GARDEN NOTES.

THE VEGETABLE GARDEN.

After sowing seed beds, cover with something, such as old matting or sacks split up. This assists in retaining the moisture, and thereby encourages the germination of the seeds; but these coverings must be removed as soon as the seeds are through, and afterwards, if rain does not come, they must be kept going with mulching.

Plant out celery as required in trenches 1ft wide and 1ft deep, with the bottom well manured and deeply dug. Give a good soaking of water after planting. Then, if dry weather continues, place some sticks across the trench and shade them. Thin out spring-grown onions, and if short manure can be procured they will be greatly benefited by a mulching or dressing between the rows. Thin also carrots and turnips. Sow for succession peas, beans, and spinach, and the main sowing of beetroot should be got in on the first favourable opportunity. Plant out vegetable marrows as advised a week or so back.

TOMATOES.

Tomatoes under glass will require attention by way of pinching out the young side shoots. They should be kept removed as they appear. Stake and tie them before they get sufficiently long to fall over. If they are allowed to do this they grow crooked in a few hours, then it is a difficult job to get them straight. Early planted ones should be in full flower and the young fruit appearing. To keep them setting freely give the bunches of bloom a shake to distribute the pollen.

FERNS.

Under glass, ferns must be shaded, or the fronds will lose that beautiful dark tint of green which is so much appreciated; but this must not be over done, or they become a cabbage-green, which is as distasteful as the other extreme. Young specimens must not suffer for want of pot room. It does not take long to make specimens if one makes a start with robust, healthy plants. The worst plants to grow are those obtained by splitting up old specimens; in fact, these old specimens that get too large and unwieldy for any useful purpose should be thrown away. If increased numbers are required, it is better to divide from young, healthy plants than from old ones. The best results, however, are derived from the sowing of fern spores. If one has only the patience to wait for them, fern spores will grow in almost any kind of soil, or even without a particle of soil. I have collected hundreds from brick walls; but where sufficient heat and moisture can be procured spores of many hardy and half-hardy ferns may be sown in boxes, placed away under the stage in a cool, damp and rather dark or shaded position. The materials should be of a rather lumpy and open nature, such as burnt or charred soil, a little leaf mould, some burnt clay or broken brick, mixed up and pressed down in shallow boxes. Do not make it fine, but press it down, lumps and all together, and water well. Then scatter the spores over the surface. Place a square of glass over them, and put the box away in a cool, and at the same time warm and moist, position, as advised above.

A good material for potting most ferns in consists of equal parts of old turfy loam, peat, leaf mould, and sand; but for maidenhair do not use the peat. Another great point in the well-being of ferns is to give plenty of good drainage—quite one-third of the pot should consist of crocks. Keep the plants well watered and the house in a moist, humid condition, as ferns do not like winds blowing through them, nor do they like cold draughts.

THE FLOWER GARDEN.

The season of bedding out is upon us again. To my mind, the first week in November is the best and safest time to do this work. A word or two as to the best material for an effective display—not elaborate, but a simple, useful, and inexpensive display within reach of the majority of my readers—will be appropriate. It may be that there are certain flower gardens with numerous small beds and walks between them. It is a difficult matter to deal satisfactory with such gardens. The demand generally in such cases is that each bed shall be independent of its neighbours, and under such circumstances it is not easy to blend colours. Nor can such gardens be planted with herbaceous plants satisfactorily, for they never look at home in small formal beds.

Fill any vacant spaces in the herbaceous borders for the summer with those things that seem most in touch with their permanent inmates. Put a few tall things at the back, such as cactus dahlias, the bright yellow single helianthus, and even summer flowering chrysanthemums; or, if there is already an abundance of flowering plants in the background, the summer introductions may consist of such things as cannas, wigandias, etc. Bare spots in the front may be filled with carnations, calceolarias, pelargoniums, and pansies.

As to annual beddings—such things as stocks, asters, marigolds, phlox drummondi, etc.—they do better by themselves than when mixed with a better class of bedding material, such as geraniums, calceolarias, verbenas, ivy-leaved geraniums, and lobelias, for the reason that many of the annuals are only a short time in flower, and their going off quickly disorganises the bed and destroys the general effect.

MOTORING NOTES.

OIL RESERVOIR AS GREASE CUP.

The car owner who is handy with tools may find it profitable to replace a number of the grease cups which lubricate important parts of the mechanism, by an oil reservoir with leads running to these various parts, such for instance, as the thurst bearing or throwout collar of the clutch. This oiler should be constructed much like a mechanical oiler with controls for each lead.

LUBRICATION ERRORS.

There are four very common lubrication errors responsible for many troubles. The statement that "oil is a good thing, you can't have too much of it," is a mistake. Oil should be kept at the proper level—no higher. Over-filling causes excessive carbon, gummed valve stems, and sooty spark-plugs. Another erroneous belief is that a heavy oil will offset the hindrance of a badly worn engine. As a matter of fact, heavier oil is no substitute for worn parts. Worn engines need overhauling, and nothing else. The cleaning of the engine crank-case with kerosene is a third mistake. The better plan is to drain the crank case when the engine is hot. This will carry off the sediment before it settles. Then flush out with a quart of fresh oil and refill to the correct level. The fourth error may be summed up in the statement, "My oil seems to work all right." The motorist cannot, however, watch from day to day the inside of an engine, hence he is in no position to know accurately the effects of different oils. While many oils may seem to work alright," only one of those oils may be giving him scientific lubrication.

AN EASY STARTING DEVICE.

Rather an unusual form of starting gear has been introduced recently on the Richardson light car a small machine which is equipped with a two-cylinder air-cooled V engine. On this engine an exhaust lifter similar to that used on a motor-cycle engine is fitted, the method of starting in such cases being to rotate the engine as fast as possible with the exhaust valves lifted; and then, when the necessary speed has been attained, to drop the exhaust valve lifter; when the inerita of the flywheel causes the crankshaft to rotate several times over compression at a fairly high rate of speed. A peculiarity, however, of the starting system is the introduction of a geared up starting handle. The spindle of the handle itself is connected to a train of gear wheels arranged similarly to the back gear of a lathe. To the last gear wheel of the train the starting shaft is attached, the result being that the rotation of the starting handle causes the shaft to turn at a higher speed. With this device, when the exhaust valves are lifted, the engine can be spun at a high speed without overmuch exertion, and when the exhaust valves are dropped the engine is able to start at once.

A NEW PETROL SUBSTITUTE.

From the lowly and sticky molasses is being produced "motor alcholol"—a substitute for petrol. Discovered by J. P. Foster, chemist of one of the big sugar plantations on the Island of Maui, Hawaii, production within the next three months will be sufficient to furnish fuel for all cars on the islands should a benzine shortage occur. According to the first reports of the new fuel brought to San Francisco, "motor alcohol" gives more power, greater mileage, easier starting and more freedom from carbon than benzine. It can be used without an adjustment of the carburettor. The new fuel is performing in automobile, marine, stationary, truck and tractor engines. In a 36-hour test made with a 75-horse-power tractor the consumption of "motor alcohol" was four gallons an hour compared to four and a-half gallons of benzine in the same engine on the same work. Examination of the cylinders showed most of the old carbon deposit removed and the remainder so soft it could be removed with the fingers.

SCIENCE NOTES.

RUBBER FOR ROADS.

Various experiments are being made in the preservation of road surfaces, now subjected to so great a strain by pertol-driven vehicles, and rubber is now being substituted for wood blocks or stone sets. Hitherto the device has been employed only to deaden sound near the hospitals and hotels. Now the Southwark Borough Council are applying it to resist the ravages of traffic. The average cost of remaking a wood road has risen to £3 a square yard, which is partly due to the necessity of deepening foundations. Six inches was formerly a sufficient depth of concrete; twice the depth is now required, and in repairing Oxford street concrete foundations of 18in have been laid down. Many London streets are "up" at the present time.

AVIATOR AND THE INVENTOR.

Writing of inventions, the Scientific American is inclined to believe that there is no field that offers more opportunity to the inventor than aviation. The science is really still in its infancy. Apart from actual constructional devices, there are so many obvious defects in the aeroplane that require remedies. Chief among them is the necessity for a braking device to give the machine only a few feet of run upon landing. Tail skids galore have been produced, but none can claim to be really effective. Brakes on the wheels have been tried, usually with the result of smashing the nose of the machine. An alterable chord on the wings has not proved altogether successful, and the alterable pitch of the propellor is not popular. The helicopter may come in time, but it is a long way from perfection.

THE PRODUCTIVE SUMP TREE.

The sump three, five or six million tons of whose fruits are gathered annually in Senegal, is a variable source of oil, sugar, and alcohol. The fruit consists of an oleaginous spindle-shaped kernel enclosed in a hard fibrous shell and surrounded by sweet pulp containing a very high percentage of sugar and enclosed in a tough skin. The kernel contains 41.80 per cent. of fats and 25.32 per cent. of nitrogenous substances. However, the shell is so difficult to crack that only the pulp can be at present considered useful for industrial exploitation. This pulp contains sufficient fermentable material to hold from 9.7 to 10.8 cm. of sugar per 100gr. of fruit. The composition of the fruit is as follows:—Sweet pulp, 42.9 per cent.; shell, 48.5 per cent.; oil bearing kernel, 8.8 per cent. The sweet pulp contains 40.3 per cent. sugar.

BELGIAN GLASS INDUSTRY.

The Belgian window and plate glass industries have about regained their pre-war position. Particular difficulty has been experienced in obtaining sodium carbonate and sodium sulphate. Compared with the metallurgical and textile industries the Belgian glass manufacturers have not suffered any great damage to their plants and machinery. The eighteen window glass factories remain practically intact, being dispoiled, however, of their belting and copper work. Of the eight plate glass plants none was seriously damaged except the American-owned mill at Courcelles which was completely destroyed. The window glass industry has been less affected by labour shortage than the plate glass plants owing to the fact that in making window glass, hand-blowing methods are used in Belgium. Glass blowers are highly skilled workers and consequently do not find it as easy to shift to other lines of employment as do the mechanical workers in plate glass. Formerly Belgian window glass manufacturers were able to compete with mechanically equipped plants in the United States and elsewhere by reason of the great efficiency and comparatively low wages of the Belgian workers. Now, however, it is an open question as to whether or not Belgian window glass factories will be able to retain their present markets when the demand for their product is reduced to normal. It does not seem probable, however, that the Belgian market for plate glass will be affected.

The successful carrying out of the work in the specified time depends on the organising capacity and driving power of the executive. The period specified is calculated on the assumption that the authority to start is given in the autumn of the year. This will allow the detail plans to be made while the preliminary work is being done, and enable stores, material, and construction plant to be obtained ready for rushing the work in the following summer.