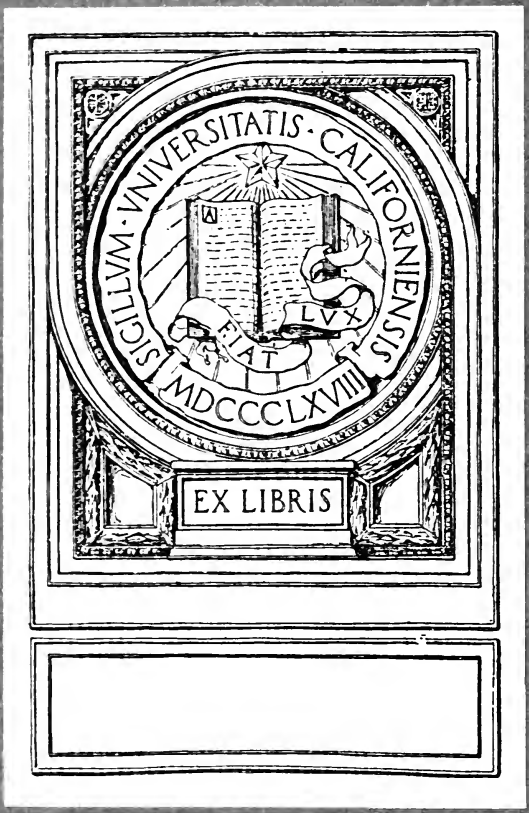
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PRACTICAL HINTS ON MODELLING DESIGN AND MURAL DECORATION

"MAENAD IN FRENZY."

(Marble bas-relief.) British Museum, No. T. 131. 2194.

OIL STUDY. BY HENRY F. W. GANZ.

PRACTICAL HINTS ON MODELLING DESIGN AND MURAL DECORATION

BY

HENRY F. W. GANZ

With Foreword by

ALFRED GILBERT, M.V.O., R.A., D.C.L.

"And I will think in gold and dream in silver,
imagine in marble and in bronze conceive,"

STEPHEN PHILLIPS.

LONDON: GIBBINGS & COMPANY

PHILADELPHIA: J. B. LIPPINCOTT CO.

1908

FOREWORD.

YEARS ago, when looking about me in vain, for some information and instruction, however elementary, as an aid, in my early attempts in Art, I should indeed have been grateful for such a text-book as the one, I am here pleased to introduce, comprehending as it does, in so concise a form, History, Theory and Practice, together with many valuable suggestions.

Sources of instruction, both theoretical and "*soi-disant*" technical, certainly existed, but on the one hand they were either too advanced and obscure for a beginner, and upon the other, they were invariably akin to the time-honoured cookery book for housewives of limited means,—tantalizingly suggestive, but actually prohibitive, by reason of their extravagancies in advice.

It is to be hoped that the Author may be tempted, by the success of this present volume, to issue a supplementary series of hand books, dealing with the more advanced methods of production in the various branches of applied Art, upon which he has of necessity, but slightly, though most ably touched, in the confined limit of the present volume. Such treatises, would be of incalculable value in the hands of students, who had derived the advantages which the study of this presentment cannot fail to assure.

The value of the knowledge of the history of Art, in a general sense, as a basis cannot be overestimated, and cannot fail to stimulate the young Artist to endeavour, and the more advanced to continue striving. The only way to a thorough appreciation of what that History teaches, is an insight into the methods employed in its creation.

This manual, in my humble opinion, provides the preparatory help needed in an admirable way, as in general tenor, it partakes rather of the nature of a *vade mecum*, than of that of a class book ; though at the same time, supplying ample illustration, and aid to a thorough understanding wherever the complexity of the subject requires diligent attention.

It has always been the fashion with those who have succeeded, to advocate the weary, dreary, and unnecessary pain of "going through the mill," rather than to extend a helping hand to the aspirant, to a share in that mill's production. Thus I have always suspected, the advice, as the dictate of a sort of Trades' Union jealousy, rather than of Brotherly concern.

I grant that the "mill" is in a way necessary for all workers with grist to grind, but seeing that to-day, Art schools, in general, are merely such, and the workshop, is mostly an adjunct to purely commercial enterprise neither offering much encouragement for intellectual harvesting, I cannot advocate the old system nor applaud the present.

The Author's intention is evidently not to entice the willing servant from his master, but to encourage the devoted slave to "Mistress Art," to make himself as capable a workman as he should be an intelligent master. It has from time immemorial been said that the Artist must be a workman, but rarely have I heard it affirmed that the workman should be an artist. To my poor understanding it has always appeared, that a true Artist, ought to be a combination of both elements, possessing at one and the same time, power to devise and skill to realize. Let me recommend therefore, to all young Artists, the necessity of general as well as of special study, so

admirably suggested by the author throughout the pages of this book.

It will be my care and delight to watch the prowess of my younger colleagues in the hope that it may discover to me hereafter some justification, if not absolution, should it appear that presumption has usurped the place of that loyalty and sincerity which I would hold, as their well-wisher, from outset to arrival.

ALFRED GILBERT.

Bruges,
April 8, 1908.

TTEMELATA. BY DONATELLO.
AT PADUA.

THE ARCH OF CONSTANTINE, ROME.

NOTE.

THE object of the following pages is to provide the student with a practical treatise on the three Arts of Design, Architecture, Sculpture and Painting.

Of the last Mr. Ganz has already written and the success attending the publication of his "Practical Hints on Painting, Composition, Landscapes, and Etching," has encouraged him to put forth another Text-book with a still larger aim. Although the author is chiefly known by his paintings and etchings he is not without experience in sculpture.

Mr. Alfred Gilbert encouraged him in his first studies in Art, by casting his wax Tazza, with which he had taken a special prize at the Slade School of Fine Arts, University College, London.

M. Alphonse Legros, then Professor at that school insisted on his students learning not only to draw and compose, but also to etch, paint, and model.

After working there some three years Mr. Ganz studied from the Elgin marbles in the British Museum and went through an exhaustive study of anatomy. The fruits of these foundation studies illustrate this and his first book. Proceeding to Berlin, he worked at painting from the life at the Royal Academy Schools there, under Professor Max Michael of Hamburg, a pupil of T. Couture of Paris and a fellow student of Puvis de Chavannes, Proust,

E. Manet, and other famous artists. It was at Berlin after two years study of the nude and the study of animals under Professor Paul Meyerheim, that Mr. Ganz painted his first picture, "Orpheus losing Eurydice," which later on, was burnt at a London frame-makers. Hearing of this Sir Coutts Lindsay offered the young artist a studio in his house where he worked at portraits, mural decorating, modelling, and scene-painting. He also painted the ceiling for the drawing room of Mr. Francis Black, the publisher, and the Pompeian decorations on the staircase of the late Sir Morell Mackenzie's house in Harley Street, and thus gained a wide experience of all kinds of art work which qualifies him to give to others the benefit of his advice and experience.

FRANK RUTTER.

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"THREE FATES?" (MARBLE) BY PHIDIAS.

PREFACE.

SOME years ago Mr. Alfred Gilbert, the Professor of Sculpture, for the time being, at the Royal Academy, London, gave a series of lectures on Sculpture. He commenced by drawing a circle on the blackboard, saying that "all art is one," and that he knew of "only one art." Further, he gave an elaborate description of the making and aim of sculpture (statues), also described various pictures with regard to their design and colour. He spoke of the genius of Turner, of his "Polyphemus deriding Ulysses." This picture, he said, "showed man in his miniature place among the elements." He considered that "Turner's work was far greater in aim than classical or antique landscape had been, for Turner understood and loved nature, while the classical artist only showed man and nature under the fear of the heathen god." Next he noted how Turner had combined the art of modelling with painting in a certain "Shipwreck" in which the side of the ship was treated as a bas-relief.

Continuing now the design of the circle on the blackboard, he added a cross, or rather the diameters, by drawing a smaller circle and other half-circles drawn on the first outline at tangents, and he introduced a variety of running lines connecting these geometrical forms. Founding his design for these lines on a flower, the seed, bud, and leaves of which he introduced as motives in the border, he explained that as the plant form grew from its root to its flower, it eventually dropped its seed when half-way up the circle and commenced again, thus illustrating Nature's law of recurring creation. On the mathematical lines of the design drawn, he suggested figures meeting and kissing at certain points, reversing

at others, and finally he added an elaborate ornamentation where necessary. In every design, he said, "there must be forms which may be *imitated* or *repeated*, thus giving *suggestion ; the value of line* (thick or thin), which, added to *expression*, will give *sentiment*. There must also be *scale*, *balance*, and *organic growth*."

Alfred Gilbert was born in 1854; he was born to a musician and a singer of Welsh extraction. When the victorious angel blew the silver trumpet blast at his birth, he provided him with an array of talents for design, modelling, form, painting and music, and above all with romance. It is the romantic spirit of the "Middle Ages" that, with nature and art, has ever inspired him. "A blameless knight," he knows no fear; he has worked out in his art the various episodes of his life. That great friend and patron of artists, Lord Leighton, advised him to settle in England, and gave him a commission for a bronze "Icarus." Gilbert came into the art world like a meteor, he cast his great statue of Charity or Love for the Shaftesbury Memorial Fountain at Piccadilly Circus, and his golden-bronze statue of Queen Victoria for her Jubilee monument at Winchester. His works and further career are known to all. If the "Icarus" prophesied the uncertainty of soaring with artificial wings, "Tragedy and Comedy" have by no means been absent from his life.

Taking Mr. Gilbert's theory "that all Art is one and that it is expressed in a universal language," I propose, with short notes, to touch on Art generally throughout the ages.

Art is practically founded on the ideals of *order*, *infinity*, and *early religion*, which were the basis of all *knowledge* of the priesthood of Ancient Egypt above everything else. In Art the Sphinx represents the Powers of Maternity,

strength and order. There were then two groups of people, the aristocracy and the workers. Moses, educated in the purple of royalty and the priesthood, the same caste, took his knowledge from them and eventually carried it with the Israelites to a new land. On the Mount of Sinai he engraved on clay tables, which he baked, the ten commandments given him by God, the immortal Spirit of light, order and truth, and offered sacrifices. He left his people the motto, "May thy days be long in the land"; they had no fear of death. The Nazarene Christ educated with the same religious ideals, added to them charity, and overcame for the first time, for the poor and the people, the pride of the priesthood, and conquered the fear of death by sacrifice and dying on the Cross, adding the promise of immortal life. His words, "Go, teach the heathen," are known to all.

Classical Art, which had thriven to this period on lines of nature and on the beauty of the body, illustrated at different times, as Divinity, *Ideality* and *Sublimity*. *Human exaltation*, and, later, *individuality*, was killed in its ideals.

Again, the priesthood of the early Church, as in Egyptian and in Jewish times, cast its trammels over all freedom in the laws of Art, and all freedom of conscience. The worship of the ideal woman was no longer Venus, Hera, Minerva, Diana of Ephesus, or Astarte, but the Jewish Madonna of Bethlehem; and the gods were no longer Zeus, Hercules, Apollo, or Mercury. It was not until the great Italian Renaissance in the thirteenth to the fifteenth centuries that Art was freed from these trammels and gave forth its greatest expression; even then it was founded on and inspired by the then recently discovered antiques, but it still had to fall in with a utilitarian basis. Painting and sculpture were simply wall-painting and the ornamentation

of buildings. Modern knowledge, science and art, are summed up in the words of the Apostle of Impressionism, Émile Zola: "Truth is on the march and nothing can arrest its progress." John Keats quotes in his "Ode on a Grecian Urn":—

> "'Beauty is Truth, Truth Beauty,'— that is all
> Ye know on earth, and all ye need to know."

The spirit necessary for Art lies in the music of Shelley's beautiful poem, "Love's Philosophy," or in Swinburne's "Chorus from Atalanta in Calydon." Brother artists—musicians like Wagner—write and compose the poetry and music of "Der Ring des Niebelungen"; the sympathetic Baudelaire thoroughly understands painting from the painter's point of view; Goethe and Lessing write on Art; James M. N. Whistler painted his "Peacock Room"—his Harmonies, Nocturnes, Arrangements, Notes, Symphonies, and touched in his colour as a musician sings. He etched and gave with *eclat* his "Ten o'clock Lecture" on February 20, 1885. All great men think and speak a universal thought and language, even Herbert Spencer, the apostle of Sociology, loved music, and wrote to C. Holme, the Editor of *The Studio*, on the growth of "L'Art Nouveau"—what he called "the return to Barbarism." Art should appeal to the æsthetic sense. What is Art? Art *is*. Art is infinity and cannot grow or progress or decay. It exists or happens. Art is Joy. It has no Mission. The work of the artist is perfect from the first, it cannot be "finished," it grows like a flower under his hand and is complete when he has done with it. Glesson White said, "As the sun colours flowers so Art colours life."

Born of love and extreme reverence, of purity and admiration of healthy nature, Art is universal and exists everywhere and for all time on the same lines. It exists

as much on the wing of a butterfly as in a Japanese colour print, and in the scent of a flower or the bloom of a peach, the grace of woman and the strength of man. The artist must work on strict lines of probity; he must build up, develop, carry out his ideal, and never cease to work and bear fruit. Guided by the experiences learnt from a continuous vital tradition of live art and the study of Nature, he will find a source of continual interest everywhere. As the great men of the Renaissance learnt their lesson from Phidias and the antique, so in his day Rubens learnt from Michael Angelo, Giorgione, Titian, Tintoretto and Veronese. More than we think, we Northerns owe our art to that great "prince of painters." Velasquez, Watteau, Gainsborough, Turner and the French Impressionists, all students of colour, light and composition, each came under the influence of Rubens.

To Rembrandt the art of "effect" and what are called "values" owe their origin; on these lines we find the works of Spagnoletto (Ribera), Franz Hals, Goya, Sir Joshua Reynolds, and many modern artists.

The two qualities of "variations of colour" and "intensities of light," effect and value, appealing as they do to different optical centres, are the leading motives of all Art. The first bring forth the painter, the second the ideals of the draughtsman, the student of form, and the sculptor. In certain cases the two are combined, as in Botticelli, Tiepolo, Vermeer of Delft. J. F. Millet was a 19th century Classicist, as were Cotman and Whistler, Diaz and Monticelli. The rest follows from actual practice, for no book-reading can make an artist, who is born and has to develop his gifts. All a book and teaching can do is to open a field of study and save time, painting being the lightening of dark colours, and sculpture the

building up of form on the lines of added light. The book of Nature lies ever open to be read by all, whether for suggesting a "motive," an "interpretation," a personal "impression," or to record an expression. All that remains is "To Beware of the Song of the Siren."

The three greatest men in Art—Phidias, Giotto, and Michael Angelo—were painters, sculptors, and architects in one. Decoration of the highest order is seen in all their work. In the Parthenon, Athens, sculpture is allied to architecture according to its strict requirements, and the Parthenon may be said to be only complete with its statues. The Gothic church, again is a composition of sculptures, while the ceiling of the Sistine Chapel is a painted form of architectural motive.

In Classical art, bas-reliefs were carved or cut into the fixed stone wall ("per forza di levare"); in Gothic art the bas-relief and modelling were often made by additions in wax, and cast in metal or in plaster ("per via di porre"). Again, Florentine sculpture has more expression in it than Classical art with its serene spirit. Florentine work was noted for the arrangement of the hair; the nose which at its juncture with the eyebrows down to the nostrils is somewhat square in character in classical work, becomes more shapely, the nasal bone and its cartilaginous part are prolonged towards the tip; again, there is more modelling about the nostril, which is thinner and more sensitive.

Michael Angelo and Donatello did not cast their works themselves, but Michael Michelozzi, the designer of the Palazzo Vecchio (1454), did so in this case, and Ghiberti, A. Pollaiuolo, Verrochio, Alessandro Leopardi, were all noted casters, as was Benvenuto Cellini, who wrote a treatise on this subject, and was the originator of modern sculpture.

The use of sculpture for position, was the only form that survived through the dark ages from antiquity without touching on Eastern marble low-relief, and the relief-sculpture in stone and marble on Moslem buildings, Persian flowers, Indian caligraphy, or Moorish architecture.

The general treatment of figure in relief is conditioned by the position and light it is in, or from a modification in proportion for artistic effect. Phidias worked for effect, allowing for distance; his background is often a little more cut back above than below, as in the frieze of the Parthenon. Donatello worked on the same lines on the Zuccone (Bald Head), on the campanile of the Duomo, which was more than 50 ft. above the ground. In the head, the eyes are deeply cut; the proportions are otherwise normal.

Donatello's "Cantoria" is perhaps more perfectly adapted to the position it was intended for than that of Luca della Robbia. The idea that a figure should be altered in its proportions, according to its intended position is a myth, for the human eye allows for the distance that it may be separated from the object it is looking at. Classical work generally is "normal" in proportion and execution, irrespective of site and circumstance, as may be seen in the groups from the "Pediment" and other Phidian marbles of the Parthenon. Phidias sought for style, composition, proportion, balance, light and shade, mass, line and silhouette, in relation to the size of the human body and the average height and distance it was to be viewed from. He gave no indication in the technique of his work that some of it was to be seen 60 ft. from the ground. There is in the architectonic Trajan's Column no variation in the salience of the figures or in its handling of material; in fact the lower

panels are a little higher in relief than the upper ones. Scopas, in the Tegea, followed the same rules. Low relief is design in perspective, and in Gothic art the upper figures are usually as much finished as the lower ones, although the subjects are near the ground. Again, the ancients used half or mezzo-rilievo (English high) for their figure compositions which adorned flat walls; the same treatment was applied to ornament in theatres and triumphal arches. The ancients excelled in the arts of very low relief; all depends in this art on outline, as may be seen on ancient vases, cameos, medals and coins. Wall relief is the perfection of figures diminishing. Pictorial or perspective reliefs were invented in the Italian Renaissance; often they project from their ground. In this very difficult art, the feet and hands may be seen sometimes shortened in relief, as on the Ghiberti Gates.

Donatello excelled in low relief (bassi-rilievi); in these there is no projection whatever, flat relief being simply clearness and refinement of beautiful forms.

Reliefs were first used in the fifteenth century, but not in Mediæval work—following the idea of the reliefs sculptured on the tomb of the Julii at St. Remy (Augustus), the Arch of Titus, and Trajan's Column. It was developed from the small decorations called grotesques in the sepulchral chambers, called caves or grottoes, because when they were discovered they were underground. In differentiation from Classical art, which was serene in spirit, noble in style, with a quality of full modelling (in the round) of the human body, Gothic art adapted the figure, either, on account of its size, to the square shape it had to fill, or to the arch of the building it was to decorate. Modern Sculpture follows these traditions.

Donatello was the first man of the Renaissance to break away from the traditional bas-relief, and model in the round.

At the apogee of Art one finds Michael Angelo. He wrote in his sonnet on Sculpture :

"Non ha l'ottimo artista alcun concetto
Ch' un marmo solo in sè non circonscriva
Col suo soverchio ; e solo a quello arriva
La man che ubbidisce all' intelletto !"

"The best of artists hath no thought to show
Which the rough stone in its superfluous shell
Doth not include ; to break the marble spell
Is all the hand that serves the brain can do."

(Translated by J. A. SYMONDS.)

Also of Night :

"Sweet is my sleep, to be mere stone,
So long as ruin and dishonour reign ;
To hear nought, to feel nought, is my great gain ;
Then wake me not, speak in an undertone."

After the Primitive paintings in Fresco and Tempera, which were in use generally until about 1444.

In the development of the art of painting the Venetians introduced canvas in the fifteenth century, to suit the requirements of atmospheric conditions, which were unfavourable to the preservation of the fresco method. They preferred canvas to plaster for their work in oils, which work was generally started in tempera and finished with glazes of oil colour and then varnished. These canvases they frequently affixed to the walls. Canvas on stretchers was lighter for carrying, and it would not crack when rolled, if prepared (not with gesso), but with flour and walnut oil, white lead on a size foundation, which when dried is re-sized and eventually re-primed. Canvas does not split, and favours works which are portable and of any size. For panels, maple, or gattice wood, or Venetian fir was preferred, poplar, lime, or, willow wood also being used.

Velasquez was the first artist to paint his pictures entirely in oil colour from first to last.

If I may be allowed to mention a technical hint here.

Time should be left for the work to dry naturally in fresh air before varnishing it. The mastics dry too quickly; amber-copal varnish is the best to use, and then only thinly in the darks. The safest varnish is copal; it is made of gum-copal fluid, boiled in hot water with turpentine.

In the art of drawing, which itself means definition of form, there are two distinct kinds: namely, search for form, like A. Dürer, or effect, light and colour on form, as Rembrandt. Raphael's work was a continuation, a development of earlier art; the methods, the groupings employed were those already in use, added to the study of Nature. One notes the arrangement of the light and the fine aerial quality of colour in "The School at Athens," which could only come that way, and the knowledge how effectively to light a large number of figures can only have been gained by personal observation.

The broad simple lighting which is seen in Italian work was dictated by the necessity of filling large spaces, viewed from afar, whence breadth of effect alone can be seen in a painting.

As William Morris wrote "A sense of music and of colour is everywhere abundant in art, and a spirit of beauty should breathe in every line;" Colour should sing, colour is everywhere. The instant there is light, colour is revealed. "Colour exists in abstract decoration. It is transmuted from visible things into artistic conventions, and gives expression of the spirit."

We read of "the sculptor who hews the white-limbed god from his marble block," how "he uses the amethyst for the purple couch for Adonis, and the sardonyx as a background to the figure of the hunting goddess. We see the red-glowing metal being poured for the deep-coloured bronze," and we read of "how the goldsmith beats his gold into roses."

A PORTION OF MICHAEL ANGELO'S DESIGN FOR SISTINE CHAPEL CEILING.

PRINCIPLES OF DESIGN IN RELATION TO THE APPLIED ARTS.

FOLLOWING the lines of my earlier book on painting, composition, and other branches of the graphic arts, the aim of the present work is to offer hints of a practical nature on the study of the applied arts. Upon consideration it will appear that there is a close relationship between the various branches of the decorative arts, and that it is impossible to fully appreciate each particular branch without some knowledge of the others. They are often closely intertwined, and would seem to spring from a common origin; the desire for the expression of the beautiful in design and plastic thought. But while recognising the essential unity of aim in the various manifestations of this feeling, a critical discrimination is necessary to the understanding of this many-sided subject. Now to consider certain principles of design. It is an axiom that decoration should follow and enforce the lines of the thing decorated, and be subservient to the structural idea. Ornament is inseparable from the thing ornamented, and it is ornament only in its place and purpose. In some sense all art is applied, the word *applied* meaning adapted for a decorative purpose.

The art of the painter differs from that of the designer, in that the latter has to consider in making his design what style of drawing is most suitable, having regard to

the material or the tools he proposes to use. He may have skill in making a decorative cartoon, or talent for working direct on the material without any design, but he has to understand, before setting to work, the principles of practical applied design and recognise the limitations of the material selected.

The distribution of the design must be considered: (1) In relation to the material of which the proposed object is composed or is to be made; (2) the purpose for which the object will be used; and (3) the place the object will ultimately occupy or is intended to decorate.

Further points to be remembered in the use of ornament are that it should *emphasise form*, that it should be *simple* in *effect*, and appear in its *right place*, that it should have such qualities as a *flow of line* and *colour* massed in characteristic shapes and suitable spots.

The essence of design is that it should be logical. The student may now try his hand upon some practical work in order to perceive more clearly the principles of design and ornament, for it is only from actual practice that decorative principles can be learned.

ELEMENTARY METHOD OF STUDY.

At the outset the pupil will have learned to draw with the pencil point on paper in true and careful outline, simple forms of flowers or fanciful shapes. The use of the brush follows with the colouring of these forms in washes of flat tint. Some practice in modelling in clay is useful, the models chosen being simple in form and pattern. By these means the hand, eye and mind are trained, and a sense of colour is cultivated. Pattern forming comes next. A plant-form is drawn in correct proportion, or the brush may be used, and is then applied by repetition to fill various shapes. Beginning with a circle, the pattern may be introduced four times, each form opposite the other, and appropriate lines drawn to connect them. This is followed by the filling in of other shapes with forms in various manners. Combined with a knowledge of colour harmonies ornamentation may be applied to all decorative purposes.

Tracing the history of drawing we find that the earlier efforts in delineation were chiefly in *outline* and *flat washes of color*, with no effect. The study of appearances came later. Two survivals of primitive art have come down to us, *Coats of Arms* and *Trade Marks*. As a kind of writing for the ignorant or primitive man, the first efforts of drawing were simple. The *simple line* was studied in Assyrian work and on the Greek vases, form being simplified and amplified.

ELEMENTARY STUDY.

The Greek designer showed a perfection in delineating with the use of line, giving the gracefulness of life, and an ideal view of living man and woman in pure line and flat spaces. This was an advance on Ancient

Egyptian painting wherein the line was purposely quiet and conventionalised in a manner closely akin to the art of sculpture.

In Assyrian design one sees more of the spirit of painting in their wall sculptures, in which the line is engraved upon subjects chosen chiefly from forms of manly beauty, with powerful accentuations on the curve of the line.

The mediæval artists began with line and flat coloured spaces in their illuminated manuscripts. The principal characteristics in the history of drawing are shown in the difference of the opposite styles, the *Severe* and the *Picturesque*. A style which was simple in Greece and in the purists of the Middle Ages, became disdainful in the great men of the Renaissance. The Severe spirit is an academic protest against the Picturesque.

The motive which prompted the delineation of certain forms and objects in the elaboration of a design has not always been the same, and curious changes may be noted in the gradual evolution of the art. The designs of earlier ages often possessed definite symbolic significance : thus an ancient Aryan ornament, which was once universally employed, consisted of "the sacred tree between two animals," sometimes varied to a fire-altar placed between worshippers. This device, the meaning of which is now obsolete, is still frequently used in some Oriental carpets and textiles.

Forms which have lost their original meaning should not now be repeated, unless they retain a decorative value. The feeling that inspired them can never be recovered, and originality, the outcome of sincerity and character, must find plenty of scope in the drawing and treatment of fresh conceptions.

ELEMENTS OF DESIGN.—Design is the arrangement of lines and masses in such relation to one another that they form a harmonious whole. All forms of decoration involve some sort of convention. Convention is inseparable from good design, which may contain a wide range of form treatment, from a minute intricacy of pattern to the finest delicacy of plant form. Broad bold effects are also indispensable to decoration, as well as richness and simplicity. Design is a language in symbols, and hence the clearer the symbol the more easily are ideas conveyed. For this reason all complexity that does not increase directness of statement should be left out.

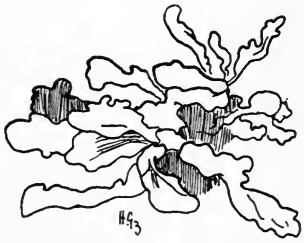
For instance, in making a wall-paper the rose tree may be selected as a motive for the design, but it need not look like a living bush, a mere suggestion of the form of the rose as a flat symbol will serve the purpose of a background on the wall-surface. The essence of what is understood as convention is merely the effort to simplify statement, one of the essentials of decorative art.

The designer of patterns must remember that it is not enough to learn the rules of art, for until knowledge of their association gives facility he cannot be a practical artist. All fine art requires a state of mind of the artist which tells him that art is not a spontaneous impulse but calculated forethought, and further that there is something besides dexterity, which works from his human faculty and heart, and shows the "spirit of life" beyond the mere mechanical elements of rules. It is by no means necessary when drawing a pattern that the actual proportion of the real plant shall be followed. What is necessary is that before designing a pattern the artist should have some thought to express. No good pattern can be made without that as a starting point. Then natural forms will furnish the language by which the expression is to be made. The expression of certain lines must be studied so that the student may know what kinds of lines express infinity, repose, movement and the reverse of all these.

Drawing for designing begins with *line*, and a decided conventionalism of natural or other forms may be allowed, provided they are suitable to the material in hand. As there is no such thing as an actual *line* in nature, natural forms must be treated in a conventional way with omissions or amplifications ; design may consist in fanciful conceptions as well as in natural forms. The flow and balance of a line and the distribution of colour in a pattern may be suggested either by existing nature or by geometrical, or by other motives.

The designer of a decoration must work in a style of drawing that seizes more upon form than effect. The design must be drawn in plain and distinct characters and may be suggested from a preparatory study of a natural or a conventional form. A hard firm outline as a base will at once give a sense of style.

Lines should by their arrangement help the pattern and scheme of the decoration. The design must also be appropriate in its planning to a given space to be filled.



LINES. — It will be seen that lines have expressive power of great variety. They may be *straight*, *curved*, or *pronounced*, and the character of a curved line may be quiet or bold, tormented or restrained, finite or infinite. The lines of infinity give suggestion and are essential to the sublime. In a firm outline when the interior markings have been traced, flat washes of colour may be introduced. Flat treatment however is not in every case essential to decoration for a surface or line may be raised or incised. Little suggestion of perspective or "light and shade" will exist in decorative design, and colour may be used in variously tinted patches or spaces without gradation. Amongst the variety of lines, we have *horizontal lines*, suggesting repose; *vertical* lines, suggesting dignity, aspiration and support; and *squares*, stability. Certain lines again suggest natural growth: *sinuous* and *undulating* ones, as well as diagonal lines and angles, movement. The quality of line in ornament depends on the material employed, and this material frequently suggests a certain treatment. A bold use of line gives character to a decoration or design, but a mere thick line will not make a decorative effect as will a beautiful pattern having unity and balance. Again, natural forms are simplified by outline. The space will often suggest the ornament that will decorate it and there are lines into which the decoration of a given space naturally falls; in a square one seeks a chequered pattern of cross-lines as a decoration, and in a circle, a ring or rays, or both combined, or a form of a cross.

It will be noted that there are in every design—

(1) Forms which may be *imitated* or *repeated*, thus giving *suggestion*.

(2) The *value of line* (thick or thin) which added to *expression*, will give *sentiment*. There must also be

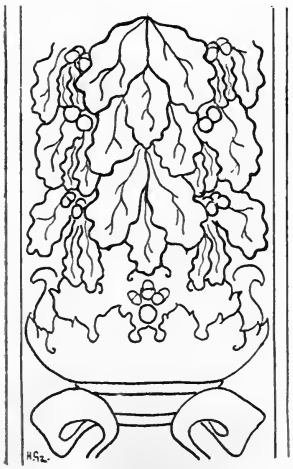
(3) *Scale*;

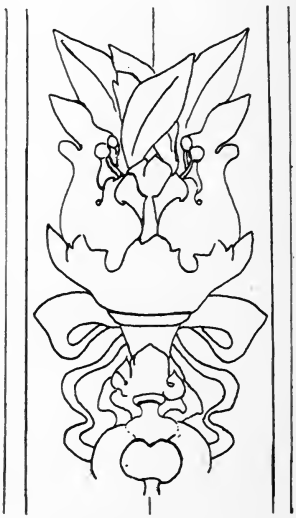
(4) *Balance*; and

(5) *Organic growth*.

Ornamental design is conditioned alone by a consideration of beauty but it must show fitness to the material to which it is to be applied, and it should not appear as an addition to, but as inseparable from the thing ornamented. Ornament should arouse a sense of pleasure and kindle the affections of the beholder. If the object becomes more lovable because of its ornament it is a sure test that it is good ornament.

A design will be *ornamental* where the purposes of the work are not purely utilitarian and *applied* when the design is planned for a practical purpose; for instance, in the cloison of enamel and the leadings of a glass window. The design for a stained-glass window will differ from one to be carried out in mosaic or used for a wall paper.





BORDERS.

Every design must be *treated* so as to suit the space it is to occupy, and be thoroughly adapted to the material selected.

The subjects chosen may be treated in any variety or combination of line or lines and the motives for them may be suggested by natural or artificial shapes or symbols and by human figures, plants, foliage, or flowers, treated conventionally. Balance, variety, repetition and proportion should also be observed in design, as well as contrast. Contrast is only a form of emphasis, which is required and used in decoration just as emphasis is required in speaking.

The actual proportion of an ornament to the background is not easily determined; it depends on the material used and must be left to the judgment of the eye. A too equal division of pattern and background is not so pleasing as the emphasis of the design on its ground. Outline is a most valuable element in ornamental design depending on the material used and the way it is worked. Outline also simplifies the effect of natural form when it is introduced. The thickness of the lead in stained glass work and the edge of the wire of cloisons in enamel follow the trend of the outline. A light ornament on a dark ground will be thrown into more pronounced relief by outlining the ornament with a thin edge of lighter colour, or where the ground is light by the use of a dark outline. An outline traced between the ground and ornament will soften the effect.

Ornament should be produced by modifying the surface during the making of the work of art and should not be added afterwards.

The treatment of a design and its working out must vary with the various tools employed, or processes used in working, or the method of work may suggest the style of the design.

Method may change, but the nature of material never does, and the material employed should proclaim itself as the original source of all appropriate ornament. The

treatment must suit some fixed purpose or process of work. The design of ornament being appropriate in its pattern to the process of execution, the ornament to be applied may be "*cut into*" or *engraved* on an object, or *put on flat*, either in *drawing* or in *colour*, or it can be *raised* on the surface. Depressed ornament can also be introduced as in niello or enamel work.

In applied sculpture, relief ornament may be kept flat, or medium, or high ; colouring is more in unison with this last style than the first, which allows for more delicate light and shade and the losing and finding of design. The essence of pattern is repetition. For repeated ornament a choice of ornamental form remote from nature is the best motive, and gives the best decorative result. Repetition suggests infinity which is one element of the sublime. Animals or human figures, whether treated conventionally or not, must be used sparingly and then only if they give good lines or masses. Animals or birds are as suitable as flowers for repetition provided they are symbolic enough, that is as long as they are not in the smallest degree realistic.

Repetition gives order to design and scale to pattern and fits it for the purposes of a background when treated on the flat.

A careful distinction should be drawn between the design that is purely sensuous and gives pleasure by reason of its form, colour, texture, light and shade—that is by its purely material qualities and the design—such as the coat of arms of a herald, which in addition to pleasing the senses makes some appeal to the mind, heart and reason, or the design whose lines tell some story. The design that makes you think of the Author of the lily is of a much higher order than the design which pleases you without provoking a single thought, or pleases you and only makes you feel the skill of the artist. The greatest art is that which expresses thought and feeling and makes the hearts of men throb in unison and mutual love.

Flat ornament is appropriate to stuffs, carpets, wall or floor decoration without having any qualifications of modelling, or light and shade.

An arabesque is a painted or plastic ornament consisting of a fantastic but well-ordered form of design or conventional arrangement. It forms essentially the coloured ornamentation of a ceiling, carpet, piece of embroidery, or decoration of a book-cover, in distinction to the plastic ornament or decoration of a frieze, a capital, or a candelabrum. The finest examples are found in Persian, Turkish, Arabian, Moorish-Japanese and Chinese coloured decorations, or in some form of Gothic. It is frequently employed in grotesque wall-painting.

The Moorish arabesque on this page illustrates its form perfectly, and is founded on the various elements that compose ornament; and thus illustrates the laws of principality, repetition, continuity, curvature, radiation, contrast, interchange, consistency and harmony.

The Arabs used this form of art, and gave it its name, in their complicated system of ornamentation.

ROMAN.

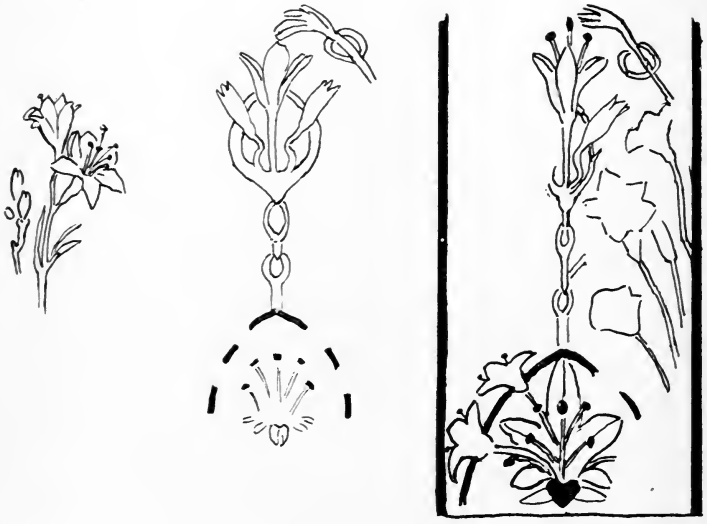
BYZANTINE.

MOORISH.
VARIOUS ARABESQUES.

GOTHIC.

ITAL. RENAISSANCE.

LESSON I.



PRACTICAL DESIGN.—Apart from the material used or the tools and processes employed, there is the composition or technique of design, which is the application of a design to its place, position and purpose. In this distribution of the design, there is always an opportunity for originality in planning. The given space has to be filled with an appropriate design which may also have to be composed on a certain area and be suitable to its place or purpose. Much will depend on the eye of the artist, which has to be satisfied no matter in what style he may work.

One method is to place certain shapes on the panel supported by subsidiary shapes connected by lines, another is to work on a geometrical ground-plan with the introduction of variously shaped masses.

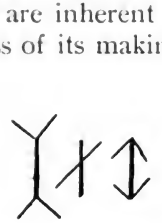
Everything, however, depends on *proportion*—the eye is displeased with a shape too nearly square or disproportionately long, a shorter or narrower shape will be better.

The distribution of the design in a given space may be shown better on a plain background, while a full pattern will give *emphasis* to the design. Emphasis may also be obtained by strength of line, mass, intensity of colour, counterchange or other forms of contrast. Designing a pattern in equal proportion each side of a vertical line gives *symmetry*. This quality is also useful, especially in smaller details, and is always the most obvious way of arriving at *balance*. Again, *organic growth* may suggest a "*motive*," and *repetition* will give order to the plan and *scale* to the pattern.

A working-drawing is finished as soon as it expresses its meaning; the actual drawing not being its end, it should by no means be over-finished. If accurate and clear for its ultimate purpose, notes of explanation and plans of its sections may be set down on the margins.

Enlargements can be made by squaring the design (if not drawn on squared paper) and then placing the forms in larger squares in the same proportion.

COLOUR.—Many colours in applied art are inherent in the material or are produced in the process of its making. The dull colour of earthenware or clay remains after firing unless they are coated with some kind of glaze or enamel.

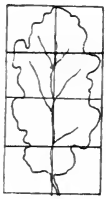


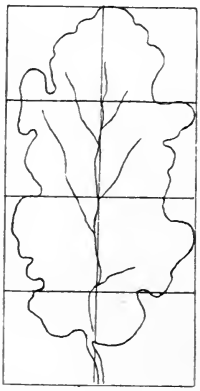
DECEPTIVE APPEARANCE OF SAME LINE.

A variety of colour is obtained by enamel owing to the use of vitreous glaze. In this art a metal such as calx (calcined tin and lead) will make enamel opaque. The peculiar colour of Della Robbia ware is due to a tin enamel.

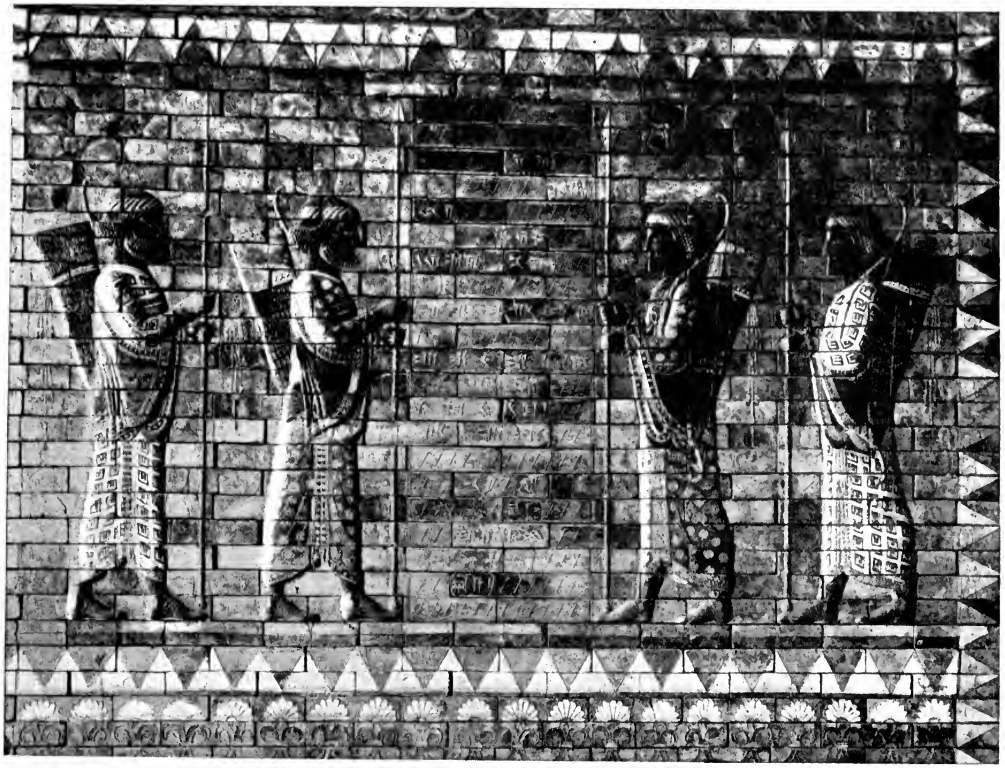
The beautiful blue in china comes from a cobalt which the Chinese potter uses with a certain form of chemical or metal.

The quality of colour for itself is perhaps found more in Oriental Art with its accepted formulæ of artificial form and its love of convention than in European Art with its imitative spirit.





The Orientals understand perfectly that beauty of colour exists unspoiled by definite forms, and a Persian carpet will give patterns of flowers and blossoms without any visible outline. Harmonies of colour are obtained by contrasts of hot and cold colours modified by neutral tints, such as different values of blue and red softened by purple, or red tones contrasted with green, harmonised with grey and brown. According to the material used, we get the whole range of colour from simple opaque tints to iridescent sheens.



PART OF A FRIEZE OF BABYLONIAN GLAZED BRICKS. "ARCHERS." Circa 500 B.C. Louvre, Paris.

MURAL DECORATION.

Nearly every branch of decorative art has been applied at some period to ornamenting wall-surfaces.

Beginning with the pre-historic drawing scratched in outline on the walls of the cave-dwellers, throughout all ages we see a variety of forms of ornament employed. Among them we find all methods of painting, reliefs sculptured in marble or stone, glazed brick and tiles, mosaics, marble veneer, sgraffito, stamped leather, wood-carving, painted cloth, stencilling, metal work, and wall papers.

The student should study and analyse the style and mode of workmanship that have been employed at various periods, and note how these have influenced the development of ornament. In approaching the study of applied art and decoration the student will find that certain branches of the fine arts—such as architecture, sculpture, and painting—have much in common, and that they are often used in combination, as in the work of the carver and the mason, the worker in mosaic and the glazer. Architecture is the idea which practically accompanies and dominates that of decoration, and, according to the strict laws that govern this branch of art, the subject must be treated as a part of an architectural whole. It must be designed and conceived in a certain composition adapted to the place it is to occupy when completed and is intended to decorate, and appear inevitably appropriate therein in its manner of grouping and arrangement. It must also be consistent with the material employed.

How the arts of design were combined and eventually separated in the case of the applied and decorative arts, of which mural decoration forms an important item, may best be traced in the following short review of

ancient and mediæval tradition in regard to decorated wall-spaces.

This will show how closely the different arts have ruled the principles of mural decoration, and explain the necessity of a thorough knowledge on the student's part of the elements of chemistry as applied to painting, the whole art of which embraces, besides oil and water-colour, fresco, stained glass, mosaic and enamel. Drawing comprises engraved, and also relief work, and some branches of sculpture.

Historical Note on Mural Decoration.

While historians of art tell us most of the leading facts connected with the history of this art during former ages, they generally lay more stress upon Egyptian, Assyrian, Greek, Roman, Byzantine, Gothic and Renaissance *styles* of ornament than upon the character of their workmanship. This was often influenced by the application of design to particular material, or by the way of working the material with various tools. The chief interest to the student should be not so much in historical and local characteristics and styles as in the mode of *workmanship* employed, and how it influenced the development of ornament at various periods. Good style should be analogous to the character and treatment of the various methods employed.

Briefly tracing the history of the various manners in which the different branches of decorative art have been applied to ornamenting wall-surfaces, one finds in the monuments, *i.e.* the temples, of ancient Egypt—generally great buildings of stone with vast halls upheld by columns lighted laterally from above—that painting and sculpture were treated in a conventional sense, which reduced these arts in their earlier forms to a subserviency to architecture. That is to say, they were used in the sense of *tinted relief* and *picture writing* in applied ornament. The true principles of decorative art are shown in the manner in which these tempera mural paintings

are carried out. Outline and flat tones of colour alone were introduced in representing symbolical figure subjects—generally drawn in profile—on the white plastered walls. The colours used were not those of fresco, *i.e.* earth colours, but brilliant purples, pinks, green, blue (a smalt or deep blue glass coloured by copper oxide), red, yellow, carbon-black and a powdered-chalk white. A full recognition of conventional decorative principles was maintained in their design. In the accessory decorations of the columns and on various other objects the Egyptians introduced several patterns, the subjects of which, suggested either by geometrical forms or by natural objects (as different parts of the lotus and papyrus plants), are so valuable that they have inspired artists down to the present day. Richly coloured glazed bricks and tiles—modelled and stamped in relief with figures and hieroglyphics, and coated with siliceous enamel—were employed for cornices, mouldings, and wall-surfaces by the ancient Egyptians, and by the Assyrians in the palaces of Babylon and Nineveh.

The frieze of enamelled brick tiles represents a group of "Archers," from the Palace at Susa, 500 B.C.; it is now hung in the Louvre, Paris. The whole decoration is about 14 ft. high, and the figures are life-size. The colour scheme of the background is of a blue-green; the figures are draped in a yellow colour and are in relief; the ornaments on the draperies, spears, and borders are yellow, picked out with white. The general design shows Assyrian origin in a style of Greek drawing and motive as may be seen in the plaster cast in South Kensington Museum.

Coming to another art, namely, Mussulman art, it will be found that, from religious scruples, it refrained entirely from the representation of the human figure. It reached, however, a higher style of development in the science of ornament than even that of the subsequent Middle Ages, where we find the rise and culminating point in the evolution of mural painting. In Moslem art we find

reliefs sculptured in marble and stone decorated with patterns mostly geometrical, and covering large surfaces, broken up into panels by bands of flowing ornament or Arabic inscriptions. Rectangular earthenware tiles are also used covered with white slip, painted in brilliant colours, and decorated with conventionalised forms of flowers or the growth of trees with branches and blossoms spreading without repetitions, or with geometrical designs (which possessed in those days a symbolic significance appealing to the Oriental mind) forming regular repeats.

One of the most striking features of Greek art is the perfection of its proportion. The general dimensions of the Greek temple, the height and thickness of the columns, and the design of the pediment show a fine sense of judgment in their treatment. In shape the building is rectangular, with doors and no windows, surrounded on all sides by single or double rows of columns which support the roof. On the two shorter sides the roof forms a triangle, the *pediment* adorned with statues. The upper parts of the walls were decorated with bas-reliefs of figures and animals, forming a *frieze*, as in the Parthenon, Athens, and the *architrave*, decorated with reliefs (*metopes*). The METOPES, frieze and figures from the pediment of the Parthenon by Phidias, are now in the British Museum.

The Roman fresco painting may be studied in the mural decorations of Pompeii and Rome. It is usually broken up by pilasters, columns, and other architectural forms painted with panels of a black, yellow, or deep red colour in "fresco buono." The colour being laid on while the stucco was moist necessitated use of earth colours. The subjects introduced on these panels in a second painting of "tempera" were painted in more vivid colours; either this or the encaustic process was used, hot melted wax being brushed all over, and a red-hot iron held near the wall so as to make the wax disappear into the absorbent stucco. The subjects intro-

duced were generally taken from history or mythology, *genre*, still-life, landscape, and decorated with more fanciful patterns of scroll work, foliage, figures of boys, animals and birds. We pass Byzantine and Early Christian art.

The art of the Italian Renaissance, with its varied characteristics, though it borrowed many forms from the newly-discovered treasures of antiquity, had nevertheless none of the serene spirit of the classical Athenian school. It was further animated by another spirit, that of Christianity, then expressed in a religion of suffering and asceticism.

An initiator of this period was Brunellesci, who built the dome of St. Maria del Fiore, between 1420 and 1434.

During this period sculpture and painting still remained entirely dependent upon architecture. Gradually civil architecture became more imposing than the ecclesiastical, and the form and character it assumed may be judged from the palaces of the Florentine nobles, such as the Riccardi Palace designed by Michelozzo. This, while retaining externally the appearance and severe form of a mediæval fortress, had in its inner courtyard numerous "grotesque" decorations on its pilasters and vaults (grotesque, a term derived from the decorations on Roman tombs known as "grottoes"). This style of decoration was used for borders to frescoes, and by Perugino, and still survives. Giotto's beautiful Gothic campanile at Florence was finished by Talenti in 1358. At one period it will be seen that the reliefs and statues introduced in buildings tended to preponderate over the constructional design, as in the Certosa in Pavia. It was to counteract this tendency that Bramante emphasised the constructional "non-decorative" aspect of a building by the use of columns and pilasters in his first design of St. Peter's in Rome.

A fine specimen of high ornate art is to be found in Jacopo Tatti's library of St. Mark, Venice, with its Doric

ground-floor, Ionic first-floor, and frieze and balustrade enriched with figures. As an isolated phenomenon, a resurrection of the antique idea may be noted in the work of Nicola Pisano, who in 1260 carved the pulpit of the baptistery, Pisa. Gothic in form, it is decorated with bas-reliefs imitated from those on Roman sarcophagi. Under the influence of artists of this and the next period the arts of painting and sculpture were detached from architecture, and began to develop on individual lines.

In the earlier frescoes the arrangement of the subjects of the pictures was usually a very simple one. *Balance* was first sought for in the *evolving* of the composition.

The stories of the Bible were told with single figures on elementary landscape or architectural backgrounds, the design being founded on mathematical shapes, as the *circle*, showing continuity, the *triangle*, suggesting stability, the *cross*, mechanical resistance, or a *vertical* line was placed in an *angular* composition, or this was based on a *horizontal* or *rectangular* one.

Next *lines of beauty* were sought, as the letter S, giving *grace* and *movement*. With the advance of Art, works founded on *compositions* of groups or on *light and shade* were evolved, and the quality of *principality* was given by *emphasis*, *contrast*, *sacrifice*, or by *breadth* of or *elaboration* of *gradation*.

Tintoretto brilliantly shows the elements of a composition founded on a star in his "Marriage of Bacchus and Ariadne." Expression was obtained by *suggestion*, *mystery*, *simplicity*, *reserve*, or *relief*.

With the advance of the art of *perspective*, a great variety of mixed forms of arrangement was arrived at, and another variety of form of composition was suggested from *monograms*.

PAINTING.

Duccio who lived between 1282-1320, having seen some Byzantine painting and enamel work, appears as the first painter of pictures (*per se*). These were designed from subjects in the painted chronicles (vellum) of the Middle Ages. Next comes Giotto, the real father of fresco, and the first of the great Florentine painters, who painted his frescoes of "The Life of St. Paul." In these he was partly inspired by the Gothic style of Giovanni Pisano, but above all by nature itself.

In the fourteenth century we pass Orcagna's fresco of "The Triumph of Death" with its conventionalised landscape background. We come to the most important decorator of the time in Masaccio, whose frescoes were a source of inspiration to many other artists. In the Church of the Carmine, Florence, he used the medium without any retouching, and obtained a richness of colour rivalling the strength of oil painting itself. In these decorative works he treated his subjects with great simplicity, placing his figures in an effect of even light, and obtaining harmony from the local colour of the draperies, flesh, ground and sky. His pictures decorate by colours and masses.

Florentine painting is essentially the filling up of well-drawn outlines with local tints, graded as light, middle, and dark.

As an adjunct to fresco or tempera painting, gilded gesso, limited to relief of patterned backgrounds, ornaments on draperies, or on the borders and frames to pictures, was frequently used.

Gesso consists of a thin coating of fine plaster, mixed with size; it was used on dry stucco relief, or on terra-cotta or stone, as a form of raised or modelled plaster work; it was often stamped with designs and coloured or

gilded. Another form of gesso, composed of plaster of Paris, or whiting, and size or glue mixed together, and applied as a paste with a brush, is still used for the decoration of picture-frames, the plaster or wood being previously made non-absorbent by a coating of shellac or varnish.

SURFACE DECORATION.—As a rule, from the 13th to 16th century, starting with the works of G. Pisano and Cimabue, schemes of wall painting were commonly carried out in fresco. Considerations of structural fitness were in time gradually overshadowed by the attraction of *surface decoration*. Originality was occasionally shown in *organic decoration*, but it was often eclipsed by the subordinate quality of surface decoration, resulting in a tendency towards a mere striving for richness of effect.

The method of treatment differed from that employed in Byzantine Church Art, which consisted mainly of geometrical or inorganic motives and forms carried out in "*marble veneer*," usually placed as a "*dado*" on the lower part of walls with mosaic above, or of alabaster squares, arranged over the whole wall, and divided into panels, &c., by bands of marble and coloured mosaic.

The FRESCO subjects were chiefly designed with figures illustrative of biblical legends, and these pictures were usually placed on the *upper* parts of wall-surfaces over a dado varying from 6 to 8 ft. in height.

LESSON II.

Fresco-Painting.

The method of mural painting for external and internal decoration practised during the thirteenth to fifteenth centuries was *fresco;* that is to say, the colour mixed with *lime* was painted on *freshly-laid plaster* while *moist.* This was done in order that the colours laid on a wet surface of lime plaster should dry permanently with it. Fresco dried quickly (from one to two days), and gave a semi-transparent quality even to opaque colour. The plaster itself set in the taking-up of the water. The colours used were *earths* (mixed with lime), *i.e.* white (calcined travertine), bianco San Giovanni or lime, black (charcoal or chalk), red (cinabrese), a red earth, burnt ochre, sinopia (light red), terra-vert, light and dark ochres, giallolino (a light yellow), and amatista (a purple-red), mixed with pure water as a vehicle. Cennini tells us that the plaster was prepared and laid in sections after the first preparation of the brick-base had been made; this base, if possible, was slightly raised by bricks on edge, and secured by leaden clamps to keep the damp away. The layers of plaster were made of (1) lime mixed with powdered brick or gritty sand (pozzolana), (2) lime and pozzolana, (3) lime and powdered marble. For the actual fresco-painting (4) the last coat (intonaco) was made of lime and gritty sand, left with its natural surface. In the process of painting the earth-pigments are laid on the moist plaster, and remain, technically speaking, on the surface, and do not sink into the wall.

Method.—The method followed by these artists was first to outline their subject with charcoal on the cartoon which had been squared off to scale to the original preparatory design, and then the outlines were drawn with a sharp iron instrument through the paper on to the wall; after this, for painting in, ochre and water was used, the light and shade and details being added with terra-rossa thinned with water. In the preparation of this

intonaco, it was spread only in such portions of the work as it was desired to paint upon at once. The plaster not painted on was cut away, and the next day a fresh patch was laid and joined up. Squares were again marked off, and the *outlines* of the figures were re-drawn on the wall while it was damp and painted in colour, in *flat tones*.

The flesh-colour was painted from three pots of prepared "flesh-colour," made of lime, bianco-sangiovanni and red (according with the desired three tones wanted), the lighter tints containing a larger quantity of lime.

Vasari relates how in some cases the fresco was finally retouched with *distemper* made from a mixture of both parts of an egg and the fluid from the fig tree, the size from glue or from gum tragacanth (soluble in water). The addition of distemper on the fresco sometimes proved dangerous, as the two mediums did not always unite, for the egg, gum, and size are chemically affected by the lime of the buon fresco. Many of the highest lights which were added where necessary have since turned colour, the white lead and the addition of size or gum sometimes turning to black.

Painting in Tempera (Latin *temperare*, to qualify by mixing, to regulate).

In *tempera* painting the colours are ground in water and used with size and white and yolk of egg, or they are prepared with starch. The dry powdered colour is worked on any *dry* ground and used with yolk of egg as a vehicle. The colours used are—white lead (biacca), orpiment, cinabro (a red oxide), light blue (used with size or gum to prevent it turning green from the yolk of egg), vermilion, lake, verdigris, and indigo ; a number of paintings in this method hang in South Kensington Museum.

In the process of painting over the preparatory fresco grounds which were laid on the wet plaster and allowed

to dry, the distemper colours used were, for instance, terra-vert (in "early" work) or grey for the shadows of flesh; grey, black, or red for the foundations of brown; blue or purple draperies, a red for blue sky, and black for the base of tree foliage. The flesh colours used were similar to those named above, mixed with white lead, upon which lighter tones to mark the highest lights were painted in solid impasto, and finally the outlines were touched in with sinopia (light red) or black. Draperies were painted with graduated colours in a similar way, with the lights hatched-in.

In treatment the effect was generally obtained by an even light, and richness was got by local colour of the draperies, the ground or the sky. No opposition of light and dark is given, and no relief, the decorative effect of the picture being due to colour and masses.

The light effect is given by the tones of the flesh and the draperies, transparent colour showing the ground through being used, and the shadows are treated with thick paint, thus reversing the process in ordinary oil-painting.

In recent times, by the introduction of the following chemical colours, a fuller palette is now used: raw and burnt terra di Siena, burnt ochres, lake-coloured burnt vitriol, purple burnt vitriol, raw and burnt umber, chrome green, cobalt green, cobalt and burnt Cologne earth (black). And as a vehicle, a mixture of raw egg and vinegar, or for scene-painting distemper colours mixed with size, painted on a basis of whiting, is used.

To obtain light grey, lampblack is used; for pink, rose pink; salmon, Venetian red; lilac, indigo and rose pink; Fr. grey, Prus. blue and lake for blue, cobalt, or Prus. blue or indigo. Em. gr. from indigo, or Prus. blue and chrome, or yel. ochre, or from emerald green.

For orange, Dutch pink and orange lead is used; for a buff tint, yel. ochre, with the addition of Venetian red; for a drab tint, the umbers. These colours are applied with hot size.

Botticelli, though not a colourist, frequently employed colour to emphasise his drawing with its "continuously-flowing line." He showed a real strength and subtle vitality in his art, which qualities may be seen, for instance, in his two frescoes now in the Louvre, Paris. These qualities do not seem always to have been fully recognised by his later admirers.

Mention must be made of Luca Signorelli's fresco, "The End of the World," at Orvieto, and his fresco, "The Triumph of Chastity" (No. 910), in the National Gallery, London.

Coming to the Venetians, we find Mantegna's carefully-executed tempera frescoes. Those from the collection of Ludovico Gonzago, the Duke of Mantua, are now in Hampton Court Palace. Composed in a classic style under Gothic influence, they combine a severe correctness of form with a healthy vitality, the highest qualities of art. A wonderful mastery of the art of perspective is shown in the way these designs are adapted to the elevation they originally were intended to occupy. They are nine in number, each 9 ft. square, and are painted on cloth, as are his pictures in grisaille of "The Triumph of Scipio" and "Samson and Delilah" (Nos. 902, 1145), in the National Gallery, London.

In Milan, on the walls of the refectory of Santa Maria delle Grazie, there are still the ruins of Leonardo Da Vinci's "Last Supper," a ruin caused by its being partly painted in oil-colour. A contemporary copy in oil, of the same size, of this work hangs in the Diploma Gallery of the Royal Academy, Burlington House.

RAPHAEL'S STANZE.—Raphael's early work was influenced in a high degree by the decorative works of Pinturicchio—painter of "The Return of Ulysses" (tempera), National Gallery, London (No. 911), who worked with Vannucci, Perugino, the author of the fresco No. 1441, now hanging in the same gallery—and by the works of Timoteo Vita. His later work, the decorations of the Stanze in the Vatican, shows in the historical and

allegorical composition of his subjects a curious fusion of Pagan and Christian spirit. The subjects of the Loggia, partly executed by his pupils, are inspired by early Roman paintings. All these were done in fresco, as was Andrea del Sarto's painting of "The Last Supper," at San Salvi, near Florence.

MICHAEL ANGELO'S PAINTING ON THE CEILING OF THE SISTINE CHAPEL.—Michael Angelo, sculptor, painter, and architect, shows the method of fresco painting perhaps at its highest in its differentiation in quality to the medium of oil.

His method of work appears to have been first to make sketches and studies of his model, and to prepare a full-sized cartoon on paper (squared off), which he fitted to the fresh-laid intonaco, the outline being then produced by the pounce-bag through pricked holes or marked through the cartoon-paper with a stylus. Next the local colours were laid in, the modelling done in cool shadow (grey), and the light painted with a full brush and softened into half-tint; the dark parts were then added. He did not repaint in distemper, but sometimes glazed in washes with a thin coat of black-grey mixed with size.

Michael Angelo took four years to paint the ceiling of the Sistine Chapel in the Vatican. The whole is a vision of striking energy and grandeur, representing the Prophets and Sibyls, seated slaves, statuesque figures, and including a number of pictures, scenes from the Old Testament. Giving the highest expression of line and form, he treats only of "local colour" in pale tints and chiaroscuro; he was indifferent to landscape.

Michael Angelo's plan was carried out on the bare ceiling, which comprises the roofing and comes down the walls to the line where the windows with their arched tops begin. The central part of the ceiling is flat, but from there it is slightly vaulted, the pendentives ending between each two of the twelve windows on either side of the chapel's walls. There is no ornament (*per se*) on the ceiling; the whole elaborate architectural

framework is painted. It is a stupendous piece of planning, with nine central panels and such architectural details as platforms, flanked by two boy caryatids on a double-base plinth holding a cornice on their heads, and pilasters, arches, and niches decorated entirely with figures.

The fresco of "The Last Judgment," a work which occupied him for seven years, is a truly personal vision of this tremendous subject with the human figure represented in every possibility of movement and line.

The frescoes of Correggio which decorate the dome of Parma Cathedral, have not always been as much appreciated as they should be by students; they show a fine power of design, and exhibit none of the sensual mysticism displayed in his oil subjects. Mention may be made of R. van der Weyden's tempera picture "The Deposition in the Tomb" (No. 664), in the National Gallery, London.

Tempera was in use at this date as the basis of picture-painting, oil colour being only employed to give a superficial glaze or lustre to this foundation.

As a decorative artist Paolo Veronese shows in his pictures luminous effects of lighting, and the splendid arrangements of rich costumes which together make up the outlook of the Venetian school. In design these subjects evince a freedom of joyous life, set forth in splendid colours, wrapped in an "envelope" of atmosphere. Among the various other artists of this school were Tintoretto, who sought for vivid contrasts of "light and shade," and Tiepolo, who exhibits great moderation and elegance in his works. This latter artist, it has been truly said, was the last of the "old painters," and the first of the modern, and nearly all the great decorators, including those of the nineteenth century, have been inspired by him. Several of his decorative pictures hang in the National Gallery, London. Charles the First's Banqueting Hall, Whitehall, now the United Service Museum, contains Rubens' ceiling painted in oil, as is also his Maria de' Medici series in the Louvre, Paris.

COMPOSITION—THE LAWS GOVERNING COMPOSITION EXPLAINED AND ANALYSED.

The use of composition is to enable an artist to knit the elements of his design together. All pictures and mural decorations—for they are closely related in their essentials—have the elements of composition in common, that should adapt a work perfectly for its purpose and material, in a simple architectural framing of upright and horizontal lines. The main idea having been found, the greatest difficulty consists in determining this arrangement and grouping.

In the case of the great originators and masters of art, we find that although the passionate quality of their work lies in its conception, the execution is elaborately calculated. Let us see how far certain rules are essential to the construction of every design and picture. *Concentration of effect* on the subject of the composition comes first. It is to be found in them all, and is particularly important in art. It will at once be apparent that *arrangement of line* by itself cannot entirely constitute composition, for effect of *light and shade*, *colour* and *perspective* also enter into the subject. This is seen in Leonardo da Vinci's oil painting of "The Last Supper."

LINES IN COMPOSITION.—A fixed rule was what was called *angular composition:* that is, dividing the picture by drawing a *diagonal line* from one corner of the picture to the other, and thus obtaining decorative spacing. An obvious rule is that of obtaining an effect by concentration of a mass of *light* surrounded by *dark*, or the reverse. Another rule is that in every subject there must be *balance* and movement. Again, there are certain parts of a picture that take the *light;* some that are *dark against light;* those that are *light against dark;* and others that are more lost or divided in effect. All this helps to give variety. Giotto frequently followed in his

frescoes a rule of repeating *lines* and *forms* to emphasise his subject, a large form being used for the principal figure, and smaller ones filling up the other parts of the design; and he occasionally treated his background like a piece of tapestry, and allowed the principal group, by an accentuation of colour in various shapes and sizes, to stand out from it. *Geometrical shapes* and *forms* were often used in the arrangement of figure pictures to give importance to the subjects; thus Raphael, composed several "Holy Families" in the shape of a *triangle* or *pyramid*. A *diamond shape* (as in his "Sistine Madonna") was used in order that the many features of the subject should be so grouped that each part might help to tell the story. *Circular* and *elliptical* composition was also used often by Botticelli, as in his "Madonna" (No. 275) in the National Gallery, London), being adapted for variety of light and shade. (This picture is in tempera varnished.) In another form of arrangement the figures and objects were composed on *concentric circles* round a central point, with lines converging to the centre of interest. In the beautiful cartoon of Raphael (painted in tempera) at South Kensington, "Christ's Charge to Peter," he gives the story of this subject by a series of progressive actions of the different figures and contrasts in their gestures, and has based his design of the figures on a *serpentine* line. This allows an opportunity for alternate masses of light and shade to come into the group. The old masters often introduced their *horizons* very low, to give fuller play to their cloud effects; this will be seen if the spectator looks upwards or is situated below the figures.

The composition of figures in a picture must not be so obvious as to suggest that they are only there to fill some otherwise *empty space, no figure* or *principal subject* should be exactly in the centre or central line of a picture, for the eye wearies of looking at regular forms and spaces. It will be found that *horizontal* lines tend to give an effect of repose. These may occasionally be broken by a

notch, and then continued, so as not to be too severe. Again, *perpendicular* lines, it will be noted, give *decorative* effect.

Michael Angelo, to suggest greater action in his figures, used a broken line.

In composing single figures to fit given spaces the square shape is the most difficult to fill, for of all angles the right angle is the most conspicuous, and it is in relation to these and the sides of the frame that the main lines of a composition of a picture are designed. Pyramidal and radiating forms of composition, round and oval lines, or any of these in combination or contrast may be useful.

In composition, to fill a given space, it will be found that it is quite easy to turn a figure round, if necessary, for the front and back view have often nearly the same outline. Again, the distance can be extended between two figures standing one in front of the other by suggesting more space in the perspective of the ground plan. This is due to short and long distance perspective.

It will be found that the point of sight and horizon determine many of the lines in a composition.

Again, in all "decorative art" there must be a beautiful pattern. This is the most distinctive difference between that art and picture composition, for it is not the thick line in the drawing that makes the decorative effect, but the qualities which the pattern must have—unity, balance, shape, &c.

Another method often used by Michael Angelo, ond amplified in our days, is the *rectangular method.* Instead of making the figures complete in themselves, the interest is extended by means of architecture and ground lines to a larger whole. The figure, not being made so important, takes its place as part of the picture as a whole, into which are introduced rectangular lines of buildings, a landscape or sea. The figure will then have a less pre-arranged appearance. A modification of the rule of always composing a complete figure in each picture is

allowable, and is often done by cutting off the lower part or any portion of the figure. This helps to give interest to the arrangement.

In decorative composition a head of a figure bending must not look too cramped, or as if it carried the frame on its head or arm.

Again, a part of the design was *emphasised* by lines leading to it, as in Leonardo da Vinci's "Last Supper," or by putting in most of the heads and figures complete, as in Raphael's fresco, "The Dispute of the Sacrament," Vatican.

EFFECT.—It will be seen that *lines*, although playing a great part in design, are to be harmonised and merged into the effects which the *light and shade* require in an oil-picture. The design without the effect of *half-tones and values* of different strengths cannot fill the scheme; the study of colour is also important. This leads to the classification of the two great divisions of artists: those that look for *outline* and *pure line* or *classical drawing* in their work as in fresco, and those that give the *picturesque aspect* and the effect of *natural drawing* in their efforts, Giotto and L. da Vinci being typical examples of the two ideas. In *classical* drawing, value of colour, again, can be used to suit the expression of the idea which is to be conveyed; for example, Raphael and Poussin purposely laid less stress on it than on their design; while Rubens, though a great colourist, for the opposite reason made beautiful drawings to aid in the expression of his colour values. Paolo Veronese's (Cagliari) drawing is as good as his colonr. Colour therefore, it will be seen, cannot be entirely disassociated from design, for the value of execution must be in accord with its conception.

A decorative effect will always be obtained if the shapes and colours are well arranged.

COLOUR.—*Colour* itself can be used either as simple colour or in values. Tiepolo, by the beauty of his *values*, gives a fair representation of light. By arrangement of colours in composition it will be found that they can

be divided into certain *hot* and *cold* tints, each relieving the other by contrast, thus giving harmony. Naturally, in a picture or decoration, the colours must be softened by the introduction of neutral tones. Again, an enormous range of the palette may be obtained by judicious arrangement in bunches, and by subdivision of some colours into more varied values and shades of the same colours. This was Veronese's practice, which he carried out with great skill. From the foregoing remarks it will have been noted that some of the old masters' conventions were based more on tradition than on the study of Nature, the continual observance of which alone can save the artist from mannerisms, and that others worked on rules formed from natural laws.

Again, some *colourists*, such as Titian and Rubens, represented the tones in their value and colour without the magic of light, and others were *luminarists*, who make light the most important thing. Later, Puvis de Chavannes found that by the representation of the colour of *atmosphere* he was enabled to carry the composition of Poussin and the antique, on which he had based himself, a step further, introducing aerial perspective and open-air effect.

The *key* of the picture having been decided, the old masters made their *base* of either yellow or brown for indoors, or grey for out-of-doors.

Then a picture was painted in a scheme of *silver* (or grey), using white, grey, green, blue, and black tones, or in a scheme of *gold* with the use of yellow, red, brown, and black tints in combination.

It has in later times been established by the study of values that on first going out into the open the effect of figures is that they are darker in tone than anything else in the landscape (and sky), and the horizon is found to be high above them. The sky, it will also be noted, will appear as the lightest part, except sometimes at evening, when the light of the setting sun falling on a figure makes the flesh appear lighter than the sky behind

it. A great variety and difference of effect will be found in the play of *sunlight on colour.*

When a subject is painted as a decoration or fresco, it need not be an exact study and impression from life, or a piece of realism, but it must be conceived according to the laws that govern this branch of art. The composition must be adapted so perfectly to the place it will occupy that another arrangement should be impossible. Starting with a preliminary designed cartoon of what forms and colours he wishes to introduce into his picture, the artist can paint it from studies or lay it in direct, painting on the wet plaster in certain pre-arranged schemes, and then use studies of the living model to help out the subject.

Outline drawings will also be of service. Enlargements from small drawings, &c., can be made by squaring them and placing the forms in larger squares in the same proportion on the cartoon, the outlines of which he can trace on the wall through the paper with an iron stylus.

A knowledge of painting and the rules of composition is not originality, nor is it harmful to its development, for originality consists in expressing your own impressions with sincerity, and not entirely from method, but from thought and feeling also. What one must seek for is character, which is life expressed in movement, form and colour. These qualities give strength.

Originality to-day may be exercised upon subjects which did not exist in the times of the ancients, or they would assuredly have used them. The beauty of the world around; the force and surroundings of machinery; the mysterious power of steam and electricity; the workmen at their labour, at rest or conferring; woman, the mistress of the art of grace, and other such subjects, to the observant, will give abundant material for original composition. In historical composition there is selection of character, the costume of the period, time of day, effect, texture, &c., to be noted.

NOTE ON RECENT WORK.

The examination of modern works shows a continued employment of the various methods for decoration already described. All mediums of painting, modelling, wood and stone carving, sgraffito, coloured plaster and gesso work, mosaic, &c., are found therein. The art of fresco has been carried to a high state of perfection, and the name which in recent times stands pre-eminent is that of the great Frenchman, Puvis de Chavannes. In the subjects decorating the Sorbonne and Pantheon at Paris, and the Museum at Amiens, he suggests poetry, symbolism and "plein-air," and presents the human figure with a simplicity of attitude akin to the spirit of Giotto. He places his subject groups with great skill against atmospheric landscape-backgrounds, and makes the grey-blue colour and the white tones of his pictures harmonise with and form part of the stone walls on which they are painted. He thus obtains a complete decorative unity. He was chosen with J. S. Sargent and E. A. Abbey to paint the decorations in the Boston Library, America. Mention may be made of J. McNeill Whistler's original decoration in gold and blue in "The Peacock Room"; and, among other mural decorations, the mosaics in St. Paul's Cathedral; the spandrils under the dome are decorated with designs by Alfred Stevens, G. F. Watts, and F. Britten. A design, evidently for fresco, by William Blake, hangs in South Kensington Museum. Various rooms in the Houses of Parliament, Westminster, are ornamented with certain "water-glass" paintings. This method, which was perfected in Germany, consists of employing paint, on prepared plastered walls, in a similar manner to water-colour painting; the work, when finished, is covered with a chemical solution that hardens and protects the surface. Frank Brangwyn used it on the external decoration of Bing's shop in Paris.

G. F. Watts executed a wall-painting in pure fresco in the Hall of Lincoln's Inn, and Lord Leighton decorated a panel in Lyndhurst Church, and two lunettes on the walls of South Kensington Museum. For these and similar paintings he employed a "spirit fresco" medium prepared from Gambier Parry's receipt by Roberson, and used for the panels in the ambulatory of the Royal Exchange. The ground used as the foundation on the plaster or canvas contains resin, wax and oil of spike, and the method consists of employing a spirit medium with prepared colours. There are also frescoes by Ford Madox Brown in the Manchester Town Hall, and various works by Albert Moore, and the decorative works of Rossetti and Burne-Jones.

OIL PAINTING.

"ANCIENT BARTER." BY HENRY F. W. GANZ.

Ordinary oil-colours can be used on canvas, which is flatted with wax varnish and spike oil, and afterwards cemented on to the wall. This marouflage or cement consists of a combination of white lead and oil, with a small admixture of resin melted in wax. These ingredients are laid on cold and plentifully on the back of the picture laid face downwards, and also on to the wall. The painting thus prepared is placed on the wall and rubbed down with a cloth or rollers, the edges of the canvas being pressed for some little time.

Technical notes on the use of oil-colours will be found in my "Practical Hints on Painting," &c.

SPIRIT FRESCO PAINTING.

According to Gambier Parry's method, a dry porous wall-surface, or stucco (lime and gritty sand) is prepared, this gives a rough texture. A medium of highly inflammable chemicals, consisting of elemi-resin, white wax, copal, and oil spike lavender, is prepared by heating process. The wall-surface is splashed with this medium mixed with turpentine, and then allowed to dry. Over this the medium, mixed with equal quantities of pure white lead and gilder's whiting, is thickly painted, and again left to dry. The result will be an absorbent white surface. Spirit fresco can also be used on canvas of a strong texture.

In painting the colours may be used as in buono or pure fresco painting (in a direct manner), and a full body of colour applied with the brush dipped in *pure* oil of spike as a vehicle. For repainting, spike oil should be used with solid colour. In this method, care has to be taken that in applying the turpentine on the wall-surface it should not be allowed to run, or it will give a shine to the painting by bringing up the resinous ingredients of the ground.

In this process all the permanent colours (as in oil painting) can be employed, for the antagonistic quality of lime has not to be reckoned with and the white used is flake white. Messrs. C. Roberson and Co., of 99, Long Acre, and Piccadilly, London, prepare the various materials

LESSON III.

MOSAIC.

Mosaic is the art of decorating surfaces with small stones or glass or marble cubes (tesseræ) so as to form pictorial designs by means of the varied colours of these materials being mechanically set together.

Mosaic may be used to decorate flat or variously-shaped surfaces, and also for decorating stucco-relief. The earlier Roman marble-mosaics were used for flooring, and the subjects chosen were generally geometrical patterns. In the later periods, figures and other objects, treated conventionally, were introduced into the designs. Several examples of these are in the British Museum.

THE PROCESS.—A bed of plaster was laid on the base, and the shape of the design sketched out with a wooden or metal point; the tesseræ were then stuck in, in their required places, and the surface finally polished. Great effect was given to the general texture of the surface by allowing the cement joints to show. The range of colour in the marble employed, always subordinated to the pattern study, was very great. A variety of subdued tints of red, yellow, green, brown, blue, grey, black and white were chosen. Small cubes and slabs of marble were used for floors and pavements, and small cubes of opaque glass for complicated pictures on wall-spaces.

The ancient Greeks frequently used mosaic let into slabs of marble in their floors, and the art spread thence to Byzantium and Arabia.

In the Middle Ages, the Italians used glass mosaic and mosaic tiles, as in St. Mark's, Venice, and introduced gold as a background to sculptured figures of saints, designed in small squares on walls (examples in South Kensington Museum). Gold mosaic was scattered amongst mosaics of coloured glass, until the rise of

wall-painting overpowered the art. Later specimens may be seen in the decorations of the new Westminster Cathedral.

METHOD.—In glass mosaic small pieces of varicoloured opaque glass tubes or rods are put together in a certain design on a soft bed of plaster on the wall-surface, and then broken off with a pair of clippers. There is no rubbing down of the surface in this process, as the natural fracture of the glass used gives a *lustre* of effect. The design for mosaic should suit the medium employed, and appear other than a translation of an oil painting. It should suggest breadth, effect, quality and repose without losing the sense of small touches. For this purpose the cartoon may be prepared in crayon on white paper tinted with broad masses of colour, or on brown paper with coloured pastels.

The wall of stone or brick, or the pavement, must have its surface first prepared, either by notching the stone or by knocking away part of the cement between the bricks, so that the cement ground may hold well. This surface is thoroughly oiled to prevent suction, and lime cement is applied in several layers. The surface of the mosaic is formed by the fractured edge of the glass cubes, broken off after being planted in the last layer of the cement.

The prepared *cartoon* or original design is squared off, and a paper squared off to the relative size required is attached to the plastered wall with *white lead*; the work is then *drawn-in* and *tinted* in sharply defined masses of colour (broken colour being used wherever possible); an *awl* is used to pierce through the outline of this cartoon into the plastered wall. The cartoon is then taken down and cut up in pieces. Each piece is then redrawn on tracing paper; the cement drying rapidly, the wall corresponding to these pieces is covered with cement, as each portion is desired to be worked on. On this freshly laid cement the different pieces of the tracing are applied, and the outlines are pricked through the paper on to the wall.

The work of putting in the "tesseræ" is started, beginning at the outlines and working inwards.

The different coloured tesseræ are laid down in a shallow box or tray, and the tools used are a pair of *clippers* to shape the tesseræ, a pair of tongs to handle them, and an *awl* to prick the cement for their insertion. The effect resulting from the uneven surfaces of the tesseræ will contain a variety of reflecting lights. In the less satisfactory process of executing the work away from the wall, the tesseræ are placed on the reversed side of a tracing, or drawing on brown paper to the design, and pasted on this paper laid flat. Over this plaster is poured. The whole is then reversed, and cemented on to the wall or floor, after which the tracing or brown paper is washed off.

The result will be an even surface of mosaic that is perfectly flat without any accidental effects of gleams of light.

A NOTE ON SGRAFFITO OR INCISED WORK.

Sgraffito (Italian, to scratch) is a method of work in plaster-stucco used in ancient times and by the Italians of the seventeenth and eighteenth centuries, and now revived. It is used for internal and external wall decoration, and can also be applied on vases of different surfaces. An example of this art may be seen on the outside wall of the Royal College of Organists, Kensington Gore, next to the Albert Hall.

The process consists in applying to the wall coloured mortars or cements in thin layers over one another, and in scraping a part of one layer away in order to obtain the various desired tints of a pre-arranged pattern.

A colouring substance of the tint for the pattern required is first mixed with mortar or cement. This is applied after the wall is well watered, and when nearly set the cartoon is nailed to the wall and the designed outline pricked through or marked with nails. The holes made by the nails are necessary for guidance in the laying of the various coats of plaster. Another coat of plaster of the colour intended for the ground is then prepared and laid in the same way. The design may be incised in the plaster with a stylus, or a mould of tin, the exact outline of the pattern can be pressed on to the surface of the plaster on the wall. With a sharp tool the upper crust of plaster is then cut away down to the face of the lower coat, and the work is completed. Several colours can be used in a similar way.

The sgraffito process demands a quick method of working, and is more closely allied to drawing than modelling or painting. Limited as are the results obtained, they may vary as follows: White lines and spaces raised and relieved against coloured ground; coloured lines and spaces sunk on a white surface; intricacy relieved by simplicity of line, or again relieved by plain spaces of coloured ground on white surface.

A NOTE ON STAINED GLASS AND PAINTED GLASS.

This is the art of either introducing transparent colours and outlines by fusing on to glass, or of putting together complete pictures composed of different pieces of coloured glass. The purpose of all stained and painted glass is chiefly for the adornment of the building in which it is placed, and should be subordinated to the effect of the interior as an architectural whole.

The design once decided upon, the work is carried out either on clear glass *painted*, or *stained glass*, of chosen coloured pieces of different shapes and sizes, with the shadows painted in silver stain; these are united by grooved strips of lead into which the pieces of glass are inserted. By these means large compositions are possible. In some cases a piece of coloured glass is fused on to another piece. The essential difference between *coloured* and *painted* glass is that coloured glass is a mosaic. It consists of small pieces separated and joined together by thin grooved strips of lead; *coloured glass* is obtained by a mixture of metallic oxides whilst in a state of fusion (pot metal). It is full of varieties of a given colour, is uneven in thickness, and full of little air-bubbles (knobs or bull's-eyes) which allow the light to pass through with a variety of effect. The fine lines and hatchings are painted with "silver stain" or *scaglia* (the scale off heated iron). The whole is held together with leaded "cases" and fastened in tne window by horizontal iron bars (armatures). A *painted window* is painted on a plate of translucent glass, and the design and colouring applied with vitrifiable colours. These enamel colours are the product of metallic oxides combined with vitreous compounds called fluxes under strong heat; the colouring matters are thus fixed on the plate of glass. Red becomes *yellow* when fired; yellow,

white; blue, *green*. Ruby red is obtained from gold, yellow from silver is also used at the back of the glass over the partly scraped red ground which is scraped away after the firing to allow this to show through. Certain spaces may also be cleared away with a thin hog-hair brush for high lights. After the process of painting, the glass is laid down in an iron muffle with various layers of cinders mixed with burnt lime, and then put into a furnace with a slow fire until they become glowing, when the colours become red-hot and run, and are incorporated with the glass.

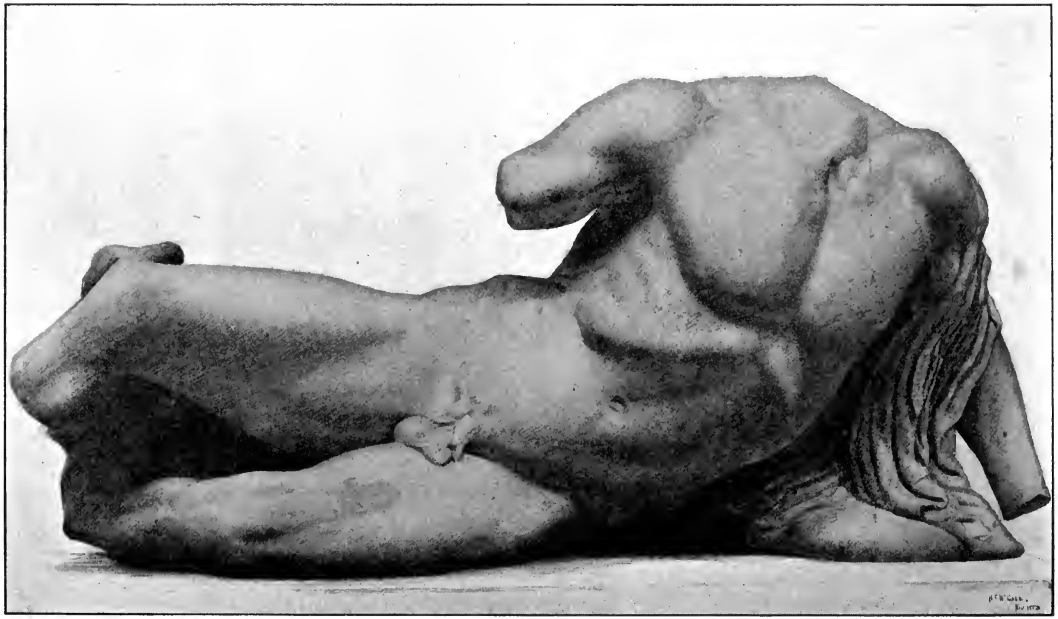
In working the stained glass process, pieces of glass, broken from large glass bottles of various colours, are cut up to fit to the outlines of the preparatory cartoon, in order that the leadings may coincide with these. This work is usually started by a preliminary arrangement of the pieces on a wooden tray or frame, the outlines being marked with a brush dipped in white lead and the pieces numbered. The pieces are then cut to measure, after first drawing with an emery point over the upper surface of the glass along the outline. This line is then damped and a red-hot pointed tool passed over it; the glass then cracks and snaps off from the sheet, and may be trimmed with the grozing iron.

A strong sense of style is necessary for this, especially for large windows, on account of the arrangement of the cross-bars of the supporting framework, which gives the whole window its requisite strength. This construction should not interfere with the lines of the composition, which they should break and disturb as little as possible. The art consists in designing a suitable cartoon with attention to colour, lines, and forms, and the successful arrangement of the leading and beauty of tints of the glass.

It is said that stained glass was originated by the glass-mosaic workers. Coloured glass windows existed in St. Sophia, Constantinople in the sixth century. Of the time of the Middle Ages, some of the earliest extant are

to be found in the small "early" round windows in the Bavarian Monastery of Tegernsee (date, end tenth century). The development of the Gothic style, with its widening windows, in the twelfth and thirteenth century shows many single figures draped in rich red colours, generally seen against tapestry backgrounds; landscape and architectural background were not introduced till the sixteenth century. It is of interest to note that Gothic tracery in the windows is set out on the principle of geometric intersections. In tracing the history of stained glass on the Continent one regrets to find that many of these have been destroyed during the Reformation. In England, however, the art was always highly cultivated; in fact a continuous tradition has existed. It was improved by the pupils of Bernhardt von Linge of the Netherlands, at the time of James I., and they are responsible for the still surviving school.

STAINED GLASS WINDOW, PETERHOUSE COLL. CHAPEL, CAMBRIDGE.
(From design by P. P. Rubens.)



PHIDIAS' "ILLYSUS." (Marble.) HENRY F. W. GANZ.

MODELLING.

A Definition of the Theory.

Sculpture is the art of *representing* or *imitating* in *plastic form*, figure or other subjects, suggested by Nature or the imagination. Sculpture in *the round* gives shape in *solid form;* that is, it gives the three dimensions of length, breadth, and depth.

The work may be carried out in a variety of materials, such as clay, bronze, marble, ivory or stone. The representation of the subject in *the round* may be worked out in different manners.

In the case of *reliefs*, which only give *incomplete* solid form and reproduce the proportions of objects in two dimensions, length and breadth, with a suggested representation of the third dimension, the modelling may be slightly or strongly brought out from the ground, in the sense of *high* (alto) with the figure sometimes almost completely detached from the ground, *low* (bassi rilievi), *high* or *half* (mezzo rilievo), or *flat* relief (stiacciati rilievi). Reliefs are only to be viewed from the front, and are usually attached to a background.

The term sculpture is used in several meanings, not only with reference to the material used for the work, but to the handling of the material; it includes the cast, metal work, chiselling, carving, stone-carving, and the art of medals, &c. Differing from the painter, with his single view outlook, the sculptor works "on the round." He indicates *form* from the observation of his model, which in sculpture is everything, and form in a deeper sense than "contour."

While the sculptor models boldly in *the round* for *realism*, he can get *delicate light and shade* by low relief, the subtlest qualities of the losing and finding of a design or form, as well as other properties of the objects'

boundaries as *the outline* (or rather countless outlines seen from every side), and masses of *light and shade* formed by *projection* and *recession*. Sculpture in the round means solid modelling, real light and shade, many and various contours on the same or a different scale of an object in its proper proportions. Relief sculpture in its forms is more closely connected with architecture; its principal subject of imitation is similar to that of sculpture in the round, but when connected with architecture its features may be modelled on a scheme of ornament. And as this art compels the artist to introduce backgrounds, he can include other objects in his representation, as landscape and other forms, but he is limited to one outline or a section of an object. Seen from a particular point of view, figures may be placed in front of one another in a varied treatment of outline. The effect of this art is given exclusively by a single contour, and its treatment of light and shade. The art in principle resembles rather graphic than plastic art, and is closely akin to the art of drawing.

THE PRACTICE.

The Essentials for Sculpture.

A piece of sculpture has to go through several stages from the model *in clay*, or *wax* on an *iron support*, to the *cast in plaster*, before it arrives at the final state of being a bronze or marble.

For most purposes a preliminary study is usually sketched on a small scale in clay or wax.

The beginner's first studies with clay on a board should be the various features of a head, or a head somewhat larger or smaller than life, as well as studies of hands and feet.

Technical Note.—Process of Modelling.

To model a figure, a sort of iron *framework* is set up, with cross-bars on which thin *lead-piping* is attached, for the foundation of the arms and legs, bent into the position required for the future figure. The leg-irons are then fixed on a *wooden stand* with this *armature*, and placed on a *turn-table* with a revolving top, in order to turn the whole model round in either direction, and to allow the work to be carried out from every point of view with the light from any side of it. Over this iron skeleton (a sort of scaffolding of the intended bony structure of the figure) modelling clay is applied and manipulated with the fingers first, and then with wooden modelling tools.

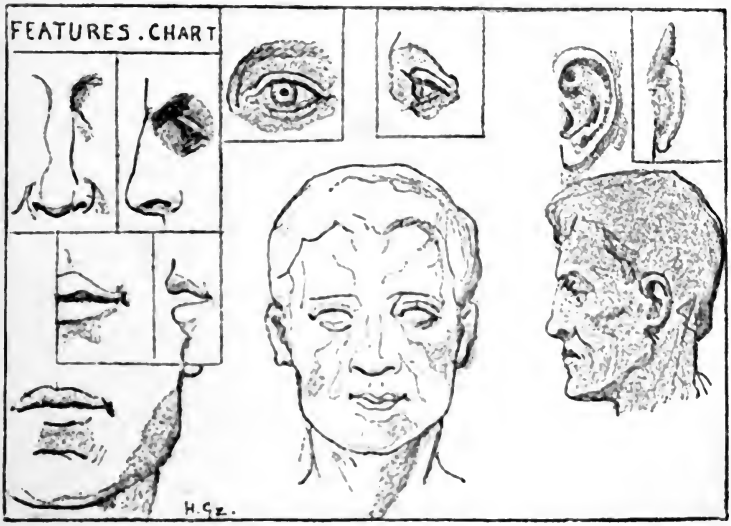
Measurements, from which the sculptor invariably works, are taken from the living model with calipers to be conveyed to the clay model he has in hand. Working on the principle of depth as his base with the smallest amount of clay, the sculptor proceeds to *build up* by *adding* thin slips of clay. From this solid foundation

he continues to produce his model, *always* by *adding* to the foundation and *never taking away* or carving the clay. Having commenced with measurements to which he makes his model accord, he continues to produce *form*, he next imitates the *light and shade* of his model, and finally seeks and compares the drawing of the object he has before him with his clay model from every side.

The *clay* used in modelling will have to be kept in a moist state by spraying water over it with a syringe, and when the sculptor is not at work on his model it must be wrapped in damp cloths or, better still, placed in an air-tight case. The work proceeds always by the addition of small pieces of clay until the state required for *casting* is reached. This casting is done either by what is termed a *waste-mould*, for the production of one cast only, or, by a *piece-mould*, generally taken from the cast thus produced.

ANTIQUE STATUE ANATOMISED. BY HENRY F. W. GANZ.

THE FEATURES OF THE FACE DESCRIBED.



To explain how to *model a head* we will take the different *features* first separately, *i.e.* the *nose, eyes, ears, mouth, chin, forehead* &c., and find what lines they are composed of.

NOSE.—The *nose* (the *front view*) starts from the *eyebrows* with two lines, which curve inwards and then outwards over the bony part of the "nasal bone" down to the *bridge*, under which they curve gently inwards. The cartilaginous part below follows, the lines curving slightly inwards and then outwards, circling down to the *point* where they meet. On either side are the *wings* (*alæ*), composed of curved lines, which run rather straighter along the *nostrils*, giving them in this view a rather small elliptical shape.

The *profile* of the *nose* consists of a short, straight, and then two slightly outward curved lines (as the case may be.)

The *nostrils* are of a longer elliptical shape, and the top edge is rather straighter than the lower edge, being slightly hidden by the *wing* of the nose; under the nostril is a slightly rounded line from the *tip* of the nose to its base.

EYE.—From the *front view* the *eye* is composed of a globe—the *eyeball* with the *pupil* and *iris*.

The *iris* is a circle of various tinted colours, which slightly deepen towards the edge (outside.) It surrounds the *pupil*, this being a circular black spot in the centre of the eye.

The *pupil* contracts in the light. Above the *eyelid* a curved form exists, along which the *eyebrow* grows, the hairs running transversely across it. The complete circle of the *pupil* is partly broken above and below by the *eyelids*.

The *top eyelid* (the more important one) is composed of two lines; the *upper* one—the top of the lid—is formed by a slightly raised curved line; and the *lower* one begins with an arched line near the nose, where it springs from the *corner* of the eye (*caruncula lachrymalis*), and then follows a long curved line. Under this line (as it were) the thickness of the skin gives the lower edge, from which the *eyelashes* spring, composed of slightly upward-curved hairs.

The *lower lid* consists of a more gently-rounded line, with a fuller one below it (formed by a little fulness of skin), and a small upper *surface* (the thickness of the flesh) above this. The *eyelashes* curve slightly downwards.

In the *profile* the circular form of the *eyeball and pupil*, under the eyelids, is well brought out. The upper and lower lids, having their outlines more in perspective, follow two short full-curved lines.

EAR.—The *ear* is a cartilaginous substance. In *profile* it consists of several rims (called the *helix* and *anti-tragus*), *inner* and *outer* gently curved surfaces. The *helix* is composed of a circular curve, and then a longer

curve running down to the *lobe* of the ear, and has two little thicknesses to it.

The *anti-helix* has a circular curve and then a longer curve running downwards, forming the one side of the *hollow*, making a nearly circular line. The *hollow* (*concha*) is bounded by a prominence called the *tragus* on the side near the cheek (a slightly rounded line).

The *anti-tragus*, in a circular line, also forms part of the lobe (lobule). The *lobule* consists of a line slightly curved downwards, and then circling upwards to the first line (the *helix*). The *joint* of the jaw is above the top of the *tragus*.

From the *back view* the ear forms a round and longer curved line, with a second circular surface inside it, the under part of the *concha* joining it to the head.

MOUTH.—The *front view* of the mouth, taking the right half, is composed of four lines, one above and one below each lip. The *bow-shape*, formed on the upper edge of the *top lip*, consists of a line making a short curve upwards, followed by a rounded part, and then a gradual curve downwards to the corner of the mouth. The *lower line* of the *upper lip* is straighter than the previous one, and consists of a short curve up and a gentle curve to the corner.

The *upper line* of the *lower lip* runs in a full curve downwards at each end. The lower line has a slightly fuller curve upwards, and then goes upward again to the corner of the mouth. *Above the mouth*, a slight *hollow* between two *columnar* forms is found, and the *surface* then runs to either cheek. *Below the mouth* another *concave surface* is found, which then gets fuller and runs downwards from the top of the *chin*. In *profile* the mouth follows similar lines a little more in perspective.

CHIN.—The *chin* (from the front view) is formed by a long oval-shaped line, having the *jaw-bone* as its base, and then curving more or less in a long line upwards to the *angle* of the jaw, and from thence in a gradual curve towards the *ear*.

FOREHEAD (the front view).—The forehead is composed of a flattened circle. The line formed by the hair at the top of the head usually follows a straight line, and then runs inwards and outwards towards the ear.

The *hollows* of the *temple* and bones of the *cheek* complete the face.

The *profile* of the forehead is formed by a line consisting of a short curve and a longer curve.

The general appearance of the head *from the back* is globular. From the top the line is slightly curved, and then becomes more curved towards the ear. Below the ear, on meeting the *muscle* of the *neck*, a straight line is formed.

With a curve towards the base of the skull, the *nape* of the neck forms a fresh surface.

The views from underneath may be studied on these principles.

Proportions of the Head.

The head is divided into four equal parts (in height).

(1) From the crown of the head to the roots of the hair.

(2) From the roots of the hair to the origin of the nose.

(3) From the origin of the nose to the lower part of the nose.

(4) From the point of the nose to the lower part of the chin.

The length of neck is a fifth part, from the chin to the top of the suprasternal *fossa*.

Width.—The line passing in *front* of the eyes is divided into five equal parts.

The eyes occupy the second and fourth, the nose the third.

The *eye* is divided into three parts, of which the middle one includes the pupil and iris; the opening of the eyes equals one of these parts.

On the middle of the third line, which divides the height of the face, the *nose* occupies a space equal to the breadth of the eye; the *nostrils* in profile equal in length a half-length of the *nose*.

The breadth of the *mouth* is one eye and a half; the height of the upper lip is equal to one-eighth of its length, and the lower lip one-fifth.

The *ear* extends from the line of the eyes to that of the nose, and in profile is broader by half.

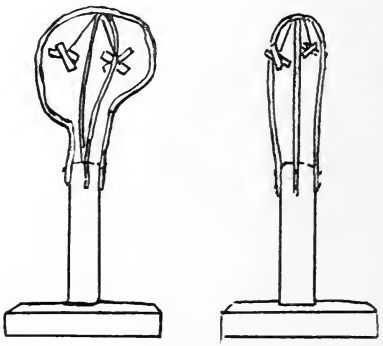
The width from one shoulder to the other at the line of the collar-bone is equal to twice the height of a head.

LESSON IV.

A Method of Modelling a Head from Life.

Place the model in a good light. A top skylight is essential to the sculptor, as the light will thus fall vertically on the head, and define the "light and shade." Place the clay model in a similar effect of light. The head should first be treated on the principle of *forms* and *planes*, attention being paid at the same time to the anatomical features of its structure; later, the *drawing* and the *texture* of the chosen subject must be indicated. The sculptor will have to work from actual measurements of the model and see that these accord with those of the bust.

Framework.—In commencing to model a head, a *framework*, or necessary scaffolding on which to lay the clay, is necessary. This consists of an upright peg or column of wood, about 12 in. in length and 2 in. thick, and tapering slightly upward. It is fixed with nails on a board of about 12 in. square and 2 in. thick, or in what is called a "bat."



Sometimes a longer piece of upright wood of about 20 in. is used with a cross-piece fixed into a slot in the column. Into this the head is modelled in clay. The *armature*, however, built of thin lead piping, used in the first-mentioned case, gives greater facility for modifying the position of the head during the progress of the work.

This armature is made as follows: two pieces of

STUDY OF A HEAD IN CLAY. THE FOUNDATION. BY W. B. FAGAN.
(*Life size*).

roughly bent thin lead piping which cross one another, and are in size and shape a little less in their measurement than the height and width of the size of a head in life, are nailed together at their topmost point, and on each side of the wooden column underneath.

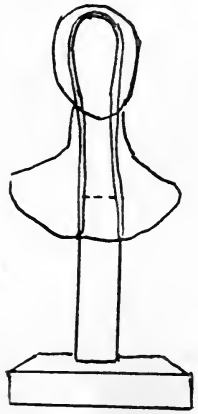
On the top of the lead piping two pieces of wood to support the clay are also fixed.

For the same purpose pieces of copper wire are sometimes nailed to this point, from which two *butterflies* attached to them are suspended. They are useful pieces of framework material, and consist of two small crossed pieces of wood which in the process of modelling are pressed against the framework and help to support the clay.

LESSON V.

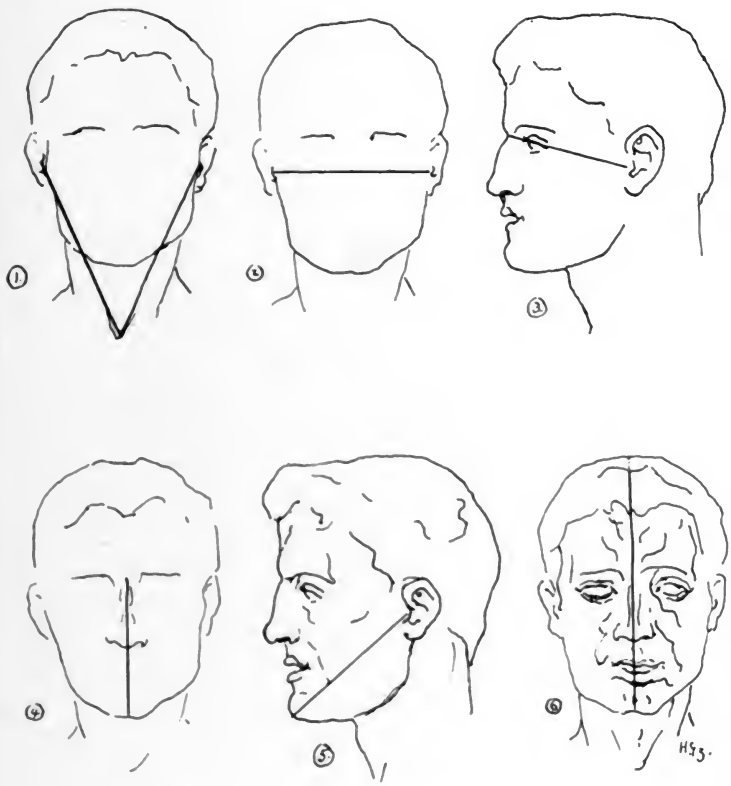
COMMENCEMENT OF MODELLING (front view).—The clay, placed on a revolving table, is roughly shaped with the hands on the framework into an ovoid form or lump, some part of the elongated column being left for the neck and shoulders.

This ovoid form suggests at the commencement little of anything human, but the work is subsequently built up by adding to this foundation in full modelling, and never *cutting away*. Taking careful measurements with calipers from the model, the height and breadth of the head is found. These measurements, called points of rest, are carried to the bust and marked there by means of a *wooden match*, which is presently pushed into the clay until the *unbarred end* of the wood accords with the projection found when measuring the model. Some allowance must be made in the first start to keep them a little less than those in nature, thereby allowing for the further addition of the added clay. Working with the fingers, begin by modelling the head by roughly making two holes for the eye-sockets, and then elevate the nose and depress the part under the chin. The head should then be set straight to the position required, measurements taken from the life with calipers should be marked off with different points on the bust.



Commencing from the front view, the following measurements will be found useful :—

(1) From the suprasternal fossa to the tragus; this should give the direction of the head on the body.



MEASUREMENTS OF THE HEAD.

(2) From the tragus of one ear to the other across the face.

(3) From the tragus to the root of the nose.

(4) From the root of the nose to the point of the chin.

(5) From the tragi of the ears to the projection of the chin.

(6) From the chin to the top of the head.

These measurements are carried by wooden or iron calipers of different sizes to the model.

A plumb-line and a spirit-level are also requisite, to test the perpendicular and horizontal lines, the latter especially if the work is carried on on a board.

In the end the judgment of the eye must finally decide, more than the measuring rule, the matter. Continuing to work with fingers and adding small strips of clay, the anatomical bony structure of the *cheek* and its projection and depression can then be indicated.

The form of the orbits of *the eyes* should follow with the *eyeballs*. Continuing the setting up, the form of the *brow* and *cheek-bones* under the eyes can be modelled.

Then the *nose* may be rudely modelled, and the part where it joins the brow suggested.

Having proceeded so far, the foundation of the head will appear in a rough-hewn state, and should be full of vigorous suggestion for its future state.

It will be found that no *angle* or *convex line* exists in the body, and that every apparent angle is made up of minute concave lines. It will also be noted that by far the most important lines are the foundation ones, which indicate the general shape. When forms appear difficult to understand, it is useful to reduce them to geometrical shapes.

Comparing the forms in a man and woman's head, in general, the principal outlines are more modified and softer in a *woman's* head than in a man's. The shapes are more ovoid in character in the brow and jaw. The *features* are slightly smaller. The *brow* has the appearance of being wider. It is less arched and the *forehead* lower than a man's, which is square in shape. The *cheek-bones* are more prominent and rounder. Another noticeable point is the line down part of the *cheek*, caused by the formation of the hair. In fact, the general slope of the *forehead* is slightly more accentuated and less curved than in man, and the top of the head further back. The jaw angle is less pronounced, the chin more pointed, and the lips fuller. The parting of the hair, again, which grows lower on to the forehead, is more

STUDY OF A HEAD IN CLAY. THE FOUNDATION. BY HENRY F. W. GANZ
(½ *Life size*). (Showing measured points.)

STUDY OF A HEAD IN CLAY. BY HENRY F. W. GANZ.
(Part of hair removed, showing measured points).

marked, and very characteristic of the sex. The *neck* will be smaller and the shoulders more rounded. In *man* the head is generally "squarer" in character, the forehead higher, and the mouth flatter and thinner.

The modelling of a man's head may be suggested better with broad powerful strokes giving the necessary force of character, while a sense of more highly finished detail carried to a greater extreme will be appropriate to the modelling of a woman's head.

By Henry F. W. Ganz.

PORTRAIT OF ALFRED GILBERT, M.V.O. R.A., D.C.L., H.R.I.

QUALITY OF THE CLAY AND OTHER MATERIALS.

Clay is the simplest material for modelling with. It can be obtained ready prepared at most potteries and art dealers at about 1s. for 7 lbs. It should be kept in a tin-lined or air-tight box, with a tap to draw off superfluous water. It is important that the clay should be kept in a proper state, neither too hard nor too soft. It should be in a state of what is called "*malleable*" consistency. If it is too hard, *tough*, it must be sprinkled with water and beaten well. In winter it must be kept damp, but protected from frost, by a stove, or an oil-cloth covering, will keep it from being affected by the outside temperature.

If clay sticks to the fingers, a sponge and water should be at hand.

If clay is too soft, it must be left to dry.

Too soft clay is called *slip*.

Wax, a more expensive material, can be procured at the caterers for artists' wants and large oil-colourmen. It is supplied by Lechertier Barbe of Jermyn Street; Reeves; Roberson of Long Acre and Piccadilly; Winsor and Newton; Lamley of South Kensington; Percy Young, and most dealers at about 2s. a pound.

Plastine, plasticine, and pâte plastique cost about 1s. 9d. a pound. This last material cannot be used for out-of-door work, as it is impervious to rain.

MODEL OF A HEAD IN CLAY. THE FOUNDATION. BY W. B. FAGAN.

LESSON VI.

Modelling a Head from Life. Progression.

Front View.—Having indicated the *eyes* in regard to the formation of the eyeballs in their sockets, the form of the *forehead* should be indicated in relation to its bony structure, and the cheek-bones modelled below the orbits and at the side of them. Next the *pupils* of the eyes can be indicated by the insertion of the fourth finger, then built round by the addition of the *eyelids.*

The *nose* may then be built up and roughly modelled with the thumb and forefingers and added to the brow, the *nostrils* indicated, the end of the nose trimmed, and the line where the nostrils join the cheek suggested.

Next, starting from the *ears,* the lower *jaw-bones* may be built up, attention being paid that the angle which they form with the ears is well shown.

Then the *upper jaws* and the *mouth,* and the two corners of the mouth, in relation to the size of the nostrils, should be studied and modelled.

The modelling of the *ears* follows. This may be done partly from the profile view; they are laid on with thin strips of clay, and the hollows may be scooped out with the fingers, but should not be "*carved*" ("*per forza di levare*").

The mass of *hair* over the forehead, &c., should then be built up, as also the *neck* and *shoulders,* beginning at the collar-bone.

LESSON VII.

Continuation of Modelling a Head.

The model may now be turned to the profile view, the sitter also.

The *chin* may be modelled, then the brow, nose, and eyes; the eyelids may be modified and the other features looked into.

The views from *underneath* may then be studied, and conveyed to the bust. This is most important, as otherwise the modelling will appear "flat." The different sections of the head should be well observed.

The modelling continues by placing on clay bit by bit ("*per via di porre*") and the various textures noted and indicated.

Drawing.—In the next stage the sculptor must confine himself to *drawing*; in this the features must severally be studied and touched up, the eyelids modified, and graduated in relation to the orbit and surrounding parts. The study of drawing continues on the bust from front, profile, three-quarters, and other views, not omitting the ones from underneath. All this will help to give character and expression to the head, and suggest the movement of forms obtained in plastic shape. Taken from every point of view, drawing will give the relative proportion, the movement of forms given by the subcutaneous bones and muscles, and the projections and the recessions of the outline. The direction of the contour must be modified by the angles, curves, and projections; and the outline should tally, in firmness or softness, with that of the model.

Effect.—The work must now be carried further by the effect of light, shade, and half tone, and constantly compared with the living model. Effect will show that if a shadow is not dark enough on the bust it is not deep enough. And if a light is not high enough it is too hollow.

STUDY OF A HEAD IN CLAY. THE FOUNDATION. BY W. B. FAGAN.

LESSON VIII.

WASTE MOULD CASTING IN PLASTER OF PARIS.

Making the Mould.

The mould is made by mechanical operation beginning at the base and working upwards. In the moulding every point and corner of the model has to be considered. The first thing to do is to lay strips of clay of about 1 or 2 in. wide, and ½ to 1 in. thick, on to the surface of the model; with these a portion of the surface is thus marked off. This portion is filled with *yellow-tinted* plaster.

The ochre is employed to show exactly the difference between this "mould" and the eventual "cast." In the process the plaster of Paris, which is used in small quantities and renewed, is mixed first with a little *ochre* and sprinkled into a cup half-full of water, stirred, then laid on the prepared space of the model. *White* plaster of Paris is then applied over this in the same way.

When the plaster is set the strip of clay is removed, and a round hole drilled, as a guide in refixing the various pieces of the mould. The other sections are similarly treated.

In laying the plaster on the model, only certain sized pieces of the mould can be made at a time. The upper edge of each piece of the mould is *painted with clay-water* to prevent the plaster adhering to it—the two parts having subsequently to be separated. The new space is filled in with plaster of Paris, and in this way the entire surface of the model is gradually covered.

This usually takes some time, and is attended with various difficulties, such as keeping the clay moist, &c. The mould being complete, it is then taken off the model piece by piece, after having been thoroughly syringed with water.

"THE VICTORY OF SAMOTHRACE." Louvre.

NOTE ON THE HISTORY OF ANCIENT SCULPTURE.

PRIMITIVE, ARCHAIC, GREEK AND ROMAN.

The origin of sculpture is wrapped in mystery. It is found in use with some peoples low in the state of civilisation. Ancient carvings of sculptured form exist on memorial stones in the SANDWICH ISLES, in the SOUTH ARCHIPELAGO, on buildings in parts of SOUTH AMERICA, and in MEXICO. Our knowledge of antiquity gives us no clue as to the reason for the worship of *animals* (EGYPT). The "earliest" subjects appear either as incised or painted work, in *marvellous* outlines of reindeer and other animals, shown in "correct" attitudes of motion, or at rest, either on horn bone, or on the walls of the caves in Hautes-Pyrénées, and in Dordogne. They are the work of the primitive hunter.

Early history relates that, after having been used in the form of simple "*stones of memory*," the head, then the body, or rather draped body, and later the symbol of the spirit of individual life were gradually included in these "stones." Idols of *human* shape (GREECE) follow, with the contemporaneous birth of Art and Religion, which for so many ages were so closely connected.

Passing the STONE and BRONZE and IRON Ages, we find that ancient EGYPTIAN art teems with statues, bas-reliefs on buildings, in bronze or in terra-cotta, coloured *glazed* figures representing gods and goddesses, some with animals' heads. Then there is the colossal Sphinx of Cheops, near the Great Pyramid. The sculptors of this period were highly trained in the technique of their art and carried out their works to a set canon of proportion. A colossal characteristic type of figure was selected and the heads of the figures especially were finely worked out. A curious fact is that the figures are usually posed standing straight up, equally on *both feet*. No sense of perspective is given. They are chiefly executed in red, black, or gray granite.

ASSYRIAN Art abounds with masterpieces. The winged figures, bulls with human faces, all of colossal size, taken from the Palace of Khorsabad, may be seen in the British Museum. Universal admiration is excited by the hunting scenes from Nimrud, also to be seen there, stone bas-reliefs, which are particularly worthy of study, especially "The Wounded Lion" and "The Dying Lioness."

It will be noted that all these sculptures eminently befit the architectural settings to which they originally were applied. The leading features of these works are a free composition, a living combination of motion, and a sense of style; the principle of alternation and contrast is ably used. The nude is of a very muscular, energetic, and correct form, and the animals are even better.

From the Temple of JERUSALEM we get such decorative motives as the *cherubim* or winged cherub, a word now used to signify an angel or winged child, an Assyrian term which passes through Hebrew into modern tongues. From CHALDEA the Greeks received those winged figures of men and animals of which we still make use.

Passing by the smaller pieces of sculpture discovered in TROY (Hissarlik); the bronze ornaments, armour, tools, and vases; the Gates of the Treasury of MYCENÆ, the pilasters and tablets of which are of coloured marble, decorated with spiral and zigzag ornaments, pointing to Oriental influence, and the palace of Cnossus, we come to GREEK Art, which was brought to perfection in less than two centuries from its origin.

"Artemis" (Delos), now in Athens (date about 620 B.C.), one of the earliest statues, is scarcely more than a head placed on a "memory stone," a rude limbless block, which might be taken for a pillar or a tree-trunk. The Greeks called these figures "CHOANA" (*Cheein*, to scrape); they were carved from wood. The "earliest" in England (Brit. Mus.) is the statue of Chares, a square-set seated male figure (stone).

It appears that certain CHIAN sculptors of the year 550 B.C. were taken to Athens, and among excavated pieces it has been found that the GREEK ARCHAIC sculptors not only *carved* but also *painted* their marble. In Greek art we find the "*earthly*" form taken as the shape of the god, and as motives mythical antiquity and idealism occupy a large field.

Passing the small stone offerings, &c., for temples and SAMOS metal-work, we find the gods and heroes are succeeded by wooden models, often gilded in part, including figures of athletes in sports or games. Various works were carried out in marble or bronze, or in ivory and gold. As subjects, gods and goddesses, and draped women, warriors and athletes, may be seen in the metopes or on the pediments of temples; portions of the Temple of Aphaia at ÆGINA are now to be seen in Munich at the Glyptothek. Some portraits and early incised vases belong to this period. A notable "*bronze*" figure of a "Charioteer" (DELPHI) marks the border-line between ARCHAIC and HELLENIC Art.

The Argive Agelados was the supposed master of Myron, Polycletus, and Phidias.

Myron was famous for his male figures of athletes in action; he shows them no longer standing bolt upright as in Egyptian art, but often bending or standing, posed on one foot, as in his "Discobolus" or "Ladas."

Polycletus was the author of a colossal ideal statue of "Hera"; of Argus (chryselephantine), now lost; of a "Doryphorus," called "The *Canon*" by the ancients, because the "correct" proportions of the figure are shown; and of a bronze figure of an "Amazon."

Phidias, a contemporary of the two former sculptors, started as a painter, and was an architect as well as a sculptor. Dedicated to the Virgin Goddess, Athene (Minerva), the Parthenon at Athens was completed in 435 B.C. The greater part of the sculpture from this temple was brought to England by Lord Elgin in 1803, and is now placed in the British Museum. It is the work

of Phidias, and includes "The Frieze of Horsemen, the Panathenaic procession of maidens and sacrificial animals and seated gods and goddesses," 524 feet in length; we possess about half (measuring 40 inches high). This may have once been painted with red draperies on a green background, and from the evidence of the holes for their insertion the horses' bridles appear to have been made of, or to have been attached with, metal. The marvellous groups from the pediments (originally 40 feet from the ground), represent the birth of Athene with sea-gods and fates, and the metopes in high-relief, represent "Lapithæ in combat with Centaurs." These latter works were probably carried out under the direction of Phidias. The Niké of Pæonius dates from 425 B.C.

Another antique statue is the "Wingless Victory" Niké Apteros, Athens. Pausanias gives a description of Phidias' seated figure of "Zeus," once in the Temple of Olympia and now lost. It was 40 feet high and carried out in ivory and gold, the god wearing a wreath made of sprays of olive, and holding in his right hand a victory and in his left a sceptre, wrought in metals. On the robe were wrought various figures and the throne was adorned with gold and stones, ebony and ivory. Another of his statues, also in ivory and gold, was the "Athene Parthenos" (also lost).

The work of Phidias shows an expression of serene strength and harmony; he fixed the types of the gods and goddesses. His decorations of the pediment and frieze give the decorative effect of well-balanced line and a distinguishing type to these subjects which later artists followed. The student should note his treatment of draperies, which show off and also explain the beauty of the body. It will further be noted that the material of which it is composed considerably affects its lines.

By Ictinus, the architect of the Parthenon, is also a frieze from the Temple of Apollo, Phigalia (British Museum), and one of the six "Caryatides" from the portico of the Erechtheum, Athens.

Scopas, who was also an architect, has left marble

portraits and the "Niobe" group; he with three other sculptors carried out the Mausoleum at Halicarnassus. The statues of "Mausolus and Artemisia" (marble), the frieze and bas-reliefs, are now in the British Museum.

Praxiteles was born about 380 B.C. His works show in their expression a languorous grace, and he represents "Eros" of Centocelle, Rome, not as a child, but in the dawn of youth. He also left a "Hermes carrying a youthful Dionysus" (Olympia) in marble, in which the free treatment of the hair may be noted and the expression of the deep-set eye, which is thrown into shadow by his treatment of the projection of the brow. An "Artemis," "Aphrodite," "Phryne," and various portraits are among his works, many of which show the influence of the art of painting, in the expression he gives to his heads. Lysippus, another artist of the fourth century, has left a bronze "Apoxyomenes" (copy, Vatican), athletes, and portraits. In the further development of Greek art comes "The Nike," Victory, of SAMOTHRACE (marble, 306 B.C.), Louvre. A seated figure of "Demeter" from CNIDUS (British Museum).

The date of the "Venus of Milo" (marble), Louvre, is unknown; it was discovered in 1820, in the Isle of MELOS.

Following the subjects of gods and goddess, heroes and athletes, with their various expressions of strength, grace, passion or elegance, we come to a series of works including scenes of violent action, physical suffering and tragedies, and "The Dying Gaul or Gladiator," by Epigonus. "The Laocoon Group" (Vatican) by Agesander, Athenodorus, and Polydorus. The "Apollo Belvedere" (from the bronze), Vatican, and "the Venus de' Medici," by Kleomenes (Uffizi, Florence).

From B.C. 195 come the "PERGAMON marbles," white marble figures of colossal size; they were once a frieze (about 9 feet high), executed in high relief; representing "The Contest between Gods and the Giants," "The Triumph of Athena." They are now placed in a large

hall in the Museum in Berlin. Finally there is a remarkable masterpiece in "The Sarcophagus or Shrine of Alexander," now in Constantinople, of Attic marble from Sidon.

The minor arts of Greece include a vast number of terra-cotta figures, chiefly draped female figures of Tanagra, from tombs; reliefs, statuettes, coins, engraved gems, masks, terminal figures, besides jewellery, chased and repoussé silver vases, fountains, burial-urns, trapezophoron, medals and many household utensils. Greek vases vary from those of natural-coloured ground (750 B.C.) to those of black figures on red ground (600 B.C.), and red on a black ground (500 to 400 B.C.).

HYDRIA. (Second Period.)

Greek art appears eventually to have drifted to ROME, and in order of history we next may note the pottery of ETRURIA, the Etruscan Sarcophagus, Lydian Tomb (British Museum), "The Arch of Titus," with its bas-reliefs, "The Trajan Column," "Antinous," the portraits of Augustus, Nerva, "Orestes and Electra," and the equestrian statue of Marcus Aurelius in Rome.

In the dark ages that followed, BYZANTINE art, with its marvellous bas-relief sculpture, shows art in an abstract and symbolical form, the Early Church's law severely controlling all composition in art.

HYDRIA. (Third Period.)

The Hydria, on page 84, is of the archaic, or second period (eighth to seventh century B.C.), and stands in the British Museum (No. A. 1356). It was found at Camirus, in Rhodes. Of a cream natural-coloured clay, it is painted with an incised design in black, white, and red colours. The ornamentation, containing the earliest form of rosette, is of rings with two rows of animals, and above a row of birds. It is 16½ inches high.

The Hydria on page 85 (a pitcher), with silhouettes of black figures on a red ground, depicting the quarrel between Ajax and Odysseus over the arms of Achilles, on the reverse side a Dionysion subject. It is of Athenian fabric, end of the sixth century B.C., third period. In the British Museum (No. B. 327.) Size about 18 inches.

RHYTON. (Fourth Period.)

The Rhyton (wine-cup) on page 86 is of the third century B.C. (fourth period). In the shape of a ram's head, it is painted with black on a red ground, with the eyes and horns tinted white. A winged figure representing Eros with cista is unpainted on a black background on the neck. Of Apulian fabric, it is now in the British Museum (No. F. 427).

The œnochoe (wine-jug), on p. 87, is of Athenian fabric, fourth century B.C. Modelled in red terra-cotta, it was originally painted. It is in the form of a helmeted female head, probably Athene. The helmet is ornamented on each side with seated female figures in relief, and in front with a head issuing from leaves; over the forehead is a row of rosettes, the earrings, originally gilt, are in the form of winged female figures surmounted by rosettes. No. G. 1. British Museum (size 9 in. high).

ŒNOCHOE. B.C. 200.

CHRISTIAN ART IN THE EAST AND WEST.

The fourth century shows several specimens of Christian sarcophagi, copies from pagan tombs, richly decorated with Biblical stories in relief. Early Christian art showed no aversion to imagery but the representation of God, and the crucified Jesus did not appear till the fifth century. At this period Byzantine influence predominated; mosaic decorations predominated on the walls and vaults of the basilica, as in the interior of Sant' Apollinare in Classe, Ravenna. The sculptured ornamentation of the pillars contains graceful designs in relief of vines, birds, &c., acanthus and thistle plants.

The bronze figure of St. Peter, Rome, is in this style. *Gothic sculpture* is of a very high order in France in the twelfth to the sixteenth centuries.

Art of the Renaissance.

In Italy Niccola Pisano carved his pulpit in the Baptistery, Pisa; this work was Gothic in form and decorated with high bas-reliefs inspired from those on Roman sarcophagi.

Mention must be made of Pisano Pisanello of Verona, the engraver of admirable medals, and painter of the picture of St. George and St. Anthony, now in the National Gallery.

Florentine sculpture began with Lorenzo Ghiberti, who decorated the great bronze doors of the Baptistery at Florence (1405-1452) with a marvellous series of bas-reliefs. These bas-reliefs are treated pictorially, having the more distant figures in lower relief than the rest, thus keeping their planes in perspective. Next there come Della Quercia, the author of the Tomb of Ilaria del Caretto, and Luca della Robbia, author of "The Cantoria;" Matteo da Pasti, the medallist of Gismondo Malatesta and Isotta degli Atti.

"DAVID." BY DONATELLO.

The highest type of naturalism, the anthithesis of classical antiquity, is seen in Donatello's "David," "St. Mark" and "St. George." Donatello excelled in the art of bassi-rilievi, as in the "Christ on the marble Pietà" (South Kensington Museum). His pupil Verrocchio designed the most beautiful equestrian figure of the Renaissance, the Condottiere Colleone at Venice, a work completed by Leopardi.

There was a great difference between the mind and art of Florence and that of Athens. In Florentine art we find an absence of serenity, an agitated realism, languorous grace and melancholy even in the rendering of joy. Between Athens and Florence had arisen the spirit of

Christianity, a religion which deified suffering and anathematised the flesh. Its mystic tenderness and fervid asceticism are reflected in Renaissance art of Italy.

In the great works of Michael Angelo one finds expressed the thoughts of a giant, who, we are told, carved the whole work himself by attacking a block of marble with vigorous strokes of the hammer. In order to produce high lights on the flesh he gave a degree of polish to certain parts of his marble. Amongst his masterpieces are his youthful Cupid, the Pietà in St. Peter's, Rome, and the "David" at Florence, and later "Moses," the Slaves in the Louvre, Paris, and the allegorical figures of "Dawn," "Twilight," "Day," and "Night" on the Medici tombs.

Benvenuto Cellini, who was a sculptor, goldsmith, and chaser of metal, has left a "Perseus," and other figures, portraits, medals, his shield (Turin), his salt-cellar (Vienna), and numerous vases.

Many works of the Middle Ages were cast in metal by the various processes and the surface then gilded, for example on the tombs of Mary of Burgundy and Charles the Bold in Bruges, and Peter Vischer's twenty-eight colossal figures round the tomb of the Emperor Maximilian at Innsbruck. That of Philippe Pot, in the Louvre, is a fine example of the Flemish Renaissance. In Limoges the works were not cast but made of hammered "(repoussé)" plates of copper, decorated with "champlevé" enamels.

Coloured sculpture, as in the Greek period, was much in vogue. The stone or carved wood was first covered with *gesso* or fine plaster mixed with size, patterns often being stamped with wooden discs on the draperies and gold colour applied.

This work was carried out by the imagers, lay sculptors, at the orders of monks who built and decorated their churches. The design of the Gothic church owed its origin to the Roman basilica, but the Gothic architects built their church in the form of a Latin cross, and,

rejecting roofs constructed of *horizontal stones*, adopted a *vault* and a *pointed* arch. The group of lines composed of the pointed arch and the gable are the base of all Gothic architecture, which owes its derivation to Doric and Corinthian styles. The principal decorative sculpture was usually placed in the lower part of the buildings, in order to render it more visible.

These figures, to answer the demands of Gothic architecture, are treated in a manner more removed from nature, and as a part of an architectural whole, than those used in classical architecture, the position of the latter being, also, usually at the summit of the building.

It is an interesting fact that a nearly complete collection of the thirteenth to fifteenth centuries' sculptors' work is to be seen in Westminster Abbey. There are two bronze effigies on the tombs of Henry III. and Queen Eleanor which are decorated with mosaics, the work of an Englishman, William Torell. Amongst the others are an effigy of Wm. of Valence, of wrought copper repoussé work, nailed on a wooden core and decorated with champlevé enamels from Limoges. Another tomb is worked in stamped gesso, with coloured decorations, while a fine gilt bronze, the recumbent figure of Henry VII., is the work of Torrigiano. There are also examples by English sculptors of recumbent figures in English alabaster of a later period. Casts of various works and architectural features may be seen in the Royal Architectural Museum, near Dean's Yard, Westminster.

NOTE ON FIRING THE CLAY MODEL.

Should it be intended to fire, or make a *terra-cotta* of, the model, the operation of hollowing the model will be necessary. This is done for several reasons: to lessen the weight of the material, to allow the clay to dry more quickly, to ease the firing, and to avoid the risk of splitting (clay shrinks in drying).

For this purpose a part of the crown of the head may be cut off by means of a piece of thin wire or thread, and the inside of the model scooped out until a uniform thickness of only about 1½ to 2 in. is left.

The bust will then be left without the wooden framework. If possible, too many butterflies and other attachments should not be used in the building of the model, if it is to be fired. The model should then be set aside to dry. When hard it is fired in a potter's kiln.

As mentioned on page 77, once the mould is complete it is taken off the model piece by piece, after having been thoroughly syringed with water. This moistens the film of clay between the joints and allows the sections to be prised out of their place.

The pieces of the mould are then well washed, so that no clay remains in them, and put into a pail of water and allowed to soak, in order that they may become non-porous. They are then drained.

LESSON IX.

Preparation of the Mould for Casting in Plaster.

A solution of soft soap is applied first to the inside pieces of the mould and left to be absorbed for about thirty minutes to prevent the cast adhering.

The pieces of the hollow mould are then re-shaped by being placed together; where the work is cast bit by bit the pieces are separately put together and their edges oiled. The whole is firmly bound with a cord and the outside saturated with water, to prevent porousness. Sometimes the pieces are cemented together, this time with *white* plaster from outside the joints, to keep them fixed in their places. Occasionally in casting it may be necessary to support or strengthen a group or the limbs by inserting a metal support into the mould. This metal is painted with Brunswick black to prevent rusting, and is eventually absorbed in the mass of the cast. For the same reason wooden struts may also be added as the casting proceeds.

LESSON X.

Making a Cast in Plaster.

To prepare plaster of Paris fill a bowl half-full with water, *add* the plaster to the water by sprinkling. The liquid plaster is poured, or flung inside the mould with the hand (in a thin coating). The mould is quietly rocked to prevent air-bubbles forming, or shaken up so that all the crevices may be filled. Three or four repetitions of fresh supplies of plaster are necessary till the cast, going through the same processes of rocking, seems to have received the plaster in its different parts, to about a uniform thickness up to an inch. It should never be made quite solid or it may crack.

The same process is applicable if the cast is made bit by bit till the entire mould is put together. Generally in *not less* than half an hour the plaster will be set. The next operation is to *chip away* the outside plaster with a mallet and dull chisel, working from the top of the mould downwards, until you chip on to the *plaster tinted with ochre;* this warns you to remove the plaster more carefully, working it out with blunt tools, when the bare cast will be displayed. A new piece mould can then be made of this cast, which can now be worked upon again and compared with the clay model before that cracks or is destroyed.

For Final Treatment.—Plaster casts may be tinted with bronze or treated with oil or yellow clay-water. It will be found that the form of sculpture which obliges convention, such as relief, especially *low relief*, is the kind that stands colouring best. A wax model of the plaster cast may also be cast in bronze (which is a special process), or copied in stone or marble, or prepared for bronze casting.

STUDY OF A HEAD IN PLASTER. "THE BOY." BY WILL FAGAN.

(From a photo by P. Laib.

GLAZED POLYCHROME EARTHENWARE BAS-RELIEF. "THE ARMS OF KING RENE OF PROVENCE." BY LUCA DELLA ROBBIA. 15th CENTURY.

Victoria and Albert Museum, South Kensington.

Other Forms of Modelling.

For reliefs a slab of slate or wood is used on which to build the work. Low relief is generally raised only to about half an inch. When modelled in clay and fired, terra-cotta reliefs are often employed as an adjunct to architecture.

Glazed Polychrome Earthenware Bas-Reliefs.—The Della Robbias employed colour on modelled clay reliefs coated with a white enamel glaze, obtained during the firing by the addition of oxide of tin to the vitreous ingredients. To this ground they sometimes added various colours, and as both the white ground and the added colours were fused on to the surface of the clay in baking they became permanent.

The enamelled earthenware medallion in high relief by Luca Della Robbia, represented on p. 98 hangs in South Kensington Museum (No. 6740). Originally an external decoration on the Villa Pantiatici Ximenes, near Florence, it was placed there in 1442. The design on the plaque, which has a diameter of 10 ft. 7 in., surrounded by a massive frame or border of leaves and fruit (7 in. in relief), represents the initails of King René of Provence and his Queen, with his arms, the legend "D'ardant desir" and a motto "Los en crossant," flanked on either side by an emblem of fire-pans or "braciers." The same arms, given by his daughter Margaret of Anjou, Queen of Henry VI., are borne by Queen's College, Cambridge.

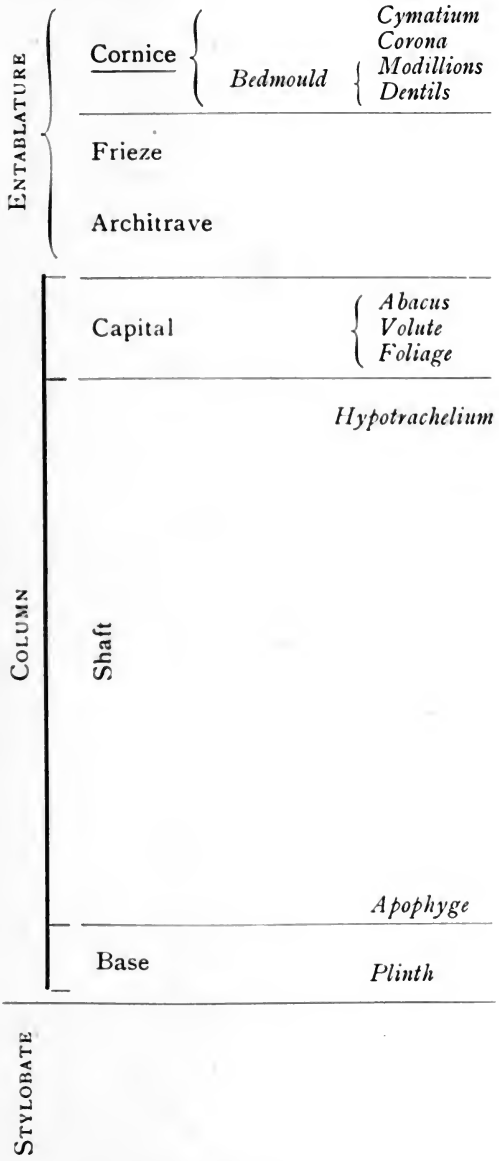
The scheme of colouring on the medallion is of green yellow, pale blue and purple on a white ground.

Plaster moulding and gesso work are also used for simple or coloured decoration. For this process of modelling in relief the cast is made of fibrous plaster, and to prevent absorption of the colour medium the plaster is prepared with a coat of shellac on which the full range of colours can be employed. Oil, tempera, water colour (afterwards varnished) and lacquer may all be painted on plaster either solidly or thinly. Gold and other metal, or stones, can be added to increase the effect. The decorated gesso work now being executed by Fred. Marriott may be noted.

A combination of metals of various tints and textures, bronzes of different colours, aluminium, ivory, and variegated sea-shells are also employed by Alfred Gilbert, and others to give harmonious decoration to sculpture either in the round or on the flat.

THE ACCESSORIES TO SCULPTURE.—The expression given by the introduction of hands as additions to a bust, the disposition of draperies, and the composition of minor details must not be lost sight of.

Again, the base or pedestal must be constructed so as to conform to the material employed, or the conditions of the architecture to which the modelling may be attached. It will be found that every object which has *sides* upstanding on some *base* consists, as it were, of a *head*, *body*, and *foot*. These forms in architecture are called the *cap*, *shaft*, and *base*, it will be found that these will usually be composed of horizontal and vertical lines, which give at once a sense of stability, symmetry, and repose. This may best be explained by taking the architectural terms. Next to the simplest form of arrangement of the object (a *wall* with *cornice* above and base below) comes a division of this wall space with upright lines (the *styles*), which may be forms in relief, such as *columns* or *pilasters*. In the *panels* formed between these a *rectangular shape* is obtained. To decorate these spaces, and dependent on them, sub-architectural forms may be employed, or let in, composed of pyramidal, oval, or circular shapes.



An Order in Architecture.

Springing from the *abacus* of a column (through which a *string-course* of bricks would be run)—*arches* of various shapes may be formed and treated in relation to the line above them, as they span from column to column, either as horizontal, curved, or angular forms. When the arch runs up to the *entablature*, a *key-stone* or bracket is used to join this projection. A *spandril* (or *-drel*) will be formed in the angular space between the curve of the arch and the level beams over the same; these often carry sculptured modelling.

THE THEORY OF BRONZE CASTING.

In the *cira-perduta* or *cire-perdue* process, the wax used for the thickness of the statue (between the core and mould of baked clay) is melted and run off before the metal is poured in. According to Benvenuto Cellini, who probably introduced the process into France, a figure was modelled in clay (or cast in plaster), slightly smaller than the proposed size, and over this a thin layer of wax was superimposed and worked and modelled upon. A mixture of pounded brick, clay and ashes, finely ground together in water, was applied in washes with a brush. Upon this soft clay was laid to strengthen the mould, bound with iron hoops, and then dried.

Various metal rods were then inserted to preserve the relative positions of the core and mould. The rough clay mould was then placed near a hot oven, which gently baked the core clay and the clay mould and melted the wax, which ran out from small holes left for this purpose, without any particle remaining within. The same vents were left for the escape of air during the metal casting, the baked core (of the same form as the model) and hollow mould (the concave of the statue) having been preserved in their relative positions by various rods of copper. Before the melted bronze was poured in and allowed to fill the hollow left between the core and mould just described, the mould was put underground

near to the furnace and propped up. This was allowed to cool and then the outer mould was broken away, and the inner core knocked and raked out through some small hole, left in a part of the model which was not conspicuous.

A beautifully accurate cast in bronze is the result. This is sometimes chased or covered with a patina of the colour desired.

'THE DANCE.' CARPEAUX. Façade of the Opera House, Paris. (Marble). Size about 12 feet high. (Cross in circle composition).

NOTE ON MARBLE CARVING.

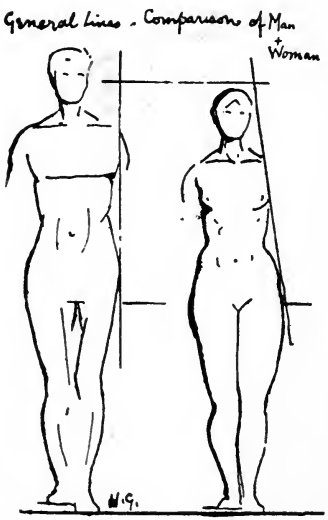
In order to make a copy in marble or stone, first select the materials carefully, having regard to their texture. Parian, Pentelic, or Carrara marble may be used, or stone of firm substance such as sandstone, slate, alabaster, granite or porphyry. For this process the most simple way of representing in stone is to place a square frame, with spaces made by strung-strings, or a flat edge over or in front of the model. This squaring off is useful for multiplying to a large scale. The model is covered with a series of marks on salient points. A pointing-machine with three arms ending in metal needles, moving in ball-and-socket joints, is required. The two arms are then applied to the model, each touching points or marks on the figure; the arms are screwed up and the machine is then carried to the marble block and set with its points on the stone. As the needle slides back on its own axis it cannot reach the point on the marble. A hole is therefore drilled till the point is sunk in the block exactly to the point touched in the plaster. This process is repeated on both model and block till a number of holes are drilled; parts are then cut away with a hammer and chisel (pointed and heavy) till the bottoms of all the holes are reached.

Next, partly by the eye and partly by measuring, the work is continued, until the finishing touches; these are carried on to the stone in the same way, and this process repeated until all the important points on the model are marked on the stone.

The actual "*carving*" of the stone then commences, a variety of different forms of chisels and tools being used. A "*subbia*" (a point or pointed and heavy chisel) for the rough work, in the large, "*calcagnuoli*" (a toothed or short chisel, with a notch in the middle) for rounding, then a flat and more slender tool, which has two notches; a broader toothed chisel ("*gradina*") is used to go gently

over the surface. A smooth chisel is then used to remove the tooth marks ; a *curved riffler* and straight *rasps* are also used for finer forms and the planing of delicate details. A *borer* is used for the deeper depths. For final softening off of the sculpture piece, the modern sculptor, unlike most of those of Greece and the Middle Ages, who left little or nothing to assistants, does very little himself of the carving of the marble except the final finishing.

Having now described the more elaborate method of carving in marble, it should be stated that the most skilled artists carve the marble direct from the living model, or from a drawing of the full face and profile views, or from a cast, the clay or a modelled relief. This method ensures a truer aspect of carved marble.



OTHER FORMS OF FRAMEWORK.

For figure or animal work each has its own particular form of framework. These should be built up in reference to the action required to be represented, and calculated to support the weight of clay used. Thus for animals an upright and cross-bar of wood (knotted) or iron (shellacked) and lead pipings will be required; and if the proposed model should be one of very large size, it will have to be modelled from a preliminary highly-finished study, and built on a framework of solid iron bars of good sound construction, put together with mathematical accuracy, and placed on a squared-off base. Iron supports, fixed and bent to the proposed positions, are fixed on to the base of the turn-table. The prospective solid parts of the proposed model (of the different limbs, &c.) have to be filled in with a foundation of pieces of wood mixed with clay and butterflies, or even with bundles of firewood. These have to be fixed at intervals on the iron bars of the framework to support the coming weight of clay. For relief a board or slab

of slate is required. In a high relief, some nails or protected pieces of iron with pieces of wood laid across may be driven in to hold up the clay; and in relief modelling undercuts should be avoided.

PROPORTIONS OF THE FIGURE.

Vitruvius gives the following measurements, which may be used with a right-angled isosceles triangle. These measurements will be found to coincide with the measure of the *hypothenuse*, starting from the fact that the length of the hypothenuse has first been taken (and so the triangle formed) from *these* three measures :—

(1) From the heel, under the inner ankle, to the middle of the patella.

(2) From the middle of the patella to the superior spinous process of the ilium.

(3) From the junction of the pubic bones, at the upper end, to the pit of the neck.

Either of the two other lines of the triangle will make five measures :—

(1) From the top of the instep to the lower end of the patella.

(2) From the top of the patella to the lower end of the junction of the pubic bones.

(3) From a little above the navel to the pit of the neck.

(4) From the knuckle to the elbow.

(5) From the elbow to the shoulder.

Another method is to divide the *upright* figure into ten equal parts. Take the face from the forehead (origin of the hair) to the chin as the *standard* of measurement :—

(1) From the top of the head to the middle of the ear.

(2) The middle of the ear to the pit of the neck.

(3) The pit of the neck to a little below the chest.

(4) and (5) To the centre of the figure, where the pubic bones join.

(6) and (7) To the middle of the patella, or knee-cap.

(8) (9) and (10) To the sole of the foot.

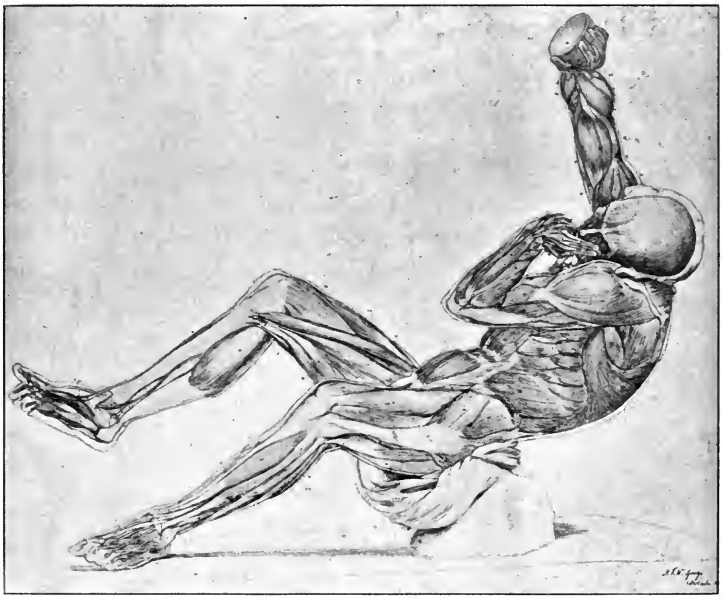
The *arms*, equal to two of these divisions : the fore-arm (from the knuckle to the elbow), two ; and the upper arm (from the elbow to the top of the shoulder), two.

For a *sitting* figure three lengths may be taken :—

(1) From the pit of the neck to the ischium or hip-bone.

(2) From the union of the thigh-bone with the hip to the knee-cap.

(3) From the knee to the sole of the foot.



ANTIQUE STATUE ANATOMISED. BY HENRY F. W. GANZ.

RECENT SCULPTURE.

In the eighteenth century we had several native sculptors in England, the most notable being John Flaxman (1755-1826), who started the Classical revival. He was the author of the "Lord Eldon" in Westminster Abbey. He decorated various Wedgwood vases, and illustrated in pencil outlines the poems of Homer and Æschylus—these hang in University College, London.

In England a further impetus was given to the art at the beginning of the nineteenth century by Sir F. Chantrey, the sculptor of several memorials and portraits; Foley, and Alfred Stevens, sculptor and painter, who designed and modelled the Wellington Monument in St. Paul's Cathedral, a magnificent conception in marble and bronze; Woolner; J. Durham, the designer of a monument of Prince Albert; J. E. Boehm, portrait-sculptor.

Coming to recent times, we find Alfred Gilbert, the sculptor of the tomb of the Duke of Clarence at Windsor. A bronze recumbent figure of the Prince lies upon a bier of Mexican onyx; on this two angels kneel, one holding an immortal crown at the head, and the other placing a broken wreath at the feet. A series of Patron Saints of Great Britain, carried out in parti-coloured bronze, are introduced into the surrounding grille. The originality of the designs for armour and various accessories of the figures may be specially noted. The design of the armour of St. George is suggested by forms of sea-shells. The monument of Queen Victoria, Winchester, and the Shaftesbury Memorial Fountain at Piccadilly Circus are also his work.

In the original design of the sculptor it was intended that water should issue in jets of various shapes and forms from different parts of the fountain, and play into a bronze basin at the base of the monument, among boys

and dolphins, which form the principal subjects of the scheme. The space which should have been left as a basin for water had to be converted into a group of steps supporting a small basin with drinking-places. The structure is therefore deprived of some 6 feet, and of a surrounding wall upon which a portrait bust of Lord Shaftesbury once stood.

Amongst his other works are bronze statuettes, "Perseus Arming," "The Offering to Hymen," "Tragedy and Comedy," and "Victory" (silver), now in South Kensington Museum. Gilbert's early work included "Icarus," a figure with wings, once belonging to Lord Leighton, and "The Enchanted Chair," a memorial to John Howard, in Bedford, and the silver épergne typifying Britannia's realm and sea power, presented to Queen Victoria by the Navy and Army on her jubilee. The bronze memorial to Henry Fawcett, with its symbolical figures, is in Westminster Abbey. Next to the most ingenious invention of design and the technical power expressed in his works is Alfred Gilbert's talent of completing the most minute details while preserving a large treatment, as may be seen in the Chain for the Mayor of Preston. He has perhaps had more influence over modern sculpture, jewellery, designing and bronze work than any other artist of the nineteenth century.

The painters, G. F. Watts and Lord Leighton, both modelled, and they encouraged the younger men; amongst whom were Thornycroft, Brock, Swan, T. Lee, the late Harry Bates, Frampton and Drury.

Abroad, down to the middle of the nineteenth century, sculptors sought their subjects of inspiration chiefly from antiquity. In France, however, the tradition of Puget and Houdon survived and inspired Rude, whose vigorous art is seen in "The Marseillaise," on the Arc de Triomphe, Paris. With Barye born in 1796, we get an incomparable sculptor of wild animals. Amongst the moderns we find Carpeaux, whose group of "The Dance," on the façade of the Opera House, Paris, represents a group of

women full of emotion and vitality. He also excelled in portraiture. Next Frémiet, the author of "Joan of Arc," "St. George" (bronze); Falguière the sculptor of "St. Vincent de Paul"; and Dalou, whose group of "Triumph" stands in the Place de la République. He came to England (and taught here), and was the author of several Bacchanalian groups, portraits, and character studies. Another Frenchman who settled here is Alphonse Legros, painter, sculptor of a fountain, and medallist. Jean Carriès, the erratic genius who died in 1894, was sculptor and art potter; his gate, decorated with various glazes and enamels, is preserved in a museum in France; another work of his is the Martyrdom of St. Fidelés. Foremost among living artists, Rodin's work is the expression of a great imagination, exhibited in powerful single figures or groups, full of deep feeling and of poetical fancy. Again, Bartholomé, the sculptor of the "Monument aux Mortes," and Roty, whose medals somewhat recall Jean Goujon's work in the Nymphs on the Fontaine des Innocents, Place des Halles, Paris.

In Belgium we have Meunier, the "Millet" of the miner and artisan.

In Germany, Rheinold Begas, author of "Borussia."

In Italy, Medardo Rosso shows great originality in his search for the effect of light vibrating on form. In his fine work, "An Infant in Sunshine," he conveys a sense of atmosphere, a motive new in sculpture. The unfortunate Ciffariello of Naples is a master of miniature sculpture.

LESSON XI.

ENAMEL.

Incising in metal which shows a bright pattern on a black ground goes by the name of "niello," a process which is supposed to have been the origin of engraving and etching.

Champlevé enamel differs from niello in two respects; it is not confined to black, and it is no longer an amalgam of metal, but a vitreous glaze or paste that is filled in.

Enamel is the art of fusing a vitreous glaze, which may be either *transparent* or *opaque*, on the surface of metal by heat, so that a picture or design may be formed by the enamel when hardened. The art of enamel comes between the art of stained glass and mosaic in the use of vitreous pastes in opaque and transparent condition.

The enamel used is based on optical glass, and may be mixed with various coloured tubes or squares of easily fusible glass. The base of the enamel is composed of a *flux* of *silicate* of *sodium* or *potassium* with *lead* (minium).

The enamel should be known as what is *hard* (containing 20 per cent. lead): that is, less susceptible of being affected by decomposition of atmospheric agencies in fusion. During the process the *flux*, which is of a transparent whitish colour, is applied and fused to the metal in one or several firings. The flux being established, it is coloured while in fusion by the addition of certain oxides of metal. Sometimes scores of "passing through" the oven may be necessary to give the desired effect. Technical experience alone can judge of the proper degree of firing, and of the equality of the heat necessary.

THE METHOD OF APPLYING ENAMEL TO METAL.

The *metal* used should be "pure"; either thin copper or gold plates are used.

The *enamel* is first ground to a powder with a *pestle* in a *mortar* and thoroughly washed with water and dried. It is then spread thinly with a brush or dusted on to the part desired to receive it; this *flux* on the plate is now dried before the charcoal furnace and placed for this purpose on a *fire-clay* plate in the *muffle*. In the yellow-red heat obtained in the *muffle-funnel* a very few minutes' time suffices for the enamel to *fuse;* it is then withdrawn.

In this process of fusing the enamel becomes fluid and adheres to the metal. The *flux* being established, the colour can be applied in the same manner according to requirements.

The density of the enamel is regulated by acid, and the enamel is rendered opaque by the addition of calx (calcined tin and lead). Binoxide of tin changes the transparency of the glass when fused into a white glazed material which obliterates the colour of the ground. On this coating other colours can be painted and fixed by a second firing especially to make them lustrous. Transparent blue and green may be put over a silver ground; red and brown or light yellow on gold. Silver is easily disturbed by the silicic acid in the enamel.

The following oxides are used :—

For a *blue* tint, oxide of cobalt.

For a *violet* tint, oxide of manganese.

For a *green* tint, cupric oxide or chromium oxide.

For a *red* tint, ferrous oxide and oxide of manganese.

For a *yellow* tint, oxide of silver, and oxide of lead or alkaline antimoniate.

For a *black* tint, oxide of manganese, cobalt.

For a *white* tint, arsenious acid (also to densify enamels).

The following metals are also used : Gold for ruby red, copper for a blue-green, or cobalt blue, or manganese violet.

VARIOUS KINDS OF ENAMEL.

Of the various kinds of enamel there are *simple enamel* of single colours on metal, or blended by two or three differently coloured pastes filled into the same cell, or of *graduated colour*.

Painting in enamel, cloisonné enamel, champlevé enamel, and *plique à jour* enamel.

In cloisonné, the cloisons of wire remain as the outline of draperies, or the designs, or for dividing colours.

The convention of using metal to represent flesh tint belongs to champlevé.

Cloisonné enamel is essentially a goldsmith's device.

FOR PAINTING IN ENAMEL.

Lavender spike oil, thinned with spirits of turpentine, is used as a vehicle when applying the enamel to the metal.

In Cloisonné Enamel.—The design is separated by raised *ribs of metal* or *cloisons* soldered on to the plate of gold or metal; into the hollows so formed the enamel is applied. The ribs of metal may be either fixed by *solder* or by the enamel itself, which is then fused.

In Champlevé Enamel.—The copper portions of the metal making the design are left by engraving hollows out of the metal with the *graver*.

After the enamel is applied it is fused and then polished with *crocus powder*.

In Plique à jour Enamel.—The ground at the back of the enamel is removed after firing.

Another form of enamel is to apply it to an embossed metal sheet. In this process a cast is first made of the requisite character and small pieces of thin metal sheets are pressed into the depressions of the plaster surface; these prepared metal sheets are then each enamelled singly and then fixed together on a cement bed.

LESSON XII.

NOTE ON THE DECORATION OF POTTERY.

The primitive way of making earthen pots is by "*throwing*," that is, shaping the lump of wet clay with the hand as it revolves rapidly on a wooden wheel before the potter. He can draw up and hollow the plastic clay revolving in front of him, into all sorts of shapes, and harden it with heat ("dried," a misnamed "biscuit").

The materials used for earthenware are a mixture of various *clays* (plastic), *water*, *flint* (refractory), *stone* (hardness), or minerals and quartz. If the colour of the clay requires it, it can be coated with finer clay and slowly fired in a kiln—this takes from 48 to 60 hours; but the condition is that the two clays have an equal "*shrinkage*" (the greatest shrinkage of clay being obtained by the least addition of silica). Unequal contraction gives what is called "*crackle*." Crackle arises from a defective cause—the glaze not assimilating with the existing hard ground, which is less sensible to the changes of temperature in the kiln.

By scratching through the outer coat of fine clay a means of decoration is obtained, or a *glaze* of transparent colour will give pattern. Modelling is often employed for raised ornaments on the unbaked clay. Ornamentation can also be applied by the means of strips of diluted clay or paste called slip, painted or dropped on the body. This gives a decoration in high relief, and can afterwards be covered with glaze. A *cover-glaze*, or decoration of pottery, is applied to the unglazed ware, which sucks up each separate brushful of colour as it is laid on, with turpentine and essence of lavender as a medium, or by a transfer printing process. The overglaze colour sinks into the glaze in the baking, and the underglaze colour floats up into it, hence a certain quality, as in "blue and white." Variety is also obtained according to the depth

of the transparent glaze obtained by successive paintings and firings.

Designs can be multiplied by a *transfer* printing process. The required design is engraved on copper plates, an ordinary rolling press being used to print the engraved lines of the pattern with an oily pigment (linseed) on strips of tissue paper; this is then applied and pressed face downwards on to the so-called "biscuit" ware while the oil is wet. The pattern in oil is thus transferred to the surface of the absorbent clay. The paper is washed off and dusted with colour, if necessary, and the printed ware baked (gloss fired) at a moderate temperature in the *hardening kiln* (about twenty-four hours). This is done before the glaze is applied to drive off the oily medium with which the pigment was mixed.

"EN PIU." MAJOLICA. 15th CENTURY.

Painted decoration may also be applied over a glaze. The beauties of colour, its opacity and transparency, lie in the crucible, and the pottery painter must think out a scheme of colour that his special palette will allow him to realise.

The oxides will deprive him of any indulgence in natural effects, but will give him a decorative effect which he could not get by disregarding the nature of vitreous colour. This is always dependent on the uncertain action of the fire upon it.

The glazes are made from metallic oxides and fusible glass, ground to a creamy paste by the addition of water, and are laid on with a brush.

The pigments for the necessary colouring are *oxides of salts of metals* which stand the heat of the kiln, only those which can stand very high heat being used for the *underglazing;* sufficiently mild heat only being necessary to fix the *overglaze* (will last from about eighteen to twenty-four hours).

The following colours are used, and are mixed with a white body or clay after being first calcined with other ingredients to develop a lighter tint:

Oxides of cobalt, to give colours varying from *black to grey.*

Antimony for *yellow.*

Oxides of copper for *deep red* and *bright blue* or *green,* according to the properties of oxygen contained.

Oxide of chromium for *green.*

Manganese for *violet* and *black.*

Manganese with iron for *black.*

Gold for *orange.*

Red marl (iron) for *light red.*

Various oxides of iron for *red, yellow,* and *brown.*

Felspathic rock and natural silicate of iron for *bright red.*

Oxide of zinc to modify the other colours.

Oxide of iron, cobalt and chromium, capable of bearing a high temperature, can stand *underglaze* painting.

Overglaze colours made of felspathic rock, crystallised, which melts in vitrification, must be mixed with flux to combine with the glaze ; this is made of *lead*, *borax*, *nitre*, *carbonates of potash* or *soda* which are used.

The colour of cobalt-blue, antimony, yellow, and chrome-green will not change in the excessive heat of the kiln ; but red, from the protoxide of iron of which it is made, will change into brown or black.

Italian painted pottery is called *Majolica* (derived from Majorca). In the process of firing the pottery an opaque whitish glaze results from the introduction of oxide of tin (termed stanniferous enamel), which forms a colourless ground for the painter. Faenza, one of the manufactories of majolica, gave the name of *faïence* to French pottery. The blue in faïence was obtained by glazing from cobalt, prepared by calcination, extracting the volatile bodies mixed with sand and salt. It is of a grey colour ; when fired it was called zaphir.

Another form of pottery is Porcelain (Chinese) ; it is composed of two earths that harmonise in resisting the heat of the kiln. One is a soft decomposed felspathic rock called *kaolin*, and the other, a harder kind of the same origin, mixed with quartz, called *petuntse*.

The majolica plate of enamelled earthenware, date 1480-1500, on page 116, has a device of two hearts and a motto "En Piu," a border of diaper scroll ornament on a white ground, and is coloured in blue, green, and orange (width $11\frac{1}{4}$ inches); in South Kensington Museum.

"MILLS UNDER THE RAMPARTS." BY HENRY F. W. GANZ.

The Spirit of Modern Design.

In recent times a style has been cultivated which, while following in some measure the spirit of ancient styles, does not seek to imitate them. It may be said that a style has sprung up in the arts which seems about to put an end to the mere imitation of the antique and Renaissance manner so long in vogue. Instead of following conventional models in design, with the exception of certain treatments suggested by the tools employed or processes used, artists have tried to give personal views to their art, and have taken as their aim the idea of giving expressive forms to their works.

The aspect of art at the present day offers a picture of the "survival of the fittest." There has been a clearing up of anachronisms in forms of style, and abandonment of the overbearing rules which often hampered and restrained many men of talent in the past.

The artist released from old masters' "executive" ideas of form and harmony has more opportunity of following his own personal inclinations in the matter of "invention and sentiment." Our minds and aspirations differing as they do from those of our forefathers no longer seek for such qualities as the showy and the *grandiose;* but, mindful of certain lessons, find that greatness is not to be judged so much by dimensions as by such essentials as a sense of subtle tones and truth. We are no longer pleased with untruth. Civilisation has smoothed all character out of workmanship by a smooth "finish," so called, in place of refinement, giving polish. We want the kind of truth that, besides acknowledging observation of nature, necessity and treatment, realises the organic growth of things, and is in accord with our feelings, perception, and will.

Picturesque accident may be made use of, but must no longer predominate, and material should be allowed

to present beauty, if possible, as it already exists in itself. The art of decorative design allied with handicraft should show that the artist is acquainted with the nature of the material to be used ; he must know how to express ideas by means of line, drawing, and colour, and show in the result training of the hand and mind.

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