

SUGGESTIONS IN FLORAL DESIGNS.

The foliage of plants is perhaps their most valuable ornamental feature, since the root, though very varied and beautiful in its modifications, does not, from its subterranean position appeal to the eye, nor would it always be a pleasing feature in a design. A line of foliage, or a stem giving off its leaves, might very fitly adorn a moulding, while a series of uprooted plants would convey a somewhat disagreeable idea to the mind, and would too quickly suggest the notion of a shelf in some out-house of the garden with its reserve store of spring bulbs or other plants laid aside till the next planting season should again call them into service. Flowers are no doubt in nature or linearly the most attractive, and on those the eye rests at once; but ornamentally the foliage has the greater value, since the forms of leaves are richer and more varied than those of blossoms, while the beauty of colour that is the chief charm of the latter does not compensate for this richness of form in the foliage. The flowering season is, in addition to this, much briefer than that of the foliage, as a plant that displays its leaves for six months may be in blossom barely as many weeks, and in addition to this, many of the types of leaf of greatest ornamental value, such as the oak, maple, and ivy, belong to plants in which the blossom is, either from the dullness of its colour, or the smallness of its parts, a very subordinate feature. In the present sheet we do not propose to deal with the variation of form (though such variation is very noticeable, as the most cursory examination of the leaves of the honeysuckle, Fig. 13; the guelder-rose, Fig. 16, and the sweet-william, Fig. 21, will at once demonstrate), but rather with the arrangement of the leaves on the stem. All leaves follow in this respect very distinct laws, though in some cases these laws naturally appeal more rapidly to the eye than others. All the natural examples now before us have the leaves developed in what botanically is termed an opposite arrangement; its valuable ornamental effect is at once evident. In Fig. 22, the masses are in alternate arrangement; the difference of effect is sufficiently obvious.—F. EDWARD HOLME, F.L.S., F.S.A.

THERE are nearly 75,000 miles of railroad in the United States, consequently it would occupy a passenger five months' time, travelling continually at the rate of twenty miles an hour, to go once over it all.

WE learn from the *Buenos Ayres Standard* that Mr. C. B. Eaton, Director General of Telegraphs, has been introducing improvements, one of which is the system of transmitting messages simultaneously from both ends of one wire.

ACCORDING to the *New York Telegrapher*, a battery man, who has tried the experiment, says that to keep the jars of a sulphate of copper battery clean, coat the inner surface of the jar for about an inch at the top with common white paint. This, he says, will entirely prevent the sulphate of zinc from accumulating of the outside of the jar.

FOREIGN AND COLONIAL NOTES.

The Suez Canal.—The revenue of this great undertaking is well maintained, and, in fact, something more than maintained. The number of vessels which passed through the canal in May was 130, as compared with 108 in May 1874, and 112 in May 1873. The receipts of May were 100,112*l.*, as compared with 82,803*l.* in May 1874, and 83,779*l.* in May, 1873. In the first five months of this year, 714 vessels passed through the canal, as compared with 560 in the corresponding period of 1873. The aggregate receipts in the first five months of this year were 525,047*l.*, as compared with 447,303*l.* in the corresponding period of 1874, and 405,992*l.* in the corresponding period of 1873.

Ordnance Survey of Palestine.—Since the return of Lieutenant Conder to Palestine last autumn, the Ordnance Survey of the Holy Land has made satisfactory progress. Lieutenant Conder took the field in October 1874, and in November he was joined by Lieutenant Kitchener, R.E., as second in command. The hills near Hebron have been explored, and Beersheba, the southern limit of the survey, has been reached.

A TALK ABOUT SMALL TOOLS.

It is to be regretted that there are not schools to teach boys the initial principles of working hand-tools, since this knowledge is essential to the proper understanding of how to use them. Simplicity in the form of an implement by no means implies facility in its use; indeed, it may be said that the more simple the tool, the greater is the skill required to use it properly and with maximum effect. Not every operator excels with pocket-knife, axe, or saw; and, with the use of every tool, there is involved the demonstration of a definite principle.

JACK-KNIFE.—Too much has never said in praise of a "jack-knife." It is a master tool for more kinds of work than can be named in any one handicraft, unless it be that of a farmer,—a sort of *vide mecum* with every man from boyhood to old age, whether he is a worker or a doer. We may take it as the type of every wood-working implement, and by it illustrate every tool in the shop.

SCRIBER.—The scriber is merely a straight-jointed piece of steel used on wood or metal for a marker, as in a pencil on paper. It must be held at a certain angle inclined to the surface, and moved by a ruler, straight-edge, or curved guide. The carpenter's gauge has a sliding guide and set-screw adjusted to the bar which carries the scribing-point, and determines the angle.

BRAD-AWL.—The brad-awl is the next simple form of a tool speedy in its action, and of universal use where small holes are to be made in wood or other soft substances. Like a miniature chisel, when its edge is placed across the grain, it acts only as a wedge, and elastic fibres close up again on its removal. This effect must be borne in mind, as well as its greater efficacy when driven by a hammer or mallet than when worked by hand. It makes a poor drill, since its edge is not adapted to the work.

SCRAPER.—The most common scraper, if not a knife, is a piece of glass, for soft substances; but being soft itself, it is not durable. The secret of its keen edge is, that the natural fracture is at right angles to the surface, which we imitate in making steel scrapers used by cabinetmakers. These are only small, thin plates like a saw-blade, upon which the edge first made by grinding being worn off is again turned on by passing along it the rounded back of a gouge, the stem of a large brad-awl, or any similar piece of hardened steel, which, if well applied, produces a uniform burr, or sometimes a wire edge. The keen scraper, by its fine shaving, reminds us of a knife-blade effect: the paring-chisel, and the plane are modifications, much limited by this angle of the edge.

AXES.—But for the amount of effect compared with the amount of energy expended, the various forms of axes stand first among tools, combining as they do the cleaving power of the wedge, the cutting edge of the knife, and the percussive force of the hammer. Their edges, however, having but small amount of guiding surface, necessitate a high degree of skill on the part of the operator. They should be as thin as is consistent with strength to resist the shocks to which they are subjected. Their cutting angle is from 25 to 40 degrees, according to circumstances. Thus, like the adze, might be called a tool of precision, since, by the accuracy of repeated blows, proportionate effect is produced. Greater accuracy can be obtained with the adze by steadying the inner hand and the end of the long handle against the body of the operator as a fulcrum. A good workman may split the sole of his slipper, when standing upon his work, without fear of grazing the skin of his toes.

CHISEL.—Using a chisel, we dispense with the cumbrous weight of the axe, and more readily modify the percussive (beyond the knife-like) effect, by graduated blows of a hammer or mallet. The "guide-principle" of one large, flat surface is here utilized in the "paring-chisel," and by keeping this closely pressed against the work, the tendency of the tool to run into the wood is controlled. The "firmer" and the "mortice" chisel differ in shape only for their special applications. To drive all of them, a mallet is preferred to a hammer, because it does not mar the chisel handle and make it rough to the hand for other purposes, though it is less effective, since wood of both tools "cushion" the blow.

To be continued.)