THE ARTISTIC PRACTICAL HANDICRAFT SERIES

JEWELLERY CRAFT

FREDERICK J. GLASS

UNIVERSITY OF LONDON PRESS Ltd

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THE ARTISTIC, PRACTICAL HANDICRAFT SERIES

FOR TEACHERS, STUDENTS, AND CRAFT-WORKERS.

F. J. GLASS.

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By

F. J. GLASS

HEAD MASTER OF THE SCHOOL OF ARTS AND CRAFTS, DONCASTER. AUTHOR OF "DESIGN AND COMPOSITION IN LINE, FORM, AND MASS," "THE INDUSTRIAL ARTS," "DRAWING, DESIGN AND CRAFT-WORK," ETC.

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PREFACE

EVERY normal person desires to make things. The creative instinct which is born in each one of us clamours for expression. In some no doubt the urge is more insistent than in others, perhaps because, having found a means of expression, the capacity for creation has not been allowed to atrophy. Most children love to make things, and should be encouraged to do so for many reasons. Craft lessons are of the greatest educational value, because they stimulate mental and motor activity simultaneously. It is generally admitted that when hand and brain are both employed much more is grasped and retained than when the brain alone is called upon to function. Furthermore, habits of industry are formed which are bound to be beneficial in the future. Children so trained are more likely to become useful and contented members of society in after-life than are those brought up with no craft instruction whatever. For if no other purpose is served, it provides them with useful and satisfying hobbies wherewith to occupy their leisure time. The tendency in commerce and industry is to shorten the hours of labour with a corresponding increase in the leisure hours. The

danger of this line is the fact that too few know what to do with their increased leisure. Often the creative faculties have become atrophied through neglect, and the adult is robbed of one of the greatest sources of happiness. We would advocate the teaching of craft work in every school, and would urge all those who desire to make things of use and beauty to seize any opportunity that may offer to gratify this desire. There is a keener appreciation of hand-made goods nowadays than there has been for many years. This is a natural reaction against the mechanically perfect, but soulless products of machinery. It would seem that the future holds brighter prospects for skilled craftsmen and also for craft teachers than at any time since machinery began its rule. There is certainly a revival of artistic handicrafts. Consequently a demand for instruction in the crafts has arisen, and it is to meet this demand that the present series of handbooks is being produced. They are intended to provide teachers and craft workers with concise practical instructions, and suggestions for the various crafts in a cheap, handy form.

FRED J. GLASS.

DONCASTER, 1928.

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JEWELLERY CRAFT

CHAPTER I

JEWELLERY AND FINE METAL CRAFT. CHARACTER OF JEWELLERY. WIRE UNITS. ANNEALING OR SOFTENING. WIRE DRAWING

Jewellery and Fine Metal Craft

MANY amateurs are reluctant to try their hands at jewellery, or work in the precious metals, because of the cost of the materials and the fear of spoiling such expensive goods. But there is no real ground for such fears, or for any reluctance, because no great quantity of metal is needed, while stones of great beauty can be purchased quite cheaply, in many cases for a few pence. Rubies, emeralds, and diamonds are certainly too costly for the average amateur to experiment with, but price is not necessarily a criterion of beauty. Many of the cheap stones are quite as beautiful as the costly ones if we could only disabuse our minds of the monetary standard. Opals are far more beautiful, to my mind, than diamonds or rubies, and they cost considerably less. Opal matrix, which has all the fire and colour of the pure stone, can be obtained at quite a reasonable price. Opal doublets, thin slices of opal mounted upon a black ground, can be bought for a few shillings.

Amethysts, mother-o'-pearl, tourmalines, turquoise matrix, lapis lazuli, bloodstones, cornelians, jargoons, moonstones, and quite a number of others, are comparatively cheap, while they are certainly charming enough to form a key-note, as it were, around which to build articles of jewellery. Silver does not cost very much; for five shillings or so we can purchase enough sheet and wire to make a number of brooches, pendants, rings, etc. Gold is more costly, and is better left alone until we have learned how to manipulate silver with some degree of skill and confidence. Then the risk of loss by spoiling becomes decidedly less, and we might venture upon gold, which is certainly not more difficult to solder or to work generally.

Cheaper Stones.

For the present we will confine our attention to silver, though if expense is a serious deterrent the beginner can practise upon copper, which is quite a beautiful metal, if we could rid our minds of the cash criterion, and works almost as easily as silver. The drawback is that few people are unconventional enough or independent enough to wear jewellery made of a metal so obviously cheap as copper. Pewter has been worn, but that is not vastly dissimilar to silver, might in fact be mistaken for it; brass, too, because it bears some resemblance to gold; but copper is copper, and unless plated with silver or gold can never masquerade as a more precious metal. Despite this, however, we might learn a good deal

by experimenting with copper before attempting the more costly metals. As previously stated we shall suggest silver for future work, though copper or gold may be substituted instead for many of the exercises.

Character of Jewellery

Jewellery should always be delicate and dainty, relying for its beauty more upon exquisite design and workmanship than upon costly materials. It should be a gem of craftsmanship, and not a mere aggregation of rare and costly stones and metals. I have seen diamonds set in platinum, and fashioned into rings, etc., and have been informed that the price was enormous, but the sight has left me as cold as the diamonds themselves. On the other hand, I have seen work in silver and cheap stones which has given me exquisite pleasure. The reason for this may be, of course, that I am a penurious craftsman instead of an opulent wealth-worshipper. Who that has seen some of the exquisite bronze work of the Celtic craftsmen could fail to respond to its beauty of workmanship? Mere rarity and costliness make no appeal, except to our cupidity; exquisite craftsmanship makes an irresistible one to the mind capable of appreciating, and there is no better way of learning to appreciate than by attempting such work for ourselves. Consequently I maintain that the workmanship, the loving expenditure of thought and labour, adds far more to the value of a jewel than will any

rare stone or costly metal. It is the evidence of human hand and brain which makes the real gem, and not the mere fact that it happens to be the "Great Mogul," the "Koh-i-noor" or the "Orloff." Bearing this in mind, we must endeavour to make our work as delicate, as dainty, in fact as exquisite, as we possibly can. Filagree is perhaps the lightest and most delicate type of work, as it is composed of fine wire bent and twisted and knit together into a compact though intricate design. The easiest avenue of approach to filagree is by way of wire units.

Wire Units

These are composed of short lengths of wire bent into various forms and ultimately combined into different patterns or designs. Perhaps the most suitable wire for the purpose is one of rectangular or oblong section, though square, round, half-round, and twisted can all be utilised to give interest and variety to the work.

Oblong Wire.

To commence with, we need some silver wire, silver solder, a draw-plate pierced with a series of gradually diminishing oblong holes, draw-tongs, some round- and square-nosed pliers (Fig. 1), borax, a jeweller's gas flame, a mouth blow-pipe, files, and a hammer. We can add to these for later exercises, but for the present they will suffice. Plate 2 shows some of the units with which we might begin, together with a few possible arrangements.

Materials.

We purchase our silver wire in the form of a stout round one, too thick for the present purpose, and also, of course, wrong in section. It is necessary to reduce it to the proper shape and thickness by pulling it through the draw-plate. It is better to buy a comparatively stout wire, as we may require it in that form occasionally, while it can always be pulled to a smaller size or different section as the need arises. Calipe Dettmers, of Poland Street, London, or C. Harrold, 2 and 3 St. Paul's Square, Birmingham, will supply sheet and wire in any thickness and quantity. An ounce of each is quite sufficient to commence with. Fine silver works better than standard, as it is purer, and having less alloy does not melt or burn so readily. If the wire is hard, it must be annealed.

Drawing Wire.

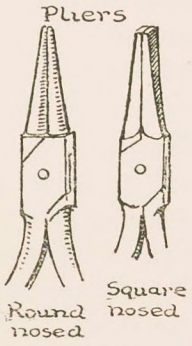


FIG. 1.

ANNEALING OR SOFTENING. WIRE DRAWING

The metal is annealed by bringing it to a red heat and either plunging into water or allowing it to cool. Either method is equally effective, though the water is the quicker. Now hammer or file one end of the wire so that it can be pushed through a hole in the draw-plate, sufficiently far to be gripped with the draw-tongs or pliers. Smear a little oil or grease over the wire to facilitate its passage through the

aperture. Grip the projecting end and pull steadily until the whole length has passed through. It will be lengthened considerably during this process, and also have lost its round section as it merges into the rectangular. Anneal it again, file or hammer the end, until it can be pushed through the next hole in the draw-plate. This time, after passing through, the wire will be much nearer the rectangle in section and after passing through one or two more it will be wholly rectangular. The wire continues to lengthen as the thickness diminishes, in fact it generally astonishes the beginner to see how much fine wire can be drawn from quite a short length of stout. As the wire gets finer, more care is needed during annealing, as it is quite easy to burn a portion, and spoil it. It should be coiled into a fairly compact ring before the flame is applied, and the heat should be steady and gentle, rather than spasmodic and fierce.

Units.

Pliers.

Now cut some lengths of wire and bend them into various shapes, as suggested on Plate 2. For most of these the round-nosed pliers are necessary, though a few must be shaped with the square ones. Before bending the wire, it is wise to mark its length upon a piece of paper, so that if satisfactory we may cut other similar lengths, whereas if too long or too short we may make the necessary adjustments. The units here suggested by no means exhaust the possibilities of wire and pliers. Others will occur to the worker

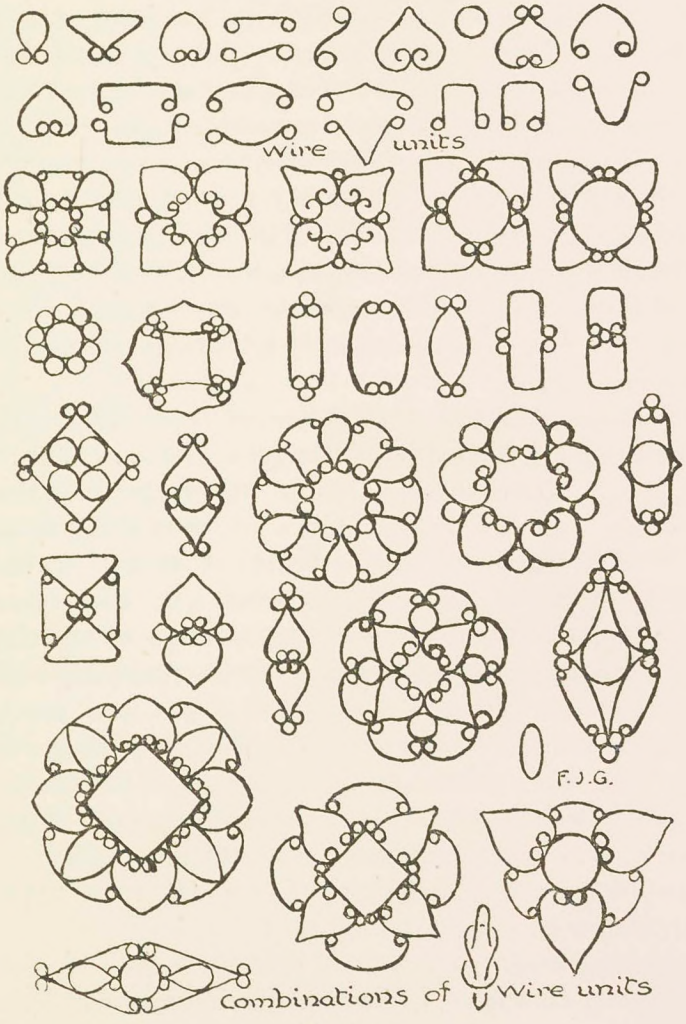


PLATE 2.

as he proceeds. The small ring or loop which terminates the wire in most cases, giving a rich finish to the end, is produced by clipping the end of the wire with the tip of the round-nosed pliers, and turning the pliers until the end of the wire comes into contact with a part higher up, having formed a complete circle. The spirals are coiled in a similar manner, though the end is not brought into contact as before.

It is fascinating work making these units, as we can keep on experimenting and discovering new shapes.

It is also educational in the truest sense, because it inculcates a knowledge of design as the outcome of a correct use of tools and materials. The work grows, as craftwork should do, from actual experiment with the media, instead of by way of paper and pencil, as too often happens. Not that we would condemn a thoughtful planning upon paper, provided it is combined with practical knowledge of the craft. But too much modern jewellery suggests that it has been designed by those who are totally ignorant of the limitations of tools and materials. Consequently its only claim to notice is its novelty, and novelty merely tickles our fancy for a moment or two, after which we demand something still more novel.

Inculcating Knowledge of Design.

Having made a number of units of various forms, repeating each unit, of course, so that we may have sufficient to work with, we arrive at a still more

interesting phase of the work, the arrangement and combination of these units into groups. The possibilities which lie in this direction are practically inexhaustible, and new arrangements will continually suggest themselves as we group and regroup the units we have made. For class work this is a very valuable exercise, as it teaches design in a fascinating and perfectly legitimate manner—by way of tools and materials. The interest is stimulated by the constantly varying shapes which result from the different combinations. It has all the fascination of a puzzle, while it evokes the creative instinct and encourages that love of producing things which is common to all normal beings, whether juvenile or adult.

Grouping Units.

For class work it is cheaper to use copper, as the aim is not so much to produce articles of jewellery as to develop hand and brain and to inculcate a love of craft work, together with a critical appreciation of good design and execution. The child is the potential purchaser of the future, and if we can develop the critical and the æsthetic faculties, we shall do much towards raising the standard of fine metal craft in the days to come. For, having developed a discriminating and thoughtful appreciation of jewellery, it is improbable that a generation so equipped will tolerate the pinchback and shoddy which so often masquerade under the guise of jewellery, and gold- and silver-smiths' work.

In the course of our experiments with the units we shall discover quite a number of combinations which, though we may not wish to solder together immediately, we may still desire to keep a record of, before we disarrange for further experiments. This may be done by laying a sheet of paper over the grouped units, and pressing with the finger-tips, until we have obtained a clear impression of the edges beneath. If the paper is damp, it will take an impression more easily. Care is needed, as the light wire is very apt to slip out of place.

Keeping Record of Groups.

It is time now to solder one of our groups together so that it may be rendered permanent. We might mention here that fine silver is preferable to standard because it is purer, and having little alloy is more safely soldered. Standard silver, especially in the form of fine wire, fuses almost as readily as the solder itself, and so needs the utmost care.

CHAPTER II

SOLDERING. SHEET METAL UNITS: RINGS OR LINKS

Soldering

THE units must be perfectly clean, and to ensure this they should be boiled in a solution of sulphuric or hydrochloric acid, 1 part acid to 6 or 8 of water, in a vessel of lead or copper. Here a note of warning. Always pour the acid into the water, and not the water into the acid, if you would avoid awkward consequences. Again, do not allow the "pickle," or dilute acid, to remain in a copper vessel, as it eats into the metal. Pour it into a bottle after it has cooled.

Acid.

Having cleaned the units and arranged them in the desired order upon a block of charcoal or a piece of asbestos, paint the joints with borax rubbed to a smooth paste upon a slab of slate or ground glass. Procure some silver solder, and scrape a portion of it bright and clean. Along the clean edge make a series of cuts $\frac{1}{8}$ inch or so apart. At right angles to these, and across them, cut again, so that a number of small snippets are separated from the sheet of solder. Lay the forefinger of the left hand (which holds the solder) along the edge when

Borax.

Solder.

Cutting Snippets of Solder.

cutting, or the pieces will fly in all directions. Perform this operation over the borax-slab, so that the paillons may fall into the paste. For the work in hand these paillons should be quite small, as a lump of solder is very unsightly in fine filagree work.

With the tip of the brush lift these small snippets from the borax and lay them carefully at the joints to be united. When each joint has been attended to, play the flame gently over the work until all the moisture has evaporated. During this process the borax will bubble and rise before settling into a thin protective film on the silver. It may be that some of the solder will become displaced by the action of the borax. Replace them and once more apply the flame.

Control of Flame.

Some practice is needed before the flame can be controlled with the mouth blowpipe. The burner is constructed so that the flame can be varied from one about 12 inches long down to a mere spark, either by turning the horizontal tube or the thumbscrew. The flame needed for our purpose is a comparatively small one.

Place the nozzle of the blowpipe upon the end of the burner, just behind the flame, and blow gently, moving the blowpipe until the flame is directed upon the work. The colour of the flame will change from its previous yellowish white to a blue tint. This denotes greater heat, because additional oxygen is being consumed. By blowing gently, a steady heat

is maintained quite sufficient for the purpose. It should be noted that the colour of the flame varies from an inner light blue cone to a darker blue outside. The hottest part is just beyond the tip of the inner light blue cone. A little experimenting in shifting the position of the blowpipe and varying the amount of wind will help us to appreciate the behaviour of the soldering flame. A gentle one is better and more easily maintained than a fierce one. Direct this flame on to the work, and move it about gradually in order to bring the whole to an uniform temperature.

Keep the flame off the solder as far as possible, and confine it to the wire units, because solder melts at a lower temperature than silver, and if the latter is too cold when the solder melts it will simply run into a ball, and ultimately burn instead of slipping into the joints. The secret of soldering is to heat the metal to the degree requisite to melt the solder, which will then flash and run over the parts protected by the film of borax. Immediately this happens, withdraw the flame, or some part will burn.

It may be that some of our joints have not soldered properly. If so, we dip our work into the acid, rinse it in clean water, and replace on the charcoal. Repaint the parts to be treated with borax, place solder where needed, and again apply the flame until the parts are united.

We have now learned something of wire work, or filagree, and of soldering.

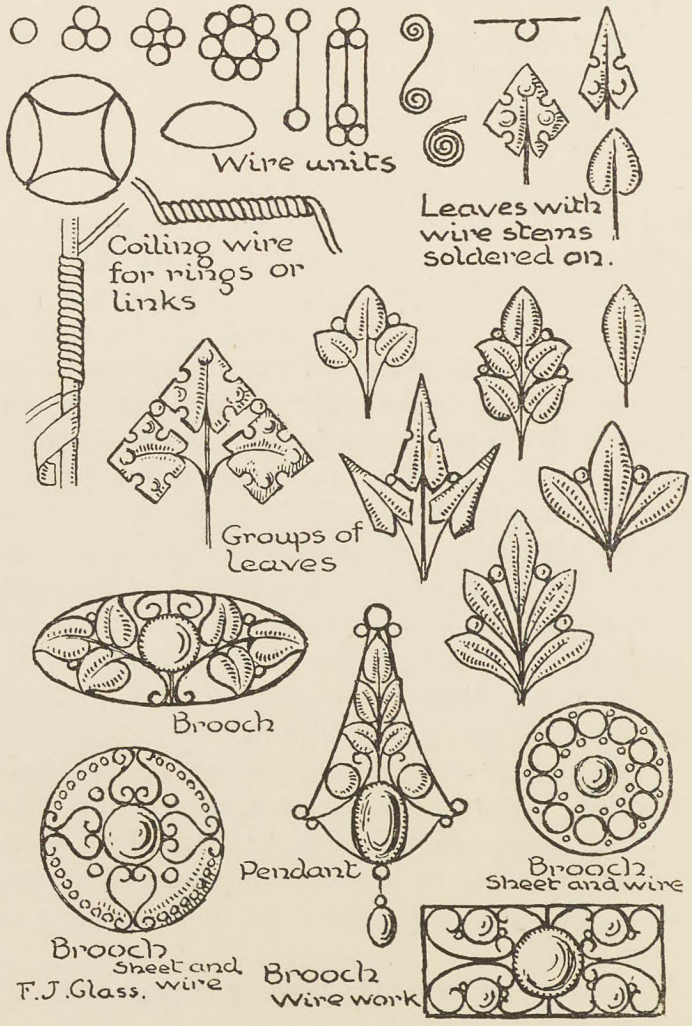

Wire units
Leaves with wire stems soldered on.
Coiling wire for rings or links
Groups of leaves
Brooch
Pendant
Brooch Sheet and wire
Brooch Sheet and wire F.J.Glass.
Brooch Wire work

PLATE 3.

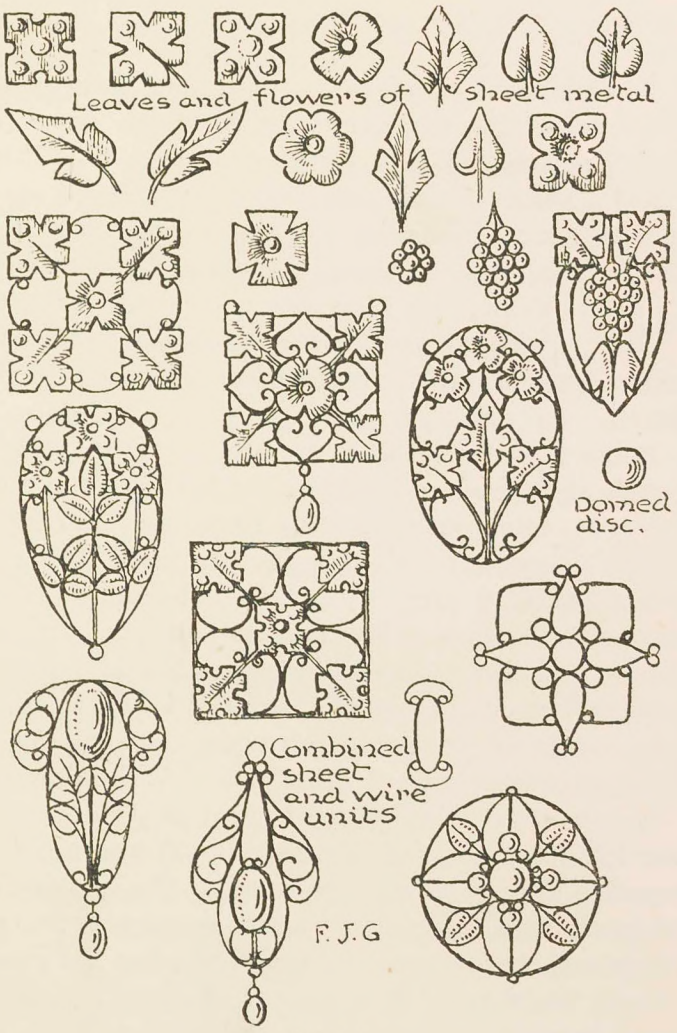

Leaves and flowers of sheet metal
Domed disc.
Combined sheet and wire units
F. J. G

PLATE 4.

Sheet-metal Units: Rings, or Links

A combination of units fashioned from sheet silver with the wire units enlarges the scope of the work and enhances its possibilities. On Plates 3 and 4 some of these units are shown, based upon squares, discs, triangular and leaf forms. We shall need a small pair of shears for cutting the metal to shape, also some fine needle files, together with others of triangular, square, and other sections which can be purchased quite cheaply by the dozen.

Files.

Some repoussé punches are also required. These can be made from rods of brass or steel, or even from large nails filed to shape and burnished smooth. Having cut our small shapes of metal and filed them to the desired forms, we lay them upon a sheet of lead and emboss them with the proper punches. Small discs of metal can be cut with hollow circular punches furnished with a cutting edge. The silver should rest upon a spare piece of brass or copper placed upon a bed of iron during this operation. The punch is held in position with the left hand and struck smartly with the repoussé hammer until it pierces the silver. The advisability of inserting a thickness of softer metal between the silver and the iron will be apparent when the punch pierces the silver. If it came into contact with the iron, it would become blunt and useless.

Punches.

These discs can be filed into conventional flower forms, and beaten into hollow cups with a round-headed punch. A small ball of silver soldered in the centre of the hollow adds much to the appearance. These balls are made from scraps of silver, painted with borax, and placed in a hollow scooped in the charcoal block. The flame is applied until the silver melts and gathers into a globular form.

Balls.

Rings, or Links

Rings are useful for many purposes, in fact they are constantly in demand for jewellery. The manner in which these are made is as follows. Procure a stout iron wire, or cylindrical rod of suitable diameter, and coil a strip of paper neatly and evenly around it. Now take some silver wire of the desired thickness and section, and wind it tightly over the paper (see Plate 3). When sufficient has been coiled around the paper-covered rod, play the flame over the whole until the paper has been burnt, enabling us to slide the coiled wire from the rod without difficulty.

Winding Wire.

Now with the tip of the shears or a fine saw cut in a straight line along one side of the cylinder of wire. This provides us with a number of separate loops, or rings, which can be used for numerous purposes. On Plate 3 is a circular brooch composed of a disc of silver around

Cutting Rings.

which is soldered a number of rings, while a stone or a boss occupies the centre, with some smaller bosses dotted between. At the top of the same plate may be seen a few groups of rings, showing how they can be combined.

Combination of Sheet and Wire

Having learned how to make units of wire and sheet metal, such as conventional leaf, flower, and other forms, we may carry our experiments in combination a stage further, by grouping both types together. The interest is considerably enhanced by the contrast between the varied surfaces of the sheet metal and the thin uniformity of the wire units.

Leaf Stems.

First of all let us complete our leaf forms by adding a midrib and stem of wire. Cut a length of fine round wire and file one end to a gradual taper. Lay this in the crevice which lies between the embossed portions on either side of the leaf, and solder in position. This gives us a leaf complete with stem, which may be combined with others to form groups, as illustrated on Plates 3 and 4. There are many possibilities here which can be exploited by student and craftsman, but we must pass on.

CHAPTER III

STONE-SETTING. REPOUSSÉ

Stone-setting

STONES are usually either faceted or "cabochon." Both have their characteristic charms, dependent to some extent upon the nature and quality of the stone, but generally the cabochon is preferable for hand-made jewellery. Furthermore, the stones so prepared are often cheaper than the others because the lapidary spends less time upon them. The cheaper stones are perhaps not considered worthy of his time and trouble, but often, for our purpose, the beauty of colour and texture more than compensates for his neglect. Stones of much beauty and interest can be purchased from A. S. Wainwright, of Warstone Lane, Birmingham, who will send a selection from which to choose. For a few shillings we can make a collection from which to select when the occasion arises.

Cabochon.

Having chosen our stone, we must decide upon the type of setting most suitable for it, and for the position it will ultimately occupy, either a box or an open setting.

Assuming that our stone is a semi-transparent one,

which looks better with the light shining through, we make an open setting. To determine the size of the band needed to enclose it, cut a strip of paper as near as we can estimate to the depth of the setting, and wind this

Open Setting.

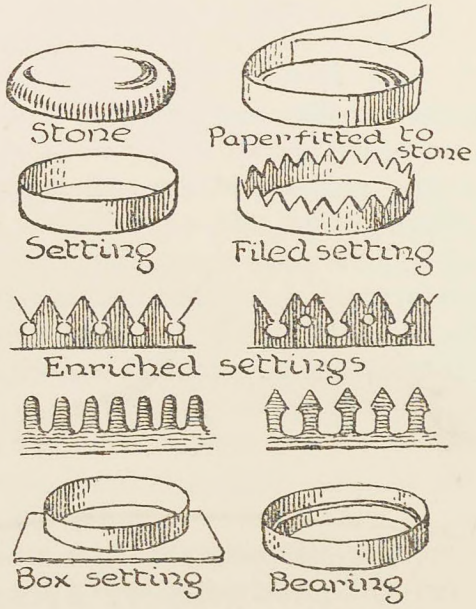


Fig. 5.

round the stone so that the ends overlap. Mark the position of the inner edge upon the overlapping portion, and cut the paper at this point. Fit around the stone again and be sure that the ends meet (Fig. 5). This is the length of the strip required, and also the width, if we have

Paper Pattern.

judged correctly. If not, we either add to or subtract from the depth of the paper, according to our needs. Cut a strip of silver to correspond with the paper, and file the ends straight and true. Anneal and bend to fit the stone. If correct, bring the edges into close contact, and solder. Shape the setting upon a triblet, or the shaft of a punch, or other suitable tool, by tapping gently with a small hammer until it is correct in form.

Bearing.

The next stage is to provide a support or bearing for the stone to rest upon. A narrow strip of silver or an oblong wire is cut to the proper length and fitted inside the setting (Fig. 5). Bend to shape, fit into place, and solder. First take the precaution of tying the outside of the setting with binding wire in order that it may not spring open when the heat required for melting the new solder is applied. It is better to turn the work top-downwards upon the charcoal and to place the snippets of solder in the joint on the underside so that it may rise upwards, without collecting upon the edge which is to support the stone.

Box-setting.

For a box-setting, the base of the ring which is to enclose the stone is filed level and placed upon a piece of sheet silver. Paint the joint with borax, and arrange the paillons of solder. Bring the flame to bear upon the whole work until the solder flashes into the joint. Trim off the edges and file true.

The next proceeding is to select suitable files, square, triangular, or rat's-tail, and to shape the claws, unless our setting is a close one, in which case the upper edge is filed thin to facilitate the bending and burnishing over the stone. Having made the setting, we have acquired a nucleus or centre around which to build up the design which may be composed of units of wire or sheet silver, or a combination of both.

Filing Claws.

Repoussé

In order to learn as much as possible about tools and materials, we will direct our attention to Plate 6, which shows some simple exercises in repoussé or embossing. For these exercises we cut some squares, circles, ellipses, or oblongs of silver. We then procure some punches the ends of which are shaped as indicated in the diagrams. These can be purchased, or, better still, filed from rods of steel or brass, or even large nails, and burnished smooth.

Making Punches.

When embossing it is necessary to work upon a firm but yielding bed, such as lead, soft wood, or stout linoleum. For elaborate work a "pitch bed," composed of pitch, resin, tallow, and brickdust or plaster of Paris, is best. (See Metal Craft in this series.) But for our present purpose one of the first mentioned will suffice.

"Pitch Bed."

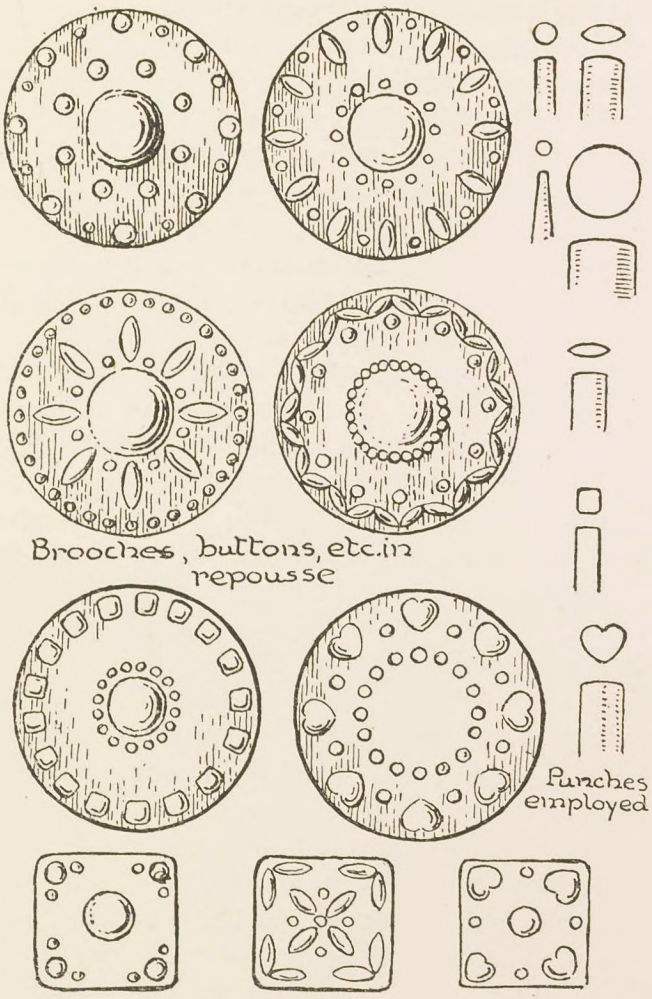


PLATE 6.

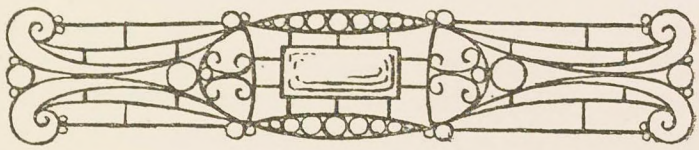
Set out carefully upon the reverse side the positions of the bosses. Hold the punch firmly in place with the left hand, while with the repoussé or chasing hammer held in the right we deal one or two smart taps for each separate boss. The metal must rest upon the lead, linoleum, or wood, which yields slightly to the force of the blow but is unaffected elsewhere. This serves to make the impression clear and sharp.

Having raised the desired bosses, filed and burnished the edge, we have completed our brooch, button, or whatever it may be save for the pin, or loop at the back. If, however, it is desired to dome the metal so that it acquires a richer, more interesting appearance, we employ the sandbag, and a doming mallet or a large boxwood doming punch, and a hammer. The silver is placed face downwards upon the sandbag and gently beaten to the requisite form.

Doming.

We may desire to add further enrichment by setting a stone in the centre. Choose a stone of proper size and shape, fashion a setting (as previously described), and solder it in the centre. Here we have a choice of methods. We may solder our setting upon the surface of the metal, or pierce a hole sufficiently large to receive it, and slip it into this hole before soldering. Place the setting in position, mark round its margin, and pierce with the fretsaw, keeping slightly inside the line, so that we may be able to file the edge clean and true afterwards. The solder

is placed on the underside and drawn by the heat of the flame through the joint. It is hardly necessary to say that the stone should not be in the setting during soldering. In fact for all work, the stone is the last thing to be fastened in position, as very few will stand the heat of the flame, and it is just as well not to subject them to it, even if they are supposed to be fire-proof. A twisted wire soldered round the setting serves to cover the joint and to add to the richness and beauty of the work.



CHAPTER IV

TWISTED WIRE. "RUSKIN STONES." CHAINS. RINGS. MAKING SILVER BALLS

Twisted Wire

TWISTED wire is valuable for many purposes. The most useful one is perhaps the double twist—two strands of wire wound about each other into a sort of slender cable. The wire must first be drawn through the draw-plate until it is sufficiently fine for our purpose. Coil it into a compact ring, and place it upon the charcoal block. Play the flame gently over it and bring it gradually to a red heat. This is to soften or anneal it. Allow to cool or plunge into cold water. Drive a nail into the bench, and bend the centre of the wire around the nail, pulling the two ends out straight so that they lie evenly side by side. Grip both ends with the draw-tongs or a pair of pliers, and twist, taking care to keep the wire taut all the time. By revolving the pliers the wires are twisted about each other. If the wires are kept taut, they will wind around each other much more neatly and correctly than if they are allowed to slacken.

Annealing.

The natural way to twist is from left to right, and so it is just as well to begin with this, though a right to left is also very useful. Keep on revolving the pliers or tongs until the wires are knit into a compact cable.

The longer we continue to twist, the tighter and more compressed will be the cable, but after a certain stage is reached it is always apt to break.

Having prepared the wire twist, cut a length sufficient to encircle the setting and solder the ends together. Slip the ring thus formed over the setting, paint the joint with borax, place some paillons of solder along the joint, and apply the flame until the solder flashes. Care should be exercised in estimating the amount of solder needed, as too much tends to clog the twisted wire, while too little, of course, makes for weakness.

Other Twists.

There are other varieties of twisted wire which are calculated to add interest to the work to which they are applied. A square wire may be twisted on itself. A plain round wire may be twisted together with a twist. Wires may also be plaited with charming results. Any of these twists or plaits may be hammered gently until they are flattened somewhat.

Flattening.

These are just a few of the possibilities which lie in twisted wires as decorative features. It is an excellent plan to spend a little time experimenting with various types of twist, endeavouring to evolve fresh ones, which may be kept for reference.

"Ruskin Stones"

Before leaving stone setting, we might consider those small plaques of earthenware coated with

different-coloured glazes which are known as "Ruskin stones." These are supplied in a charming variety of shapes and colours at a very moderate price, and may be used with considerable advantage in some forms of jewellery. They are larger than most precious stones and far less costly, consequently it is not so imperative that the maximum amount should be exhibited. In fact it seems to add to the charm if the "Ruskin stone" is "half concealed and half revealed." Plate 7 indicates how this may be done by designing simple pierced patterns, to lay over the stones serving a double purpose—to keep the stone in position, replacing the usual setting, and to break up its surface into smaller, more interesting shapes. Brooches, pendants, etc., may be fashioned in this manner without further adornment, the colour of stone and silver enhanced by this thoughtful breaking-up of the main shape into smaller ones, being quite sufficient.

A word of warning may be necessary here with regard to the fitting together of the work. Solder cannot be used while the earthenware is in place, or the heat will break it. The method usually adopted is as follows. First cut a piece of metal suitable for the back, similar to the stone in size and contour. This may be of German silver or other inexpensive metal. To this is soldered the pin and catch for a brooch, or the necessary links or rings for a pendant. Next cut a shape

Backing for Stone.

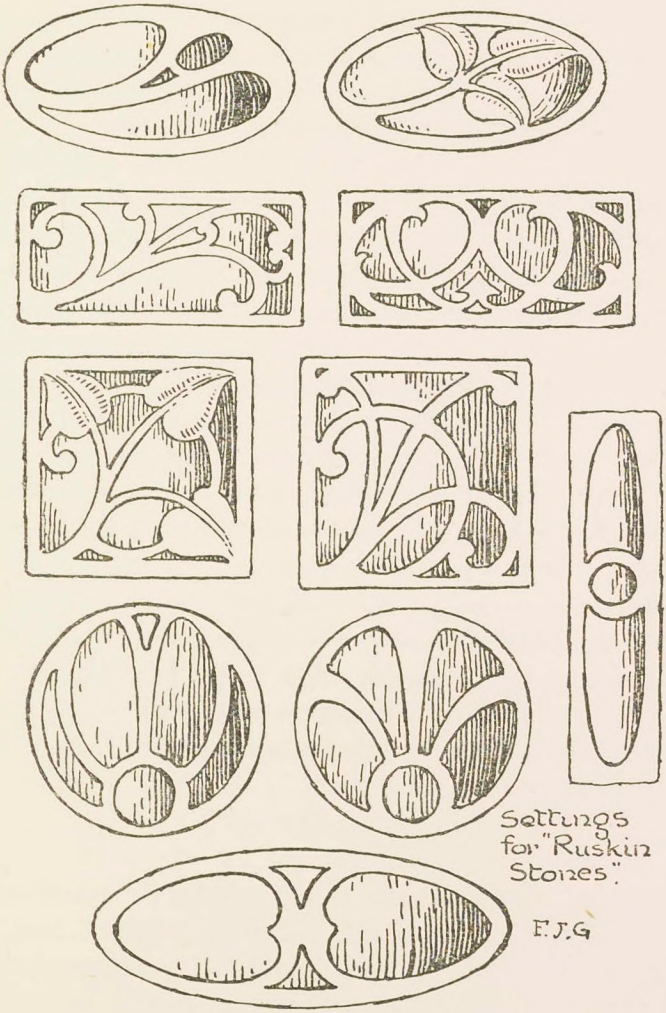


PLATE 7.

of silver, similar again but larger all round by $\frac{1}{4}$ or $\frac{3}{8}$ inch or so to allow for the thickness of the earthenware plaque, and for the margin which is turned over the back to hold the work together.

Now plan the shapes to be perforated and pierce with the fretsaw. Anneal the silver and by rubbing gently with the rounded end of a boxwood punch persuade it to adapt itself to the convex contour of the stone. It may need annealing a few times during this process, as it soon hardens. When the silver has assumed the shape of the stone, and lies in intimate contact with it, there must remain sufficient margin below to overlap the metal base. This is filed thin in order that it may bend readily, and lie neatly when burnished over. We might also true up any of the shapes which may need it with suitable files. Once more anneal the silver, lay the stone in position upon the back plate, adjust the silver, and burnish the thinned margin over the edge of the metal base. If the edge creases, or forms into ridges, a file will soon level it off, while a further application of the burnisher serves to smooth and finish.

Chains

Chains of considerable variety can be purchased from dealers which are decidedly useful, but it adds to the interest and also to the independence of the craftsman if he makes his own. Very fine chains are exceedingly tedious to make, and are really

not worth while when they can be bought so cheaply ; but even these can be made more charming by inserting a series of handmade links at studied intervals.

Plate 8 shows some combinations of the wire units previously dealt with, which are suitable for links. These are but a few of the many combinations possible, and are merely intended to indicate what can be done in this way. The student is strongly advised to experiment with the units available in order to discover some of the innumerable forms obtainable in this manner. Plates 2 and 3 contain further suggestions. Stones may be set in some of the links, and leaf, flower, and other forms fashioned from sheet silver can be introduced. Bracelets, pendant chains, necklaces, etc., may be built up in this manner.

Rings

Stones.

Rings require some degree of neatness and skill, as they should fit comfortably, and not be clumsy or heavy. Generally a stone is needed, because, except for wedding or signet rings, the plain metal is hardly rich enough or interesting enough in colour without. We have dealt with stone setting, so we need not detail this portion of the work. Choose a suitable stone, and place it in a proper setting, open or closed as the case may be. The next stage is the band which encircles the finger, which may be cut from a sheet of fairly stout gold or silver, or composed of wire as fancy dictates.

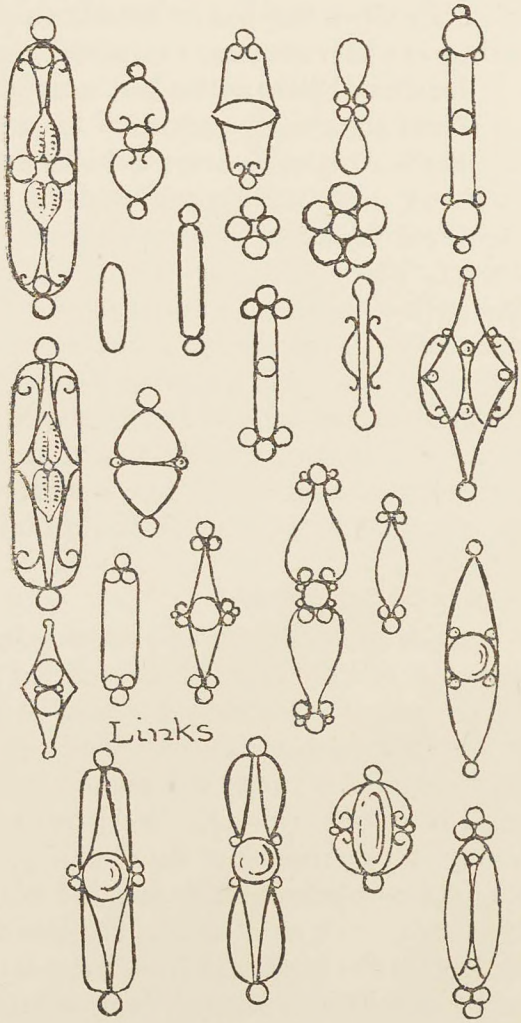


PLATE 8.

Fig. 9 shows some bands suitable for the purpose. A half-round wire, a square, and an oblong one or a strip of metal makes a suitable basis. These may be used singly or in combination. A half-round wire with a right- and left-hand twist, or a square wire soldered to each edge, an oblong with a half-round, or a right- and a left-hand twist fastened to the edges, are all suitable.

Bands.

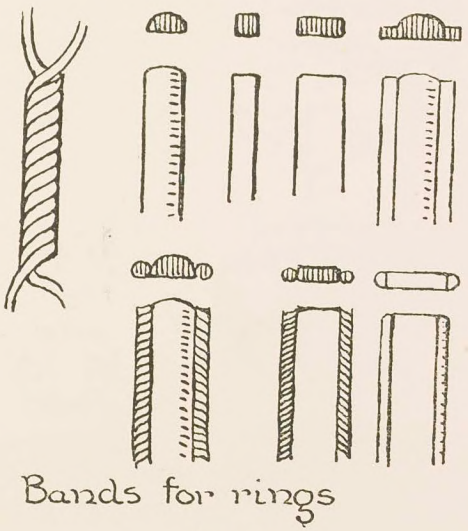


Fig. 9.

Having prepared our design and settled upon the form, we take up the setting and estimate its width, as this must be deducted from the length of the band which is to encircle the finger. It is a good plan to cut a strip of paper and wrap it round the finger for which the ring is intended, and mark off the correct length. Cut this to size, lay the setting at one end, and deduct its width.

Paper Pattern.

The next stage is to saw off a length of the prepared

band equal to that of the paper pattern. For a plain ring it is merely necessary to coil the band into a circle, and to solder the setting neatly between the two ends. See that the joints are neat and close. It will probably be necessary to file the surfaces in order to make them lie in close contact. A ring of twisted

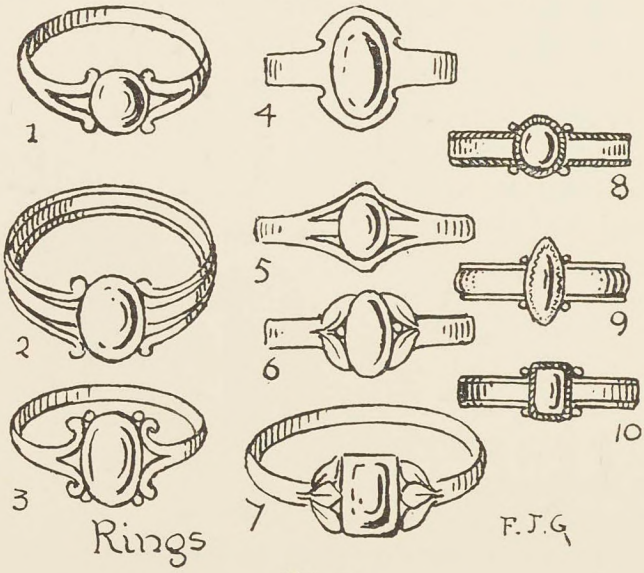


Fig. 10.

wire fitted over the setting will serve to cover the junction of band and setting, and also to enrich the ring.

For ring making, a triblet or slightly tapering rod of iron (an old cotton spindle serves quite well) is necessary upon which to correct the shape (Fig. 11).

Solder some small balls of silver between the band and the setting (Fig. 10).

Making Silver Balls

These little balls may be made from scrap silver, by cutting it into small portions, sufficient (as near as we can estimate) to form the desired globules. Hollow some slight depressions in the charcoal block, brush a little borax paste over the silver and apply the flame until the metal goes from red to white, and finally melts into a globule. It is somewhat difficult to cut scrap silver into portions which when melted will produce balls of uniform size. They will probably be found to vary considerably, however carefully we may estimate. By making a quantity, and selecting those of similar size, we may obtain a sufficient number for the purpose in hand, setting the rest aside for future work.

Fig. 11.

If, however, it is essential that we should have a number of balls uniform in size, the most expeditious way is to make a number of links, as previously described, and to melt them on the charcoal. All these links contain the same amount of metal, consequently when melted they produce balls of similar size. Having soldered

Links for Balls.

the balls in position, the ring is trued up on the triblet, cleaned, and polished.

Other forms of rings are illustrated in Fig. 10. No. 1 shows a plain band split at the ends, and the two pieces opened out into a sort of V-shape. The setting is placed between the four tips so obtained and soldered. In order to enrich these tips, they may be melted slightly until they assume a rounded form. Considerable care is required during this operation, as it is easy to burn the metal or to melt too much. Brush a little borax paste over the tip of the silver, and apply the flame, blowing gently, until the metal melts and gathers into a globular form. No. 2 is composed of three wires, the outer two being separated from the centre one as the stone is approached, and opened out so that the setting may be clasped between them. The ends are melted slightly to enrich them. No. 3 is similar to No. 1, except that the ends are opened wider. No. 4 is a shaped band of metal with the joint at the back instead of at either side of the setting. The setting itself may be soldered upon the surface of the silver band, or the band may be pierced for its reception. No. 5 is similar. No. 6 is a plain band with a couple of leaves soldered at either side of the setting. No. 7 has three leaves. Enough has been said to indicate how rings are made; other designs and arrangements will occur to the craftsman after one or two of the above have been constructed.

CHAPTER V

BUCKLES. BROOCHES. BROOCH PINS. PENDANTS

Buckles

PLATE 12 shows some buckles. No. 1 is composed of sheet silver, elliptical in form, set with a stone and enriched with a series of small bosses.

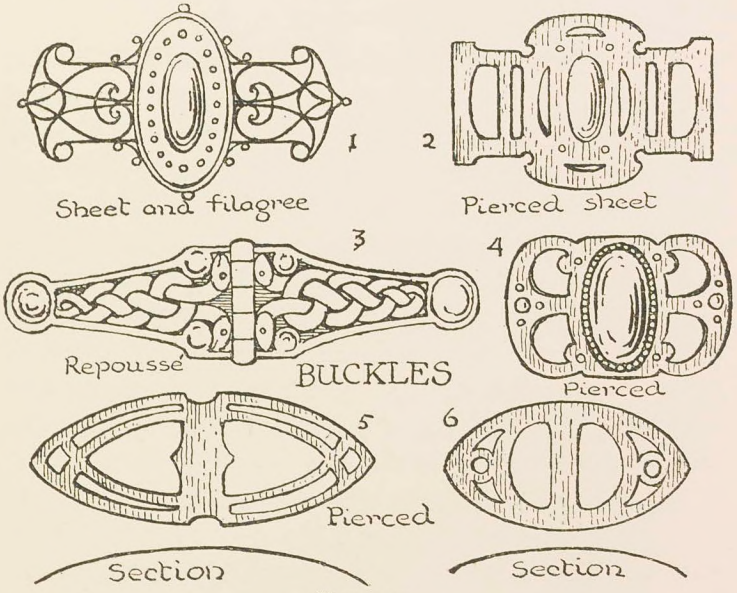


PLATE 12.

Outside is some filagree, fashioned of wire, rectangular or square in section. No. 2 is of pierced metal

with a stone set in the centre, also No. 4. No. 3 is embossed with a Celtic design of intertwined serpents which will need to be executed upon the pitch bed. The centre is hinged. The hinge is made by pulling a tube with the aid of the swage block and draw-plate, as described in METAL CRAFT, cutting it into convenient lengths, and soldering alternate pieces to either half of the buckle. Nos. 5 and 6 are pierced.

BROOCHES

Plate 13 shows a number of designs suitable for brooches. No. 1 is of sheet metal, gold or silver, set with a stone and enriched with wire units and little balls. No. 2 is similar. No. 3 is a bar of silver, or gold-hammered at the ends and filed to shape, with wire units added, and a stone in the centre. No. 4 is much the same. Nos. 5 and 6 are of sheet metal with wire units and balls soldered thereto, No. 6 being pierced. No. 7 is of sheet metal, pierced, with a central stone and a square wire along top and bottom edges for a part of the way, and also around the openings at the ends.

No. 8 is pierced sheet, with a stone, and wire units. No. 9 is composed of wire, and leaf and flower forms, with small balls between the leaves. No. 10 is similar, except that small domes of metal are soldered about the stone. No. 11 is composed of wire. No. 12 is wire, with flower forms. No. 13 is wire. No. 14

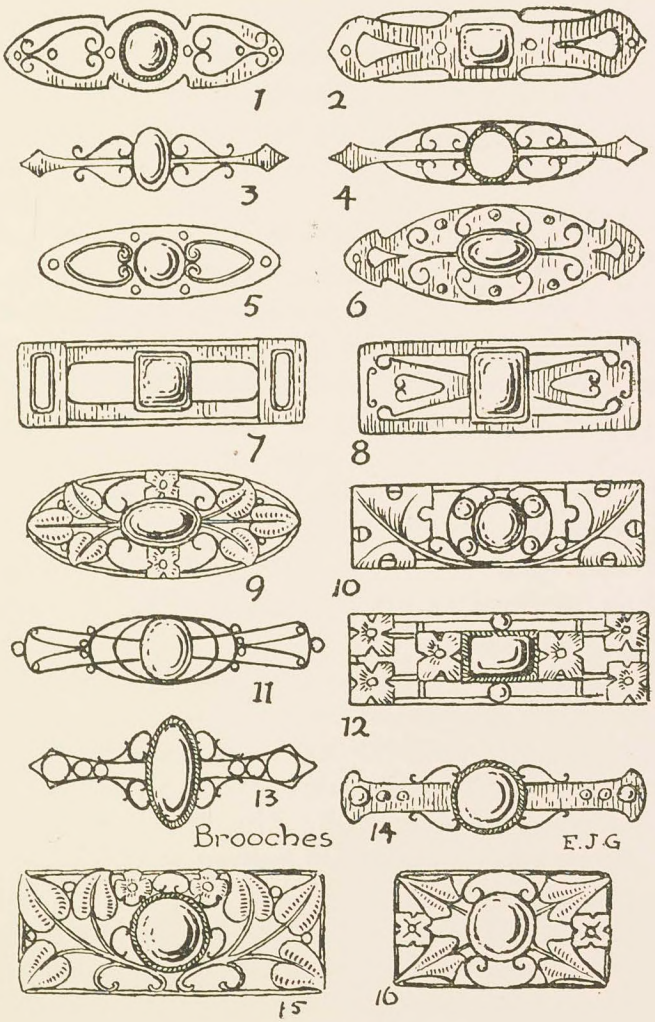


PLATE 13.

is a bar with bosses and wire units. Nos. 15 and 16 are of wire with leaf and flower forms. The make-up of these will be obvious enough after what has been written previously. The pin introduces a new problem.

Brooch Pins

These may be purchased ready for soldering in place if desired, but it is just as well that we should be independent, and make them for ourselves, if only that we should know exactly how. Take a length of wire for the pin. This may be of silver, German silver, brass, or other metal, provided it is suitable for, and harmonises with, the work in hand. Silver is somewhat soft after it has been soldered, because of the heat necessary, and unless hardened is apt to bend readily. A harder metal is perhaps preferable.

Metal for Pin.

Having procured the wire, we file it to a fine point at one end, and burnish it smooth. Now draw a fine tube, cut a small portion from it and solder this to the other end of the wire, after cutting it to the length needed for the pin. This will form part of the hinge joint. The other portion is made from a narrow strip of silver bent so that the two ends make right angles with the part between. This results in a sort of U shape, and the base of the form or the distance between the two uprights should coincide with the length of the tube on the pin (Fig. 14).

Across one of the open sides solder a small strip of silver to act as a sort of spring for the pin. Pierce the two upright pieces so that a wire may pass through both and also through the small tube on the pin, when it is placed in position between.

Spring.

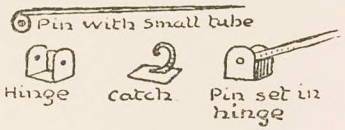
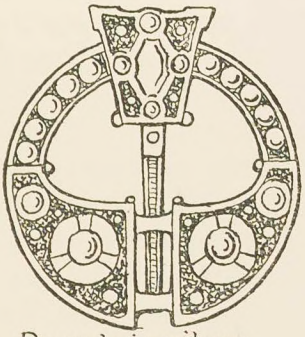


FIG. 14.

Next coil a piece of fairly stout wire into a loop to form the catch, and solder to a metal base (Fig. 14). Fasten these to the back of the brooch, hinge at one end, and catch at the other. Put the pin into place in the hinge and pass a short length of wire through the two sides and through the tube. Tap the ends of the wire until a head is formed which will keep it in place. It will be noticed that the small portion soldered to the front of the hinge comes into contact with the pin and serves to hold it tight against the catch.

Catch.

Riveting Ends of Wire.



Brooch in silver repousse', set with amethists, based on the Celtic.

FIG. 15.

The pin is now complete. It saves a deal of trouble to purchase this part ready made, as it is scarcely

worth while; but the craftsman should know how to do it, hence the above description.

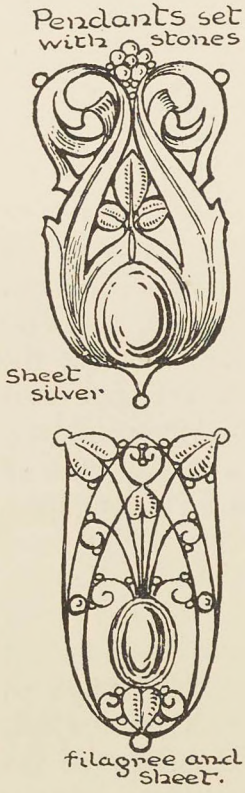


FIG. 16.

Fig. 15 is a brooch of Celtic design executed in repoussé and adorned with three amethysts or other suitable stones.

PENDANTS

Fig. 16 shows two pendants, one cut from sheet silver and set with a stone, while the other is of wire, with leaves, small balls, and a stone. For the lower one we select our stone and make a setting. We then shape the two oval forms of rectangular wire, taking care that they combine pleasantly when together. By adding the small heart-shaped unit at the top we might solder these together before proceeding. The next stage is to bend the other wires and to solder a leaf to the ends of those which run from the stone to the top corners and the small central one. Place in position together with the leaf at the bottom, and the setting; and solder all together. Finally, add the rings and the balls. It is advisable to solder as much

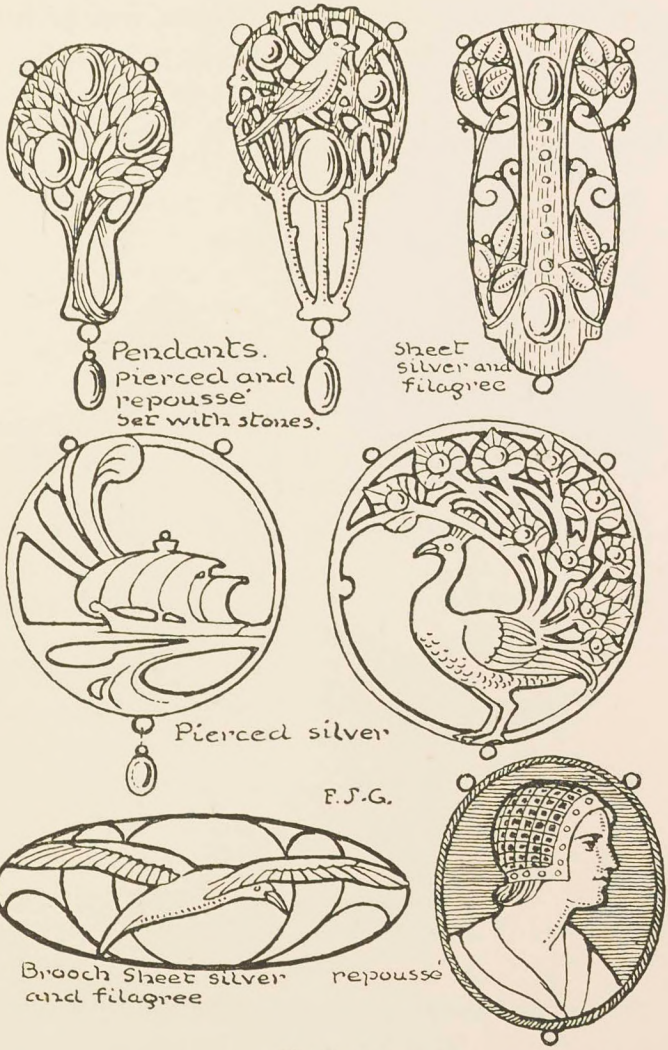

Pendants.
Pierced and
repousse'
set with stones.
Sheet
silver and
filagree
Pierced silver
F.S.G.
Brooch Sheet silver
and filagree
repousse'

PLATE 17.

as possible at once in order to avoid too frequent heating of the work, as solder is apt to burn and to eat into the metal.

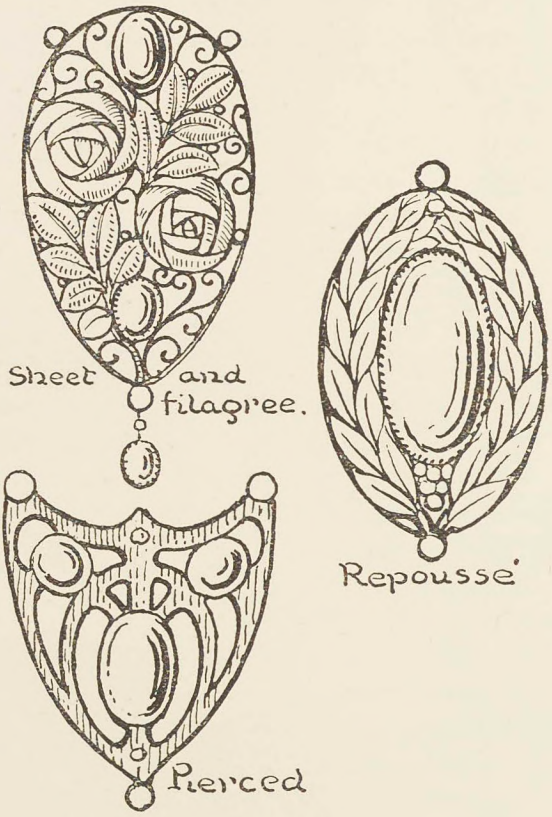


FIG. 18.

Plate 17 gives some further suggestions for brooches and pendants. The first one is in repoussé and is

worked upon the pitch bed with fine punches, and then pierced with the fretsaw. The next is similar, also the peacock and the boat. The head in profile will require very careful execution, as it depends entirely upon the drawing and modelling. The sea-bird is beaten first and then fitted to the framework of wire.

Fig. 18 gives three other suggestions. The top one is composed of roses and leaves, worked separately and soldered together, with scrolls of wire fitted into the spaces between. The wreath is beaten upon the pitch bed; the lowest one is pierced.

FIG. 19.

Scoop. Fig. 19 shows a scoop, the handle of which is composed of a piece of fairly stout sheet silver, cut as indicated in the diagram, after which

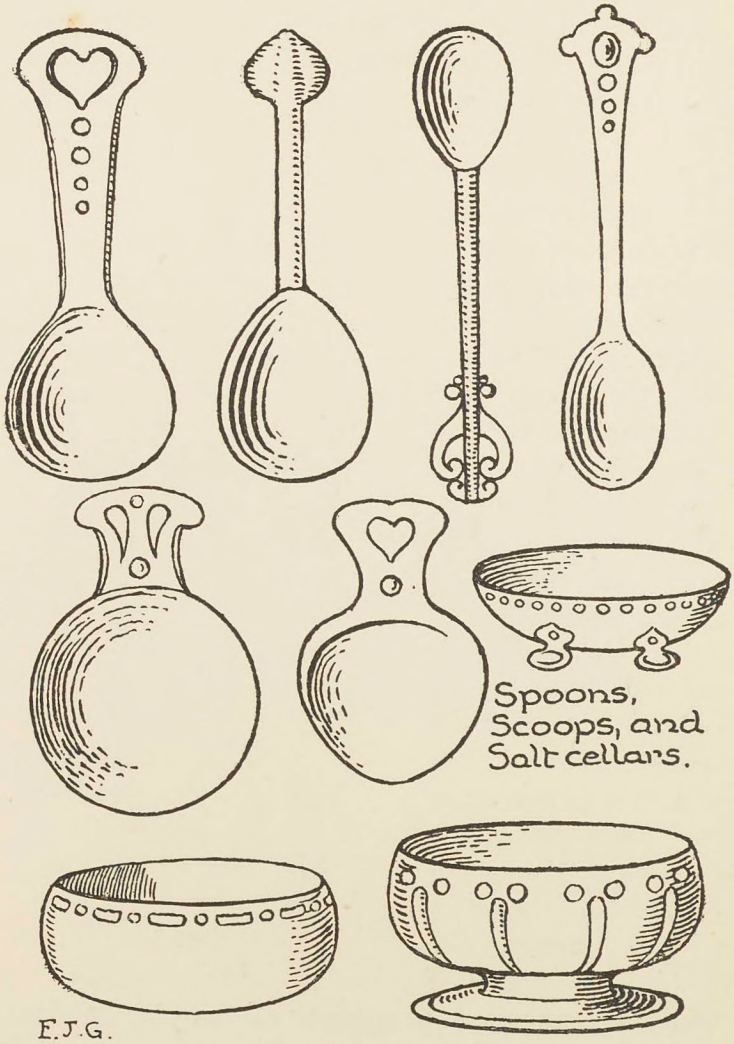


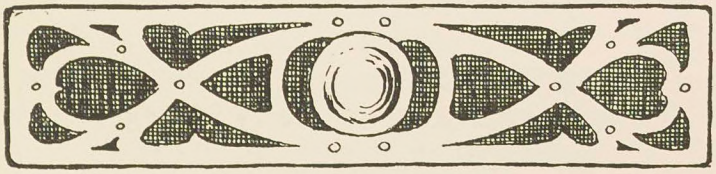
PLATE 20.

the strips are opened out and bent into scrolls, with little balls soldered into the joints. The bowl portion is hollowed out upon the sandbag, and planished upon a suitable stake. Special spoon stakes are sold for the purpose, but generally it is possible to find some suitable shape of steel or iron without purchasing a separate tool for each job we may have in hand.

Spoon Stakes.

Plate 20 gives some further suggestions. The first scoop may be cut in one piece, beaten into shape, embossed, and pierced, or the scoop and the handle made separately and soldered together. The handles of the next two are of stout wire, the first one annealed and spread by hammering until the end is wide enough to file into shape. The next one is filed to a tapering form. The salt-cellars are raised, as described in METAL CRAFT in this series. One of these has three little feet which are prepared separately and riveted or soldered to the bowl. The bosses are beaten from the inside, while the bowl rests upon the pitch bed. The right-hand bottom one has a domed disc for a base which is united with the bowl by a collar piece or ring.

Salt-cellars.



CHAPTER VI

PLAQUES. CASKET

Plaques

PLATE 21 shows some suggestions for plaque decoration, also Fig. 22. For each of these the method of procedure is similar. First plan the design on paper, taking care that the "repeat" will fit accurately round the plaque. To ensure this, it is better to strike some concentric circles to represent the size of the plaque and the width of the embossed border. Divide the border circles into the requisite number of equal parts, i.e. the number of repeats we require, and fit the unit of decoration into this space. Having prepared the design, we cut a disc of silver somewhat larger than the drawing to allow for the treatment of the edge, when the work is complete.

"Repeats."

Transfer the design to the metal by means of carbon paper and a hard point. Remove the drawing and go over the lines of the design with a sharp point in order that they may not be obliterated during subsequent operations. Now hollow the centre of the plaque by beating with the doming mallet upon the sandbag, and then hammering

Incising design.

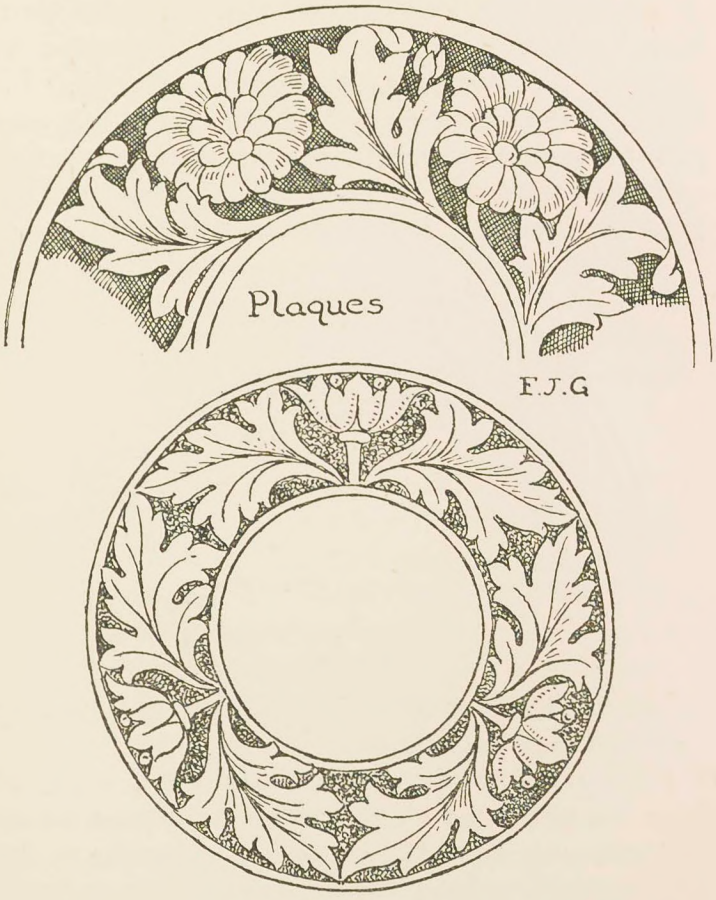


PLATE 21.

upon a block of wood in which a hollow has been carved. Finally, planish upon a suitable stake.

The next stage is "tracing" or incising the lines

of the design with a small chisel-shaped punch known as a "tracer." The metal must be embedded in the pitch for this purpose, and also for the repoussé work which follows. It may perhaps be more convenient to trace the design before hollowing the centre of the plaque, as it fits upon the pitch more easily. It is better to hollow the centre

Tracing.

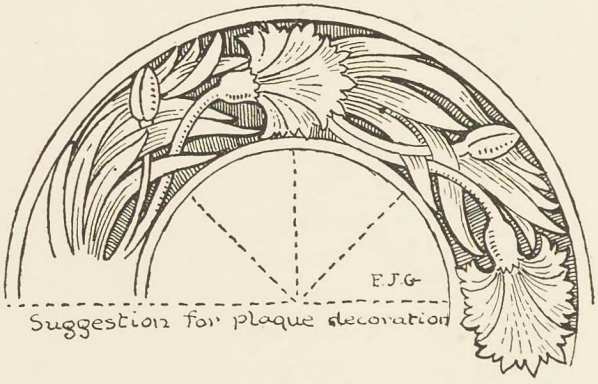


FIG. 22.

before modelling or embossing the pattern, or we may spoil it during the beating.

Having traced the design the work is removed from the pitch, and cleaned either by wiping, whilst hot, with a rag dipped in paraffin, or by heating to that degree which reduces the composition to ashes. It is now placed face downwards upon the pitch bed. The traced lines, which on the right side are incised, appear on this, the under side, as raised lines.

We now proceed to emboss the necessary parts

with suitable punches. This process has been described at some length in METAL CRAFT. Having finished the repoussé, we enrich the edge either by bending at right angles or by turning it round a wire so as to enclose it. The wired edge is very rich, and satisfactory.

Embossing.

Wired Edge.

Plate 23 shows some simple trays which need but little explanation. First plan on paper and transfer the pattern to a suitable piece of silver. Hollow the centre and pierce or emboss the design. Treat the edge either by hammering over a half-moon stake or by wiring. Clean and polish.

CASKET

Plate 24 is a suggestion for a small box or casket. The shapes of the metal required are shown. The box itself is set out in one piece, the sides being bent at right angles over the edge of a square stake until the edges of the metal are all in intimate contact, when they are soldered. Prior to this, however, we must apply any decoration which may have been decided upon, as the metal should be flat during this process.

Setting Out.

It will be noted in the pattern on Plate 24 that each side has an additional strip suggested by dotted lines. This strip may be bent at right angles and soldered to the inner margin of the side which comes into contact with it. The box is naturally stronger than it would be if the sides were soldered edge to edge.

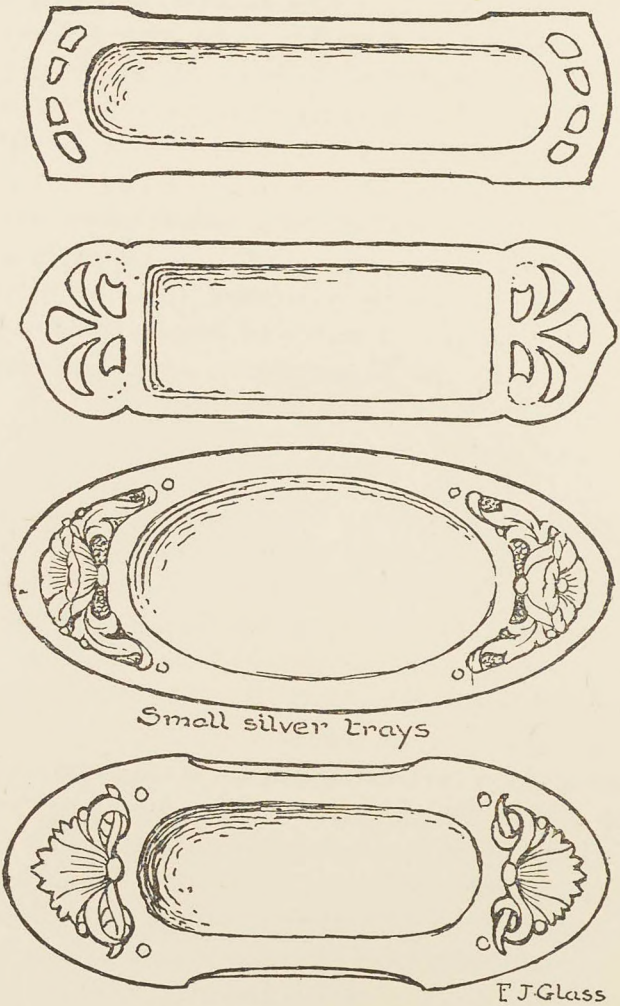


PLATE 23.

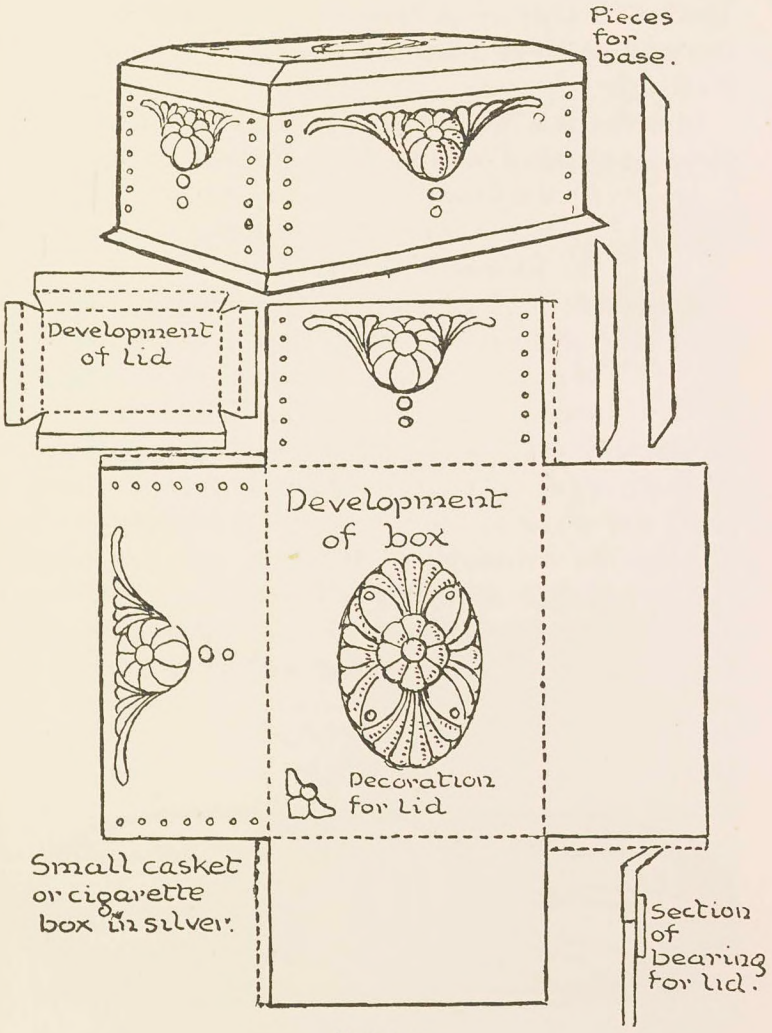

Pieces for base.
Development of lid
Development of box
Decoration for lid
Small casket or cigarette box in silver.
Section of bearing for lid.

PLATE 24.

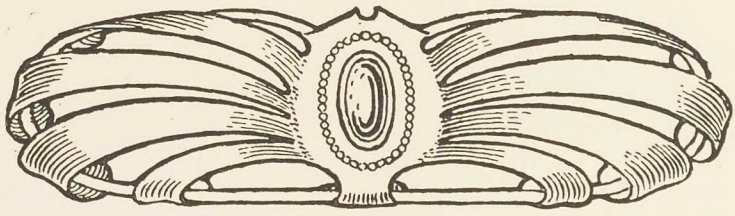
The base is finished by fastening some strips of silver arranged to slope from the box to the ground (see Plate 24).

Fitting Lid.

In order that the lid (which is also cut from one piece as suggested) may fit, strips of silver are soldered to the inside of the box, so as to project ½ inch or so above the sides, over which the lid may be fitted.

Hinge.

If desired, a hinge may be used instead. Pull a small tube and cut into short lengths, preferably an uneven number, as the pieces can be arranged symmetrically if uneven. The hinge must be carefully fixed or the lid will not open properly, or, being open, will refuse to shut. It must be remembered that some of the tubes will be soldered to the lid, and the remainder to the box, and that when soldered to their respective portions of the box they must lie in a straight line, so that a wire may pass through upon which the hinge will revolve.



CHAPTER VII

SUGAR-BASINS, CREAM-JUGS, TEAPOTS, NAPKIN RINGS, ETC.

Sugar-basins, Cream-jugs, Teapots

ON Plate 25 is a simple sugar-basin, "raised" from a disc of silver. First set out the form upon paper as a simple elevation, in order that the contour may be pleasing. We next discover the size of the disc, which when beaten up will result in the required form. Fig. 26 shows how this is done. The sides are flattened out, so to speak, until they lie in the same plane as the base. The line A B represents the diameter of the circle required for the bowl shown. The sugar-bowl on Plate 25 is set out in the same manner.

Setting Out.

Having cut the disc, we strike a circle for the base, and then, inside and out, inscribe a series of concentric circles to serve as guide lines during the raising process. If the metal is hard, anneal it. Now place it upon the sandbag, and with the doming mallet deal a series of uniform blows following the circles previously described, commencing at the inner one, and working gradually outwards until the edge is reached. Strike evenly and uniformly, revolving the metal with the left hand so that the

"Raising"

blows may fall side by side and not one upon another.

Having gone round once, it will be necessary to

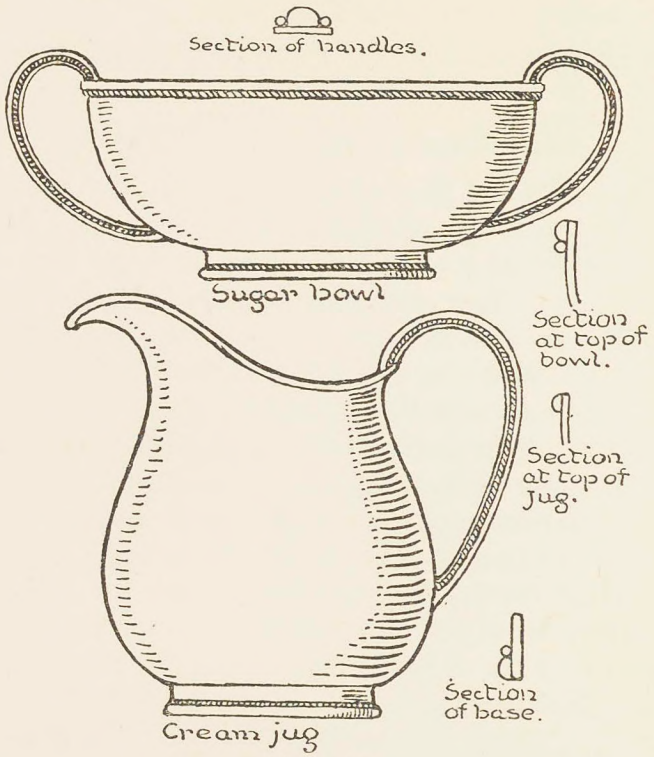


PLATE 25.

anneal the metal again and to deal a further series of blows. The next stage carries us to stakes and hammers. These are illustrated in METAL CRAFT, where the process is also dealt with. It seems hardly

necessary to repeat the instructions here. So we will proceed.

The handles are fashioned from half-round wire,

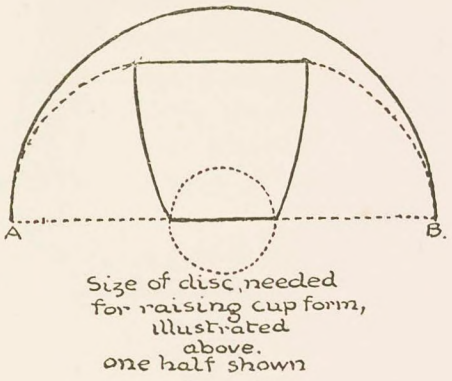


FIG. 26.

soldered to a strip of metal with a wire twist soldered on either side. The base is a collar of silver soldered in position with a half-round

Handles.

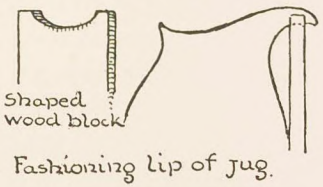


FIG. 27.

wire and a twist added. The cream-jug is similarly made, except for the lip, which is shaped after the form has been raised, and finished upon a block of wood carved as in Fig. 27.

Base.

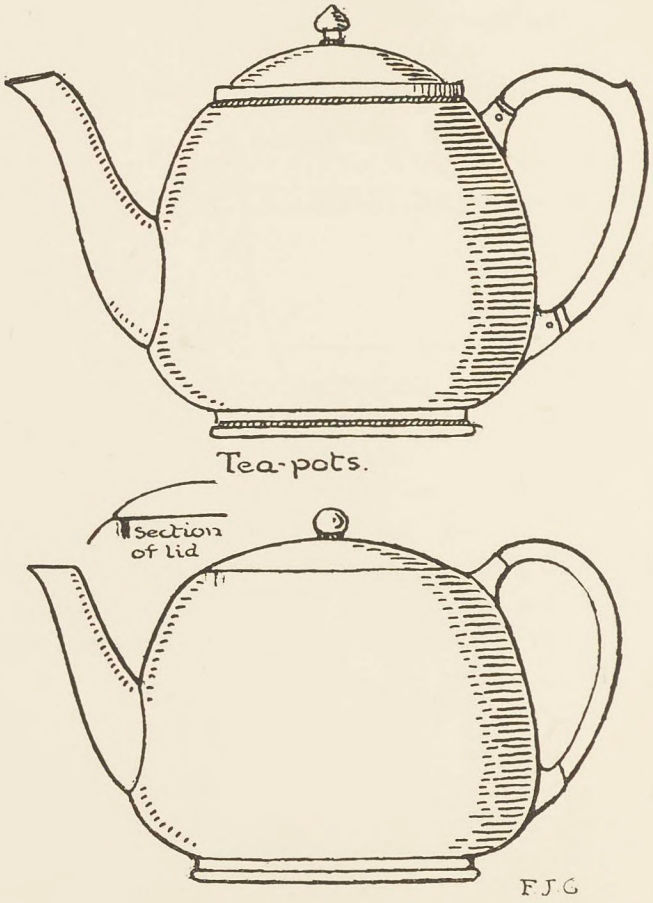


PLATE 28.

The teapots on Plate 28 present the same problems, with the addition of spout, lid, and handle. The spout is set out as a truncated cone (Fig. 29), preferably

with an interlocking joint as illustrated in Fig. 30. It is then hammered into shape, carefully adjusted, and soldered to the pot. Some provision must of course be made for the tea to flow from the bowl into the spout. The best plan is to bore a series of holes in the pot, inside the area to be covered by the spout. These will act as a strainer, and also serve to regulate the flow of liquid. The handle is made of ebony, ivory, or other suitable material, riveted into metal sockets soldered to the pot. Metal is not altogether satisfactory for handles, because it tends to conduct, and also to retain, heat. It may be used, however, if the handle is neatly enwrapped with split cane, raffia, or other suitable material. The lids are hammered into shape from discs, and fitted into position either with a flange to slip inside the top, or a hinge. The base is a collar, with wire added as enrichment. The knob may be solid, or beaten in two halves and soldered together.

Spout.

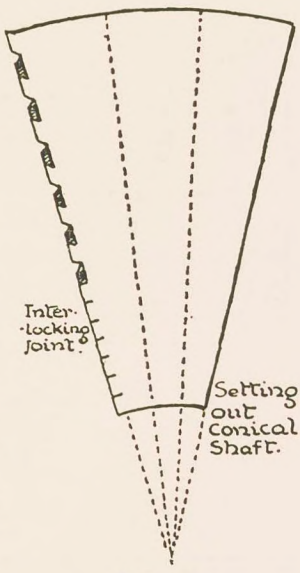


FIG. 29.

Lids.

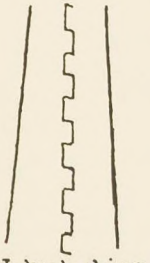
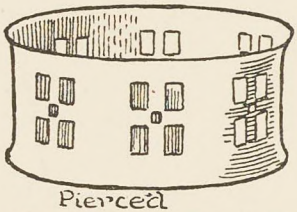
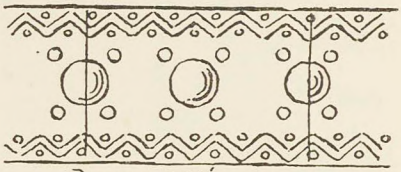
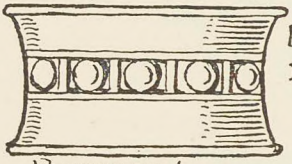


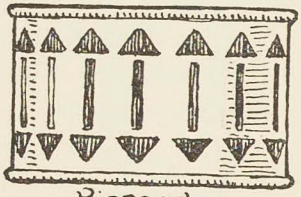
FIG. 30.

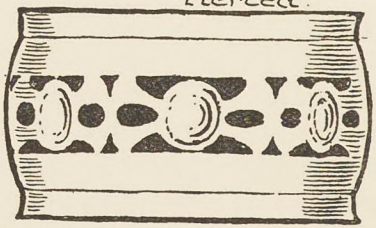


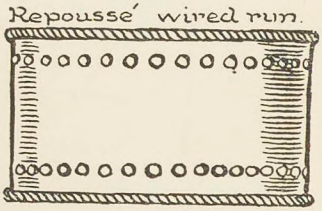




Napkin rings







F.J.Glass.

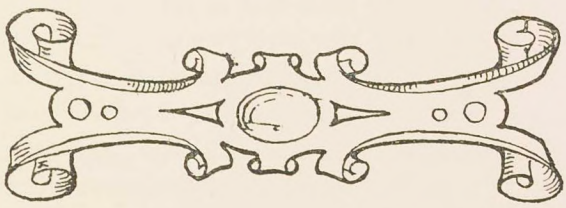
PLATE 31.

Napkin Rings

The napkin rings should occasion little, if any, difficulty at this stage. The illustrations on Plate 31 are almost self-explanatory. First draw the ring in elevation, and produce the lines on either side, until the length on both sides is equal to that of the centre. This means that the diameter of the ring is set out in a straight line three times in order to find the length needed for the desired ring. This is not absolutely accurate, as punctilious critics will probably point out, with the air of persons discovering a blunder, but as an infinitesimal shade of difference in the circumference of the ring will not matter much either way, it is near enough for our purpose.

Setting Out.

Piercing, repoussé, and other processes involved have been dealt with.



CHAPTER VIII

VASES, INTERLOCKING JOINTS, CUPS, CLEANING, POLISHING, ETC.

Vases, and Interlocking Joints

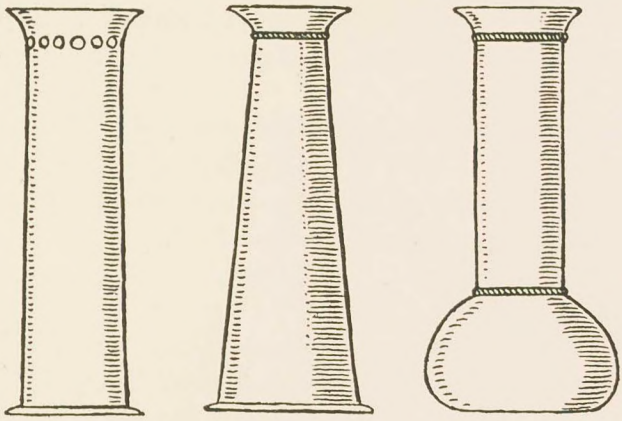
THE vases on Plate 32 are based on cylindrical and conical forms. Once more a drawing is made and the forms developed, either as in Fig. 29, if for a cone, or if for a cylinder as the ring on Plate 31. The interlocking joint is best here because some little treatment may be needed afterwards (Figs. 29 and 30). This joint is made by snipping one edge to a depth of $\frac{1}{4}$ inch or so, at regular intervals, until the whole length is divided up.

Take each piece between the cuts, and bend alternately up and down, so that an angle is formed between the bent pieces. File the opposite edge (which fits into the angle) until it is thin enough to slip well home. Place the two edges in position and hammer until the whole joint lies flat and even. Solder with hard solder, and with files and hammer make a smooth even surface. This is a strong joint, but has the disadvantage of being somewhat obvious. The butt or edge to edge is much neater, but correspondingly weaker. The lap, or overlapping joint,

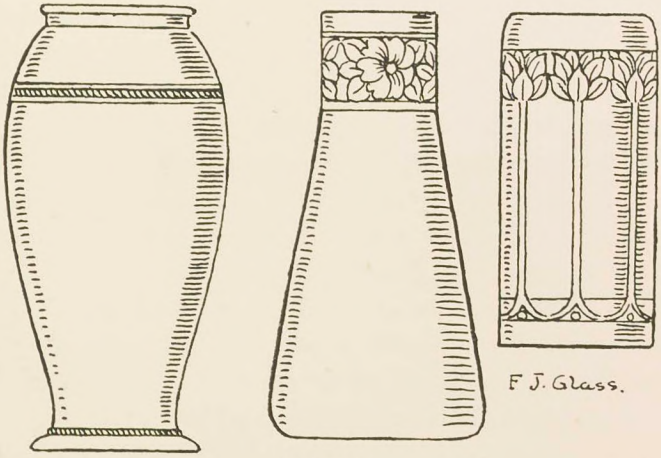
Treatment of Edge.

Butt Joint.

Lap Joint.



Simple vases.



F J. Glass.

PLATE 32.

is stronger and only a degree less neat. In fact it can be filed and finished until it vies with the butt. The

interlocking joint can also be smoothed to a great extent, but its ultimate appearance must be somewhat like Fig. 30.

The embossing is done before the edges are brought together. The wire is added afterwards. The bowl form at the base of the right-hand top vase is raised from a disc, as previously described.

Cups

Plate 33 illustrates three cup forms, which are set out as shown in Fig. 26 and then "raised" into shape. The knop and the shaft in No. 1 are both set out as truncated cones (Fig. 29), the knop being hammered into shape afterwards. If desired, it may be raised from the flat like the cup, but it is quicker to treat it as a cone. The base is domed, and pierced to receive the shaft, with a wire twist soldered on to make a neat joint.

Setting Out.

No. 2 is similar except that the shaft is made of four separate strips cut and beaten into shape and either soldered or riveted to cup and base. No. 3 has a cylindrical collar between cup and base. The handles on Nos. 1 and 3 may be fashioned from a stout half-round wire, or as previously suggested for the sugar-bowl and cream-jug on Plate 25.

Cleaning

We have mentioned before that an acid bath is very useful for cleaning the metal. A solution of

hydrochloric or sulphuric acid, 1 part acid to 6 or 8 of water kept in an earthenware vessel, will produce

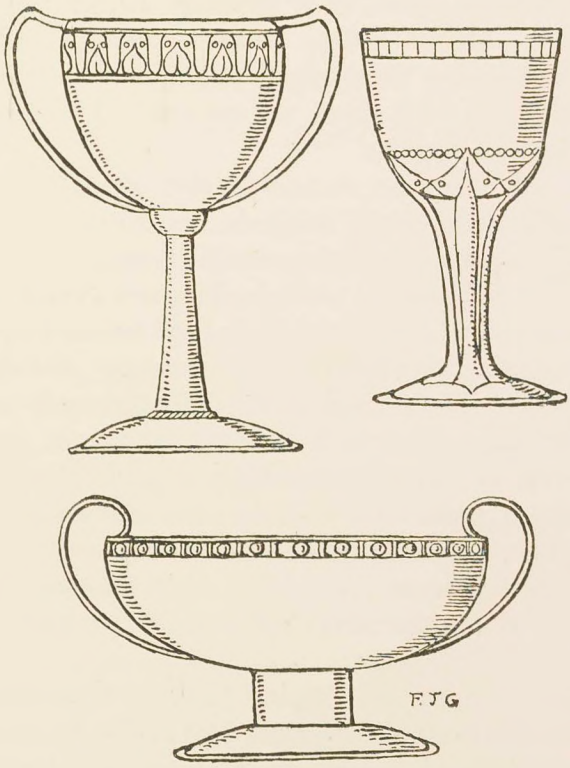


PLATE 33.

a beautiful white tint if the silver is plunged into it when hot. Or the work may be boiled in a copper vessel containing some of the solution. It is then polished with whiting, Sheffield lime, emery flour,

rouge, tripoli powder, or one of the many brands of metal polish upon the market. It does not matter much what is used, as it depends mainly upon the rubbing. Match sticks, threads, string, and soft rags, in addition to chamois leather, are all useful for polishing, as with them we are enabled to get into crevices and corners.

Colouring.

For colouring or darkening the silver, potassium sulphide, ammonium sulphide, or barium sulphide may be employed. Generally ammonium sulphide is used, as it gives an interesting range of colour. This is diluted and brushed over the work (preferably while the latter is warm), and directly the desired tint is obtained the ammonium is washed off with clean water. It is better to do this work in the open air, as it is decidedly odoriferous. If the prominent parts of the design are rubbed with the chamois or a soft rag, and a little whiting and water, the colour will be removed, giving an interesting contrast between the white silver and the deeper tone of the " oxidised " portions.

There is some overlapping between exercises dealt with in this book and those in METAL CRAFT, as might be expected when the subjects are so analogous. Hence some of the processes are treated rather briefly. If the reader fails to grasp these thoroughly, it may help him to refer to METAL CRAFT.

CHAPTER IX

HISTORIC NOTE

GOLD and silver have been used from time immemorial, not so much for utilitarian purposes as for purposes of adornment, quite useless from the strictly utilitarian standpoint, perhaps indeed sheer criminal waste. But from the artistic standpoint they are doubly useful and interesting, because they have served as media for the expression and gratification of the æsthetic instinct. The artist and craftsman have used them not so much because they wanted pots and vessels for cooking or holding food, but because they were obsessed with the idea of making something beautiful. Copper, bronze, brass, iron, lead, pewter (and nowadays aluminium), are all useful metals, and all comparatively cheap, and though quite capable of being used beautifully they are at any rate demonstrably capable of being employed usefully. In fact the evidence lies about us on every hand.

We need not discuss here the possibility of combining use and beauty, or speculate as to how far the one is dependent upon, or the actual outcome of, the other. We may merely state that beauty and fitness are inseparable, and so the chances are that a supremely

useful article stands an excellent chance of being beautiful as well.

As soon as man discovered the value and utility of metals, and how to manipulate them with the aid of fire, he began to employ those which we term precious. Gold was more largely used than silver, it is true, but both occur side by side with bronze amongst the relics from which we endeavour to glean some idea of the prehistoric peoples who were responsible for that phase of human development known as the " Bronze Age."

Subsequent to this period they have been used by practically every people in every period up to the present time. From the dawn of history we find them in Egypt, Phœnicia, Babylonia, Greece, Rome, Britain, China, Japan, India, and in fact in every country where the crafts have been practised. From the tombs of Egypt many objects of gold and silver have been excavated, some of them very beautifully executed, and often adorned with jewels and a sort of enamel or fused glass. The Greeks were also very skilful in the handling of precious metals. In the British Museum are many excellent examples of Greek and Roman work, such as fibulæ, bracelets, finger-rings, earrings, necklaces, studs, pins, etc. There are also articles of adornment fashioned from bronze. An example of these is a flat bronze pendant with a receptacle in the centre to contain amulets or charms. These pendants were known as bullæ and were of

Etruscan origin, but were adopted by the Romans. The Indians, the Chinese, and the Japanese have all produced fine though characteristic work in the precious metals, to which they have applied jewels and enamels with great skill.

In England we possess some wonderful examples of the goldsmith's craft. As far back as the Domesday Book we find mention of Otto the Goldsmith, while the Gloucester Candlestick in South Kensington Museum dates from 1110 or even earlier. By the end of the twelfth century the Goldsmiths' Guild was a very important factor in the civic and industrial life of the period. In 1393 the Goldsmiths were incorporated, and became the first of the City Companies under royal charter.

Unfortunately, the examples which have come down to us from the Middle Ages are comparatively few, but decidedly interesting and often very beautiful. During the Renaissance we know that practically every Italian craftsman practised the goldsmith's art. In fact they did most things. A painter was not only a producer of pictures, nor was a sculptor merely a carver of statues. Usually the painter carved as well, while the sculptor often painted, and both practised the goldsmith's and jeweller's craft. The best known name during the Italian Renaissance for metal work was Benvenuto Cellini, but his fame probably rests as much upon his *Memoirs* as upon the work which remains, and is attributed to him. He was not more

skilful than many of his contemporaries, less so in fact, but if we believed him, we should be of the opinion that Benvenuto was the best of them all. We might even gather the idea that no one had ever been quite like him ; possibly this is so, but not quite in the way he would have us believe.

From that period to the present day the goldsmith, the silversmith, and jeweller have been practising their crafts, and many interesting and beautiful examples await our inspection. Most of our museums possess examples which will amply repay the time we may spend in studying them. In fact the more we know about the work which has been done, the more likely we are to make real progress.