., and even the fully expanded heads of the Compositæ close when wetted, as if for the very purpose of carrying the seed safe to land. When landed high up by the tides and waves, and perhaps driven a little inland by the first inshore gale, the pods, &c., will dry, and opening will shed their seed; and these will then be ready for all the many means of dispersal by which Nature sows her broad fields, and which have excited the admiration of every observer. But when the seed is sown in its new home then, as I believe, comes the ordeal; will the old occupants in the great struggle for life allow the new and solitary immigrant room and sustenance? *Charles Darwin, Down, Farnborough, Kent, May* 21.

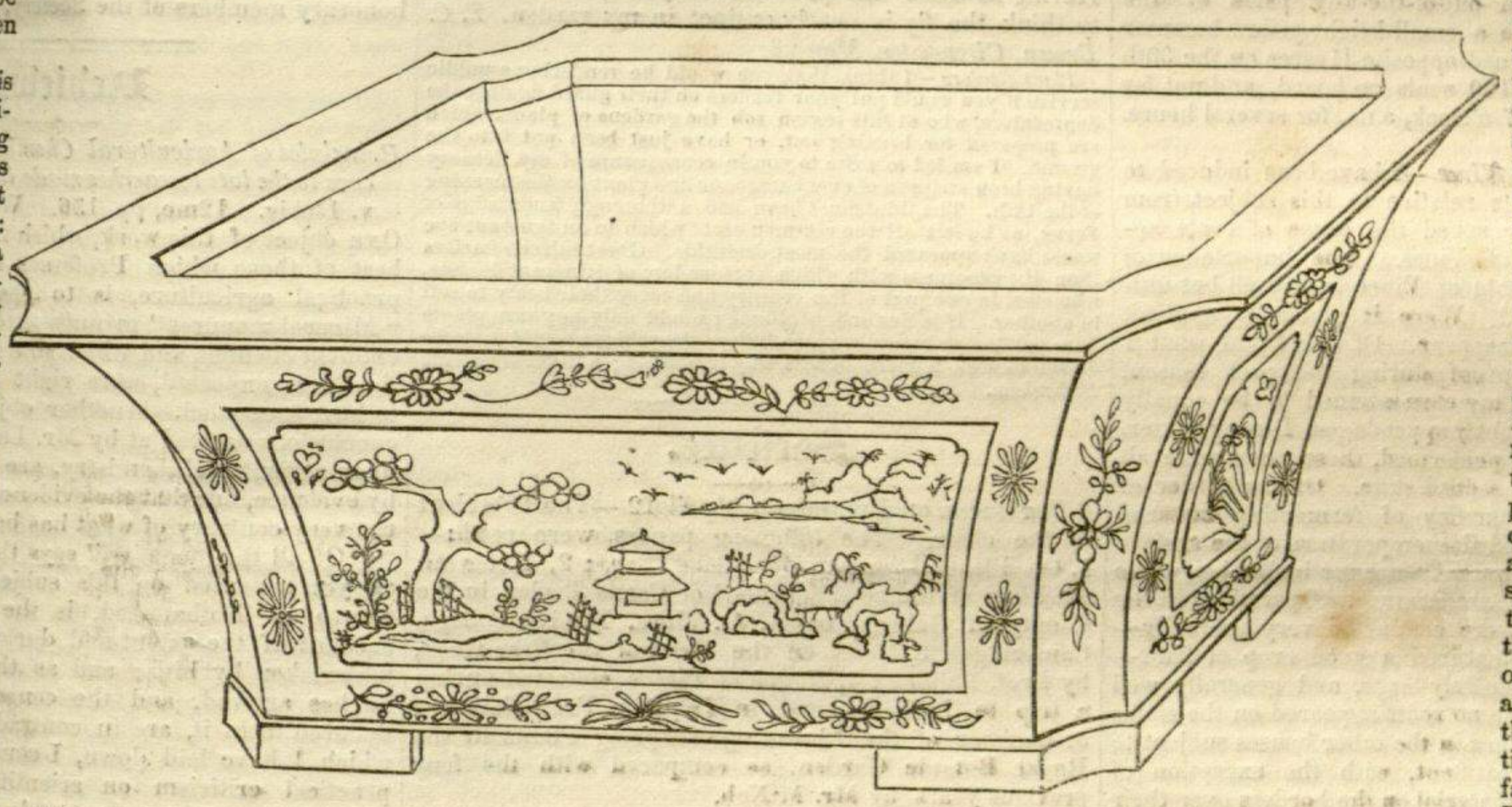
COMMON THINGS.

Preparing Scarlet Geraniums for Bedding. — The season has been so peculiar that the usual routine system of treating bedding plants has been completely upset. Few things have yet been planted out, and therefore considerable care has been required to keep them so long in a thriving state. To give Scarlet Geraniums intended for beds artificial heat after they have been struck and potted off, as is often done, would not answer this year; that would very much frustrate the end every good cultivator ought to have in view, viz., plants sufficiently healthy and hardy to profit by the naturally increasing warmth of the weather at planting out time, instead of, as is too frequently the case, receiving a check from which it takes them a long time to recover. If the plants are kept cool and properly hardened off by exposure to sun and air during the spring months whenever the weather will permit they will show more flowers in proportion to the size of the plants in June than similar ones which had been subjected to heat would in July. The same remarks are applicable to all other kinds of plants kept over winter for bedding purposes. In short artificial heat is unnecessary, even although the plants had been kept in the cutting pots during winter and required shifting in the spring; this can be easily accomplished without forcing them to make premature growths, which never get hardened before planting time. Too much shade, after they are kept in temporary quarters out of doors where accommodation is limited, also aggravates the evil. The result in both cases is that the plants shed their foliage, and for a long time look shabby.

Scillas.—These should be as common as Snowdrops and Crocuses in every garden where early spring flowers are sought for. They have many recommendations. Growing but a few inches high, and bearing for the most part blue flowers, they form beautiful beds, or margins to beds, in situations where now such plants as Crocuses and Snowdrops are almost exclusively depended on for the earliest bloom. The Snowdrop, as is well known, furnishes white blossoms only, and the Crocus supplies various tints of orange, white, yellow, and purple; but in neither is the pure blue colour to be found. Those, therefore, who desire to render their gardens ornamental at the earliest dawn of spring, should procure and plant Scillas largely; there are several kinds adapted for that purpose. S. bifolia grows about 3 or 4 inches high, and when growing freely, throws up several flower spikes, each of which bears from four to eight blue flowers, during April and May. S. verna grows about the same size, and bears a roundish head of purplish blue flowers, in May and June. S. amœna is also about the same stature, and produces largish drooping light blue flowers, in April and May. S. sibirica, another of these dwarf species, has drooping blossoms, of a beautiful clear light blue, which are borne in April. Of S. bifolia there are at least two very distinct varieties, one having white and another blue blossoms. They are easily cultivated.

CHINESE FLOWER POTS.

We have certainly made wonderful progress in plant culture during these last 25 years, and this may have induced us to cling so stoutly as we have done to the old stereotyped form of flower-pot; another reason why we have confined ourselves so much to that kind of pot may be the great convenience it affords in shifting plants from small pots into larger ones, and also the facility it furnishes of examining at any time the state of the roots. Besides there may be another reason, the most potent of all, for using almost exclusively our common form of flower pots, and that is their inexpensiveness. For some purposes, however, they may with advantage be dispensed with; *cultivate* plants in them if you please, but keep them out of the drawing-room, where they are anything but models of taste, and take a lesson from the Chinese. In the accompanying sketch you have a perspective drawing of a common Chinese garden flower-pot, which was sent me by Mr. Fortune embedded in the soil of a Wardian case, having some seeds sown in it. When cleaned it appeared to me to be very superior to our common pots. It is very smooth on the surface, and the colour that of a cake of Indian red paint. The ornaments are white and very agreeably relieve the tone of the Indian red; in fact, in point of form and finish it is an exceedingly tasteful article and fit for any drawing-room window. I am aware that attempts have been made to improve our common garden pots, but the forms hitherto recommended, and the offensive colour of the clay of which they were manufactured, rendered them anything but drawing-room ornaments. If something more classical and artistic in design were invented worthy of a place in a lady's sitting room, we should soon see the ugly green baskets with their covering of yellow sickly moss now employed vanish. Besides such huddling of plants together and smothering them in sphagnum is altogether as unnatural as it is at variance with good taste. *R. Glendinning.*



Home Correspondence.

Annuals.—A few words respecting this useful class of flowers may probably not be out of place, as I am of opinion that they are not encouraged as their merits deserve, chiefly perhaps from the almost general impression that their blossoms are but short lived. It cannot be denied that such is often the case, but I wish it to be known that this is owing more to mismanagement than to the real deficiencies of the plants. Some of them may be noticed in the parterres of our nobles, in the small gardens of the citizen amateur, and in the borders surrounding the humble cottage; but owing to carelessness or injudicious management they are rendered of ephemeral duration, although many of them have good recommendations, such as colour, habit, and profusion of bloom. The Zinnias even dazzle the eyes when looking on them beneath a hot summer's sun; the glittering Portulaccas, the dwarf and lovely Mesembryanthemum bicolor, the nice Calandrinia splendens, the beautifully veined Salpiglossis, the rich dark and light blue of Eutoca viscida, and Nemophila insignis, the splendid Platystemon californicum, Phlox Drummondi, Campanulas, Stocks, Lobelias, Gilias, Asters, Indian Pinks, and a great quantity of others, arise in my memory and claim a notice, but particularly the truly handsome Sphenogyne speciosa. When well managed, a bed of this plant cannot be equalled for the richness of its peculiar colour—viz., orange yellow, with a dark eye, each flower being larger than a half-crown piece. Annuals are too often sown so thickly in the open border that the plants choke each other in growing, and are starved into a premature maturity. In this case the real resources of the plants are not developed, and premature decay is the natural result; the blossoms are no sooner partially produced than their career is run. The duration of some annuals, I must acknowledge, is brief, and to have a summer's display constant forethought must be exercised to keep up a succession, but still they are capable of a much greater degree of usefulness than they in general afford; many of them being of easy culture and soon out of bloom, we are careless in recognising the fact that they demand attention to induce them to fully develope their beauties. It often happens that annuals sown early under the protection of frames are kept too warm and thereby rendered weakly, and they are mostly too thick and in small pots; those placed in the borders or beds are either sown and left to grow without attention, or are transplanted from the frames in weak tangled masses, unable to struggle successfully with their change of circumstances, which renders their brief duration a great deal more limited. As a general rule, annuals should be treated as individual plants, at least this course should be adopted in the early stages of their growth; the greater length of time they flower, size of their blooms, strong and healthy habit are the best recommendations I can offer in favour of such a system. For some of the later annuals a good plan is to sow their seeds in some convenient situation, in a light shallow soil, well incorporated with fine leaf mould in order to induce an abundance of fibres. It is well to render the natural surface perfectly solid, and add artificially all the soil required. As soon as the plants are of sufficient size, they should be transplanted into a situation similarly prepared to that where the seeds were sown, and at sufficient distances from each other, to allow their removal with as little mutilation of the roots as possible. If a constant succession of plants is provided in this way they can be moved at any time in the summer months, and often without a leaf flagging. As a matter of course a cloudy day is desirable for the operation, but if they are grown as I have suggested, bright weather need be no obstacle to their removal. Leaf-mould is the best soil for growing them in until their final removal, as the fibres ramify so thickly in the decaying leaves, that in the process of shifting to their final destination little or no damage is sustained, and where a few beds or vacancies in the borders have to be filled up, a couple of young men with trowels and hand-barrow will soon accomplish the desired effect. Annuals that are required to remain as long a period as possible in bloom should never be allowed to perfect seeds; it should be remembered, as a physiological fact closely bearing upon practical gardening, that the great end of all organic life is to perpetuate its kind, and that by taking advantage of this principle and retarding such a consummation, a more protracted existence can be procured. By this practice plants naturally annuals are often rendered perennials. *John McArdell, late Gr. to H. Sharples, Esq.*

The Vinegar Plant (see p. 336.)—If your correspondent will try the undermentioned receipt he will find it answer. To three-quarters of a pound of coarse sugar add half a pound of treacle; put them into a stone or glass pot that will hold about two gallons, and is about 1 foot in diameter; its mouth should not be less than 8 inches in diameter with a rim, for the convenience of tying down. Having prepared the above, pour one gallon of boiling water on the sugar and treacle; stir well to dissolve them, and when cooled down to about blood-heat add your plant, keeping the part that was separated from the parent uppermost. Then get a piece