HOW TO PREPARE PHOTOGRAPHIC BACKGROUNDS.

THE following practical directions for making photographic backgrounds are translated from the paper by Hans Hartmann by the *British Journal of Photography*. The best foundation for a background is a stretcher such as a painter uses for stretching his canvas. It must have cross-pieces at the corners, and the wood should be strong enough not to warp, as it is liable to do when the paper is stretched upon it. For a stretcher eight feet square the framework should be from three and a-half to four inches wide, and from three-quarters of an inch to an inch in thickness. If the frame can be suspended by an iron roller from a groove it may be moved easily. An arrangement by which the frame can be inclined as desired either towards or away from the light is very advantageous, as it allows of the same background producing either a light or a dark effect as is most suited to the costume of the sitter. The background may also be darkened at pleasure by furniture, curtains, or screens, by methods often described in these pages, and which cannot be too strongly commended.

Paper and linen, fine or coarse (shirting, twill, &c.), are the stuffs upon which one can paint best. Shirting is generally sent into the market with a good deal of gloss and dressing. Fasten it then upon the frame by nails only half driven in, and, having carried the first coat of paint (for which directions will be given later) over it, observe carefully whether it shrinks together. If, as is frequently the case with shirting that has been hot-pressed, it do not shrink enough, take out some of the nails, especially those at the corners, and stretch the stuff back before it gets dry. Twill is better in this respect, and on account of its roughness it is easier to paint upon it; but, on the other hand, it is heavier. If it be intended to stretch paper—say wall-paper—upon the linen foundation it is as well not to paste the latter to the edges, but, if possible, an inch or so back. This, to some extent, prevents warping. One can make excellent backgrounds for oneself by pasting upon the foundation a paper with a tasteful pattern not too harsh in colouring, and about knee-high another paper having a brown tone, and filling up the space between the wall-paper and the simulated panel with a moulding. The latter can be made more natural-looking if small semicircular sticks be stuck on so as to form squares or rectangles; and, if it be thought desirable, the ground inclosed may be filled up with painted ornaments.

I now come to the colours which are easiest to use, and which are so constituted that one can trust to their appearance to the eye without afterwards finding that one has been deceived, and that their photographed effect is really something quite different.

For size colour chalk, ochre, umber, and Cassel brown are most suitable. The chalk, ochre, and umber must all be steeped in cold water before being mixed with the size, and the last (umber) must be left somewhat longer on account of its tendency to swell. Cassel brown is sold, rubbed down in water, and is kept in a pot under water. It it be allowed to dry it becomes as hard as stone, insoluble in water, and perfectly useless; but, as mixed with chalk it gives a most beautiful warm grey tint, I use it willingly, notwithstanding. When mixed with chalk and size it may be easily and equally put on. If one wish to change the tone the ground tone can be modified by English red, chrome green, or any blue.

As a binding medium for the colour take a lukewarm 10 per cent. solution of size in water, or a strong freshly-made starch paste. The quantity of size required cannot be specified exactly, but must—and therein lies the difficulty, a difficulty which hinders many from using size colours—be determined by experiment, because the quantity of size required varies according to the under-ground. Take a thin solution of size and mix it well (preferably in a mortar with a porcelain pestle) with the colour previously stirred into water, and make a trial upon the same piece of stuff and with the same brush as you intend to use afterwards. Paint upon three places near each other—on the first somewhat thickly; on the second with natural even strokes; and on the third with colour somewhat dry. If there be too little size the colour will come off after drying if the hand be drawn across it. If there be too much it will be streaky; more raw colour and water should be added, and then the strength must be tested again. If the mixture be right the surface will be equal. The degree of thickness is easily found by experience, and the addition of water is not likely to do much harm, especially if it be tepid.

Now paint away with regular strokes, taking care not to stop at half-dry places, or the result will certainly be streaky. If it be found, on trial, that the colour sinks too much into the stuff—as is always the case with strong linen—then, before painting, a ground layer of chalk and strong size water, which must be sifted before use, should be passed over it if a perfectly clean surface be desired. This substratum must become thoroughly dry. If it have a great deal of size it will be hard and smooth; if it have little it will drink in more of the colour which follows it, and which, consequently, requires more size. This substratum may be smoothed down, to remove any loose threads from the linen, with an evenly-sawn piece of pumice-stone, and when perfectly dry it may be rubbed down evenly with soapy water (soft soap dissolved in hot water); then an extremely equal tint may be expected when it is painted over.

If it be intended to draw lines, panels, or divisions upon the background, the measurements are set off exactly with a ruler, and the lines are best drawn with a charcoal-blackened cord, which is strained upon the given measurement, and is then taken hold of by the middle between the finger and thumb, raised out a little way from the background so that when suddenly let go it flies back, striking against the background and marking on it a perfectly straight line. If a mistake occur the charcoal can easily be removed by dusting.

Ornaments are easily stencilled on. Take a piece of paper the size and form of the panel to be decorated with an arabesque, double it together, and draw upon one half the half of the symmetrical figure, so that the middle of the latter shall correspond to the fold of the paper. Then take a needle and prick the pattern pretty closely through both folds of the paper. Now spread the paper out flat, and you have the design complete. If a square design or a rosette be wanted, fold the paper twice, taking the corner as a centre; then, by pricking, the design will be transferred to the three other quarters, and a double symmetrical figure is obtained. The design can now be traced upon the subject to be painted by dusting finely-powdered charcoal, mixed with a little gum, through the holes in the paper. The design is then gone over with a pencil. As the background is generally not very sharp a very great degree of accuracy in the details is of less importance than the proper tone; the neighbourhood of the figure does not require the same lively ornamentation as the more distant places.

Good examples (models) are to be found in the numerous journals devoted to art and manufactures, in every paperhanging establishment, and, lastly, in the photographs of the ancient and modern *genre* pictures which abound in every style.

Patterns may also be cut out of oiled paper; but this plan is only to be recommended in the case of small ornaments. A brush with shorter and stiffer bristles is required for this, and it must be carefully drawn across the stencil paper for fear of any of the superfluous colour running down between the pattern and the ground and disturbing the cleanness of the outline.

The materials for size colour painting are cheap. A few paint-pots a ruler, a line, and suitable brushes—that is all. The latter are, unfortunately, not always to be had good; but, at all events, get them as large and long in the bristle as possible. Fine hair pencils are not used for size colour. The fine lines are drawn with a long, thin pencil made for the special purpose.

The advantages of size colour, its great cheapness, the equality of its washes, and, above all, the absence of gloss, adapt it for use in backgrounds in a way that is not counterbalanced by the ease with which it is injured by damp or frequent rubbing against; but when it comes to be a matter of painting furniture, pillars, balustrades, and such often-handled requisites, wax paint is preferable. It stands damp, can be as equally laid on, and is as free from gloss as the size colour. When it is used the chalk is replaced by zinc white or white lead, rubbed down with oil or finely powdered. Cassel brown must also be laid aside, and in its stead Russian sienna, burnt ochre, or burnt umber may be taken. The binding medium is equal parts of wax and mastic resin melted together in turpentine over a slow fire. The greatest care must be taken during this process, as the substances employed are very inflammable. To this mixture a small quantity of copaiba balsam may be added. If it be found necessary during use to thin yet further colours to which this mixture has been added, a weak emulsion of wax in turpentine will be found suitable.

If it be desired to paint a large surface of linen with size colour the linen must first get a foundation coat of chalk and linseed varnish, and be thoroughly dry. Upon wood, *carton-pierre*, metal, porcelain, &c., the paint can be laid on at once. By brushing lightly any degree of gloss can be conferred upon it. If the gloss be too great a single coat of turpentine is enough to render the surface perfectly dead. This method is more costly and is not so easy for the amateur, but it gives more durable results, and allows one to work upon any sort of foundation. If the painted parts may remain glossy linseed oil can be added to the colour instead of the solution of wax. Oil colour may also be made pretty matt by a thin coating of turpentine or wax.

Very good ornaments can also be made out of vases, boxes, and similar accessories by gilding them with gold bronze mixed with gum water. A simple box with a coat of paint cleanly put on, and a pretty ornament painted upon it, has a very good effect.

Finally, upon paper backgrounds one can work with water-colours. Take some cakes of sepia and dissolve them the evening before using in a sufficient quantity of water; then paint in pale washes, with a soft flat hair pencil fixed with tin, until the desired tone be secured. When the first wash is dry it may be gone over again, only care must always be taken not to touch the half-dry places, or streakiness will be the result. While it is best to keep the frame perpendicular during the time the background is being painted with size colour, it is preferable to lay it flat while being painted in water colour, as the colour is not then so spotty. *English Mechanic.*

Colouring Drawings.—I did not intend to answer this query, as most of my experience has been in mechanical engineers' offices, and you seem to want to know about tints used in architectural drawings. However, as I think Mr. Fennell has hardly given the answer you want, the following is pretty nearly correct as far as it goes:—As to metals, the following tints are mostly used: Cast iron, neutral tint (if you mix it yourself a mixture of blue, indigo is best, and Indian ink and crimson lake). Wrought and malleable: Prussian blue. Brass: Indian yellow; or, failing that, gamboge. Copper: Indian yellow and crimson lake. Steel: light purple, crimson lake, and Prussian blue (about 75 per cent. of the former). Other metals, such as lead and patent metals: Prussian blue and Indian ink. For other materials the following tints are used:—Wood, light burnt sienna; the graining is done with Indian ink. Brick, light crimson lake. Firebrick, yellow ochre. Stone, warm sepia; but many other tints and mixtures with this are used according to the kind and state of the stone. For instance, in a set of drawings I once did for an architect all the dressed stone was coloured gamboge and Indian ink, and the rough stone warm sepia; slates, indigo; tiles and earthenware ornaments, Indian red; concrete, foundations, &c., mixtures of sepia, yellow ochre, and Indian ink. Most of these colours are used almost universally to represent the annexed substances, but others are used differently in different offices according to taste. As my work in years past has been in some of the leading engineers' drawing offices—and I have had to do with work from very many others—I think I can warrant this list to be, "take it for all in all," the one most usually adhered to.—MATHETES.

Novelties in Paper.—When the usefulness of compressed paper for railway wheels was demonstrated two or three years ago, people asked "What next?" The question can now be answered. The latest use of paper appears to be for chimney-pots. They are made in Breslau, and are light and durable. Before the paper pulp is moulded and compressed into the required shape, it is treated with chemicals which render it non-inflammable. Specimens of paper and cloth made from the California cactus were recently exhibited before the Maryland Academy of Sciences. The cactus grows abundantly in many of the Western States and Territories, and it is found on arid soil where nothing can be cultivated. The success that has been met with in making paper from this plant is so marked that the business will probably be attempted on a large scale.

CHOOSING A SCYTHE.—The disposition of steel in a scythe is to be best understood by seeing one which has been broken across the blade. Sometimes tools of this class are steeled "naked," so that all the steel shows itself at once on the top side of the blade, but this plan is not to be recommended. It is better to have iron on both sides of the steel which just shows itself along the edge, and runs in toward the back to stiffen the blade and to form a constant cutting edge as the tool wears away. Now, in buying a tool, bear in mind that the most steel may show in the one steeled naked, because all that is there is in sight, but in the other case there would be a great deal more steel useful for carrying an edge, although it would show less because the bulk of it would be hidden between the iron. It will not do, then, to be deceived by appearances. The best plan is to depend on a good maker for good steel and sufficient of it.