

are, indeed, many painters, to whom the axiom, 'Let well alone,' is peculiarly applicable.

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### Of the complex associations of colours, reviewed critically

618. It is evident that the rules prescribed for judging of a colour, and the associations of two colours, in an absolute manner, must serve for judging under the colours of an association, however complex it may be. We shall consider the masses of colours which are upon the same plane, the extent which each occupies, and the harmony which unites them together. On submitting to a similar examination the colours on the other planes, we can then look at the colours of the latter. The critic who is well satisfied with seeing clearly at the same time, only a very small number of the objects that a picture presents to him and who is also accustomed to examine a coloured composition in this manner, is in the position of a person who reads in succession writing on the same side of a sheet of paper; one series of lines crossing the first at right angles, and the third composed of lines running diagonally across the paper. The critic must review the *ensemble* of the picture as to its colours, and then, being attentive to their particular and general associations, he will be in a condition to enter into the thought of the painter, and to see whether he has employed the most suitable harmonies to express it; . . . although it is easier to form with opposed colours than with neighbouring colours binary assortments favourable to the associated colours, yet, when a great number of pure and brilliant colours are employed, it is more difficult to harmonize them than if we produced the effect with a small number of colours, which would involve only the harmony of analogy, or that of scale, or of hue.

619. Although harmony of contrast most favourably causes two colours to impart value to each other, yet, when we desire to derive the greatest advantage from a union of numerous brilliant colours in any work — a picture, for instance, — this diversity presents some difficulties in the general harmony, which a smaller number of colours, and especially of brilliant colours, would not present. It is, therefore, evident that, if we compare two effective pictures, well adapted to be judged under the relation of colour (other things being equal), the one which presents more harmony of contrast of colour will have the greater merit, on account of the difficulty overcome in the employment of the colours; but it must not be inferred that the painter of the other picture is not a colourist; for the art of colouring is composed of several elements, and the talent of opposing pure colours to each other, is only one of these elements.

620. Let us now consider the relations existing between the subjects of painting and the harmonies they admit of. We know that the more pictures address the eye by numerous contrasts, the more difficulty the spectator experiences in fixing his attention; especially if the colours are pure, varied, and skilfully distributed upon canvas. It results, therefore, from this, that these colours, being much more vivid than the flesh tints, the painter who wishes that his idea should be found in the expression of his figures, and who, deeming this part of his art superior to the rest, is convinced that the

eyes of most people ignorant of the art of seeing, being carried away by their first impressions, are incapable of returning from these to receive others; — the painter, I say, who knows all this, and is conscious of his power, will be restrained in the use of harmonies of contrast, and prodigal of the harmonies of analogy. But he will not derive advantage from these harmonies, especially in a subject covering a vast space filled with human figures, as the 'Last Judgment' of M. Angelo, unless he avoids confusion by correct drawing, by a distribution of the figures in groups, skilfully distributed over the canvas, so that they may cover it almost equally, yet without cold symmetry. The eye of the spectator must embrace all these groups easily, and seize the respective positions; while in looking into one of them he must discover a variety which will invite his attention to other groups.

621. The painter who fails to gain the effects of the physiognomies, &c., in having recourse to the harmonies of analogy, will not have the same advantage in fixing general attention, as the painter who employs the harmonies of contrast.

The harmonies of contrast of colour are especially applicable to scenes (illuminated by a too-vivid light), representing fetes, ceremonies, &c., which may be sober without being mournful; they are also applicable to large subjects, comprising groups of men animated with various passions.

The result of this view is, that the critic must never compare the colouring of two large compositions without taking into account the difference which may exist in the suitability of each subject with one kind of harmony more than with the other.

## 6 William Henry Fox Talbot (1800–1877) 'Photogenic Drawing'

Artists had made use of the camera obscura since the Renaissance, and the principle of projecting an image through a small hole onto a screen had been known to the Greeks. It was not until the 1830s in France and England, however, that scientific developments of the previous century quite suddenly bore fruit in two different methods of mechanically reproducing, and then fixing, images. The precise question of priority between Fox Talbot and Daguerre (see IIC7) is unclear, but the implications for art were profound, and rapidly felt. Henry Fox Talbot, a Cambridge-trained scientist, developed a method of making negative images on paper in 1835, spurred by a wish to record landscapes he had seen in Italy a few years before. By 1839 he was able to fix these images. On hearing of Daguerre's breakthrough in France, Fox Talbot hastily wrote the present paper which was delivered to the Royal Society in London on 31 January 1839. In addition to the technicalities of his process, Fox Talbot speculated about possible applications. These he saw mainly as the recording of landscapes and plants, buildings and sculptures, by scientists, architects, archaeologists and so on. But he was also drawn briefly to note the aesthetic properties peculiar to 'photogenic drawing' itself, particularly regarding detail and qualities of light and shade. To that extent photography, at the very moment of its birth, was perceived as containing the seeds of those independent effects which ultimately led it to overtake, and not merely to serve, drawing and painting as the primary representational mode of modern society. The full title of Fox Talbot's paper was 'Some Account of the Art of Photogenic Drawing, or, The Process by Which Natural Objects May Be Made to Delineate Themselves without the Aid of the Artist's Pencil'. He had it privately printed as a pamphlet in London, and its first publication proper followed in *The London and Edinburgh Philosophical Magazine and Journal of Science*, volume XIV, March

1839. Our extracts are taken from the text as reprinted in Beaumont Newhall (ed.), *Photography: Essays and Images*, New York and London: Secker and Warburg, 1980/81, pp. 23–31.

In the spring of 1834 I began to put in practice a method which I had devised some time previously, for employing to purposes of utility the very curious property which has long been known to chemists to be possessed by the nitrate of silver; namely, its discolouration when exposed to the violet rays of light. This property appeared to me to be perhaps capable of useful application in the following manner.

I proposed to spread on a sheet of paper a sufficient quantity of the nitrate of silver, and then to set the paper in the sunshine, having first placed before it some object casting a well-defined shadow. The light, acting on the rest of the paper, would naturally blacken it, while the parts in shadow would retain their whiteness. Thus I expected that a kind of image or picture would be produced, resembling to a certain degree the object from which it was derived. I expected, however, also, that it would be necessary to preserve such images in a portfolio, and to view them only by candlelight; because if by daylight, the same natural process which formed the images would destroy them, by blackening the rest of the paper.

Such was my leading idea before it was enlarged and corrected by experience. It was not until some time after, and when I was in possession of several novel and curious results, that I thought of inquiring whether this process had been ever proposed or attempted before? I found that in fact it had; but apparently not followed up to any extent, or with much perseverance. The few notices that I have been able to meet with are vague and unsatisfactory; merely stating that such a method exists of obtaining the outline of an object, but going into no details respecting the best and most advantageous manner of proceeding.

The only definite account of the matter which I have been able to meet with, is contained in the first volume of the *Journal of the Royal Institution*, page 170, from which it appears that the idea was originally started by Mr Wedgwood, and a numerous series of experiments made both by him and Sir Humphry Davy, which however ended in failure. I will take the liberty of quoting a few passages from his memoir.

'The copy of a painting, immediately after being taken, must be kept in an obscure place. It may indeed be examined in the shade, but in this case the exposure should be only for a few minutes. No attempts that have been made to prevent the uncoloured parts from being acted upon by light, have as yet been successful. They have been covered with a thin coating of fine varnish; but this has not destroyed their susceptibility of becoming coloured. When the solar rays are passed through a print and thrown upon prepared paper, the unshaded parts are slowly copied; but the lights transmitted by the shaded parts are seldom so definite as to form a distinct resemblance of them by producing different intensities of colour.

'The images formed by means of a *camera obscura* have been found to be too faint to produce, in any moderate time, an effect upon the nitrate of silver. To copy these images was the first object of Mr Wedgwood, but all his numerous experiments proved unsuccessful.'

These are the observations of Sir Humphry Davy. I have been informed by a scientific friend that this unfavourable result of Mr Wedgwood's and Sir Humphry Davy's experiments, was the chief cause which discouraged him from following up with perseverance the idea which he had also entertained of fixing the beautiful images of the *camera obscura*. And no doubt, when so distinguished an experimenter as Sir Humphry Davy announced 'that all experiments had proved unsuccessful,' such a statement was calculated materially to discourage further inquiry. The circumstance also, announced by Davy, that the paper on which these images were depicted was liable to become entirely dark, and that nothing hitherto tried would prevent it, would perhaps have induced me to consider the attempt as hopeless, if I had not (fortunately) before I read it, already discovered a method of overcoming this difficulty, and of *fixing* the image in such a manner that it is no more liable to injury or destruction. [...]

### First Applications of this Process

The first kind of objects which I attempted to copy by this process were flowers and leaves, either fresh or selected from my herbarium. These it renders with the utmost truth and fidelity, exhibiting even the venation of the leaves, the minute hairs that clothe the plant, &c. &c.

It is so natural to associate the idea of *labour* with great complexity and elaborate detail of execution, that one is more struck at seeing the thousand florets of an *Agrostis* depicted with all its capillary branchlets (and so accurately, that none of all this multitude shall want its little bivalve calyx, requiring to be examined through a lens), than one is by the picture of the large and simple leaf of an oak or a chestnut. But in truth the difficulty is in both cases the same. The one of these takes no more time to execute than the other; for the object which would take the most skilful artist days or weeks of labour to trace or to copy, is effected by the boundless powers of natural chemistry in the space of a few seconds.

To give an idea of the degree of accuracy with which some objects can be imitated by this process, I need only mention one instance. Upon one occasion, having made an image of a piece of lace of an elaborate pattern, I showed it to some persons at the distance of a few feet, with the inquiry, whether it was a good representation? when the reply was, 'That they were not to be so easily deceived, for that it was evidently no picture, but the piece of lace itself.'

At the very commencement of my experiments upon this subject, when I saw how beautiful were the images which were thus produced by the action of light, I regretted the more that they were destined to have such a brief existence, and I resolved to attempt to find out, if possible, some method of preventing this, or retarding it as much as possible. [...]

My first trials were unsuccessful, as indeed I expected; but after some time I discovered a method which answers perfectly, and shortly afterwards another. On one of these more especially I have made numerous experiments; the other I have comparatively little used, because it appears to require more nicety in the management. It is, however, equal, if not superior, to the first in brilliancy of effect.

This chemical change, which I call the *preserving process*, is far more effectual than could have been anticipated. The paper, which had previously been so sensitive to light, becomes completely insensible to it, insomuch that I am able to show the Society specimens which have been exposed for an hour to the full summer sun, and from which exposure the image has suffered nothing, but retains its perfect whiteness.

### On the Art of Fixing a Shadow

The phenomenon which I have now briefly mentioned appears to me to partake of the character of the *marvellous*, almost as much as any fact which physical investigation has yet brought to our knowledge. The most transitory of things, a shadow, the proverbial emblem of all that is fleeting and momentary, may be fettered by the spells of our '*natural magic*', and may be fixed for ever in the position which it seemed only destined for a single instant to occupy.

This remarkable phenomenon, of whatever value it may turn out in its application to the arts, will at least be accepted as a new proof of the value of the inductive methods of modern science, which by noticing the occurrence of unusual circumstances (which accident perhaps first manifests in some small degree), and by following them up with experiments, and varying the conditions of these until the true law of nature which they express is apprehended, conducts us at length to consequences altogether unexpected, remote from usual experience, and contrary to almost universal belief. Such is the fact, that we may receive on paper the fleeting shadow, arrest it there and in the space of a single minute fix it there so firmly as to be no more capable of change, even if thrown back into the sunbeam from which it derived its origin. [...]

### Portraits

Another purpose for which I think my method will be found very convenient, is the making of outline portraits, or *silhouettes*. These are now often traced by the hand from shadows projected by a candle. But the hand is liable to err from the true outline, and a very small deviation causes a notable diminution in the resemblance. I believe this manual process cannot be compared with the truth and fidelity with which the portrait is given by means of solar light.

### Paintings on Glass

The shadow-pictures which are formed by exposing paintings on glass to solar light are very pleasing. The glass itself, around the painting, should be blackened; such, for instance, as are often employed for the magic lantern. The paintings on the glass should have no bright yellows or reds, for these stop the violet rays of light, which are the only effective ones. The pictures thus formed resemble the productions of the artist's pencil more, perhaps, than any of the others. Persons to whom I have shown them have generally mistaken them for such, at the same time observing, that the *style* was new to them, and must be one rather difficult to acquire. It is in these pictures

only that, as yet, I have observed indications of *colour*. I have not had time to pursue this branch of the inquiry further. It would be a great thing if by any means we could accomplish the delineation of objects in their natural colours. I am not very sanguine respecting the possibility of this; yet, as I have just now remarked, it appears possible to obtain at least *some indication* of variety of tint. [...]

### Architecture, Landscape, and External Nature

... Perhaps the most curious application of this art is the one I am now about to relate. At least it is that which has appeared the most surprising to those who have examined my collection of pictures formed by solar light.

Every one is acquainted with the beautiful effects which are produced by a *camera obscura* and has admired the vivid picture of external nature which it displays. It had often occurred to me, that if it were possible to retain upon the paper the lovely scene which thus illuminates it for a moment, or if we could but fix the outline of it, the lights and shadows, divested of all *colour*, such a result could not fail to be most interesting. And however much I might be disposed at first to treat this notion as a scientific dream, yet when I had succeeded in fixing the images of the solar microscope by means of a peculiarly sensitive paper, there appeared no longer any doubt that an analogous process would succeed in copying the objects of external nature, although indeed they are much less illuminated.

Not having with me in the country a *camera obscura* of any considerable size, I constructed one out of a large box, the image being thrown upon one end of it by a good object glass fixed in the opposite end. This apparatus being armed with a sensitive paper, was taken out in a summer afternoon and placed about one hundred yards from a building favourably illuminated by the sun. An hour or two afterwards I opened the box, and I found depicted upon the paper a very distinct representation of the building, with the exception of those parts of it which lay in the shade. A little experience in this branch of the art showed me that with smaller *camerae obscurae* the effect would be produced in a smaller time. Accordingly I had several small boxes made, in which I fixed lenses of shorter focus, and with these I obtained very perfect but extremely small pictures; such as without great stretch of imagination might be supposed to be the work of some Lilliputian artist. They require indeed examination with a lens to discover all their minutiae.

In the summer of 1835 I made in this way a great number of representations of my house in the country, which is well suited to the purpose, from its ancient and remarkable architecture. And this building I believe to be the first that was ever yet known to have drawn its own picture.

The method of proceeding was this: having first adjusted the paper to the proper focus in each of these little *camerae*, I then took a number of them with me out of doors and placed them in different situations around the building. After the lapse of half an hour I gathered them all up, and brought them within doors to open them. When opened, there was found in each a miniature picture of the objects before which it had been placed.

To the traveller in distant lands, who is ignorant, as too many unfortunately are, of the art of drawing, this little invention may prove of real service; and even to the artist

himself, however skilful he may be. For although this natural process does not produce an effect much resembling the productions of his pencil, and therefore cannot be considered as capable of replacing them, yet it is to be recollected that he may often be so situated as to be able to devote only a single hour to the delineation of some very interesting locality. Now, since nothing prevents him from simultaneously disposing, in different positions, any number of these little *camerae*, it is evident that their collective results, when examined afterwards, may furnish him with a large body of interesting memorials, and with numerous details which he had not had himself time either to note down or to delineate.

### Delineations of Sculpture

Another use which I propose to make of my invention is for the copying of statues and bas-reliefs. I place these in strong sunshine, and put before them at a proper distance, and in the requisite position, a small *camera obscura* containing the prepared paper. In this way I have obtained images of various statues, &c. I have not pursued this branch of the subject to any extent; but I expect interesting results from it, and that it may be usefully employed under many circumstances.

### Copying of Engravings

The invention may be employed with great facility for obtaining copies of drawings or engravings, or facsimiles of MSS. For this purpose the engraving is pressed upon the prepared paper, with its engraved side in contact with the latter. The pressure must be as uniform as possible, that the contact may be perfect; for the least interval sensibly injures the result, by producing a kind of cloudiness in lieu of the sharp strokes of the original.

When placed in the sun, the solar light gradually traverses the paper, except in those places where it is prevented from doing so by the opaque lines of the engraving. It therefore of course makes an exact image or print of the design. This is one of the experiments which Davy and Wedgwood state that they tried, but failed, from want of sufficient sensibility in their paper.

The length of time requisite for effecting the copy depends on the thickness of the paper on which the engraving has been printed. At first I thought that it would not be possible to succeed with thick papers; but I found on trial that the success of the method was by no means so limited. It is enough for the purpose, if the paper allows any of the solar light to pass. When the paper is thick, I allow half an hour for the formation of a good copy. In this way I have copied very minute, complicated, and delicate engravings, crowded with figures of small size, which were rendered with great distinctness.

The effect of the copy, though of course unlike the original (substituting as it does lights for shadows, and vice versa,) yet is often very pleasing, and would, I think, suggest to artists useful ideas respecting light and shade. [...]

I have thus endeavoured to give a brief outline of some of the peculiarities attending this new process, which I offer to the lovers of science and nature. That

it is susceptible of great improvements, I have no manner of doubt; but even in its present state I believe it will be found capable of many useful and important applications besides those of which I have given a short account in the preceding pages.

## 7 Joseph-Louis Gay-Lussac (1778–1850) Report on the Daguerreotype

The Daguerreotype photographic process was developed in France in the 1830s on the basis of technical developments made by a lithographer, Nicephore Niepce in the late 1820s. Louis-Jacques-Mande Daguerre was a scene painter and owner of the Diorama in Paris. This was a device for displaying large paintings, some 14 x 20 metres in size, of famous scenes and events. Daguerre used a camera obscura to trace scenes projected onto the canvases, and it was a desire to fix these images that stimulated his experiment in photography. By 1837 he was able to fix images on a copper plate. The momentous nature of the discovery was quickly understood, and in 1839 the French government purchased the rights to the process. Daguerre and Niepce's son received annual pension for life. On 30 July 1839 the Report of a Special Commission was read to the French parliament recommending approval of the Bill for the purchase and the pensions which had been drawn up the previous month. The Report was delivered by Joseph-Louis Gay-Lussac himself an eminent scientist and member of the Institut de France. While recognizing the present limitations of the process, the Report stresses the potential of Daguerre's discovery, in particular for the natural sciences, but also for travellers, architects and painters. The present extracts from Gay-Lussac's Report are taken from the translation by J. P. Simon of Daguerre's book *A Practical Description of that Process called the Daguerreotype*, London: John Churchill, 1839, pp. 9–16. The Report was followed by technical description of the Daguerreotype process.

### Gentlemen,

Whatever contributes to the progress of civilization, and tends to ameliorate the physical or moral welfare of man, ought to be the constant object of the solicitude of an enlightened government, which, even at the height of its grandeur, does not forget to bestow honourable rewards on those who aid in this noble task, and who happy efforts are crowned with success.

It is thus that already do the law and guardians of property in literature and the useful arts, secure to the inventors advantages proportionate to the services they have rendered to society; a mode of remuneration so much the more just, so much the more honourable, that it resolves itself into a contribution absolutely voluntary, in exchange for the services they have rendered, and that, independent of the caprices, or whims of favours.

However, if such a mode of encouragement is the best in the most part of circumstances, there are cases in which it is impracticable, or at least inadequate whilst other great discoveries demand the most marked and solemn testimonies.

Gentlemen (or my Lords), Such appears to us the discovery of M. Daguerre, [which is the art of fixing the images produced by the Camera Obscura on a metal surface, and there to be permanently fixed.

However, we must hasten to state, that (though we wish not to reflect on the merit of that beautiful discovery), the design of the artist (*light*) is not replete in colours, 'black and white' being the composition of the whole. The natural image, varied in colours, may remain long, and perhaps for ever, a hidden mystery to human sagacity. Yet let us not rashly say that it is impossible; for the success of M. Daguerre unfolds to the world a new order of possibility. Requested to give our opinion on the importance and consequences of M. Daguerre's invention, we have formed it on the perfection of the results. [...] Our conviction on the importance of that new invention is complete, and we should be glad to find the House participating in the same feelings. It is certain that, from the discovery of M. Daguerre, physical science is now put in possession of a chemical re-agent, sensible, in a very extraordinary degree, to luminous rays or influences, of a new instrument, which will become, for the intensity of light, and all the phenomena of the luminous bodies, that which the microscope is for minute objects, and that it will give rise to new researches and new discoveries.

Already this re-actif has received the most delicate impressions by the feeble light of the moon; and M. Arago has conceived the hope, that a lunar chart may be traced by that satellite herself.

This House has had an opportunity of convincing itself by the proofs that were submitted to its inspection, that bas-reliefs, statues, monuments, in a word, inanimate nature, can be rendered, with a perfection unattainable otherwise, since the impressions taken by M. Daguerre's process are the faithful images of Nature herself.

The perspective of a landscape, and of every object, is traced with a precision and mathematical exactness; nothing, no not even the smallest object can escape the eye and pencil of the new painter '*light*', and as only a few minutes are required for the perfection of its work, a field of battle in all its phases will be represented with a perfection inaccessible by any other means.

Artificial arts for the representation of forms – the designs for perfect models of perspective, as well as the distribution of light and of shadows – the natural sciences for the study of species and their organization will surely make of M. Daguerre's process numerous applications. In short, the problem of its application to the taking of likenesses is nearly resolved, and the difficulties which remain yet unconquered are weighed and can leave little doubt of their being overcome. Nevertheless it must not be forgotten that coloured objects are not reproduced with their proper colours, and that the various luminous rays not acting alike on M. Daguerre's re-actif, the harmony of shades and of lights, or luminous rays, in coloured objects is inevitably altered. This is a point of demarcation traced by nature herself to the new process. [...]

The chief advantage of M. Daguerre's process consists in obtaining quickly, and in a most correct manner, the image of objects, whether it be to preserve it, or to reproduce (or copy) it afterwards by engravings, or by lithographic means; from this it will appear, that if only concentrated in the hands of a single individual, an invention like this would not have had sufficient scope to unfold its merits; whilst on the contrary, if freely given to the public this invention will receive in the hands of the painter, of the architect, of the traveller, and in the hands of the naturalist, numberless applications. In short, in the possession of a single individual, it would have remained a long time stationary (that is, unpropagated) and would have faded away (or been

forgotten) perhaps. On the contrary in the hands of the public, it will grow (or improve), and will ameliorate itself by the aid of all; thus under such circumstances it became important that it was made a public property. On the other hand, the invention of M. Daguerre ought to have attracted the attention of the government, and induced it to confer on him a marked and solemn reward.

To those who are proud of national glory (*as the liberals of this country say*), and who know, that a people do not shine over other nations, but in proportion to the greater progress that they are enabled to make in the advancement of civilization; towards such, it will be observed, the process of M. Daguerre must be a great discovery. He is the origin of a new art, in the midst of an old civilization, which will be a marked date or event, that will be considered and preserved as a title of national glory.

## 8 Joseph Mallord William Turner (1775–1851) on Printmaking

Printmaking formed a major part of Turner's output. The reasons for this were partly technical. Despite the monochrome nature of most printing and Turner's reputation as a colourist, there were relationships between techniques employed in print media and water-colour painting, as well as the potentially dramatic contrasts of light and dark, that encouraged a cross-fertilization of experiment. There were also economic reasons, however. A considerable part of Turner's income derived from his marketing of engravings. Indeed, his first series, the *Liber Studiorum* of 1807 (based on Claude's *Liber Veritatis*) was designed to publicize Turner's expertise across a range of artistic genres. Subsequent series were worked up from landscape sketches made on his extensive travels (e.g. *Rivers of England*). In addition, prints were made from finished oil paintings. In 1838 Turner exhibited at the Royal Academy a pair of paintings: *Ancient Italy* and *Modern Italy*. The latter was turned over for engraving the following year. Turner's correspondence with the engraver William Miller gives an insight into both his working methods and his enduring financial concerns. The present letters are taken from the *Collected Correspondence of J. M. W. Turner* (nos 246, 250, 251), edited by John Gage, Oxford, 1980: Clarendon Press, pp. 184–5, 187–8. Internal editorial marks are Gage's.

22 Oct. 1841

My Dear Sir,

So much time – for I only return'd from Switzerland last night – since your letter and the arrival of the proof, for Mr Moon has sent only *one*, that I hope you have proceeded with the plate, in which case it is evident you must take off *three* and mark the two for me – if you adopt the same medium of transfer – but I would say send them direct – my remarks would be wholly yours – and some inconvenience to both avoided – if you have not done anything take off one for me... so now to business.

It appears to me that you have advanced so far that I do think I could now recollect sufficiently – without the Picture before me but will now point out *turn over* and answer your questions viz. if the sky you feel [is] right you could advance more confidently therefore do not touch the sky at present but work the rest up to it. The distance may be too dark, tho it wants more fine work, more character of woods down to the very campagna of Rome a bare sterile flat... much lighter in tone.