

production is enormous. In Wolverhampton alone, which is the chief seat of the manufacture, as many as 100,000 trays and waiters, will be turned out in a week, when trade is good. Most of these, however common, used to be painted by hand, with a celerity of execution that would put Wardour street to the blush. It was said that a "skilled artist" could with ease paint two gross of landscapes in a day. Most of this common decoration is now effected by the new method of transfer printing, for which probably porcelain decoration suggested the idea. The pattern or picture is printed by the lithographic process on fine tissue paper, which is laid face downward on the japanned plate, and adheres to the sticky varnish with which it has been treated. After a time the paper can be wiped off but the colours remain and are afterwards fixed by stoving. A new decorated tin has come into the market printed in the sheet, it is laid, directly on the metal, with such permanency as enables it to be made up afterwards into canisters and other articles without injury, and this has very much cheapened the production of those articles. Generally speaking a much better taste prevails now than formerly, and the monstrosities that so delighted our forefathers are rapidly disappearing. "Abraham in red, sacrificing Isaac in blue, on a green altar with a black ground," is no longer the highest ideal of tea-tray art.—From "*Great Industries of Great Britain*".

PEARL INLAYING ON IRON.

The method by which pearl inlays are made upon enamelled or japanned cast or sheet iron is very simple, and at the same time the results obtained are very striking.

Cast and sheet iron and *papier maché* are the materials upon which pearl is generally inlaid. If the article be of cast iron, it is well cleaned from the sand which usually adheres to the casting, and is blackened with a coat of varnish and lampblack. When this is thoroughly dried, a coat of japan or black varnish is spread evenly upon it. Before the varnish becomes too dry, pieces of pearl cut in the form of leaves, roses or such flowers as the fancy of the artist may dictate, or the character of the article may require, are laid upon the varnish and pressed down with the finger, and they immediately adhere to the varnished surface. The sheets of pearl may be obtained so thin as to be more like paper than anything else. After the pieces are in place the work is put into a heated oven and kept there for several hours, or until the varnish is perfectly dried. It is then taken from the oven and another coat of varnish applied indiscriminately on the surface of the pearl and the previous coating, and again placed in the oven till dry. This process is repeated several times, until the thickness of the varnish is such that top of the pearl is level with the body of the varnish, which is then scraped off the pearl with a knife, and the surface of pearl and the varnish around it are found to be quite even. The pearl is then rubbed with a piece of pumice-stone and water, and the surface of the varnish is rubbed smooth with powdered pumice-stone, moistened with water.

It is in this unfinished state that the pearl has the appearance of being inlaid, and from which it derives its name. It is, in fact, inlaid in the varnished surface, to which it adheres with surprising firmness. Its final beauty and finish depend altogether on the skill of the artist under whose hands the shapeless and almost unmeaning pieces of pearl are made to assume the form of beautiful flowers, leaves, &c. The artist traces the stems and leaves of the flowers with a camel's hair pencil dipped in a size made of varnish and turpentine; upon this he lays gold leaf, which adheres where there is size, and the superfluous gold is carefully brushed off with a piece of silk. The flowers and leaves are then painted in colors, and when dry the picture and surface of the article are covered with a coat of refined white varnish. One point should be observed, which is too frequently forgotten by those who paint upon pearl in this country, and that is to use only transparent colors when painting on the pearl itself. This is the secret of the great brilliancy obtained in most of the European work upon pearl.

The kinds of pearl used are three—mother-of-pearl, in the pearl oyster, or white pearl, as it is called by the artist, and it is known by its clear white surface; aurora shell, which can readily be told by its wrinkled appearance and its various prismatic colors, and is made from the shell of the genus of *Mollusca* known as the sear-ear or ear shell, and known to the conchologist as *Haliotis*; the green snail shell, which can be told by its glistening colors of light and dark green, or soft yellow and bright and beautiful pink, blended together.

To manufacture the pearl ready for inlaying, the workman cuts the rough shells in pieces with saws, and then grinds the pieces

upon both sides upon a common grindstone until they are of the requisite thinness. Out of these pieces the artist cuts the forms of leaves, flowers, &c., with a pair of common scissors preparatory to placing them in the varnished surface. The necessary forms may be cut from the thin pieces of pearl by means of a punch and dies, with power applied by the foot of the operator. When a number of pieces are required of the same size, the pieces may be fastened together with glue as one solid plate, and then the required form marked upon the outside one; then these being held in a vise, the form can be carefully sawed out with a fine saw. By placing the cemented pieces in warm water, the glue softens, and the shells are easily separated and the glue washed off. The artist is no longer under the necessity of preparing the shells for himself, as they can be obtained all ready for use at almost any artist's material store in the country.

The art of inlaying is not confined to the representation of flowers alone; landscapes, with houses, castles, trees, churches and bridges are very easily made, and when represented as being seen by moonlight are very beautiful. The rising moon can be represented surrounded by clouds of gold and silver bronze, and when pieces of pearl are placed in certain positions to reflect their colors, the moonbeams are represented as glancing over the landscape in alternate light and shadow.

A varnished surface can be ornamented by transferring drawings or engravings to it, and the process is quite simple. A thin coat of copal varnish is spread upon the surface of the article, and when nearly dry the engraving is applied with its face downward and carefully pressed to exclude all air bubbles. When the varnish is sufficiently dry, the paper is thoroughly moistened with a sponge dipped in warm water, and the paper can be rubbed off, leaving all the lines of the print upon the varnished surface. We have sometimes seen an engraving very successfully transferred bodily, paper and all, to a varnished surface. The paper seemed to be inlaid in the varnish somewhat as the pearl is in the process just described. Its appearance was of course much better than that from engraving laid upon the varnish while soft and then varnished over in the usual way. It should be noted that if the paper is to be mounted under the varnish it should be sized to permit the "striking through."

ON THE SO-CALLED "CRY STALLIZATION OF CANADA BALSAM" AND HOW TO MAKE ORNAMENTAL PICTURE FRAMES.

To the Editor of the Scientific American:

In your last issue you publish an article by Mr. Geo. M. Hopkins, who, writing on the above in answer to a statement made by Professor Barker, holds that he does not "think that the beautiful arborescent forms are anything more than cohesion figures," in which he is right. Some years ago, when I was employed in a picture frame factory, one of the mechanics, a Mr. Jackson, who was working there with me, said he knew a German who used to make picture frames from glass, the process of which he tried to keep a secret, but which was captured from him by Mr. Jackson; and as I think it might be of some amusement and practical utility to some of your numerous readers if you publish the same, I will give you the process:

After having agreed upon the length and width of the frame, get four strips of glass, and after having cleaned them take one of these strips and pour some pure asphaltum, which has been dissolved in turpentine by heat, on the entire length of the strip; and if now you take another of the strips and lay it on the asphaltum, and then press the two strips together with your fingers, you can produce as many "ferns and cacti" as you please by holding the strips between you and the light. After having produced some of these "ferns and cacti," which you wish to retain, apply a knife between one of the ends of the strips and gently pull them apart and lay them aside, so that they may become hard or dry; now proceed with the remaining two strips in the same manner as described, care being taken to match the "ferns or cacti" as near as possible to the one on the two first strips. After having become hard or dry, apply any colour or colours that you may fancy on the asphaltum, and let this also dry; then apply some thin composition smoothly with a knife over the coloured parts of the strips, this composition being the same that they employ for ornaments for pictures frames, etc. When this has also become hard, cut the ends of the strips with a diamond to the proper angle and length, and glue them on four strips of wood which are also of the proper angle and length, and nail them together; the sides of this frame may then be encased with gold or other mouldings.

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