It sometimes happens that the fertilizer used to enrich the soil will germinate insects which destroy or impair the roots of the plants; the indications of such being the case are that the leaves will turn red or yellow, and will flag or droop during the warmer portions of the day. If this occurs while the plants are in pots, an effectual remedy is to let the mold in the pots get so dry that the leaves of the plant commence to droop; then place the hand over the surface of the mold, letting the stem of the plant pass between the fingers; then turn the flower pot upside down, and slap the bottom of the pot with the other hand. After one or two such blows, the pot may be lifted off without disturbing the mold from the roots of the plant, and the insects will be found on either the outside of the mold or on the sides of the flower pot. After removing them, the pot may be replaced, and the plant watered. If, however, the flower beds are infested with insects, the soil should be allowed to get comparatively dry, and a piece of carrot, parsnip, or turnip placed upon the surface as a bait and covered over with two or three cabbage leaves. An inspection early in the morning will discover the insects around the bait.

PEGGING DOWN CREEPING PLANTS.

To propagate lobelias and verbenas, the first bloom should be picked off, and the branches, as they extend, should be pegged down closely to the surface of the mold. The branches will then take root as they lengthen; and by thus drawing a large amount of sustenance from the soil, they will bloom very freely and cover a large space. A verbena may thus be made to cover a square yard, and a lobelia a square foot, of ground. When a plant is permitted to bloom, the growth of its branches is very seriously retarded. For example, a balsam, or lady's slipper, as it is commonly termed, kept free from bloom and continuously repotted (as the roots extend) into a larger pot, may, under favorable circumstances, be grown as large as a good-sized gooseberry or currant bush. Asters and stocks require transplanting from the seed bed so soon as the plant has six leaves, to another bed, placing them about six inches apart: then when they are large enough to set into the beds, they should be well watered both before and after removal.

TRANSPLANTING.

The object of transplanting is to check the growth of the top, and to extend the growth of the roots of the plant, thus enabling it to draw increased proportionate sustenance from the soil.

As soon as the plants in the seed bed have four leaves, the weakly ones should be removed to give room to the healthy ones, otherwise the abundance of leaves will draw the plants up, causing them to grow tall, slender, and weakly. Before removing them, however, it is well to water the bed, so that those removed can be drawn from the earth without disturbing the soil around those remaining.

Flowers require a light soil, to obtain which sand may be mixed with heavy soil. Sufficient ammonia to just taint the water will be found an excellent means of promoting the growth of the plants; soapsuds will also have the same effect. Watering should take place in the morning during the spring, and at night during the summer months; for the reason that, in the spring, the nights are apt to be cold, and the watering would make the soil still colder; and in the summer the water evaporates very quickly from the soil if applied during the day. Water which has been exposed to the open air should be used, and not that drawn from a hydrant or a well; and if after watering, the surface of the soil becomes caked, it should be disturbed with a rake, or the growth of the plants will be seriously impeded. The water should be applied in as fine spray as possible, and in no case poured upon the plants. All plants should be planted deeply into the soil, which should be pressed moderately firmly to and around the roots.

POTTING PLANTS.

The mold for potting should be light and loamy, the fertilizing material used being well decayed. If the soil is rich of itself, it is better to be either very sparing with the fertilizer or to dispense with it altogether. In the bottom of the pot, place several small broken pieces of crockery or similar material to assist the drainage; and in setting the plant, be careful to keep it well down in the pot and to press the mold moderately around the roots. The surface of the mold should be about half an inch below the level of the top of the flower pot. Slips should be planted close to the sides of the pot, and in small pots.

When a plant becomes pot-bound, that is, when the roots have become matted around the sides and bottom of the pot, the plant, so soon as it has ceased blooming, should be repotted in a larger pot. It is not necessary to remove any of the mold from the roots, but simply to fill in the space in the larger pot with new and rich mold.

Plants kept in the windows should be turned every morning, or the light, striking on one side only, will draw the plant to that side so that all its branches and leaves will turn towards the window. The water in the saucers should never be applied to the plants. In cutting slips of any plant, always choose the youngest branches; and cut off the slip at the junction of a joint or leaf, since the roots shoot more readily from such joints. If you follow these directions and put sufficient sulphate of ammonia to just taint the water applied to your plants, you may cultivate with success almost any plant, even though you are an entire novice.

Ashes and Iron for Flowers.

The observation of practical and experimental gardeners seems to confirm the fact that, to procure brilliant colors in flowers, it is necessary to supply the soil with an abundance of ferruginous constituents and silica. The latter supplies a material (says S. E. Todd, in one of our foreign exchanges) which is of vast importance in the production of that brilliancy of the petals and the dark green luster of the leaves. Then, if potash be added, or the ground be dressed round about the growing flowers with unleached wood ashes, an increased brilliancy will appear in every petal and leaf.

Any person who cultivates only a few flowers in pots, or between grassy lawns, or on spacious parterres, may readily satisfy himself of the exceedingly useful part the foregoing materials play in the production of beautiful flowers. Even white flowers, or roses that have petals nearly white, will be greatly improved in brilliancy by providing iron sand, and unleached ashes for the roots of growing plants. Ferruginous material may be applied to the soil where flowers are growing, or where they are to grow, by procuring a supply of oxide of iron, in the form of the dark colored scales that fall from the heated bars of iron when the metal is hammered by the blacksmiths.

Iron turnings and iron filings, which may be obtained for a trifle at most machine shops, should be worked into the soil near flowers; and in a few years it will be perceived that all the minute fragments will have been dissolved, thus furnishing the choicest material for painting the gayest colors of the flower garden. When there is an excess of vegetable mold in a flower bed, and a deficiency of silica or sand, the flowers will never be so rich in color, nor so brilliant, as they would be were a liberal dressing of sand, or sandy loam, worked down into the bed, where the growing roots could reach it. If wood ashes can be obtained readily, let a dressing be spread over the surface of the ground, about half an inch deep, and be raked in.

A dressing of quicklime will be found excellent for flowers of every description. It is also of eminent importance to improve the fertility of the soil where flowers are growing, in order to have mature, plump, ripe seed. Let the foregoing materials be spread around the flowers, and raked in at any convenient period of the year. When soil is prepared for flowers in pots, let some sand, some oxide of iron, and ashes be mingled thoroughly with the leaf mold.

SCIENTIFIC AND PRACTICAL INFORMATION.

TESTING TINNED PLATES FOR LEAD.

M. Fordas recently communicated to the French Academy of Sciences the following simple method of determining the presence of lead in tin vessels employed for packing articles of food. The metal to be tested is first touched with nitric acid, and then heated, when the acid evaporates. If lead be contained, stannic acid and nitrate of lead remain. Iodide of potassium is then applied, forming yellow iodide of lead; while the stannic acid is white. The yellow stain, therefore, indicates lead, the white, tin.

NEW TESTS OF STEEL.

MM. Trève and Duvassier have lately conducted extended investigations into the nature of steels, and their coercitive force. Fifteen bars of steel, divided into five series of three each and differently carbonized, each received a peculiar temper. They were then magnetized to saturation, and their magnetic force determined by the method of deviations. A bar containing 0·950 per cent of carbon and tempered in cold water gave a maximum deviation, represented by 47. Another bar, with a similar percentage of carbon, but tempered in boiling water, gave 44. A third bar, with a like percentage, but tempered in oil, at 50° Fah., gave 43. The influence of the tempering liquid is here evident.

The effect of the proportion of carbon contained in different bars was also very marked. Thus a bar containing 0·950 per cent gave a maximum of 47; another, with 0·250 per cent, gave but 13. By describing the curves of variations for the different series of bars, the influence of the carbon and of the tempering liquid becomes clearly apparent. It is a remarkable fact that the curves of elasticity and the magnetic curves of the bars are closely similar, the carbon appearing to give elasticity to the steel, and at the same time to increase its magnetic capacity.

ALLOYS OF PLATINUM AND IRON.

M. H. Sainte-Claire Deville says: On analyzing platin-iridium, iron and platinum are united in the state of oxides intimately mixed. If this matter is treated with a current of hydrogen, oxide of iridium is reduced at common temperatures from 392° to 1,112° Fah. The metals are then alloyed; for if digested with hydrochloric acid, a few bubbles only of hydrogen escape, and very little iron is dissolved, even when it exists in the alloy to the extent of 10 per cent. Iron and iridium are thus capable of combining at low temperatures, and the same is probably the case with iron and platinum. Under these conditions, the alloy is evidently not homogeneous. Breithaupt admits the existence of platinum ores containing 14 to 19 per cent of iron. Berzelius, only once however, found a specimen containing as much as 12·98 per cent; and M. Debray and the author have never found more than 13. Platinum may be freed from iron by cupellation in chlorine gas. If heated from 2,192° to 2,732° Fah. in this gas, it is volatilized in the form of brilliant crystals, and deposited in all the hot parts of the apparatus

THE utilization of the sewage of Paris on the plains of Gennevilliers, containing an area of 800 acres of light sandy soil, is now being practically carried out. A large sewer is now being constructed to carry away the sewage from the main sewer at Clichy-sur-Seine. The new sewer will be of 5 feet 6 inches internal diameter, and about 4,150 yards in length; and when completed, half the sewage of Paris will be utilized.

Paper Barrels and Boxes.

The manufacture of paper barrels, boxes, and similar vessels, for use in place of those generally made of wood, is rapidly increasing, seven patents and an equal number of factories for producing the articles being now in operation, all in the Western States.

In the first of these patents, the paper used in the fabrication is prepared principally from straw, and is pressed, several sheets at a time, into a firm, compact sheet, which when dry becomes tougher than wood. The sheet is then bent into cylindrical form, and its opposing edges, which are previously cut into dovetails, fitted together. Double pointed nails are drawn through the dovetailed ends from the outside of the barrel, and are clinched upon the inner surface of a strip of wood placed vertically along the inside of the joint. The heads are of wood, fitted into the ends with a flange resting against the edge, and are secured by nails driven through the sides of the barrel. Hoops of wood or iron are added to protect the latter from abrasion or wear, and the paper is thoroughly waterproofed.

Another mode of making the barrels is to form them directly from the paper pulp, the latter being taken from the cylinder of the wet paper machine and carried around an expanded cylinder until it becomes of the requisite thickness. The cylinder is then contracted and removed, leaving the barrel all formed and ready for passage between two rollers. These are so arranged that one presses on the inside and the other on the outside of the barrel, moving the latter between them, and at the same time compressing and hardening the paper. The vessel is then a jointless cylinder, and nothing remains but to insert the heads and secure the hoops in place.

Securing the heads in paper barrels appears to be a difficult portion of the manufacture, and there are two patents on this especial point. In one the invention consists in fastening manilla or other strong paper around the head so as to form a flexible edge. This, after the head is inserted, is crimped so as to line the rim of the barrel, over which it is bent and secured by hoops.

The second inventor proposes either to press one head into shape from paper pulp, at the time when the barrel is formed about the cylinder, or else to make the heads separate and turn up their edges around the peripheries. This turned-up portion serves the same purpose as the flexible paper in the case just described, but differs in construction, being riveted to the cask through iron hoops.

Another plan for making barrels differs essentially from those already described, in that each barrel is formed of two cylinders instead of but one. One cylinder is placed inside the other, so as to serve as a lining, and, being shorter, to form shoulders on which the heads are rested. Thick paper is interposed between the cylinders, and all are pasted firmly together. The interposing paper is carried up above the rim and folded over the edges. Paper packages for lard, butter, and similar materials are composed of sheets glued together and pressed into shape in dies. This is done while the paper and glue are still moist, and a sheet of muslin, placed under the substance in the concave die, prevents cracking or tearing at the joints.

A Large Mass of Native Copper.

A few days since, a mass of native copper, said to be the largest ever discovered, was brought from Lake Superior to St. Louis, Mo. The mass is heart-shaped, and weighs 6,000lbs., exceeding nearly double the weight of the famous copper boulder which was transported many years ago from the same region to the Smithsonian Institute. The new specimen exhibits the pure copper to the eye, and contains 98 per cent of the metal. It was taken out from an ancient digging, sixteen and a half feet below the surface, by a Mr. Davis, who had spent 25 years in copper mining. The mass, when found, had evidently been detached from its bed by the ancient miners. A number of pieces of copper were found besides the mass, weighing from 1 oz. to 17 lbs., which were evidently clippings by the old miners. Stone hammers weighing from ten to thirty pounds have been found in cart loads, several specimens of which were brought away with the copper.

These were the primitive tools with which these ancient miners had to do their work, and are found either perfect or broken from use, and the fragments are found scattered through the *débris*. It has been computed that two hundred of these old miners with their rude methods could barely be equivalent to two of the skilled miners of the present day. Who, and to what race they belonged, and at what time these people flourished, is not satisfactorily known, and can only be the subject of conjecture. The only plausible assumption is that they belonged to the ancient mound builders, and worked in metals, anterior to the Indian races, as evidences of their occupancy were seen by the early Jesuit explorers, and specimens which they clipped from the copper rocks are found scattered over the whole continent.

CEMENT FOR MARBLE AND ALABASTER.—Mix 12 parts of Portland cement, 6 parts of slaked lime, 6 parts of fine sand, and 1 part of infusorial earth, and make up into a thick paste with silicate of soda. The object to be cemented does not require to be heated. It sets in twenty-four hours, and the fracture cannot be readily found.

THE results of the experiments for testing the proportion of carbonic acid in the air, made during the first ascension of the Zenith, show that, at the altitude of 2,260 feet, the volumes of carbonic acid contained in 10,000 volumes of air are 2·40; at 3,200 feet, 3·00.