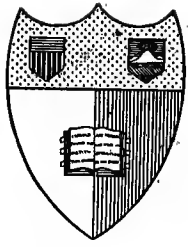

No. 27.]

THE

PRINCIPLES OF COLOURING

IN

PAINTING.

By CHARLES MARTEL.

SIXTEENTH EDITION.

Ars probat artificem.

LONDON:
WINSOR & NEWTON, Limited, 38, RATHBONE PLACE, W.
1885.

Price One Shilling.

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BY CHARLES MARTEL., *pseud.*

[Thomas Dolf.]

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CONTENTS.

PREFACE.

THE object of this little book is to explain the principles upon which harmony of colour in painting depends, and to indicate the readiest and surest way of attaining it. It will be seen that the sight of colours is not so simple an affair as is usually supposed, because the eye, while viewing a coloured object, passes through certain successive stages which are due to the physiological fact that the eye is constructed for seeing *white* light. These stages or conditions give rise to the various kinds of contrast here explained.

Without a knowledge of these phenomena, it is impossible for the painter to imitate his model correctly, except at the expense of much unnecessary time and labour; *with* this knowledge, he can anticipate all the influences at work which cause coloured objects to appear to him different from what they really are.

Numerous works on colour and colouring are extant; but they treat only of *material* colours. It is only within a few years that the subject of contrast of

colours, in its optical relations, has been investigated, and we are now in possession of certain principles, having all the precision and certainty of *laws*, which guide the painter in the art of colouring as surely as the laws of optics guide him in the art of perspective.

This fortunate result for the painter is due to the laborious investigations of the celebrated chemist, M. Chevreul, who has detailed his numerous experiments in an octavo volume of 450 pages.* To this interesting volume we must refer the reader who desires to learn the mode by which the results set forth were arrived at—contenting ourselves with remarking, that these researches were conducted on a truly scientific method, and the results do not admit of question or dispute; for the author takes nothing for granted; everything is submitted to observation, and verified by experiment: these experiments can be repeated by any one desirous of entire conviction.

The law of simultaneous contrast is based upon the following remarkable fact:—

That, whenever we view a colour placed beside another colour, it not only appears changed, but changes the other colour, so that both appear different from what they really are.

* "The Principles of Harmony and Contrast of Colours, and their Application to the Arts," from the French of E. Chevreul. Longmans and Co. London, 1854.

It is not meant that the natural appearance of the coloured materials is altered; but, that owing to the eye being constructed for seeing *white* light, it passes through certain successive stages, which cause the colours looked at to *appear* changed. From this fact the painter learns, that to imitate his model faithfully he must copy it differently from what it appears to him.

At first sight, it may appear that this phenomenon would give rise to great difficulty and uncertainty in attempting to imitate coloured objects. So doubtless it would, were not the law which governs the phenomena of contrast thoroughly investigated and understood. It is by the knowledge of this law, that all doubt, difficulty, and uncertainty are removed from him who studies it; the only precaution necessary is to avoid hasty conclusions. The law must be studied in all its bearings before it can be safely applied, but this study is neither long nor difficult.

It may be said, that all our good pictures have been painted by artists who were ignorant of the law of contrast; but it must be admitted that these successful results have only been arrived at after numerous failures, for every picture painted in ignorance of the law must in some measure be an experiment; and the artist attains the desired harmony by the aid of "an eye for colour," without knowing how.

THE PRINCIPLES OF COLOURING IN PAINTING.

DEFINITION OF THE WORDS TONE, SCALE, HUE.

IN order to give precision and clearness to what follows, it is necessary to define certain terms employed while speaking of colours; for, usually, they are not so well defined but that when one is used we are not sure another is not meant.

Among those to which the greatest ambiguity is attached are the words *tints*, *shades*, and *hues* of colours; so indiscriminate and loose in their application, that we are generally left in doubt as to the kind of modification they are intended to indicate. Yet these modifications may be comprised under two kinds. One, in which a given colour is modified by the addition of a small quantity of another colour (*hues*); the other where a normal colour is modified by the addition of white or black (*tints* and *shades*).

Now these words should never be applied indifferently: therefore in this book—

The word TONES of a colour will be exclusively employed to designate the different modifications

which that colour, taken in its normal state, or at its maximum intensity, is capable of receiving from the addition of white, which weakens or reduces its *tone*, and black, which deepens it.

Therefore, the word *tone* will be substituted both for tint and shade.

The word SCALE is applied to the collection of tones thus modified. The pure colour is the normal tone of the scale, if this normal tone does not belong to a broken or reduced scale, *i.e.*, to a scale all the tones of which are reduced with black.

The word HUES will be exclusively applied to the modifications which a colour receives by the addition of a small quantity of another colour; for instance, where blue is modified by red or yellow, added in such small quantities that the blue, still being *blue*, yet differs from what it was before the addition of red or yellow, in being violet or green.

We say, the tones of the *blue* scale, the tones of the *red* scale, the tones of the *yellow* scale, the tones of the *violet* scale, the tones of the *green* scale, the tones of the *orange* scale.

We say *hues* of blue to designate all the scales the colour of which, still remaining blue, yet differs from pure blue; for each hue will comprehend in itself the tones which constitute a scale more or less allied to the blue scale.

In the same sense we say, *hues* of yellow, *hues* of red, *hues* of green, *hues* of orange.

Colours are distinguished by artists, as *pure*, *broken*, *reduced*, *grey*, or *dull*, &c.

The *Pure* colours comprehend those which are called *simple* or *primary*—red, yellow, and blue, and those which result from their binary compounds, *secondaries*—orange, violet, green, and their hues.

The *broken* colours comprehend the pure colours mixed with black, from the highest to the deepest tone.

It is admitted that the mixture of the three primary colours in certain proportions produces black, from which it becomes evident, that whenever we mix these three colours in such proportions that two of them predominate, black will result, arising from the mixture of the whole of that colour which is in small quantity, with suitable proportions of the two predominant colours.

Thus, if a small proportion of blue is added to red and yellow, a little black is produced which goes to reduce or *break* the orange.

COLOUR.

The source of colour is light, which is either natural or artificial. Natural light, derived from the sun, is termed white or solar light. Artificial light is obtained from burning bodies, &c., and is generally coloured.

Light is either direct or diffused:—*direct* when the sun's rays fall upon any object; *diffused* when ordinary daylight illumines objects with white light, causing them to appear of their peculiar colours.

Diffused daylight, however, is not always white, but is subject to certain modifications arising from peculiar states of the atmosphere, the presence or absence of clouds, &c., the golden hues of sunset contrast greatly with the blue-grey of the morning.

Colour is presented to us independently of material substances, only in the image of the prismatic spectrum; the blue, red, green, &c., of which are the types of pure colours.

SEPARATION OF WHITE LIGHT INTO COLOURED LIGHT.*

When a ray of solar light (a sunbeam) is passed through a prism of flint glass, and the image or *prismatic spectrum* received upon a screen of white paper, it is found to consist of numerous rays of different colours, which are conveniently divided into six groups, viz.: *red, orange, yellow, green, blue, violet.* The limits of each colour are not strongly defined in this spectrum, for they run into or blend with each other, forming various *hues.* Thus, there is a space where the red appears *pure* red, whence it gradually runs into *orange*, by first mixing with the extreme portion, and afterwards with increasing portions of the yellow rays. Then we arrive at a space of pure *yellow.* Further on this yellow becomes greenish, by blending with the extreme *blue* rays, which go on increasing until we arrive at pure *green*, which gradually becomes bluer and bluer until we arrive at pure *blue.* Beyond the blue we again approach red, by which are produced various hues of *violet*, termed lavender, purple, or indigo, according as the blue or red predominates.

Of these six colours, three are termed *primaries*, because they are the source whence all other colours are derived by mixture.

Thus, blue mixed with yellow produces green; mixed with red it yields violet; red mixed with yellow produces orange. These mixtures of the primaries in *pairs* are termed *secondaries.*

The following table exhibits the primaries and the secondaries with their *hues*, resulting from mixtures of the primaries in various proportions, but in *pairs.*

* The artist should provide himself with a prism of flint-glass mounted on a stand for experiments, also with pieces of coloured glass.

Pure Colours and their Hues.	1. Primary or Pure Colours.	R. Y. B.	
		4. 0. 0.	Red.
		0. 4. 0.	Yellow.
		0. 0. 4.	Blue.
	2. Secondaries composed of equal parts.	2. 2. 0.	Orange.
		0. 2. 2.	Green.
		2. 0. 2.	Violet
	3. Secondary Hues.	3. 0. 1.	Violet Red.
		3. 1. 0.	Red Orange.
		1. 3. 0.	Orange Yellow.
		0. 3. 1.	Yellow Green.
		0. 1. 3.	Green Blue.
		1. 0. 3.	Blue Violet.
Compounds of the three Primary Colours yield Greys and Black		1. 1. 1.	Normal Grey.

A *normal* colour is that colour in its integrity, unmixed with white, black, or any other colour.

The modifications a primary colour can receive from mixture with another primary, or with its complementary, or with white, black, and grey, are as follows:—

Suppose the colour to be normal red:

By adding to the Normal Red,
1. Blue, we produce Violet and its hues.
2. Yellow, we produce Green and its hues.
3. White, various light tones of Red.
4. Black, various dark tones of Red.
5. Grey, various broken tones—Red-Greys or Browns.
6. Green Grey.

If the colour is blue:

By adding to the Normal Blue,
1. Red, we produce Violet and its hues.
2. Yellow, we produce Green and its hues.
3. White, various light tones of Blue.
4. Black, various dark tones of Blue.
5. Grey, various broken tones—Blue-Greys.
6. Orange, Grey.

Normal grey is black mixed with white in various proportions, producing numerous *tones* of pure grey.

Greys also result from the mixture of all three primaries in various proportions, producing coloured greys.

COMPLEMENTARY COLOURS.

Theoretically, the union of red, yellow, and blue, in proper proportions, constitutes *white* light. It is immaterial whether we mix the rays of the three separate colours, or of one with the other two in combination; if we mix red with green, the same result ensues as if we mixed with red blue and yellow; because green is composed of blue and yellow; from this we learn, that any primary mixed with a secondary composed of the other two primaries, forms the complement of rays necessary to constitute or make up white light, and *vice versâ*.

The colour required with another colour to form white light is called the *complementary* of that colour; thus:

Green is the complementary of red, and *vice versâ*. Blue is the complementary of orange, and *vice versâ*. Yellow is the complementary of violet, and *vice versâ*, because blue and orange, red and green, and yellow and violet, each make up the full complement of rays necessary to form white light.

The following is a very pleasing mode of observing complementary colours:

Place a sheet of white paper on a table opposite to one of two windows admitting diffused daylight into a room; take a piece of coloured glass or gelatine, and place it so that the coloured light transmitted through it falls over the surface of the paper; then place an opaque object on the paper close to the coloured glass; its shadow will not appear black or of the colour of the glass, as might be supposed, but of its *complementary* colour; thus, if the glass is

red, the colour of the shadow will be *green*, although the whole of the paper surrounding it appears *red;* if the glass is blue, the shadow will appear orange; if it is green, the shadow will appear red, and so with other colours.

It is absolutely necessary for the success of this experiment, that the paper be also illuminated with the white light admitted from the other window.

MIXTURE OF COLOURS.

The very great difference between the results arising from the mixture of the pure coloured rays of the spectrum, and those from material colours or *pigments,* must be taken into consideration.

When, by means of a convex lens, we reunite the coloured rays of the spectrum, *white* light is reproduced; but when we mix coloured materials, which we call blue, yellow, and red, the compound is never white, but grey or black, even if we take these coloured pigments in the exact proportions in which their colours exist in the spectrum. Our purest blue (ultramarine) reflects red as well as blue rays. Gamboge, our purest yellow, reflects blue as well as yellow rays; and carmine reflects yellow as well as red rays.

Now it must be remarked, that whenever the third primary colour is present in any mixture of coloured materials, it tends to form *grey* by mixing with a sufficient quantity of the other coloured rays to neutralize it, and the presence of this grey *breaks,* or tarnishes the pure colour.

The skill of the artists' colourman is chiefly directed to the preparation of pigments of pure colours; many pigments are found in nature, or prepared by artificial means, of much greater purity than can be

attained by mixing pigments representing the primary colours; thus, the impurity inherent in such coloured materials becomes of little or no consequence to the artist, as these natural or artificial pigments will generally supply him with the pure tint required.

One point, however, must be dwelt upon for a moment, as a hint in mixing pigments.

Suppose we wish to obtain a pure green (which consists of blue and yellow only), it is evident that it will be better to take a blue tinged with *yellow*, rather than with *red*, and a yellow tinged with blue, to form the mixture. If we took either a blue or a yellow, tinged with red, this latter colour would go to form some grey in the compound, which would tarnish the green. In like manner, when we seek to form orange, we must take care that neither the red nor the yellow contains blue; so also with violet, the blue and the red must contain no yellow.

COLOURS OF BODIES.

In the present stage of our knowledge, it is difficult to offer a satisfactory explanation of the cause of the peculiar colours of different substances; that is, why grass is green, or copper red, or silver white; it is usual to account for them by saying that all bodies *absorb* certain colours and *reflect* others; the colour absorbed being always *complementary* to that reflected. Thus, if a body is green, it is said to absorb the red rays, and reflect blue and yellow, and so with the others.

Colours				
Reflected	RED.	YELLOW.	BLUE.
Absorbed	*Blue and Yellow.*	*Red and Blue.*	*Yellow and Red.*
Reflected	GREEN.	VIOLET.	ORANGE.
Absorbed	*Red.*	*Yellow.*	*Blue.*

Besides the coloured rays, every substance reflects white light, more or less irregularly, according to the form of the body and the amount of its gloss or polish.

An unpolished white body reflects all the rays, while a black body absorbs them; yet, as it also reflects a small quantity of white light, it is rendered visible.

CONTRASTS OF COLOURS.

There are three kinds of contrasts of colours which are called into action by the sight of coloured bodies; viz., the simultaneous, the successive, and the mixed.

In *simultaneous contrast* are included all the phenomena of modification which differently coloured objects appear to undergo in their colours, and in the height of their tone, when viewed simultaneously.

In *successive contrast* are included all the phenomena observable when the eyes, having looked at one or more coloured objects for a time, perceive, upon turning them away, images of these objects, having the colour complementary to that which is peculiar to each.

The *mixed contrast* results when the eyes, having seen for a certain time a given colour, acquire an aptitude to see, for another period, the complementary of that colour, as well as a new colour which may be presented to them by another object. The colour the eyes then perceive is the colour of this new object added to the complementary of the first.

The phenomena of contrast depend on the physiological fact of the eye being constructed for seeing *white* light; consequently, when a strong coloured light is presented to it, the organ immediately begins to call up another colour, which with the first contains the coloured elements of which white light is com-

posed; this second colour is always the *complementary* of that first seen.

Suppose the eye sees red—it is immediately excited to see green, and actually calls it up, even when none is present, as may be proved by directing the eye upon a sheet of paper, after having looked for some seconds upon a bright red flower. A faint *green* image of this red flower will appear on the plain white paper: this is an example of *successive* contrast. Now it is evident that if we continued looking at this red object, the green called up by the eye would be added to the red, and consequently tarnish it by forming *grey*, through the addition of a faint green to the red colour of the object; and this holds true of every colour looked at, and constitutes the phenomenon of mixed contrast. But suppose this red object is contiguous to another object of a different colour—say yellow, what ensues?

Why, the eye looking for a time at red, begins to see green; if it then looks at yellow the green colour called up by the eye is added to the yellow, making it appear greenish: if the eye looks first at the yellow, and then at the red, the complementary of the yellow, which is violet, is added to the red, tinging it blue; or what amounts to the same thing, the deficient primary *blue* is called up and added to both colours.

This is an example of *simultaneous* contrast, which includes *successive* contrast and *mixed* contrast.

Now, if a painter is working at a bright red drapery, it is evident that the eye becoming fatigued by looking too long upon this colour, the artist will try in vain to attain the degree of purity he aims at, unless he restores the eye to the normal state by looking at green.

It constantly happens that a painter will labour all day upon a representation of his model, and quit his

task dissatisfied and dispirited; but returning to his easel with the eye fresh and vigorous, will be agreeably surprised at the purity and freshness of the tints, which appeared dull and tarnished when he left them.

CONTRAST OF TONE.

We must not omit, however, to take into consideration *contrast of tone* as well as *contrast of colour,* as it plays a very important part in the sight of colours.

Contrast of tone (or intensity) may be made evident in the following manner:—

Take a piece of cardboard of 2½ inches square, and mark upon it ten divisions of a quarter of an inch in width; cover the whole with an even wash of Indian ink; when this is dry, cover with another wash all the divisions except the first; when this is dry, repeat the wash upon all the divisions except the first and second, and so on until the ten divisions are covered with tones increasing in intensity from the first to the tenth.

On now looking at the card, we perceive, that instead of its exhibiting *flat tints*, each division appears of a tone gradually shaded from the line of contact; the result of which is, that the divisions viewed from a suitable distance will resemble channelled grooves rather than flat surfaces, thus presenting the appearance of a fluted column; with this difference, however, that in a real channel, the lighted part would throw a reflection on the darker part.

The effect of contrast of tone is to make the light parts lighter, and the dark parts darker, of two bodies in contiguity; and this contrast of tone is observable in coloured bodies as well as in grey.

When two coloured objects are in juxtaposition, if there is an inequality in intensity or *tone*, this difference is enhanced, making the colours of the objects to differ as much as possible from each other.

This phenomenon gives rise to very important consequences in painting in flat tints, as will be shown hereafter.

The greater the difference between each colour and the complementary added to it (other things being equal), the more striking will be the modification of the juxtaposed colours; if the colours are complementary, they purify each other, and become more varied.

Therefore, the painter has the power of changing the qualities of pigments by simple juxtaposition. He can either enhance the value of both, or sacrifice one and exalt the other; and in cases where a pleasing *ensemble* is not presented by his model, he can adapt the colours he is at liberty to choose to those which are inherent in the model, so as to arrive at a satisfactory and harmonious effect.

COLOURS ASSOCIATED WITH WHITE.

Having examined the effects produced by the juxtaposition of coloured bodies with each other, we have next to consider the influence of the contiguity of white upon coloured objects.

The effect of placing white near a coloured body, is to strengthen and heighten that colour, while the complementary called up by the sight of the colour is added to the white and tinges it.

Black and white are in some respects complementary to each other, and when in contact, appear to differ more from each other than when viewed separately.

This effect appears to be due to the fact, that as all bodies reflect some white light as well as coloured light, the proximity of white in excess neutralises that reflected by the coloured body; and as the effect of mixing white with a colour is to weaken the tone or intensity of the latter, so taking away this white will strengthen it.

COLOURS ASSOCIATED WITH BLACK.

Black substances reflect a small quantity of white light, which receives the complementary of the colour contiguous to the black. If this colour is deep, it gives rise to a luminous complementary, such as orange, or yellow, and enfeebles the black, while the other complementaries, such as violet or green, strengthen and purify it.

If green is juxtaposed with black, its complementary red, added to the black, makes it appear rusty.

A black being always deeper than the juxtaposed colour, gives rise to contrast of tone, and it tends to lower the tone of the colour.

The colours which associate best with black are orange, yellow, blue, and violet.

COLOURS ASSOCIATED WITH GREY.

The primary colours gain in brilliancy and purity by the proximity of grey, but the effects are very different from the proximity of the same colours with white. With dark colours such as blue and violet, and the deep tones in general, it forms assortments of analogous harmonies; with the luminous colours, such as red, orange, yellow, and the light tones of green, grey forms harmonies of contrast.

Although grey never produces a bad effect in its assortment with two luminous colours, in most cases the association is dull and inferior to black and white. It is better than black with

1. Orange and Violet.
2. Green and Blue.
3. Green and Violet.

HARMONIES OF COLOURS.

There are six distinct harmonies of colours, comprised in two kinds.

FIRST KIND.

HARMONIES OF ANALOGOUS COLOURS.

First. The *harmony of scale,* produced by the simultaneous view of different tones of a single scale, more or less approximating.

Second. The *harmony of hues,* produced by the simultaneous view of tones of the same intensity, or nearly so, belonging to scales more or less approximating.

Third. The *harmony of a dominant coloured light,* produced by the simultaneous view of different colours assorted comformably to the laws of contrast, but one of them predominating, as would result from seeing these colours through a slightly stained glass.

SECOND KIND.

HARMONIES OF CONTRAST.

First. The *harmony of contrast of scale,* produced by the simultaneous view of two tones of the same scale, very distant from each other.

Second. The *harmony of contrast of hues,* produced by the simultaneous view of tones of different height, each belonging to contiguous scales.

Third. The *harmony of contrast of colours*, produced by the simultaneous view of colours belonging to scales very far asunder, assorted according to the law of contrast; the difference in height of juxtaposed hues may also augment the contrast of colours.

The simultaneous view of different colours belonging to scales more or less near to each other, may be agreeable; but the assortment of the scales which produce this effect is exceedingly difficult to obtain, because the nearer the scales are allied, the more frequently it happens, that not only one of the colours injures its neighbour, but the two injure each other.

The painter can, nevertheless, make use of this harmony by sacrificing one of the colours, which he lowers to make the other more brilliant.

The simultaneous view of the series of tones of the same scale is agreeable, particularly if the tones are at equal intervals and sufficiently numerous, say, from eighteen to thirty.

The simultaneous view of complementary colours, or of binary unions of colours, which without being complementary, are nevertheless very different, is also agreeable.

Different colours, more or less well assorted, according to the law of contrast, being seen through a coloured glass (which is not sufficiently deep to make us see all the colours of the tint peculiar to the glass), afford a spectacle which is not without its charm, and which evidently stands between that produced by tones of the same scale, and that by colours more or less well assorted; for it is evident that if the glass was deeper in colour it would cause every object to appear entirely of its own peculiar colour.

The *ground*, as well as the interval we place between the coloured materials, has some influence upon the effect of colours.

THE ART OF PAINTING.

THE Art of Painting consists in the reproduction of the images of coloured objects by means of coloured materials or pigments, ground in oil, or other glutinous vehicle.

There are two systems of painting: one in *chiar-oscuro*, the other *flat tints*.

The first consists in representing, as accurately as possible, upon the flat surface of canvas, wood, stone, metals, walls, &c., an object in relief, in such manner that the image makes an impression upon the eye of the spectator similar to that produced by the object itself.

Therefore, every part of the image which in the model receives *direct* light, and which reflects it to the eye of a spectator viewing the object from the same point the painter himself viewed it, must be painted with white, and bright colours.

While the parts of the image corresponding to those which, in the same object, do not reflect to the spectator as much light as the first, must appear in colours more or less dimmed with black, or, what is the same thing, by shade.

It is then by the brightness of white or coloured light, by the weakening of light by means of black, that the painter manages, with the aid of a plane image, to attain all the illusion of an object in relief.

The art of producing this effect by the distribution of light and shade constitutes what is called *chiaroscuro*.

There is a method of imitating coloured objects much simpler by its facility of execution than the preceding, which consists in tracing the outline of the different parts of a model, and in colouring them uniformly with their peculiar colours. There is no relief, no projections, it is the plane image of the object, since all the parts receive an uniform tint.

This system of imitation is *painting in flat tints*.

PAINTING IN CHIAROSCURO.

We must first take into consideration the modifications produced on the colours of the model by the quality of the light falling upon it, and by which it is illuminated.

To illustrate these modifications, let us take three cases in which they may be observed; in the first two, the lighted surfaces are plane, and all the superficial parts homogeneous, and in the same conditions, except that of *lighting* in the second case. In the third case, we shall consider the position of the spectator viewing by diffused daylight an object whose surface is disposed so as not to act equally in all its parts upon the light reflected by it to the eye of the spectator.

First case. Modifications produced by coloured lights falling upon the model.

Second case. Modifications produced by two different lights—as the light of the sun, and diffused daylight—each lighting distinct parts of the same object.

Third case. Modifications produced by diffused daylight.

I.

MODIFICATIONS PRODUCED BY COLOURED LIGHT

When coloured rays, emanating from any source whatever, fall upon a coloured surface, which is at the same time lighted by diffused daylight, it experiences a change of hue similar to that produced by adding to it a pigment of the same colour as the coloured light.

This may be shown experimentally, by partially exposing the coloured surface to the sun's rays transmitted through coloured glass: the portion of the stuff protected from these rays is lighted by the direct light of the sun. The portion of the surface receiving the action of the coloured rays being exposed to diffused daylight, reflects also rays of that light it would have reflected in case it had been protected from the rays transmitted through the coloured glass.

Examples:—

MODIFICATIONS PRODUCED BY RED LIGHT.

When Red falls upon a

Black stuff, they make it appear of a purple black, deeper than the part lighted directly by the sun.
White stuff, they make it appear red.
Red stuff, they make it appear redder than the part lighted by the sun.
Orange stuff, they make it appear redder than the part lighted by the sun.
Yellow stuff, they make it appear orange.
Green stuff, they produce different effects according to the tone of the green: if it is deep, a reddish black is produced; if it is light, there is a little red reflected, which gives a reddish grey.
Light blue stuff, they make it appear violet.
Violet stuff, they make it appear purple.

The modifications produced by blue, green, and other coloured lights are easily observed by experiment, and are very instructive to the painter.

II.

MODIFICATIONS PRODUCED BY TWO LIGHTS OF DIFFERENT INTENSITY.

These are of two kinds.

1. The modification produced by the sun's rays falling upon one part of the surface of a coloured body, while the other part is lighted by diffused daylight.

2. The modification produced when two parts of the same object are unequally illuminated by diffused light.

First modification. An object lighted partly by the sun, and partly by diffused daylight.

To observe this kind of modification, we must extend upon a table exposed to the sun, a piece of coloured stuff about 2½ inches square, and place in the middle a piece of black wire, then put parallel to this, in the middle of each half, two wires, about 3-10ths of an inch wide, then perpendicularly to this, fix a piece of blackened tin plate of 1½ inch in breadth, and of sufficient length to cast a shadow across the half of the cloth when placed in the plane of the sun's rays.

We may then observe the following effects :

If the stuff is *red*, the portion illuminated by the sun's rays is more orange or less blue than the part which is in shade, and the lighted portion adjoining.

If the stuff is *orange*, the illuminated portion is more orange or less grey than the part which is in shade.

If the stuff is *yellow*, the illuminated part is more vivid, more orange than the part in shade.

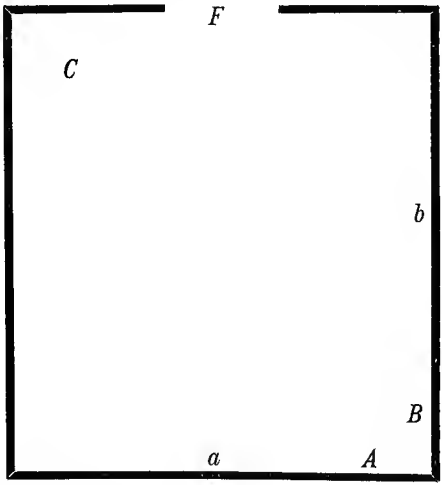
If the stuff is *green*, the lighted part is less blue or yellower than the part in shade.

If the stuff is *blue*, the lighted part is less violet and more green than the part in shade.

If the stuff is *violet*, the lighted part is redder or less blue than the shaded part.

Second modification. Two contiguous parts of the same object viewed simultaneously, when they are unequally lighted by the same diffused light, differ from each other not only in height of tone, but also in the optical composition of colour.

Although this modification cannot be essentially different from the preceding, yet as there is generally a disposition to neglect it, it will be useful to describe how we can observe it, and repeat the direction the modifications of red, orange, yellow, green, and blue follow.



Place half a sheet of coloured paper upon the partition *b* of a chamber receiving diffused daylight by a window F. Place another half sheet upon the partition *a* in such a manner that it will be lighted directly by

the diffused daylight, while the other is only indirectly lighted by the light diffused from the walls, floor and ceiling—it being understood that the diffused light thus reflected must be only white light—then stand at C so as to see both half sheets at once; that which is upon the partition *a*, and most lighted, is marked A, and the other, which is upon the partition *b*, and less lighted, by B.

EFFECTS.

RED COLOUR.

The half-sheet B is deeper, and more of a crimson red, or less yellow than the half-sheet A.

ORANGE COLOUR.

The half-sheet B is deeper, and of an orange more red or less yellow, than the half-sheet A.

YELLOW COLOUR.

The half-sheet B is duller, and of a greener yellow than the half-sheet A.

BLUE COLOUR.

The half-sheet B is deeper, and of a blue, I shall not say more violet, but less green than the half sheet A.

VIOLET COLOUR.

The half-sheet B is deeper, and of a violet less red, or more blue, than the half-sheet A.

GREEN COLOUR.

The half-sheet B is deeper, and of a greenish yellow, or more blue than the half-sheet A.

From these observations we learn that the colour of the same body varies not only in intensity or *tone*,

but also in *hue*, according as it is lighted directly by the sun, by diffused daylight, or by diffused reflected light.

This result must never be overlooked whenever we attempt to imitate the colours of material objects.

III.

Modifications produced by diffused daylight, reflected by a surface, all the parts of which are not in the same position relatively to the spectator.

Distant bodies are rendered sensible to the eye, just in proportion as they radiate, or reflect, or transmit the light which acts upon the retina.

According to the laws of reflection, it happens that those portions of a surface which are in relief or intaglio, must reflect the light in such manner that the eye of the spectator, in a given position, will see these parts very diversely lighted, so that the parts of this surface will be, relatively to the eye, in the same condition as the homogeneous parts of a plane surface which are illuminated by lights of unequal intensity.

There will be this difference, however, that the parts of the surface of a body which appears to us in intaglio, or especially in relief, being but feebly varied in most of the contiguous parts, there will generally be a gradual diminution in the effects presented to us by the case in which we studied the modifications which appear when two plane homogeneous surfaces are lighted by diffused lights of unequal intensity.

The sphere presents a remarkable example of the manner in which light is distributed upon a convex surface relatively to the eye of an observer who views it from a given position.

It is not important to examine this gradation of

white light between parts illuminated thereby, and those which are not, but only to regard the principal modifications, and, take for examples, the cases where they are as evident as possible.

These modifications can be reduced to the four following :—

First modification, produced by the maximum of white light which the surface of a coloured body is capable of reflecting.

Other things being equal, the more the surface of a body is polished, the more it will reflect white and coloured light ; thus, a stick of red sealing-wax, when broken, presents in the fractured parts a duller and more tarnished colour than the outside.

On the other hand, if we observe this same outside surface suitably placed, we shall perceive a white stripe parallel to the axis of the cylinder, produced by a quantity of colourless reflected light, so considerable that the red light reflected from this stripe is insensible to the eye which observes it.

Thus, the white light reflected by a coloured body can be of sufficient intensity to render the colour of the body insensible in some of its parts.

Second modification, produced by those parts of a coloured surface which send to the eye, in proportion to the coloured light, less of white light than the other parts differently lighted, or differently placed with regard to the spectator.

When the eye sees certain parts of the surface of a polished coloured object, or one more or less smooth when not polished, which reflects to it, proportionally to the coloured light, less of white light than the other parts differently illuminated or differently placed in relation to the spectator, the first parts will appear, in most cases, of a more intense tone of colour than the second.

EXAMPLES.

a. A stick of red sealing-wax presents—starting from the white stripe mentioned above, a red colour, deeper in proportion as less white light reaches the eye. Thus, in a certain position where the white stripe appears to be in the middle of the cylinder, the part most lighted will appear coloured, reflecting a red inclining to scarlet, while that which is the least lighted reflects a red inclining to crimson.

b. If the eye is directed into a gold vase of sufficient depth, the gold does not appear *yellow*, as on the exterior surface, but of a *red orange*, because less white light, in proportion to coloured light, reaches the eye in the first case than in the second. For this reason, the concave parts of gold ornaments appear redder than the convex.

c. The folds of bright draperies present the same modification to an eye properly placed. The effect is particularly remarkable in yellow silk stuffs, and in sky-blue; for we can easily understand that it is less marked when the stuffs are not so bright, and of dark colours.

d. There are some stuffs which appear to be of two tones of the same scale of colour, and sometimes also of two tones of two contiguous scales, although the weft and the warp of these stuffs are of the same tone and the same colour. The cause of this appearance is very simple; the threads which, parallel to each other, form the pattern, are in a different direction to the threads which constitute the ground of the stuff. Thence, whatever may be the position of the spectator with regard to the stuff, the threads of the pattern will always reflect coloured and white light in a different proportion to the threads of the ground, and

according to the position of the spectator, the design will appear now lighter, now darker than the ground.

Third modification, produced when one part of the surface of an object, coloured or not coloured, reflects little or no light to the eye of the spectator.

When one part of the surface of a body which is in the field of vision of the spectator sends little or no light to his eyes, either because this part is not directly lighted, or because the light it reflects is not in a suitable direction, then it appears black, or more or less dark.

Fourth modification. The colour complementary to that of a coloured object is developed in one of its parts in consequence of simultaneous contrast.

A natural consequence of the law of simultaneous contrast in general, and of the effect of a colour upon grey and black in particular, is that, since the same objects present some parts more or less obscure contiguous to parts where we see the colour peculiar to the object, the first part will appear tinted of the complementary to this colour; but to observe this effect it is necessary that the grey part reflects to the eye white light, and little or none of the coloured light which the object naturally reflects.

a. Fourth modification in a single coloured stuff.

For example, if we stand at the back of a chamber looking towards a window admitting daylight, and a person clothed in a new blue coat stands looking through the window at objects on the outside, the eye will perceive the cloth on the shoulders of a different colour from that of the back, because the nap of the cloth is disposed in a contrary direction in one part to the other, that of the shoulders appears of a fine blue, while that of the back will appear orange-grey, through the effect of contrast of the blue part with a part that reflects very little white light to the eye, without, or almost without, blue light.

If the garment be of a deep green, the grey part will appear reddish; if it be violet, maroon, or claret, the grey part will appear yellow.

The complementary is developed only upon cloths of dark and sombre colours; thus red, scarlet, orange, yellow, and light blue garments do not exhibit it because they have always too much of the essential colour which is reflected. The modification is limited to that where one of the parts is more strongly illuminated by diffused light than the other.

There is still another circumstance where this fourth modification appears evident; it is when we look upon a series of light tones—blues, pinks, &c. (belonging to the same scale), of a skein of silk or wool placed upon an easel in such manner that one-half of the same skein presents to the eye threads disposed in a contrary direction to those of the other half. The half of the skein which does not reflect coloured light to the eye appears tinted with the complementary of the other half which does reflect it.

b. Fourth modification in a stuff presenting a dark and a light tone belonging to the same scale. If we place in juxtaposition a well-assorted dark tone and a light tone of the same scale, the light tone will appear of the colour complementary to the scale to which it belongs. This modification is too important in the explanation of certain phenomena often exhibited by the products of the calico-printer to permit its being passed over hastily.

When we look for several seconds on a fabric dyed with a coloured ground, and on which we put patterns intended to be white, but which owing to the imperfection of the process employed, retain a light tone of the colour of the ground, the patterns will appear of the complementary of this latter.

Thus, upon a ground of yellow chrome they will

appear *violet*, upon a ground of orange chrome they will appear *blue*, upon a green ground *pink*, &c. To dispel the illusion, and recognise the true tint of the pattern, it is only necessary to cover the ground with paper perforated with the design of the pattern, which then permits us to see only the pattern coloured like the ground.

The influence of a dark tone upon a feeble tone then is such that not only is the latter neutralized, but also the place it occupies upon the cloth appears tinted with its complementary colour.

Coloured stuffs with white patterns present certain modifications which must be noticed in this place. If we regard a sky-blue silk with white flowers, the weft of which is in an opposite direction to the weft of the blue ground, we shall see the flowers *white*, if they are placed in the most favourable manner for receiving the white light reflected by them; while in the contrary position we shall actually see these flowers *orange*. There is still much white light reflected; but it is not sufficiently vivid to neutralize the development of the complementary of the ground.

PERSPECTIVE.

In painting, we recognise two kinds of perspective, the *linear* and the *aërial*.

The first is the art of producing upon a plane surface the lineaments and contours of objects and their various parts in the relations to position and size in which the eye perceives them.

The second is the art of distributing, in a painted imitation, light and shade, as the eye of the painter perceives them in objects placed in different planes,

and in each particular object which he wishes to imitate upon a surface.

It is evident that aërial perspective comprehends the observation and reproduction of the principal modifications of colours which have just been examined in succession, and that *true* or *absolute* colouring in painting can only be as faithful a reproduction of this as possible.

PAINTING IN FLAT TINTS.

In painting in flat tints the colours are neither shaded nor blended together, nor modified by the coloured rays coming from objects near to that which the painter has imitated.

In pictures which belong to this kind of painting, the representation of the model is reduced to the observance of linear perspective, to the employment of vivid colours in the foreground, and of pale and grey colours in the distance.

If the choice of contiguous colours has been in conformity with the law of simultaneous contrast, the effect of the colour will be greater than if the picture had been painted on the system of chiaroscuro.

If it is beyond dispute that painting in flat tints preceded that in chiaroscuro, yet it would be an error to believe that at the point at which we have arrived in Europe, we must renounce the first to practise exclusively the second, for in every instance where painting is an accessory and not a principal feature, painting in flat tints is preferable in every respect to the other.

The essentials of painting in flat tints necessarily reside in the perfection of the outlines and the colours. These outlines contribute to render the impression of

colours stronger and more agreeable, when, circumscribing forms clothed in colours, they concur with them in suggesting to the mind a graceful object, although, in fact, the imitation of it does not give a faithful representation.

In conformity with what has been said, we may consider painting in flat tints will be advantageously employed—

1. When the objects represented are at such a distance that the finish of an elaborate picture would be lost.

2. When a picture is an accessory, decorating an object whose use would render it improper to finish it too highly, on account of its price. Such are the paintings which ornament screens, work-boxes, tables, &c. In this case, the objects preferable as models are those whose beauty of colours and simplicity of form are so remarkable as to attract the eye by outlines easily traced, and by their vivid colours:—as birds, insects, flowers, &c.

COLOURING IN PAINTING.

True or *absolute colouring* may be defined the faithful reproduction in painting of the modifications which light enables us to perceive in the objects selected by the painter for his models :—

But for want of analyzing these modifications, the word *colouring*—usually defined the result of the applications upon a plane surface of coloured materials with which the painter imitates a natural, or represents an imaginary object—receives in its applications to the simplest as well as the most complex pictures, significations so diverse, according to the kind of pictures, the taste and knowledge of the persons using this word, that it will be necessary to apply to the various significations it has in ordinary language the analysis already made of the different elements of *absolute colouring*.

In the ordinary use of the word *colouring*, we allude to the manner, more or less perfect, in which the painter has complied with the rules :—

1. Of aërial perspective relative to white light and to shade, or, in other words, irrespective of colour.

2. Of aërial perspective relative to variously coloured light.

3. Of the harmony of local colours, and of that of the colours of the different objects composing the picture.

ARTICLE I.

Of Colouring, with regard to aërial perspective, relative to white light and to shade.

For an artist to be a *colourist*, we must not suppose the employment of many colours in a composition to be essential, for in painting in *camaïeu,* the simplest of all, in which we only distinguish two colours, including white, the artist will be honoured with the title of *colourist* if his work presents lights and shades distributed as they are upon the model, leaving out, of course, those modifications arising from colours which he had not upon his palette: and to convince ourselves that the expression is not unjust, it will suffice to remark that the model might very well appear to the painter coloured in a single colour, modified by light and shade.

In the same sense, the term *colourist* can always be applied to the engraver, who by means of his *burin,* reproduces a picture as faithfully as possible, in respect both to the aërial perspective of its different planes, and to the relief of each particular object.

ARTICLE II.

Of Colouring, with regard to aërial perspective, relative to variously coloured light.

It may happen that the imitation is perfectly faithful, or the reverse.

A. PERFECTLY FAITHFUL IMITATION.

A painter who has faithfully reproduced the aërial perspective, with all its modifications of white and coloured light, and of shade, has a *true* or *absolute colouring;* but, it may be doubted if the imitation in which this quality is found will be universally judged

as perfect as that in which this quality is not found, at least in the same degree.

B. IMPERFECTLY FAITHFUL IMITATION.

We will now examine the principal cases which may occur when we observe pictures in which the modifications of differently coloured light are not faithfully imitated.

First Case.—A painter has perfectly seized upon all the modifications of white and coloured light, but in his imitation, all the modifications, or a part only, are more prominent than in nature.

Generally speaking, *true*, but *exaggerated colouring* is more agreeable than *absolute colouring*, and many persons, who experience pleasure in seeing the modifications of exaggerated coloured light in a picture do not feel the same pleasure from the sight of the model, because the modifications corresponding to those which are imitated in excess are not sufficiently prominent to be evident to them.

Besides, the eye has a natural relish for an excess of the exciting cause, analogous to the inclination for highly seasoned food and strong drink.

In our judgment of a picture whose colours appear *exaggerated*, and which does not occupy the place for which it was intended by the painter, we must not omit to take into account the light of the place which it is to occupy, and the distance from which the spectator views it, otherwise we incur the risk of greatly deceiving ourselves.

Second Case.—A painter has perfectly seized all the modifications of light which bring forward the planes and objects: the modifications of the coloured light of his picture are true, but the colours are not those of the model.

This case comprehends those pictures in which there

is a dominant colour which is not in the model. This dominant colour is often called *the tone of the picture*, and *the tone of the painter*, if he uses it habitually.

We should form a correct idea of these pictures if we supposed that the artist had painted them while looking at his model through a glass of precisely the same colour, to enable him to perceive the tint which predominates in his imitation. We can also cite, as an example of this kind of imitation, a landscape painted from its reflection in a black mirror, because the effect of the picture is very soft and harmonious.

We also understand how it happens that a picture comprised under this head may have an agreeable or disagreeable dominant colour; and that the expressions *brilliant* or *warm colouring*, or *cold* or *dull colouring* applies to those pictures the colours of which are unfaithful to the model, but which have an agreeable or disagreeable effect.

ARTICLE III.

Of Colouring in respect to the harmony of local colours and to that of the colours of the different objects composing the picture.

The colouring of a picture may be *true* or *absolute*, and yet the effect may not be agreeable, because the colours of the objects have no harmony. On the contrary, a picture may please by the harmony of the local colours of each object, by that of the colours of objects contiguous to each other, and yet may offend by the gradation of the lights and shades, and by the fidelity of the colours. In a word, it offends by *true* or *absolute* colouring; and the proof that it might please is, that pictures in flat tints, the colours of which are perfectly assorted to the eye, although opposed to those which we know belong to the objects imitated, produce, under the relation of general harmony of colours, an extremely agreeable effect.

RESULT OF THE PRECEDING CONSIDERATIONS.

The general conclusions resulting from the analysis just made of the word colouring in ordinary language, is that the epithet *colourist* may be applied to painters endowed in very different degrees with the faculty of imitating coloured objects by means of painting.

Those to whom all the difficulties of chiaroscuro and drawing are known, may give the name of colourists to painters remarkable for the skill with which they bring out objects placed upon the different planes of their pictures, by means of correct drawing, and a skilful gradation of light and shade, even when their pictures do not exactly reproduce every modification of coloured light, and have not this harmony of different colours properly distributed to complete the effects of perfect colouring.

Those who have no facility in judging of painting, or who are ignorant of the art of chiaroscuro, are generally inclined to refuse the title of colourist to the painters of whom we have spoken, while they unhesitatingly accord it to others who have reproduced the modifications of coloured light, and tastefully distributed the different colours in their pictures. Besides, colour so powerfully influences the eyes that frequently those who are strangers to painting can only conceive a colourist skilful where the tints are vivid, although he may have failed in the manner in which he has represented differently coloured objects upon the canvas.

We see by this how the judgment of many persons brought to bear upon the same picture will differ from each other, according to the importance which they respectively attach to one quality of colouring rather than to another.

Let us now consider what a perfect colourist must be, or rather the conditions which every painter must fulfil in a picture to whom this qualification can be applied.

For a painter to be a perfect colourist, he must not only imitate the model by reproducing the image faithfully, in respect to aërial perspective relative to the variously coloured light; but, also, the harmony of tints must be found in the local colours, and in the colours of the different objects imitated; and this is the place to remark, that if in every composition there are colours inherent in the model, which the painter cannot change without being unfaithful to nature, there are others at his disposal which must be chosen so as to harmonize with the first.

Having defined what a painter is as a perfect colourist, conformably to the analysis made of the word *colouring*, and considered the painter individually, that is to say, without comparing him with others, we must now consider this definition in relation to contemporary painters, and those old enough for their pictures to have undergone some change, and the varnish covering them having become more or less yellow.

When the pictures have been recently painted, and they represent familiar objects, we can always see if the painter has fulfilled all the conditions of a perfect colourist, by comparing the model with his representation.

From what has been said, it is evident that when a change in the colours of a picture has been effected by time, it is impossible to determine whether the artist who painted it should be called a *perfect colourist;* but, recalling what has been said of the painter, who has correctly seized all the modifications of light adapted to bring out the distances and the relief of objects, who has represented the modifications of coloured light with perfect truth, but which are not those of the model—we may easily conceive

how at this day, after one, two, or three centuries, we can give the name of *colourist* to Albano, Titian, Rubens, and others.

The pictures of these great masters present to us gradations, more or less perfect, of light and shade, and such harmonies of colour that it is impossible either to mistake or not to admire them; and the idea that so many pictures not more than twenty or five-and-twenty years old, painted by artists of undoubted skill, have lost in colour more than those of the old masters, also increases our admiration of the latter.

UTILITY OF THE LAW OF SIMULTANEOUS CONTRAST OF COLOURS.

Having defined the principal modifications which bodies experience when they become evident to us by means of the white or coloured light they reflect, and having examined painting, and defined colouring conformably with the study of these modifications, it now remains to speak of the law of contrast of colours, with respect to the advantages the painter will find in it when required.

1. To perceive promptly and surely the modifications of light on the model.

2. To imitate these modifications promptly and surely.

3. To harmonise the colours of a composition, and having regard to those which must necessarily be found in the imitation, because they are inherent in the nature of the objects he must reproduce.

ARTICLE I.

Utility of this law in enabling us to perceive promptly and surely the modifications of light on the model.

The painter must know, and especially *see*, the modifications of white light, shade and colours, which

the model presents to him in the circumstances under which he would reproduce it.

Now what do we learn from the law of *simultaneous contrast of colours?*

It is this:—when we regard attentively two coloured objects at the same time, neither of them appears of the colour peculiar to it; that is to say, such as it would appear if viewed separately, but of a tint resulting from its peculiar colour and the complementary of the colour of the other object.

On the other hand, if the colours of the objects are not of the same tone, the lightest tone will be weakened and the deepest tone deepened; in fact, by juxtaposition they will appear different from what they really are.

The first conclusion to be deduced from this is, that the painter will rapidly appreciate in his model the colour peculiar to each part, and the modifications of tone and of colour which they may receive from contiguous colours. He will then be much better prepared to imitate what he sees than if he were ignorant of this law.

He will also perceive modifications, which if they had not always escaped him because of their feeble intensity, might have been disregarded because the eye is susceptible of fatigue, especially when it seeks to disentangle the modifications, the cause of which is not known, and which are not very prominent.

This is the proper place to return to *mixed contrast*, in order to make evident how the painter is exposed to seeing the colours of his model inaccurately.

For the eye, after observing one colour for a certain time, having acquired a tendency to see its complementary, and as this tendency is of some duration, it follows, not only that the eyes of the painter, thus modified, cannot see correctly the colour which he had

for some time looked at, but also another which might strike them while this modification lasts.

So that, conformably to what we know of mixed contrasts, the eyes will see, not the colour which strikes him in the second place, but the result of this colour, and of the complementary of that first seen.

We can establish three conditions in the appearance of the same object relative to the state of the eye.

In the *first,* the organ simply perceives the image of the object without taking into account the distribution of the colours, light and shade.

In the *second,* the spectator seeking to properly understand this distribution, observes it attentively, and then the object presents to him all the phenomena of simultaneous contrast of tone and colour it is capable of exciting in us.

In the *third* circumstance, the organ, from the prolonged impression of the colours, possesses in the highest degree a tendency to see the complementary of these colours; it must be understood that these different states of the organ are not interrupted, but continuous, and that if we examined them separately, it was with the view of explaining the diversity of the impression of the same object upon the sight, and to make evident to painters all the inconveniences attendant upon a too prolonged view of the model.

The dull colouring with which many artists of merit have been reproached, is doubtless partly due to this cause, as will be shown hereafter.

ARTICLE II.

Utility of this law, in order to imitate promptly and surely the modifications of light on the model.

The painter, knowing that the impression of one colour beside another, is the result of the mixture of the first with the complementary of the second, has

only to mentally estimate the intensity of the influence of this complementary, to reproduce faithfully in his imitation the complex effect before his eyes.

After having placed upon his canvas the two colours required, as they appear to him in the isolated state, he will see if the imitation agrees with the model, and if he is not satisfied he must then recognise the correction which has to be made.

Take the following examples:—

I.

Suppose a painter has to imitate a white stuff with two contiguous borders, one red, the other blue, he perceives that each of them is changed by virtue of their reciprocal contrast; thus the red becomes more and more orange in proportion as it approaches the blue, and the blue becomes more and more green as it approaches the red. The painter knowing by the law of contrast the effect of blue upon red, and reciprocally red upon blue, will always reflect that the green hues of the blue, and the orange hues of the red, result from contrast; consequently, in painting the borders simply with red and blue, reduced in some parts by white or by shade, the effect he wishes to imitate will be reproduced.

In case it is found that the painting is not sufficiently marked, he is sure of what he must add without departing from the truth, otherwise he must exaggerate a little.

II.

Suppose it is a grey pattern upon a yellow ground, the ground may be of paper, silk, cotton, or wool: according to its contrast, the pattern will appear of a lilac or a violet colour.

The painter who would imitate this object, which

may be a tapestry, or drapery, can reproduce it faithfully with grey.

These two examples are appropriate to explain the difficulties encountered by painters who are ignorant of the law of contrast of colours.

For the painter ignorant of the reciprocal influences of blue and red, supposes he must represent what he sees; consequently he adds green to his blue, and orange to his red: as in the second example, he will trace a pattern more or less violet upon the yellow ground; now what would happen? Why, the imitation would never be perfectly faithful, it would be exaggerated, supposing, of course, that at first the painter had perfectly seized the modifications of the model, and subsequently having perceived the exaggeration of his imitation, he has not retouched it sufficiently to produce a perfectly faithful effect. If he had arrived at this latter result, it is evident it would only be after trials, more or less numerous, since he must have effaced what was first done.

III.

We will now instance a case of contrast of tone, taking different tones of the same colour, contiguous to each other.

Suppose the painter has to represent in a picture several bands in juxtaposition, of different tones of the same scale, in flat tints: to imitate it correctly, it is evident he must paint in flat tints; but this object will appear to the eye a channelled surface, the line where two bands touch will, by the effect of contrast of tone, appear like a relief—hence it follows, if the painter is ignorant of this, he will reproduce, not an absolute copy of the model, but an exaggerated one; or if, dissatisfied with his first imitation, he arrives at a faithful reproduction of the model, it will be after several attempts.

These examples show, that to imitate the model faithfully we must copy it differently from what we see it.

The correctness of the six following principles will be evident to the painter who has studied what has been said on the law of contrast.

FIRST PRINCIPLE.

Put a colour upon a canvas, it not only colours that part of the canvas to which the pencil has been applied, but it also colours the surrounding space with the complementary of this colour.

Thus a red circle appears surrounded with a green aureola, which grows weaker and weaker as it extends from the circle.

A green circle is surrounded with a red aureola.

An orange circle is surrounded with a blue aureola.

A blue circle is surrounded with an orange aureola.

A yellow circle is surrounded with a violet aureola.

A violet circle is surrounded with a yellow aureola.

SECOND PRINCIPLE.

To place white beside a colour is to heighten its tone. It is the same as if we took away from the colour the white light which enfeebled its intensity.

THIRD PRINCIPLE.

Put black beside a colour, it weakens its tone; in some cases it impoverishes it: such is the influence of black upon certain yellows. It is in fact to add to black, the complementary of the contiguous colour.

FOURTH PRINCIPLE.

Put grey beside a colour it is rendered more brilliant, and at the same time it tints this grey with its complementary.

From this principle it results that in many cases where grey is near a pure colour in the model, the painter, if he wishes to imitate this grey which appears

to him tinted with the complementary of the pure colour, need not have recourse to a coloured grey, as the effect ought to be produced in the imitation by the juxtaposition of the colour with the grey which is near it.

Moreover, the importance of this principle cannot be doubted, when we consider that all the modifications which monochromous objects may present, excepting those which result from the reflections of coloured light emanating from neighbouring objects, belong to the different relations of position between the parts of the object and the eye of the spectator; so that it is strictly true to say, that, to reproduce by painting all these modifications, it suffices to have a colour exactly identical with that of the model, and black and white. In fact, with white we can reproduce all the modifications due to the weakening of the colour by light, and with black those which are necessary to raise its tone.

If the colour of the model in certain parts gives rise to the manifestation of its complementary, because these parts do not return to the eye sufficient colour and white light to neutralize this manifestation, the modification alluded to is reproduced in the imitation by the employment of a tone of normal grey, properly surrounded with the colour of the object.

FIFTH PRINCIPLE.

To put a dark colour near a different, but lighter colour, is to heighten the tone of the first, and to lower that of the second, independently of the modification resulting from the mixture of the complementaries.

An important consequence of this principle is, that the first effect may neutralize the second, or even destroy it altogether: for example, a light blue placed beside a yellow, tinges it orange, and consequently heightens its tone, while there are some blues so dark relatively to the yellow that they weaken it, and not

only hide the orange tint, but even cause sensitive eyes to feel that the yellow is rather green than orange: a very natural result, if we consider that the paler the yellow becomes the more it tends to appear green.

SIXTH PRINCIPLE.

Put beside each other two flat tints of different tones of the same colour; chiaroscuro is produced, because, in setting out from the line of juxtaposition, the tint of the band of the highest tone is insensibly enfeebled; while setting out from the same line the tint of the band of the lowest tone becomes heightened, there is then a true gradation of light.

The observance of these principles, and especially the perfect knowledge of all the consequences of the last three, will exercise a very favourable influence upon the art of painting, in giving to the artist a knowledge of colours which he cannot possess before the law of their simultaneous contrast has been developed, and followed in its consequences as it now is.

The painter will gain, not only in the rapidity with which he will see the model, but also in the rapidity and truth with which he will be able to reproduce the image. Among the details he endeavours to render, there are many which, due to contrast either of tone or colour, will reproduce themselves.

It is probable that the Greek painters, whose palette was composed of white, black, red, yellow and blue, and who executed so many pictures which their contemporaries have spoken of with intense admiration, painted conformably to the simple method described above; attaching themselves to great effects, many minor ones resulted.

Sir Joshua Reynolds remarked that "A picture, to possess harmony of colouring, should look as if it was painted with one colour (suppose umber and white),

and when the chiaroscuro was complete the colour of each object should be glazed over it." Such was probably the method of Titian.

ARTICLE III.

Utility of law, in order to harmonise the colours which enter into a composition with reference to those which must be reproduced, because they are inherent in the nature of the object represented.

In all, or nearly all, the objects delineated in painting, we must distinguish the colours which the painter is under the necessity of using, and those which he is at liberty to choose, because they are not like the former, inherent in the model.

For example, in painting a human figure the colour of the flesh, the eyes, and the hair, are fixed by the model, but the painter has a choice of draperies, ornaments, backgrounds, &c.

In a historical picture, the flesh colours are, in the majority of the figures, at the choice of the painter, as are also the draperies, and all the accessories, which can be designed and placed as desired.

In a landscape the colours are given by the subject, yet not so arbitrarily but we can substitute for the true colour the colour of a neighbouring scale. The artist can choose the colour of the sky, imagine numerous accidental effects, introduce into his composition animals, draped figures, carriages, &c., the form and colour of which may be selected so as to produce the best possible effect with the objects peculiar to the scene.

A painter is also master of his choice in a dominant colour which produces upon every object in his composition the same effect as if they were illuminated by a light of the same colour, or, what amounts to the same thing, seen through a coloured glass.

If the law of contrast affords different methods of

imparting value to a colour inherent in the model, genius alone can indicate the method which a painter should prefer to others in realising his idea upon the canvas, and so render it evident to the sight.

Whenever we desire to attract the eye by colours, doubtless the principle *harmony of contrast* must be our guide.

The law of simultaneous contrast indicates the means by which the pure colours may be made to give value to each other; means which, although spoken of, are but little understood, as may be seen in the crowd of portraits in vivid tints so badly assorted, and in those numerous small compositions in tints broken with grey, where we look in vain for a pure tone, which, however, from the subject represented, are eminently adapted to receive all the vivid colours which the painter in flat tints employs.

The contrast of the most opposite colours is as agreeable as possible when they are of the same tone. But if, by using too great intensity of colours, *crudity* is feared, then we must have recourse to the light tones of their respective scales.

When the painter breaks tones with grey, and wishes to avoid monotony, or when upon planes which are distant, but not sufficiently so to render the differences of colour inappreciable, he wishes every part to be as distinct as possible, he must have recourse to the principle of harmony of contrast, and mix *grey* with his colours,

This method of bringing out a colour by contrast, in employing either light tones, complementary, or more or less opposed, or broken tones more or less grey, and of tints complementary to each other; or in employing a broken tone of a tint complementary to a contiguous colour more or less pure, ought to particularly engage the attention of portrait painters.

A portrait of a lady may have a very mediocre effect, because neither the colour of the dress nor of the background have been properly selected.

The portrait painter must endeavour to find the predominating colour in a complexion he has to paint; this found, and faithfully reproduced, he must next seek what among the accessories at his disposal will give value to it.

There is a very prevalent error that the complexion in women, to be beautiful, must consist only of red and white; if this opinion is correct as regards most of the women of our temperate climate, it is certain that in warmer climes, there are brown, bronzed, copper-coloured complexions even, endued with a brilliancy, I may say beauty, appreciated only by those who in pronouncing upon a new object, wait until they have got rid of habitual impressions, which (although the majority of men do not know it), exercise so powerful an influence upon the judgment of the objects seen for the first time.

Suppose a painter would always derive the greatest possible advantage from colours, without being under the necessity of multiplying them; if he had to paint large draperies of a single colour, he might with advantage have recourse to the coloured rays emanating from neighbouring bodies, whether they are perceptible to the spectator, or out of sight.

For example, a green or yellow light falling upon part of a blue drapery, makes it green, and by contrast heightens the blue violet tone of the rest, a golden yellow light falling on part of a purple drapery imparts to it a yellow tone, which makes the purple of the rest come out, &c.

To the painter, who undertakes to produce the effects of chiaroscuro, the principle harmony of contrast secures the means of realizing, with respect to bril-

liancy of colouring and distinctness of parts, effects which the painter who graduates neither the lights nor the shades produces without difficulty by means of flat tints.

It now remains to treat of the case where a painter wishes less diversity in the object, less variety in the colours, employs only with reserve the *harmony of contrast,* preferring to it, the more easily to attain his end, the *harmony of scale* and the harmony of hues.

The greater the number of different colours and accessories in a composition, the more the eyes of the spectator are distracted, and the more difficulty is experienced in fixing the attention. If this condition of diversity of colours and accessories is obligatory on the artist, the more obstacles there are to overcome when he wishes to draw and fix the attention of the spectator upon the physiognomy of the figures he would reproduce, whether these figures represent the actors in one scene only, or whether they are simply portraits.

In the latter case, if the model has a common physiognomy which recommends itself neither by the beauty nor the expression of its features, and still more if a natural defect must be dissembled or concealed, all that is accessory to this physiognomy, all the resources of contrasted colours well assorted, must come to the aid of the painter.

But if the artist perceives great purity of expression, with nobility and loftiness of character existing in his model, or if a physiognomy (to most eyes common-place) strikes him by one of those expressions which he judges to belong only to men animated by noble ideas in politics, science, art, and literature—it is to the physiognomy of such models he should address himself; upon these he should fix his chief attention, so that in reproducing them upon his canvas no one can mistake the resemblance, nor overlook the

feeling which guided his pencil. Everything being accessory to the physiognomy, the drapery will be black or of sombre colours; if ornaments relieve them they will be simple, and always in connection with the subject.

In examining, from this point of view, the *chef-d'œuvres* of Vandyck, and tracing their beautiful effects to the simplicity of the means by which they are produced, and when we regard the elegance of their attitudes, which always appear natural, the taste which presides over the selection of the draperies, ornaments, and other accessories, we are struck with admiration at the genius of the artist who has not had recourse to those means of attracting attention so much abused at the present day, either by giving a heroic attitude to a vulgar person, or the resemblance of profound thought to a common-place physiognomy, or in seeking extraordinary effects of light; for example, in filling the figure with a strong light while the rest of the composition is in shade.

There is yet an important observation to be made, which is to avoid as much as possible the same kind of images as ornaments of different objects.

Thus figures clothed in draperies with large flower patterns which a painter has placed in a room where the carpet and porcelain vases repeat the same images to the spectator, always produce an objectionable effect, because they make it troublesome for the eye to separate the different parts of the picture, which the similarity of ornaments tends to confound together.

On the same principle, the painter must generally avoid placing beside the faithful reproduction of a model, the reproduction of an imitation which repeats this model.

For example, when he paints a vase of flowers the artist produces most effect, other things being equal

(supposing he wishes to fix attention upon the flowers he paints from nature), in painting the vase of white or grey porcelain, instead of one decorated with a profusion of similar objects.

To conclude these remarks upon colouring, it now remains to treat of the case where a painter wishes a particular colour to predominate in his composition; or, to speak more correctly, the case where the scene he represents is lighted by a coloured light diffused over every object. The better to understand this, he must not only take simultaneous contrast into consideration, but also the modification which results from the mixture of colours comprising the recomposition of white light by means of a proper proportion of the differently coloured elementary rays.

Whenever a painter would make a coloured light predominate in a composition, he must attentively consider the modifications of light resulting from coloured rays falling upon bodies of various colours, he must understand, that although the coloured light chosen imparts value to certain colours of the objects upon which it falls, it also impoverishes and neutralises others; consequently when the artist has decided upon employing a predominant colour, he must renounce certain others, for if he does not, the effect produced will be false. For example:—

If the colour orange predominates in a picture, for the colouring to be true, it must necessarily follow—

1. That the purple must be more or less red.
2. That the red must be more or less scarlet.
3. That the scarlet must be more or less yellow.
4. That the orange must be more intense, more vivid.
5. That the yellows must be more or less intense and orange.
6. That the greens lose their blue, and consequently become yellower.

7. That the light blues become more or less light grey.

8. That the deep indigo becomes more or less maroon.

9. That the violets lose some of their blue.

We clearly see, then, that orange light heightens all the colours which contain red and yellow; while neutralising a portion of blue in proportion to its intensity, it destroys wholly, or in part, this colour in the body it illuminates, and consequently disturbs the green and violets.

In every composition of small extent, the colours as well as the objects represented must be distributed with a kind of symmetry, so as to avoid an appearance of spottiness.

For want of a good distribution of objects, it often happens that the canvas is not filled in some parts, or if it is, there is an evident confusion in many places; so also, if the colours are not distributed properly, it will happen that some of them will be spotty, because they are too isolated from the others.

In conclusion, those painters who will study the mixed and simultaneous contrast of colours, in order to employ the coloured elements of their palette rationally, will perfect themselves in *absolute colouring* as they perfect themselves in linear perspective, by studying the elements of geometry which govern this branch of their art.

ON THE SELECTION OF DRAPERY FOR PORTRAITS.

It is well known that the colour of the skin and complexion can be greatly modified by the colour of the drapery; the modification may have the effect of enhancing or injuring the result aimed at, according

as the painter is familiar with or ignorant of the law of contrast.

The painter is often, especially with the fair sex, compelled in matters of costume to submit to the caprice of the sitter; when, however, he is at liberty to choose for himself the colours and arrangement of the drapery, he will naturally strive to produce the best result within his power.

In order to proceed intelligibly, he will regard women as generally belonging to one of two types; the one comprising those with light hair and blue eyes, the other, those with black hair and black eyes. The complexion of each of these being, more or less, white, and in certain parts rosy.

Now it must be evident that the juxtaposition of the head-dress and other articles of the toilet should be a matter of profound consideration, for a colour may contrast favourably with the hair, yet produce a disagreeable effect with the skin.

Light hair is essentially of a colour resulting from a mixture of red, yellow, and brown, therefore a very pale orange brown, the colour of the skin, although of a lower tone, is analogous to it, except in the red parts; blue eyes are therefore the only parts of the fair type which contrast with the hair and complexion, for the red parts produce only a harmony of analogy with the rest of the skin, or at most, only a contrast of hue and not of colour, and the parts of the skin contiguous to the hair, the eyebrows and eyelashes, give rise only to a harmony of analogy, either of scale or of hue. In the fair type, then, the harmonies of analogy evidently predominate over the harmonies of contrast.

The type with black hair, considered in the same way as the type with fair hair, shows us the harmonies of contrast predominating over the harmonies of

analogy, for the hair, eyebrows, eyelashes, and eyes contrast in tone and colour, not only with the white of the skin, but also with the red parts, which in this type are really redder, or less rosy than in the blonde type, and a decided red associated with black, gives to the latter the character of an *excessively deep* colour, either blue or green.

Custom, based upon experience, has already decided upon those colours which assort best with light or black hair, and they are those which produce the greatest contrasts; thus sky-blue, known to accord well with blondes, is the nearest colour complementary to orange, which is the base of the tint of their hair and complexions. Two colours long esteemed to accord well with black hair—yellow and red, more or less orange, contrast in the same manner with them.

The juxtaposition of the drapery with the various flesh tints of women, will suggest to the portrait-painter many remarks arising from the principles before laid down. The most important will be here noticed.

Red Drapery.—Pink or rose-red put in contrast with rosy complexions causes them to lose some of their freshness; it is necessary, then, to separate the rose-colour from the skin in some way, and the simplest is (without having recourse to coloured stuffs), to edge the draperies with a border of lace, which produces the effect of grey by the mixture of the white threads which reflect light, and the interstices which absorb it, and there is also a mixture of light and shade which recalls the effect of grey.

Dark red is less objectionable for some complexions than rose-red, because, being deeper than this latter, it tends to impart whiteness to them, in consequence of contrast of tone.

Green Drapery.—A light delicate green is, on the contrary, favourable to all fair complexions which are

deficient in rose, and to which more may be imparted without objection ; but to complexions already too red it is not so favourable, nor to those which have a tint of orange mixed with brown, because the red added to this tint by the green will appear of a brick-red hue. In this case, a dark green will be less objectionable than a delicate green.

Yellow Drapery.—Yellow is even less favourable to a fair skin than light green, because it imparts violet to it. To such skins as are more yellow than orange, it imparts white, but such a combination is very dull and heavy for a fair complexion.

When the skin is tinted more with orange than with yellow, we can make it rosy by neutralizing the yellow. Yellow produces this effect upon the black-haired type, and thus it is that it suits brunettes.

Violet Drapery.—Violet, the complementary of yellow, produces the contrary effect ; for it imparts some greenish-yellow to fair complexions. It augments the yellow tint of yellow and orange skins. The little blue there may be in a complexion it makes green ; violet then, unless it is sufficiently deep to whiten the skin by contrast of tone, is one of the least favourable colours for the skin.

Blue Drapery.—Blue imparts orange which is susceptible of allying itself favourably to white, and to the light flesh tints of fair complexions which have already a more or less determined tint of this colour. Therefore, blue is suitable to most blondes, and in this case justifies its reputation.

It will not suit brunettes, for they have already too much of orange.

Orange Drapery.—Orange is too glaring to be agreeable, it makes fair complexions appear blue ; whitens those which have an orange tint, and imparts a green hue to those which are yellow.

White Drapery.—Drapery of a lustreless white, such as cambric-muslin, assorts well with a fresh complexion, the rose colour of which it relieves, but it is unsuitable to complexions having a disagreeable tint, because white raises the tone of all colours.

Very light and thin white draperies, such as muslin and lace, have a quite different aspect. They appear more grey than white, because of the interstices, which absorb the light, and the threads reflect it, producing the effect of a mixture of white and black, or grey.

Black Drapery.—Black draperies, lowering the tone of the colours with which they are in juxtaposition, whiten the skin; but if the vermilion or rosy parts are to a certain point distinct from the drapery, it follows, that although lowered in tone they will appear redder, relatively to the white parts of the skin contiguous to this same drapery, than if the contiguity did not exist.

We will now consider the effect of the head-dress, particularly bonnets, which cover the head sufficiently to reflect their particular colours upon their complexion.

The influence of the colour *reflected* by the bonnet is exceedingly small; the effect a coloured bonnet produces is chiefly that of contrast; the colour reflected is chiefly upon the temples, the contiguous parts appear coloured with the complementary of the colour of the bonnet.

With respect to the fair-haired type—

A *black* bonnet with white feathers, and white, pink, or red flowers, is suited to a fair complexion.

A lustreless *white* bonnet does not suit a fair and rosy complexion, but bonnets of lace, muslin, or crape suit all complexions. A white bonnet may be trimmed with white, pink, or, preferably with blue flowers.

A *light blue* bonnet is very suitable for the light-haired type; it may be trimmed with white flowers,

and in many cases with yellow and orange, but not with pink or violet flowers.

A *green* bonnet is advantageous to fair and rosy complexions. It may be trimmed with white flowers but preferably with pink.

A *pink* bonnet must not be too close to the skin; and if it is found that the hair does not produce sufficient separation, the distance from the bonnet may be increased by white, or preferably by green. A wreath of white flowers amid their leaves has a good effect.

A *light* or *deep red* can only be recommended when the painter desires to diminish too warm a tint in the complexion.

The painter should never admit orange or yellow bonnets; nor even violet if avoidable.

For the type with black hair—

A *black* bonnet does not contrast so well with the black-haired type as with the light, yet it may produce a good effect, and receive, with advantage, trimming of white, red, pink, orange, and yellow.

A *white* bonnet gives rise to the same remarks as were made concerning its use for the blonde type, except that for brunettes, preference should be given to trimmings of red, pink, orange, and yellow, rather than blue. Bonnets of pink, red, and cerise are suitable for brunettes when the hair separates the bonnet as much as possible from the complexion. With the *red* bonnet, white feathers accord very well; with the pink, white flowers with abundance of leaves are effective.

A *yellow* bonnet suits a brunette very well, and receives advantageously violet or blue trimmings; the hair must always interpose between the complexion and the head-dress.

It is the same with bonnets of a *broken orange,* for which blue trimmings are very suitable.

A *green* bonnet suits fair and light rosy complexions; pink, red, or white flowers are to be preferred.

A *blue* bonnet is suitable only to a fair or light red complexion, nor can it be allied to such as have a light tint of orange brown. When it suits a brunette, it may be advantageously trimmed with yellow or orange.

A *violet* bonnet is unsuitable to every complexion, unless we interpose the hair and yellow trimmings between it and the skin.

Whenever the colour chosen for the bonnet does not realise the desired object, even when the complexion is separated from the head-dress by large masses of hair, it is advantageous to place between the latter and the bonnet certain accessories, such as ribbons, wreaths, detached flowers, &c., of a colour complementary to that of the bonnet; the same colour should also be placed on the outside of the bonnet.

Between the extremes of the two types named above, there are many intermediate varieties, which the artist must distinguish, and estimate the harmony most suitable to the model; he must decide whether the predominating tint in a complexion had better be exalted or diminished, either as a whole, or in one of its elementary colours, or whether it must be altogether neutralised; in case he wishes to weaken it, he must ascertain whether this can best be done by means of drapery of a darker tone, and so to form a harmony of contrast, either of scale or of hue; or whether, on the contrary, it is preferable to attain the same end by opposing to this tint a drapery of its complementary colour, taken at a sufficiently high tone, to produce the double effect of weakening by contrast of tone, and at the same time to produce contrast of colour with that portion of the tint which is not neutralised.

THE END.

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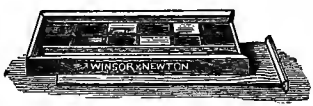

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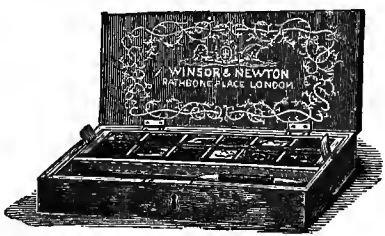

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				s.	d.
Box containing 12 **HALF CAKE** Colours, Brushes and other fittings				9	0
Ditto	18	ditto	ditto ...	12	0
Ditto	24	ditto	ditto ...	18	0

"LOCK" MAHOGANY BOXES WITH DRAWER.

				s.	d.
Box containing 12 **HALF CAKE** Colours, Brushes and other fittings				12	0
Ditto	18	ditto	ditto ...	15	0
Ditto	24	ditto	ditto ...	21	0

"COMPLETE" MAHOGANY BOXES.

				s.	d.
Box containing 12 **HALF CAKE** Colours, Brushes and fittings complete				14	0
Ditto	18	ditto	ditto ...	18	0
Ditto	24	ditto	ditto ...	25	0

"CADDY LID" MAHOGANY BOXES.

				s.	d.
Box containing 12 **HALF CAKE** Colours, Brushes and superior fittings				20	0
Ditto	18	ditto	ditto ...	25	0
Ditto	24	ditto	ditto ...	31	6

WINSOR & NEWTON'S

MOIST WATER COLOURS

IN PORCELAIN PANS.

WINSOR & NEWTON'S Moist Water Colours *are prepared after peculiar processes, and by a system of treatment known only to themselves.* Their characteristic qualities of easy solubility and prompt readiness for use are retained unimpaired, for an unlimited time; so that a box of them, which may have been laid aside for two or three years, when required again, will be found *as serviceable as when purchased.* Temperature does not affect these colours; they remain as "Moist" in Tropical climates as in England; accordingly, they are confidently recommended to persons who are going to INDIA, and to all residents in the East. While having the valuable quality of solubility, they possess another and all important one, *of drying perfectly firm on the paper.* Their tints, too, are pure and luminous, and their washes clear and even.

In Sketching from Nature, and when representing transient and evanescent effects, the superiority of the Moist Colours is at once felt and appreciated. Ever ready for instant application, they enable the desired tint to be produced *at once*—a result unattainable by the old tedious method of rubbing dry cakes, which not unfrequently permits the effect, and with it the *thought* of the artist, to vanish, before the material can be obtained. It was this quality which, on their first introduction, secured for WINSOR & NEWTON'S Moist Colours the eminent popularity that they still enjoy with both professional and amateur artists.

The Moist Colours are placed in pans of thin porcelain, and are afterwards enclosed in tin-foil for protection; they are also put up in Collapsible Tubes, in which form they are found convenient, when a quantity of colour is required.

WINSOR & NEWTON'S

MOIST WATER COLOURS,

IN

WHOLE AND HALF PANS.

SIZE OF WHOLE PAN COLOURS.

SIZE OF HALF PAN COLOURS.

WHOLE PAN COLOURS, 1*s.* each.—HALF PAN COLOURS, 6*d.* each.

Antwerp Blue
Bistre
Blue Black
Brown Ochre
Brown Pink
Burnt Sienna
Burnt Umber
Charcoal Grey
Chinese White
Chrome Yellow
Chrome Deep
Chrome Orange
Cologne Earth
Emerald Green
Gamboge
Hooker's Green, No. 1.
Hooker's Green, No. 2.
Indian Red
Indigo
Italian Pink
Ivory Black
Lamp Black
Light Red
Mauve
Naples Yellow
Neutral Tint
New Blue
Olive Green
Payne's Grey
Prussian Blue
Prussian Green
Raw Sienna
Raw Umber
Roman Ochre
Sap Green
Terre Verte
Vandyke Brown
Venetian Red
Vermilion
Yellow Lake
Yellow Ochre

WHOLE PAN COLOURS, 1*s.* 6*d.* each.—HALF PAN COLOURS, 9*d.* each.

Brown Madder
Cerulean Blue
Crimson Lake
Leitch's Blue
(or Cyanine Blue)
Mars Yellow
Neutral Orange
Purple Lake
Roman Sepia
Rubens' Madder
Scarlet Lake
Scarlet Vermilion
Sepia
Warm Sepia

WHOLE PAN COLOURS, 2*s.* each.—HALF PAN COLOURS, 1*s.* each.

Cobalt Blue
Indian Yellow
Lemon Yellow
Orange Vermilion
Violet Carmine
Viridian
(or Veronese Green)

WHOLE PAN COLOURS, 3*s.* each.—HALF PAN COLOURS, 1*s.* 6*d.* each.

Aureolin
Burnt Carmine
Cadmium Yellow
Cadmium Yellow, Pale
Cadmium Orange
Carmine
Field's Orange Vermilion
French Blue
(or French Ultramarine)
Gallstone
Indian Purple
Intense Blue
Mars Orange
Oxide of Chromium
Pink Madder
Pure Scarlet
Rose Madder
(or Madder Lake)

WHOLE PAN COLOURS, 5*s.* each.—HALF PAN COLOURS, 2*s.* 6*d.* each.

Madder Carmine
Purple Madder
Smalt
Ultramarine Ash

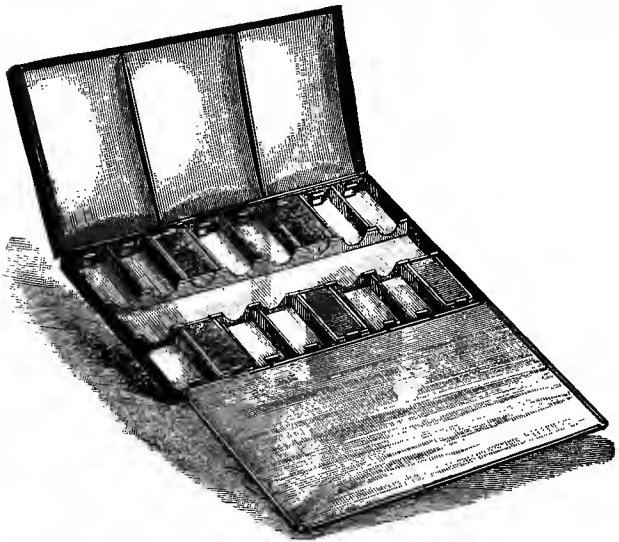
WINSOR & NEWTON'S

"NEW PATENT SPRING"

JAPANNED TIN BOXES,

FITTED WITH

MOIST WATER COLOURS, IN WHOLE PANS.



Messrs. WINSOR & NEWTON, Limited, have much pleasure in introducing this **NEW BOX** to contain **MOIST WATER COLOURS,** which they have confidently brought out as a valuable improvement and gain to both Artist and Amateur.

The Pans of Colours are placed in these boxes *without any trouble whatever, and they are readily moved from one position to another at pleasure.* They are secured by the employment of a V spring at one end or side of the partitions of the Box, as shown in the illustration. They are firmly held; and thus the inconvenience of fixing the colours into the Box with a cement is removed, as well as the trouble incident to *replenishing* a Box constructed on the old plan.

Messrs. WINSOR & NEWTON, Limited, have secured Letters Patent for this Box for Great Britain, the principal Countries of Europe, and for the United States of America.

MOIST WATER COLOURS IN "PATENT SPRING" JAPANNED BOXES.

(CONTINUED.)

3 Whole Pan Colour Box, containing

Chinese White, New Blue and Sepia ... ... 7*s.* 0*d.*

(The Empty Box, 3*s.* 6*d.*)

4 Whole Pan Colour Box, containing

Raw Sienna, Light Red, Cobalt and Vandyke Brown ... 8*s.* 6*d.*

(The Empty Box, 3*s.* 9*d.*)

6 Whole Pan Colour Box, containing

Gamboge, Raw Sienna, Light Red, Crimson Lake, Prussian Blue and Vandyke Brown ... ... 10*s.* 6*d.*

(The Empty Box, 4*s.*)

8 Whole Pan Colour Box, containing

Gamboge, Raw Sienna, Burnt Sienna, Light Red, Crimson Lake, Cobalt, Prussian Blue and Vandyke Brown ... ... 14*s.* 0*d.*

(The Empty Box, 4*s.* 6*d.*)

10 Whole Pan Colour Box, containing

Gamboge, Yellow Ochre, Raw Sienna, Burnt Sienna, Light Red, Crimson Lake, Cobalt, Prussian Blue, Vandyke Brown and Brown Pink ... ... 16*s.* 6*d.*

(The Empty Box, 5*s.* 3*d.*)

12 Whole Pan Colour Box, containing

Gamboge, Yellow Ochre, Raw Sienna, Burnt Sienna, Light Red, Vermilion (½), Indian Red (½), Crimson Lake, Cobalt, Prussian Blue, Payne's Grey, Vandyke Brown and Brown Pink 19*s.* 0*d.*

(The Empty Box, 5*s.* 9*d.*)

14 Whole Pan Colour Box, containing

Gamboge, Yellow Ochre, Raw Sienna, Burnt Sienna, Light Red, Vermilion (½), Indian Red (½), Crimson Lake, Brown Madder, Cobalt, Prussian Blue, Payne's Grey, Vandyke Brown, Sepia and Brown Pink ... ... £1 2*s.* 6*d.*

(The Empty Box, 6*s.* 3*d.*)

16 Whole Pan Colour Box, containing

Gamboge, Lemon Yellow (½), Cadmium Yellow (½), Yellow Ochre, Raw Sienna, Burnt Sienna, Light Red, Vermilion (½), Indian Red (½), Crimson Lake, Rose Madder, Brown Madder, Cobalt, Indigo, Payne's Grey, Vandyke Brown, Emerald Green (½), Viridian (½) and Brown Pink ... ... £1 8*s.* 6*d.*

(The Empty Box, 6*s.* 9*d.*)

MOIST WATER COLOURS IN "PATENT SPRING" JAPANNED BOXES.

(CONTINUED.)

18 Whole Pan Colour Box, containing

Gamboge, Cadmium Yellow, Yellow Ochre, Raw Sienna, Burnt Sienna, Light Red, Vermilion (½), Indian Red (½), Crimson Lake, Rose Madder, Brown Madder, Cobalt, Indigo, Payne's Grey, Vandyke Brown, Sepia, Emerald Green (½), Viridian (½), Brown Pink and Lamp Black ... ... £1 12*s.* 6*d.*

(The Empty Box, 7*s.* 6*d.*)

20 Whole Pan Colour Box, containing

Gamboge, Cadmium Yellow, Yellow Ochre, Raw Sienna, Burnt Sienna, Light Red, Vermilion (½), Indian Red (½), Crimson Lake, Rose Madder, Brown Madder, Cerulean Blue, Cobalt, Prussian Blue, Indigo, Payne's Grey, Vandyke Brown, Sepia, Emerald Green (½), Viridian (½), Brown Pink and Lamp Black...£1 15*s.* 6*d*

(The Empty Box, 8*s.*)

24 Whole Pan Colour Box, containing

Gamboge, Lemon Yellow, Cadmium Yellow, Aureolin, Yellow Ochre, Raw Sienna, Burnt Sienna, Light Red, Vermilion (½), Indian Red (½), Crimson Lake, Rose Madder, Brown Madder, Cerulean Blue, Cobalt, Prussian Blue, Indigo, Payne's Grey, Vandyke Brown, Sepia, Emerald Green (½), Oxide Chromium (½), Viridian, Olive Green, Brown Pink and Lamp Black... £2 5*s.* 0*d.*

(The Empty Box, 9*s.*)

WINSOR & NEWTON'S

"NEW PATENT SPRING"

JAPANNED TIN BOXES,

FITTED WITH

MOIST WATER COLOURS, IN HALF PANS.

6 Half Pan Colour Box, containing

Gamboge, Yellow Ochre, Light Red, Crimson Lake, Prussian Blue and Vandyke Brown ... ... 7*s.* 0*d.*

(The Empty Box, 3*s.* 9*d.*)

8 Half Pan Colour Box, containing

Gamboge, Yellow Ochre, Burnt Sienna, Light Red, Crimson Lake, Cobalt, Indigo and Vandyke Brown ... ... 9*s.* 0*d.*

(The Empty Box, 4*s.* 3*d.*)

MOIST WATER COLOURS IN "PATENT SPRING" JAPANNED BOXES.

(CONTINUED.)

10 Half Pan Colour Box, containing

Gamboge, Yellow Ochre, Raw Sienna, Burnt Sienna, Light Red, Crimson Lake, Cobalt, Indigo, Vandyke Brown and Brown Pink ... ... 10*s.* 6*d.*

(The Empty Box, 4*s.* 9*d.*)

12 Half Pan Colour Box, containing

Gamboge, Yellow Ochre, Raw Sienna, Burnt Sienna, Vermilion, Light Red, Crimson Lake, Brown Madder, Cobalt, Indigo, Vandyke Brown and Brown Pink ... ... 12*s.* 0*d.*

(The Empty Box, 5*s.* 3*d.*)

14 Half Pan Colour Box, containing

Gamboge, Yellow Ochre, Raw Sienna, Burnt Sienna, Vermilion, Light Red, Indian Red, Crimson Lake, Cobalt, Indigo, Neutral Tint, Vandyke Brown, Brown Pink and Lamp Black ... 13*s.* 6*d.*

(The Empty Box, 5*s.* 9*d.*)

16 Half Pan Colour Box, containing

Gamboge, Cadmium Yellow, Yellow Ochre, Raw Sienna, Burnt Sienna, Vermilion, Light Red, Indian Red, Crimson Lake, Brown Madder, Cobalt, Indigo, Neutral Tint, Vandyke Brown, Brown Pink and Lamp Black ... ... 16*s.* 0*d.*

(The Empty Box, 6*s.*)

18 Half Pan Colour Box, containing

Gamboge, Cadmium Yellow, Yellow Ochre, Raw Sienna, Burnt Sienna, Vermilion, Light Red, Indian Red, Crimson Lake, Rose Madder, Brown Madder, Cobalt, Indigo, Neutral Tint, Vandyke Brown, Emerald Green, Brown Pink and Lamp Black ... 18*s.* 6*d.*

(The Empty Box, 6*s.* 6*d.*)

20 Half Pan Colour Box, containing

Gamboge, Cadmium Yellow, Yellow Ochre, Raw Sienna, Burnt Sienna, Vermilion, Light Red, Indian Red, Crimson Lake, Rose Madder, Brown Madder, Cobalt, French Blue, Indigo, Neutral Tint, Vandyke Brown, Emerald Green, Oxide Chromium, Brown Pink and Lamp Black ... ... 22*s.* 0*d.*

(The Empty Box, 7*s.*)

24 Half Pan Colour Box, containing

Gamboge, Lemon Yellow, Cadmium Yellow, Yellow Ochre, Raw Sienna, Burnt Sienna, Vermilion, Light Red, Indian Red, Crimson Lake, Rose Madder, Purple Madder, Brown Madder, Cobalt, French Blue, Prussian Blue, Indigo, Neutral Tint, Vandyke Brown, Sepia, Emerald Green, Oxide Chromium, Brown Pink and Lamp Black ... ... 27*s.* 0*d.*

(The Empty Box, 7*s.* 6*d.*)

WINSOR & NEWTON'S

MOIST WATER COLOURS

IN COLLAPSIBLE TUBES.

Moist Water Colours in Tubes, though somewhat wasteful, are of assistance as furnishing quickly a quantity of colour, and affording facilities for power of touch and vigour of effect. They should be used within reasonable time, as they do not keep so long, or so well, as the ordinary Moist Colours in porcelain pans.

1s. each.

Antwerp Blue	Chrome Deep	Light Red	Raw Umber
Bistre	Chrome Orange	Naples Yellow	Roman Ochre
Blue Black	Emerald Green	Neutral Tint	Terre Verte
Brown Ochre	Gamboge	New Blue	Vandyke Brown
Brown Pink	Indian Red	Olive Green	Venetian Red
Burnt Sienna	Indigo	Payne's Grey	Vermilion
Burnt Umber	Italian Pink	Prussian Blue	Yellow Lake
Cologne Earth	Ivory Black	Prussian Green	Yellow Ochre
Chrome Yellow	Lamp Black	Raw Sienna	

1s. 6*d*. each.

Brown Madder	Leitch's Blue	Purple Lake	Scarlet Vermilion
Crimson Lake	(or Cyanine Blue)	Roman Sepia	Sepia
Mars Yellow	Neutral Orange	Scarlet Lake	Warm Sepia

2s. each.

Cobalt Blue	Orange Vermilion	Viridian
Indian Yellow	Violet Carmine	(or Veronese Green)
Lemon Yellow		

3s. each.

Aureolin	Cadmium Orange	Field's Orange	Mars Orange
Burnt Carmine	Carmine	Vermilion	Oxide of Chromium
Cadmium Yellow	French Blue (or	Gallstone	Pink Madder
Cadmium Yellow, Pale	Fr. Ultramarine)	Indian Purple	Rose Madder

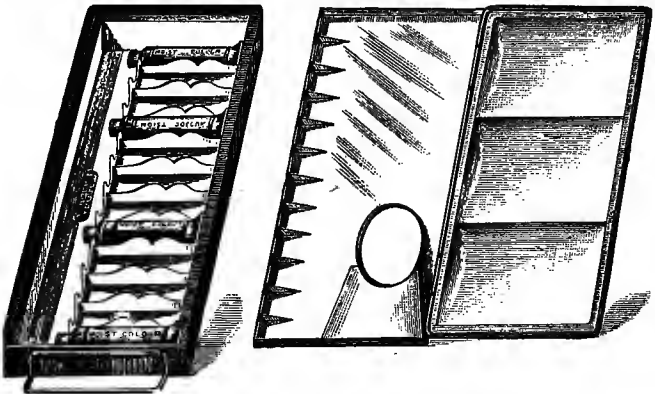
5s. each.

Purple Madder	Smalt	Ultramarine Ash

WINSOR & NEWTON'S

JAPANNED TIN BOXES OF

MOIST WATER COLOURS IN COLLAPSIBLE TUBES.



Box containing 12 Water Colours in Tubes.

Gamboge, Raw Sienna, Yellow Ochre, Burnt Sienna, Crimson Lake, Light Red, Vermilion, Cobalt, Indigo, Brown Pink, Vandyke Brown and Payne's Grey ... ... £1 2*s.* 6*d.*
(The Empty Box, 9*s.*)

Box containing 15 Water Colours in Tubes.

Gamboge, Cadmium Yellow, Raw Sienna, Yellow Ochre, Burnt Sienna, Crimson Lake, Light Red, Indian Red, Brown Madder, Cobalt, Prussian Blue, Viridian, Brown Pink, Vandyke Brown and Payne's Grey £1 10*s.* 6*d.*
(The Empty Box, 10*s.* 6*d.*)

Box containing 20 Water Colours in Tubes.

Gamboge, Cadmium Yellow, Raw Sienna, Yellow Ochre, Burnt Sienna, Rose Madder, Crimson Lake, Light Red, Vermilion, Indian Red, Violet Carmine, Brown Madder, Cobalt, Indigo, Emerald Green, Viridian, Brown Pink, Vandyke Brown, Payne's Grey and Sepia ... ... £2 2*s.* 0*d.*
(The Empty Box, 13*s.* 6*d.*)

Box containing 24 Water Colours in Tubes.

Gamboge, Cadmium Yellow, Raw Sienna, Yellow Ochre, Deep Chrome, Mars Orange, Burnt Sienna, Rose Madder, Crimson Lake, Light Red, Vermilion, Indian Red, Brown Madder, Purple Lake, Cobalt, French Blue, Prussian Blue, Indigo, Emerald Green, Viridian, Brown Pink, Vandyke Brown, Payne's Grey and Sepia ... ... £2 10*s.* 6*d.*
(The Empty Box, 14*s.* 6*d.*)

Box containing 30 Water Colours in Tubes.

Gamboge, Cadmium Yellow, Cadmium Orange, Italian Pink, Raw Sienna, Yellow Ochre, Orange Chrome, Mars Orange, Burnt Sienna, Rose Madder, Crimson Lake, Light Red, Orange Vermilion, Vermilion, Indian Red, Brown Madder, Purple Lake, Cobalt, French Blue, Prussian Blue, Indigo, Emerald Green, Viridian, Olive Green, Terre Verte, Brown Pink, Vandyke Brown, Neutral Tint, Sepia, and Ivory Black. Also bottles of Chinese White, Indelible Brown Ink, Ox Gall; and a copper plated Water Bottle £3 12*s.* 6*d.*
(The Empty Box, 19*s.*)

WINSOR & NEWTON'S

PERMANENT CHINESE WHITE

IN BOTTLES OR TUBES.

A peculiar preparation of White Oxide of Zinc, the only Perfectly Permanent White Pigment for Water Colour Painters.

SMALL BOTTLE OR TUBE, 6*d.*
LARGE ditto ditto 1*s.*

It is now half a century since WINSOR & NEWTON turned their attention to remedying a want much felt by Water Colour Painters, viz.: a White which would combine *perfect permanency* with good body in working. The invention and introduction of the pigment named *by them* "Chinese White" was the result, and its superior body and freedom of working immediately attracted the notice of the leading Water Colour Painters.

The late Mr. J. D. Harding being very desirous of ascertaining its permanency, submitted it to the examination of one of the greatest Chemists in Europe (the late Mr. Faraday), who satisfied him that it might be employed with perfect safety, and strongly recommended it in preference to all other white pigments. In "*Principles and Practice of Art*," Mr. Harding wrote:—

"When this pigment, which is prepared by WINSOR & NEWTON, under the name of 'Chinese White,' was first put into my hands, some years ago, I applied to one of my friends, whose name as a chemist and philosopher is amongst the most distinguished in our country, to analyse it for me, and to tell me if I might rely on its durability; the reply was, that if it would in all other respects answer the purpose I required of it, I had nothing to fear on account of its durability."

Ever since the year 1834 WINSOR & NEWTON'S Chinese White has been used by all the Eminent Water Colour Artists, and it is a source of great satisfaction that they are able to say, *that in no instance has any work of art, in which their White has been used, suffered from its employment*, while prior to its introduction the complaints of Whites changing were of every-day occurrence.

WINSOR & NEWTON'S

LIQUID WATER COLOURS AND MEDIUMS.

(Size of the bottles of Liquid Colours.)

	Bottles. s.	d.	Half Bottles. s.	d.
Indian Ink	1	0	0	6
Carmine	1	0	0	6
Sepia	1	0	0	6
Indelible Brown Ink	1	0	0	6
Prout's Brown ...	1	0	0	6
Prussian Blue ...	1	0	0	6
Lamp Black ...	1	0	0	6
Vermilion	1	0	0	6
Asphaltum	1	0	0	6
Ox Gall, colourless...	1	0	0	6
Gum Water ...	1	0	0	6
Gold Ink	1	0	0	6
Silver Ink	1	0	0	6
Chinese White ...	1	0	0	6

	Bottles. s.	d.	Half Pots. s.	d.
Water Colour Megilp	1	0	Not sold in Half Bottles or Pots.	
Glass Medium, No. 1	1	0		
Ditto ditto No. 2	1	0		
Opaque Body for Illuminating...	1	0		
Raising Preparation for ditto	1	0		
The following are in China Pots—				
Burnish Gold Size ...	1	0		
Mat Gold Size ...	1	0		
Ox Gall, Prepared...	1	0	0	6

WINSOR & NEWTON'S

BRUSHES FOR WATER COLOUR DRAWING.

BROWN OR RED SABLE IN QUILLS.

Crow.

Duck.

Small Goose.

Goose.

Extra Goose.

Extra Small Swan.

Small Swan.

Middle Swan.

Large Swan.

(The Brushes are the sizes of the above Illustrations.)
Prices are on the opposite page.

WINSOR & NEWTON'S

BROWN SABLE BRUSHES

(IN QUILLS).

		s.	d.	IN LONG QUILLS.		s.	d.
Crow	each	0	6	Extra Small Swan	each	4	0
Duck	,,	0	9	Small	,, ,,	5	6
Small Goose ...	,,	1	0	Middle	,, ,,	7	6
Goose	,,	1	3	Large	,, ,,	10	0
Extra Goose ...	,,	1	9				

See Illustrations on opposite page for the sizes of the Brushes.

RED SABLE BRUSHES

(IN QUILLS).

		s.	d.	IN LONG QUILLS.		s.	d.
Crow	each	0	6	Extra Small Swan	each	4	0
Duck	,,	0	10	Small	,, ,,	5	6
Small Goose ...	,,	1	3	Middle	,, ,,	7	6
Goose	,,	1	6	Large	,, ,,	10	0
Extra Goose ...	,,	2	0				

See Illustrations on opposite page for the sizes of the Brushes.

SIBERIAN HAIR BRUSHES

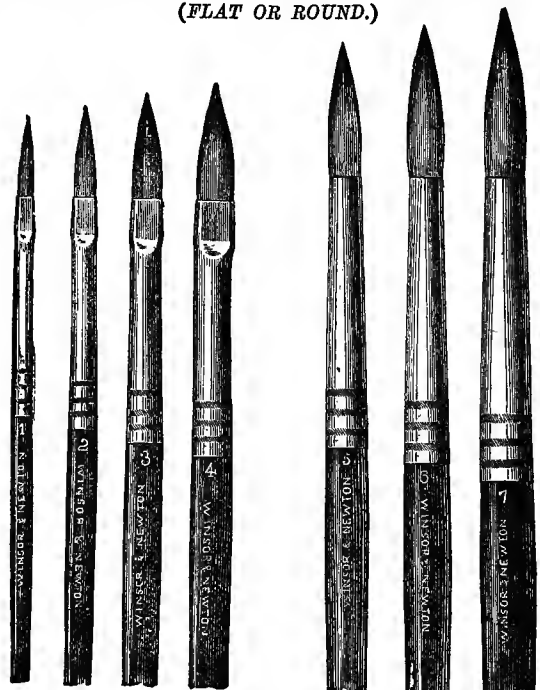
(IN QUILLS).

Extra quality.

		s.	d.	IN LONG QUILLS.		s.	d.
Crow	each	0	2	Extra Small Swan	each	0	9
Duck	,,	0	2	Small	,, ... ,,	1	0
Goose	,,	0	3	Middle	,, ... ,,	1	6
				Large	,, ... ,,	2	6

See Illustrations on opposite page for the sizes of the Brushes.

WINSOR AND NEWTON'S
FINEST BROWN OR RED WATER COLOUR
SABLES IN ALBATA FERRULES.
(FLAT OR ROUND.)



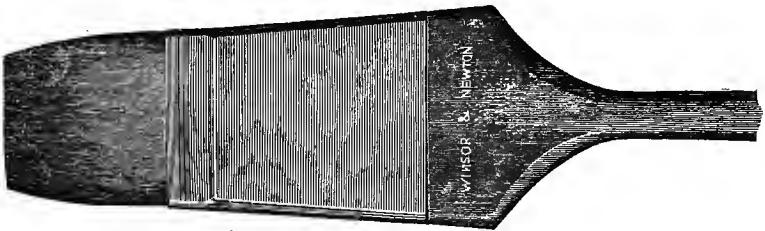
THE BRUSHES ARE THE SIZES OF THE ABOVE ILLUSTRATIONS.

BROWN SABLE HAIR.	s.	d.	RED SABLE HAIR.	s.	d.
No. 1, Flat or Round, each	1	3	No. 1, Flat or Round, each	1	3
,, 2 ,, ,, ,,	1	6	,, 2 ,, ,, ,,	1	6
,, 3 ,, ,, ,,	1	9	,, 3 ,, ,, ,,	1	9
,, 4 ,, ,, ,,	2	0	,, 4 ,, ,, ,,	2	3
,, 5 ,, ,, ,,	2	3	,, 5 ,, ,, ,,	2	6
,, 6 ,, ,, ,,	2	6	,, 6 ,, ,, ,,	3	0
,, 7 ,, ,, ,,	3	6	,, 7 ,, ,, ,,	4	0

Larger sizes are also made, particulars and prices of which may be had on application.

FLAT RED SABLE BRUSHES,

WITH ALBATA FERRULES.

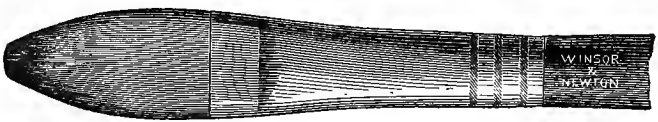


(ILLUSTRATION OF AN INCH BRUSH.)

These Brushes are made in the following sizes:
$\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 2, and $2\frac{1}{2}$ inches wide. Price 5*s.* per inch.

WASH OR SKY BRUSHES,

FLAT OR ROUND.



	Flat.		Round.	
	s.	*d.*	*s.*	*d.*
Wash Brushes, Siberian Hair, with Tin Ferrules (as illustrated) ... ... each	1	0	1	3
Ditto, Dyed Sable Hair, with Tin Ferrules ... ,,	3	6	4	0
Ditto, ditto with Albata Ferrules ,,	4	0	4	6

FLAT CAMEL HAIR BRUSHES,

IN TIN FERRULES.

Made from $\frac{1}{2}$ inch to 4 inches wide. Price 8*d.* per inch.

DRAWING PAPERS.

Messrs. WINSOR & NEWTON, Limited, pay particular attention to this department of their business, and keep constantly on hand a very large and varied Stock of First-class Drawing Papers, comprising every kind required by Artists.

WHATMAN'S DRAWING PAPERS.

IN THE FOLLOWING SIZES AND SURFACES.	Inchee.	Per Sheet. s.	Per Sheet. d.	Per Quire. s.	Per Quire. d.
Demy ... ...Notpressed and Hotpressed,	20 by 15½	0	2	3	0
Medium ... ... Ditto ditto	22 ,, 17½	0	2½	4	6
Royal ... ... Ditto ditto	24 ,, 19½	0	3	5	9
Imperial ... { Notpressed, Hotpressed, and Rongh ... ... }	30¾ ,, 22	0	5	9	6
Dble. Elephant ... Ditto ditto	40 ,, 27	0	9	17	0
Antiquarian ...Notpressed	52¾ ,, 30¾	4	0	84	0

WHATMAN'S "THICK" DRAWING PAPERS.

	WEIGHT.	Per Sheet. s.	Per Sheet. d.	*Seamless. Per Sheet. s.	*Seamless. Per Sheet. d.
Royal ... ... { Hotpressed, Not, and Rough }	60 lbs. to ream	0	5	—	
Imperial, Thick... Ditto ditto	90 lbs. ,,	0	8	0	9
Ditto Extra Thick Ditto ditto	140 lbs. ,,	1	0	1	2
Double Elephant, Extra Thick { Not ... ... }	235 lbs. ,,	1	9	2	0

* *Seamless Papers are dried flat, and have no mark down the centre of the sheet.*

WHATMAN'S "BINFIELD" DRAWING PAPERS.

This is a seamless paper made expressly for high-class Water Colour Drawings.

	Per Sheet. s.	Per Sheet. d.
Imperial, 30 inches by 22, Not surface, 72 lbs. to the ream	1	6
,, 30 ,, 22 ,, 140 lbs. ,,	3	0

WHATMAN'S "CRESWICK" DRAWING PAPERS.

(Resembling the celebrated Creswick Paper in texture and tint.)

	Per Sheet.	SEAMLESS. Per Sheet.
	s. d.	s. d.
Imperial (Not and Rough) 110 lbs. to the ream ...	0 9	1 0
Double Elephant, ditto 210 ,, ,,	1 6	1 9
Ditto ditto 210 ,, ,,		
(*Very old and in fine condition, made in the year* 1865)	—	3 0

"HARDING'S" DRAWING PAPERS.

	Per Sheet.	Per Quire.
	s. d.	s. d.
Imperial ... ... 30½ inches by 22 inches	0 5	8 0
Ditto Extra thick ... ,, ,,	0 10	16 0

"HOLLINGWORTH'S" BEST MACHINE-MADE DRAWING PAPERS.

	Inches.	Weight.	Per Sheet.	Per Quire.
			s. d.	s. d.
Demy (Hotpressed & Not)	20 by 15½	24 lbs. to ream	0 1	1 10
Medium ditto	22 ,, 17¾	32 ,, ,,	0 1½	2 6
Royal ditto	24 ,, 19	42 ,, ,,	0 2	3 3
Imperial ditto	30¼ ,, 22¼	72 ,, ,,	0 3	5 6
Dble. Elephant ditto	40 ,, 26¾	130 ,, ,,	0 6	10 6

PLAT DRAWING "CARTRIDGE" PAPERS.

	Inches.	Weight.	Per Quire.
			s. d.
Medium	22 by 17	30 lbs. to ream ...	1 3
Royal	24 ,, 19	35 ,, ,, ...	2 0
Thin Log	26 ,, 21	40 ,, ,, ...	2 3
Thick Log	26 ,, 21	50 ,, ,, ...	2 9
Students' Cartridge ...	30 ,, 22	60 ,, ,, ...	3 2
Thin Engineers' ...	30 ,, 22	72 ,, ,, ...	4 0
Thick Engineers' ...	30 ,, 22	90 ,, ,, ...	5 0

"CONTINUOUS CARTOON" DRAWING CARTRIDGES.

			Per Yard. s.	d.
*White Cartoon Paper ...	36 inches wide		0	4
,, ,, ,, ...	45 ,, ...		0	6
Best ,, ,, Thick .	54 ,, ...		1	0
,, ,, ,, Thin...	54 ,, ...		0	6
,, ,, ,, Thick .	60 ,, ...		1	0
Tinted Cartoon Paper ...	54 ,, ...	}	1	0
Three tints, Buff, Stone, and French Grey ...		}		
* This Paper in Rolls of 50 yards	per Roll		13	6

"MACHINE-MADE" TINTED CRAYON PAPERS.

	Inches.		Per Sheet. s.	d.	Per Quire. s.	d.
Royal ...	24 by 19	40lbs. to the ream	0	2	3	0
Imperial ...	30 ,, 21½	90 ,, ,,	0	4	6	9
Dble. Elephant	40 ,, 27	144 ,, ,,	0	6	10	6

"HAND-MADE" TINTED CRAYON PAPERS.

Extra Stout:—90 lbs. to the Ream.

	Per Sheet. s.	d.	Per Quire. s.	d.
Imperial, 30 inches by 22	0	7	12	0

A great variety of tints in both machine and hand made Crayon Papers are kept in Stock; Pattern Books may be had on application.

VELLUM DRAWING PAPER,

MADE EXPRESSLY FOR

Illuminating, Flower Painting, Etching, &c.,

A highly finished Toned Paper, resembling Vellum.

	Per Sheet. s.	d.	Per Quire. s.	d.
Royal (size 24½ inches by 19½), Whatman's make, weighing 100 lbs. to the ream	1	0	19	6

OUTSIDE SHEETS OF WHATMAN'S AND OTHER DRAWING PAPERS.

	s.	d.
14 lb. Parcels of assorted kinds and surfaces	12	0

N.B.—These Outside Drawing Papers will be sorted to suit customers' requirements as much as possible.

WINSOR & NEWTON'S

MOUNTING BOARDS.

SCHOOL MOUNTING BOARDS.

				Best quality
		s. d.		s. d.
Royal	24 inches by 19, Medium Thick, per dozen	1 10		2 6
,,	24 ,, 19, Thick ... ,,	2 9		3 6
Imperial	31 ,, 21, Medium Thick ,,	2 9		3 9
,,	31 ,, 21, Thick ... ,,	4 0		5 0

The above Boards can be had one inch larger each way, if the edges are UNTRIMMED.

FINE MOUNTING BOARDS.

				THICKNESS.		
				4 sheet.	6 sheet.	8 sheet.
				s. d.	s. d.	s. d.
Half Imperial	21¼ inches by 14¼ ...	each		0 3	0 4	0 5
Royal ...	23 ,, 18¼ ...	,,		0 4	0 5	0 6
Imperial ...	28¾ ,, 21¼ ...	,,		0 6	0 8	0 10

EXTRA SUPERFINE MOUNTING BOARDS.

				3 sheet.	4 sheet.	6 sheet.	8 sheet.
				s. d.	s. d.	s. d.	s. d.
Half Imperial	21½ inches by 14½, each			0 3	0 4	0 6	—
Royal ...	23 ,, 18¼ ,,			0 4	0 6	0 8	—
Imperial ...	28¾ ,, 21¼ ,,			0 6	0 8	1 0	1 4
Atlas ...	33¼ ,, 26 ,,			—	1 4	2 0	2 6
Dble. Elephant	38½ ,, 26 ,,			—	1 6	2 3	3 3

All Mounting Boards on this page are supplied Tinted at the same prices.

BEST MOUNTING BOARDS.

WITH WHATMAN'S DRAWING PAPER ON ONE SIDE.

		s.	d.
Royal, 6 sheet	each	1	0
Imperial, 6 sheet	,,	1	6

WINSOR & NEWTON'S BRISTOL BOARDS.

					2 sheet.		3 sheet.		4 sheet.		6 sheet.	
					s.	d.	s.	d.	s.	d.	s.	d.
Foolscap	15¼	inches	by	12½	each	0	3	0	4	0	5	0	6
Demy	18¼	,,		14⅝	,,	0	4	0	5	0	7	0	10
Medium	20¾	,,		16½	,,	0	5	0	7	0	9	1	2
Royal	22⅝	,,		18¼	,,	0	6	0	9	1	0	1	6
Imperial	28	,,		20	,,	0	10	1	3	1	9	2	8

TURNBULL'S LONDON DRAWING BOARDS.

					2 sheet.		3 sheet.		4 sheet.		6 shest..	
					s.	d.	s.	d.	s.	d.	s.	d.
Foolscap	15	inches	by	12 -	each	0	5	0	7	0	9	1	0
Demy	18	,,		14 -	,,	0	7	0	10	1	2	1	6
Medium	20½	,,		15½ -	,,	0	9	1	2	1	6	2	3
Royal -	22	,,		17½ -	,,	1	0	1	6	2	0	2	9

WINSOR & NEWTON'S DRAWING BOARDS.

IN PACKETS.

No.						Size.			Per Packet.	
									s.	d.
1.	Packet, containing	6	White	Boards,		11½ inches	by	9 ...	0	6
2.	,,	,,	12	,,	,,	11½	,,	9 ...	1	0
3.	,,	,,	6	,,	,,	14¼	,,	10½ ...	1	0
4.	,,	,,	12	,,	,,	14¼	,,	10½ ...	2	0
5.	,,	,,	24	Tinted	,,	4⅝	,,	3½ ...	0	6
6.	,,	,,	24	,,	,,	6	,,	3⅞ ...	0	9
7.	,,	,,	24	,,	,,	7	,,	4½ ...	1	0
8.	,,	,,	14	,,	,,	10	,,	7 ...	1	0
9.	,,	,,	12	,,	,,	11½	,,	9 ...	1	0

Numbers 5 to 9 can either be used as White or Tinted Boards, as they are White on the reverse side.

SOLID DRAWING BLOCKS.

WITH OR WITHOUT COVERS.

SOLID BLOCK WITH HALF-ROUND COVER.

Made with WHATMAN'S THICK Drawing Papers.

These Blocks contain 32 *Sheets, the upper sheet of which can be easily removed by inserting the point of a penknife under it.*							Solid Blocks.		Solid Blocks Half Bound	
							s.	*d.*	*s.*	*d.*
32mo.	Imperial	...	5	inches by	3½	... each	1	2	2	0
16mo.	Royal	...	5½	,,	4½	... ,,	1	6	2	6
,,	Imperial	...	7	,,	5	... ,,	2	0	3	0
8vo.	Royal	...	9	,,	5½	... ,,	2	6	3	9
,,	Imperial	...	10	,,	7	... ,,	3	3	4	9
4to.	Royal	...	11½	,,	9	... ,,	4	6	6	9
6mo.	Imperial	...	14	,,	6¾	... ,,	4	9	7	0
4to.	Imperial	...	14	,,	10	... ,,	6	6	9	0
3mo.	Imperial	...	18	,,	10	... ,,	9	0	13	6
Half	Royal	...	18	,,	11½	... ,,	9	9	14	0
Half	Imperial	...	20	,,	14	... ,,	12	6	18	0

N.B.—Solid Blocks, when made of Machine TINTED PAPERS, *are about one-fourth lees in price than the above.*

SOLID DRAWING BLOCKS.

Made with WHATMAN'S EXTRA THICK Drawing Papers.

The Double Elephant sizes are only to be had with the "Not" surface.

	Inches.	*Containing 20 Sheets. Solid Blocks. s.	d.	Solid Blocks Half Bound s.	d.	*Containing 32 Sheets Solid Blocks. s.	d.	Solid Blocks Half Bound s.	d.
32mo. Imperial ...	5 by 3½ each	1	2	2	0	1	6	2	6
16mo. Imperial ...	7 ,, 5 ,,	2	0	3	0	2	8	3	6
,, Dble. Elephant	9 ,, 6 ,,	3	0	4	3	4	3	5	3
8vo. Imperial ...	10 ,, 7 ,,	3	3	4	9	4	9	6	0
6mo. Imperial ...	14 ,, 6¾ ,,	4	9	7	0	6	6	9	0
8vo. Dble. Elephant	12 ,, 9 ,,	5	6	8	0	8	0	10	6
4to. Imperial ...	14 ,, 10 ,,	6	6	9	0	9	3	11	9
3mo. Imperial ...	18 ,, 10 ,,	9	0	13	6	12	9	17	0
4to. Dble. Elephant	18 ,, 12 ,,	11	0	15	9	16	0	21	0
Half Imperial ...	20 ,, 14 ,,	12	6	18	0	19	0	24	0

* *Solid Blocks of* EXTRA THICK PAPER, *containing* **20** *sheets, have been made to avoid the* WEIGHT *and* EXPENSE *of those with* **32**—*the prices are uniform with those made with* THICK DRAWING PAPERS.

SOLID BLOCK SKETCH BOOKS.

Made as Half-bound Sketch Books, but with the three outer edges fastened as ordinary Blocks.

Each Book contains 32 leaves of WHATMAN'S Thick Paper.

		s.	d.
32mo. Imperial	5 inches by 3½ ... each	2	0
24mo. Imperial	7 ,, 3¼ ... ,,	2	8
16mo. Imperial	7 ,, 5 ... ,,	3	0
8vo. Royal	9 ,, 5½ ... ,,	4	3
12mo. Imperial	10 ,, 4½ ... ,,	4	3
8vo. Imperial	10 ,, 7 ... ,,	5	0

These Books when made of Machine TINTED PAPERS *are about one-fourth less in price than the above.*

SKETCH BOOKS, HALF BOUND.

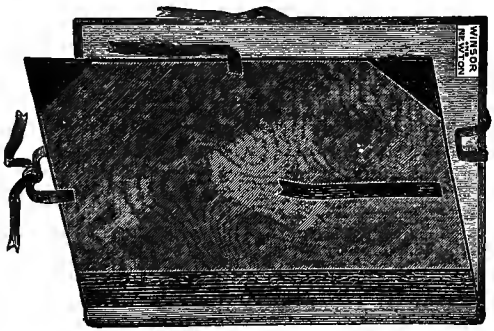
Leather Backs, Cloth Sides, and Elastic Band to fasten.

(FORTY LEAVES IN EACH BOOK.)

	Inches.	Made of Whatman's Drawing Papers. s.	d.	Made of Tinted Crayon Papers. s.	d.
32mo. Imperial ...	5 inches by 8½ each	1	6	1	3
24mo. Imperial ...	7 ,, 3¼ ,,	2	0	1	6
16mo. Imperial ...	7 ,, 5 ,,	2	3	2	0
8vo. Royal ...	9 ,, 5½ ,,	2	9	2	3
12mo. Imperial ...	10 ,, 4½ ,,	3	0	2	8
8vo. Imperial ...	10 ,, 7 ,,	4	0	3	6
4to. Royal ...	11½ ,, 9 ,,	4	9	3	9
4to. Imperial ...	14½ ,, 10 ,,	6	9	5	9

SUPERIOR PORTFOLIOS.

Leather Backs and Corners, Cloth Sides, and Silk Strings.



								With Flaps.	
						s.	d.	s.	d.
Half Demy ...	15½	inches	by	10½	... each	2	3	3	3
4to. Imperial ...	15	,,		11	... ,,	2	6	3	6
Music	16	,,		11	... ,,	2	6	3	6
Half Medium ...	17	,,		11½	... ,,	3	0	4	0
Half Royal ...	19	,,		13	... ,,	3	9	5	0
Demy	21	,,		15½	... ,,	4	6	6	0
Half Imperial...	22	,,		16	... ,,	5	3	6	9
Medium ...	22	,,		17	... ,,	5	9	7	3
Royal	25	,,		19	... ,,	6	9	8	8
Super Royal ...	27	,,		20	... ,,	8	8	10	6
Imperial ...	31	,,		22	... ,,	12	9	15	9
Atlas	34	,,		26	... ,,	15	9	19	6
Colombier ...	36	,,		24	... ,,	17	6	21	0
Dble. Elephant	40	,,		28	... ,,	24	0	30	0

BEST PORTFOLIOS.

These Portfolios are made of the best Morocco Leather, with cloth sides and gold lines.

With Outside Flap and Stiff Inside Flaps.

							s.	d.
Half Demy	...	15½ inches by	10½	...	...	each	5	6
Quarto Imperial	...	15 ,,	11	...	...	,,	6	6
Music ...	...	16 ,,	11	...	...	,,	6	6
Half Medium	...	17 ,,	11½	...	...	,,	7	0
Half Royal	...	19 ,,	13	...	...	,,	9	0
Demy ...	...	21 ,,	15½	...	...	,,	10	6
Half Imperial	...	22 ,,	16	...	...	,,	11	6
Medium ...	...	22 ,,	17	...	...	,,	12	0
Royal ...	...	25 ,,	19	...	...	,,	14	6
Super Royal	...	27 ,,	20	...	...	,,	18	0
Imperial ...	...	31 ,,	22	...	...	,,	25	6
Atlas ...	...	34 ,,	26	...	...	,,	33	0
Colombier ...	...	36 ,,	24	...	...	,,	36	0
Double Elephant	...	40 ,,	28	...	...	,,	45	0

Bramah Locks fitted to any of the above Portfolios, 10s. extra.

SKETCHING PORTFOLIOS.

WITH JAPANNED TIN FRAMES TO FASTEN THE PAPER DOWN.

Half-Bound, with Leather Outside Flap, and Pocket to contain Loose Sketches, or Reserve of Paper.

							s.	d.
8vo. Imperial	...	11½ inches by	8	...	...	each	4	6
4to. Royal ...	...	12¼ ,,	9¾	...	...	,,	5	3
6mo. Imperial	...	15½ ,,	7¾	...	...	,,	6	0
4to. Imperial	...	15½ ,,	11½	...	...	,,	6	6
4to. Double Elephant		20½ ,,	13½	...	...	,,	10	6
Half Imperial	...	22½ ,,	15½	...	...	,,	13	0

WINSOR & NEWTON'S

DRAWING PENCILS.

Messrs. WINSOR & NEWTON, Limited, beg to draw attention to their Drawing Pencils, the range of which consists of a good PENNY Pencil for Schools and ordinary use; a TWOPENNY Pencil for Students; a THREEPENNY Pencil, of hexagon form, for Offices and Artists; a FOURPENNY Pencil, Cumberland lead, free from grit and yielding colour readily; a FIVEPENNY Pencil (hexagon), containing plumbago of the highest quality and adapted for Engineers, where thin and perfect lines and ready erasure are essential; and a SIXPENNY Pencil, made expressly for the use of Artists, with an extra quantity of Cumberland lead. These pencils retain the fine qualities of erasure and colour of the original celebrated Lead.

DEGREES.

HHHH. Extremely hard (for Engineering or Drawing on Wood).
HHH. Very hard (for Architectural Drawing).
HH. Hard (for fine Outline Drawing).
H. Moderately hard (for light sketching).
FF. Very firm (for light shading).
F. Firm (for fine drawing).
HB. Moderately hard and black (for free sketching).
B. Black (for ordinary shading).
BB. Soft black (for deep shading).
EHB. Hard and black, extra size lead (for bold sketching).
BBB. Very black, extra size lead (for deep shading).
BBBB. Soft and black extra size lead (for full, rich, deep shading).

N.B.—Penny Pencils are only made in Four Degrees, namely—
H. HB. B. and **BB.**

SOFT COLOURED FRENCH CRAYONS.

NOTICE.—*These Crayons being very fragile, are* LIABLE *to breakage in transit. Their utility, however, is not impaired by their being in smaller pieces.*

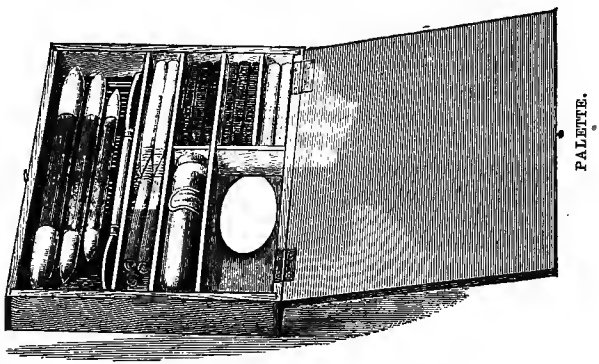
	s.	d.		s.	d.
Box containing 26 Coloured Crayons	3	6	Box containing 56 Coloured Crayons	7	0
Ditto ditto 42...	4	6	Ditto ditto 62...	10	0

CRAYONS AND CHALKS—VARIOUS.

	s.	d.
Square Red Conté Crayons ... ... per doz.	0	6
Square Black Conté Crayons, No. 1 (Hard) No. 2 (Medium) and No. 3 (Soft) ... ,,	0	6
Round Red Conté Crayons ... ... ,,	0	10
Round Black Conté Crayons, Nos. 1 and 2... ... ,,	0	10
Round Black Glazed Conté Crayons ... ... ,,	1	3
Conté Crayons in polished Cedar, Nos. 1 and 2 ... each	0	2
Ditto ,, plain ,, No. 3 ... ,,	0	3
Boxes of Square Black Conté Crayons, containing 12 Crayons, assorted Nos. 1, 2 and 3 ... ,,	0	6
Stumping Chalk, "Velours à sauce," in tinfoil ... ,,	0	3
Ditto ,, ,, ,, in glass bottles ,,	0	6
Crayons, Lemoine's Square White, Nos. 1 and 2 ... per doz.	0	6
Ditto ,, ,, ,, in boxes of 12... per box	0	6
Ditto ,, Round ,, ... per doz.	0	9
Ditto ,, ,, ,, in boxes of 12... per box	0	9
Chalk, Lemercier's Lithographic, Nos. 1, 2 and 3 in boxes of 12 ... ... ,,	1	0
Ditto Square White for Black Boards ... per gross box	1	0
Ditto Round White Dustless ,, ... ,,	2	0
Ditto ,, in boxes of 12 ... ... per box	0	3
Ditto Paper-covered Square White, in boxes of 12 ,,	0	6
Ditto Best White, Hard, Middle or Soft ... ... per oz.	0	8
Ditto Red ... ... ,,	0	6
Ditto Compressed Black Italian ... ... ,,	0	9
Charcoal in bundles of 50 sticks ... ...per bundle	1	0
Ditto in boxes of 12 sticks ... ... per box	0	3
Ditto Vine, in boxes of 25 sticks ... ... ,,	1	0
Ditto Scene Painters' in bundles of 25 extra large sticks ... ... per bundle	1	6
Ditto in Reeds ... ... per stick	0	1

THUMB-HOLE PALETTE CHALK BOX.

For Students, Schools of Art, &c. &c.



The Lid of this Box is covered inside with Wash Leather, which forms a Stumping Palette, and the thumb-hole is arranged to allow of the Box being held on the hand as easily as an ordinary Palette.

The Box contains—Four each Nos. 1, 2, and 3 Square Black Conté Crayons; Two each Nos. 1 and 2 Lemoine's Round White Crayons; a Bottle Stumping Chalk (Sauce Velours); Two White Paper Stumps; and One No. 2 White Leather Stump; Four each White and Grey Tortillon Stumps; and One Brass Portcrayon.

The *Weight*, fitted complete, is under 8 oz.. or about the same as an ordinary 12-inch Mahogany Palette.

Price 3*s.* 6*d.*, fitted complete.

BEST FRENCH PASTEL CRAYONS.

In Round Fancy Cardboard Boxes.

(MANUFACTURED SPECIALLY FOR MESSRS. WINSOR AND NEWTON, EACH CRAYON BEING LABELLED WITH THEIR NAME.)

	s.	*d.*		*s.*	*d.*
Box containing 12 *pointed* Coloured Crayons ...	1	0	Box containing 30 *pointed* Coloured Crayons ...	2	6
Ditto ,, 18 ,,	1	6	Ditto ,, 36 ,,	3	0
Ditto ,, 24 ,,	2	0	Ditto ,, 48 ,,	4	0

DRAWING BOARDS,

Mahogany and Deal.

	Inches.	Clamped Deal. s.	d.	Panelled Deal. s.	d.	Loose Panelled Deal. s.	d.	Loose Panelled Mahogany s.	d.
4to. Imperial ...	13 by 9½ each	1	3	2	0	3	9	5	8
4to. Colombier ...	15 „ 11 „	1	6	2	6	4	9	6	9
½ Royal	17 „ 10½ „	1	9	2	9	5	3	7	6
Demy	18 „ 13½ „	2	0	3	0	6	0	8	8
½ Imperial ...	19 „ 13½ „	2	3	3	3	6	6	9	6
½ Imperial, full size	22 „ 16 „	3	0	4	3	7	0	10	9
Medium	20 „ 15½ „	2	9	3	9	6	9	10	2
Royal	22 „ 17 „	3	3	4	9	7	6	12	0
Imperial... ...	28 „ 19 „	4	3	6	0	10	6	17	0
Imperial full size	30 „ 21 „	5	6	7	6	13	6	21	0
Double Elephant	38 „ 24 „	8	6	—		—		—	

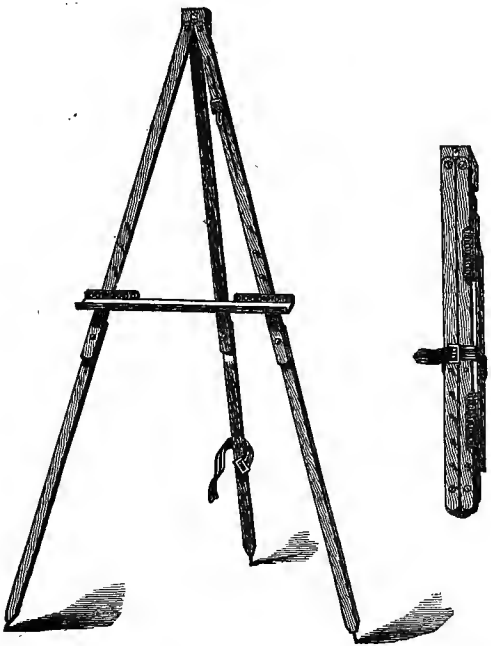
DRAWING BOARDS,

Made of Seasoned Poplar.

	Inches.	CLAMPED, With Hard Beech or Oak Ends. s.	d.	LOOSE PANEL, With Hard Beech Frames. s.	d.
4to. Royal ...	10½ by 8 each	1	0	2	0
4to. Imperial ...	13 „ 9½ „	1	2	2	3
4to. Colombier ...	15 „ 11 „	1	6	3	0
½ Royal	17 „ 10½ „	1	8	3	9
½ Imperial ...	19 „ 13½ „	2	2	4	6
½ Imperial, full size	22 „ 16 „	2	9	5	3
Medium	20 „ 15½ „	2	6	5	0
Royal	22 „ 17 „	3	0	6	9
½ Double Elephant	24 „ 19 „	3	6	7	6
Imperial	28 „ 19 „	3	9	8	3
Imperial, full size	30 „ 21 „	4	6	—	
Double Elephant...	38 „ 24 „	7	6	—	

LIGHT FOLDING SKETCHING EASEL.

(Inexpensive and Portable,)



The weight of the above Easel is under 2 lbs., its height in use is 4 feet 2 inches, and when folded for travelling 2 feet 2 inches; it is strong, firm, and simple in construction.

Price *5s.* each.

SUNDRIES.

Aluminium in Shells, Saucers, and Cakes.
British Birds, Studies of, by Miss West, in Chromo-Lithography, set of twelve, in wrapper, 12*s.*
Bronzes in Powder, of all shades.
Burnishers, Agate, various shapes, 2*s.* each.
China Palettes, and China Sundries for Artists' use.
Drawing Pins, all kinds, from 4*d.* to 1*s.* 6*d.* per dozen.
Etching Materials, separate and in fitted Boxes.
Flower Studies, by Miss Kate Sadler, in Chromo-Lithography, set of twelve, in wrapper, 18*s.*, with Instructions.
Gold Shells, 4*d.*, 6*d.*, 9*d.*, and 1*s.* each.
Gold Saucers, 9*d.*, 1*s.* 6*d.*, 2*s.*, and 4*s.* each.
Gold, Cakes of, 5*s.* 6*d.* each.
Gold Paint and Preparation (Bessemer's)—in bottles, small size, 1*s.* 6*d.*; middle size, 2*s.* 6*d.*
Glue, Indian, in Sticks, 2*d.* each.
Gum, Le Keux's Sweet, per bottle, with Brush, 1*s.*
Horn Centres, 3*d.* each.
Indian Inks, Finest Nankin, from 6*d.* to 14*s.* per stick.
India Rubber.
India Rubber Pencils, 4*d.* each.
Ink and Pencil Erasers, 4*d.* each.
Ivories, prepared for Miniature Painting, from 8*d.* to 12*s.* each.
Ivory Palette Knives, Tracers, Brush Rests, &c.
Mathematical Instruments, separate or in Boxes.
Models in Relief (Imitations of Plaster Casts in Cardboard.)
Pens, Gillott's Steel Lithographic, 2*s.* per card of one dozen.
Pencils, Boxes containing six Drawing Pencils, Chalks, India Rubber, and Drawing Pins, 1*s.*
Pencils, Boxes containing six Best Hexagonal Drawing Pencils, for Engineers, 2*s.* 6*d.*
Portcrayons—Brass, 4*d.* and 6*d.*; Albata, 8*d.*; Silver-plated, 1*s.* each.
Silver Paint and Preparation (Bessemer's)—Bottles, 1*s.* 6*d.*
Silver Shells, 3*d.*; **Saucers,** 1*s.*; **Cakes,** 1*s.* each.
Sketching Easels, Stools, Umbrellas, and Bags.
Set Squares and Straight Edges.
Studies for Lead Pencil, Crayon, Sepia, and Water Colour, in great variety.
Stumps, Leather and Paper, various sizes.
Tortillons, or small Paper Stumps.
T Squares—English or French shapes, Mahogany or Pear Wood, in great variety.
Tracing Papers and Tracing Cloths, various.
Vellum (prepared for use), cut in sizes, from 9*d.* to 30*s.* each.
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