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THE

PROGRESS OF PHOTOGRAPHY.

PHOTO-LITHOGRAPHY.

PHOTOGRAPHIC PICTURES ETCHED ON METAL-PLATES.

PHOTOGRAPHY, considered in its relation to Art, is making rapid advances; photography, regarded as a science, is not slumbering; but we have not to record any remarkable discovery: the new facts which have been brought forward are very few, and not particularly important. There are, however, many points of singular interest, which appear to require especial notice in our Journal; and to these, as marking the steps of progress, this paper will be devoted. The sudden manner in which photography has seized upon the public mind after years of neglect, proves that it had been checked by the impediments which were placed upon it; these being removed, it advances, as by a spring, at once in popular estimation; and we have photographic exhibitions displaying the beauties of the art to the world; photographic publications, instructing the eye into familiarity with the scenes which religion and history have haloed; and, the PHOTOGRAPHIC SOCIETY, with the Queen and Prince Albert for Patrons, and Sir Charles Eastlake, the President of the Royal Academy, for its President. These are the great external evidences of the attention photography is now receiving; and beyond these, we find every class of society, from the peer to the peasant, from the artist to the artisan, ladies as well as gentlemen, all studying the mysteries of cameras, inquiring into the curves of lenses, and eagerly soiling their fingers in endeavours to obtain sun-pictures. Table-turning has not much that is amusing in it, and far less that is instructive; but attention to the turning of the yellow iodide of silver to a deep brown colour proves some delightful truths, and improves our perceptions of the Beautiful. Truth to nature—as far as regards correctness of outline and minute detail—is one of the great advantages of photography. We know that each picture tells its story with all fidelity, and that in looking at a photograph of the temple of Denderra or of the walls of Baelbec, we see the whole as we should see it did we stand upon the spot and distinguish on the stones the very grinding of the sands which, borne lightly by upon the winds, have left traces of their paths behind them. Beyond this, if we avail ourselves of the advantages of the *stereoscope*, roundness and distance are both realised and on the tables of our own drawing-rooms may we examine at our leisure, those far-distant scenes in which we are interested, without the toil of travel. So great is this fidelity, that photography is employed to register the daily progress of great works, and the Emperor of Russia in St. Petersburgh, and Mr. Vignolles in England regularly learn the state of the great suspension-bridge at Kieff, over the Dnieper, which the English engineer is now building, by means of photographic pictures.

Notwithstanding this correctness of outline and perfection of detail, the photographic picture yet wants that delicate gradation of tones which ever marks the beautiful in nature. So great is the charm of many of these sun-pictures, that their admirers are disposed to regard them as perfect. By doing so they endanger the progress of the art; amateurs will be disposed to rest satisfied with productions which are not reflexes of nature,—which are indeed only outlines of objects, wanting that filling-in which is the life of all. Let us recommend as a study all photographers to take the finest picture they can obtain of any scene, and examine it by the side of a black mirror reflecting the same scene. "Looking upon this picture and on this, the counterfeit presentment," they will see wherein the one is wanting, the perfection of the other. It is not that there is an entire absence of colour, but it is that the tones which mark the receding of the landscape from the eye—which may by analogy be compared to a dissolving note of music—a dying cadence—are not realised in the photographic picture. In the productions of Mr. Stewart and of M. Martin, this has been produced with greater success than in any others in relation to landscape, and in many of the charming views of Edinburgh, by Messrs. Ross and Thomson, this realisation of "airy distance" is nearly complete. But, taking the selected production from the portfolios of either of these photographic artists, and subjecting it to the test of the mirror, it will soon be seen that the photograph exhibits harsh contrasts which are not to be discovered in nature. This is due to the inequality of chemical power, in the radiations from different surfaces, these being determined principally by their colour; these colours observing a different order in their relation to *lights* and *shadows*, than in their action upon the chemically-prepared surface.

The photographer may content himself with those pictures which his camera-obscura gives him, on some specified preparation, such as the iodide of silver. He may vary his results, by varying the proportions of the chemicals with which he prepares his paper or his plate;—and, by changing his practice, as it relates to length of exposure, the character of the incident light and other circumstances, he may obtain much that is pleasing in effect. Still, he has not a true transcript of that picture which nature has thrown upon the tablet in his camera, and until he can obtain a preparation on which there is a greater equalisation of action than on the iodide of silver, he will not realise the perfection of photography.

Sir John Herschel, at a very early period recommended bromide of silver, as being superior in this respect to many other argentiferous compounds. He has, in a communication made by him to the Photographic Society, renewed his recommendation in all its force. The action of the prismatic image on the chemical preparation we employ, must ever be the guide by which the photographer is directed. Now the solar spectrum produces a much shorter impression on paper covered with iodide of silver, than it does on that which is prepared with the bromide of silver. In the first, as an example, the green rays of the spectrum are nearly inactive, in the second they act with some degree of energy. It has ever been observed that the masses of forest scenery are, on the photograph, represented too darkly, and that unless there has been a strong reflection of sunlight from the glazed surface of leaves, they are not impressed on the picture with relative intensity, as compared with other objects. By the use of the bromide of silver this may be to a certain extent obviated as Sir John Herschel suggests. We believe, however, that by attention to some of the combinations of the organic acids with the metals, particularly with silver, a still superior result may be obtained. A complete examination of this branch of the science is required; it is to be hoped that the Photographic Society will stimulate inquiry in this very promising direction.

The refined investigations of Professor Stokes have brought to our knowledge a set of luminous rays, with which we had been hitherto unacquainted. These rays exist far beyond the prismatic spectrum of Newton, having a much higher order of refrangibility than any of the Newtonian rays. By means of a solution of disulphate of quinine, or of a decoction of the bark of the horse chestnut, this "new light" is rendered beautifully apparent, shining from the surface on which the sun's rays fall with a pure celestial blue colour. It is not our intention here to analyse the researches of this able experimental philosopher further than they relate to Photography. It has been long known that a class of rays, producing no sensation of light but energetically changing the white salts of silver black, existed beyond the most refrangible luminous rays of the spectrum. Over this space the luminous rays discovered by Mr. Stokes are distributed, and hence it has been inferred that the chemical rays are rendered visible. This view appears to have been adopted without sufficient consideration of all the phenomena. We know that intensity of light by no means indicates chemical power, the yellow rays of the spectrum, which are by far the most luminous, are the least chemically active of all those chromatic bands; therefore it will be evident that *Light* and *Photographic change* are not identical phenomena, and since the chemical power increases regularly with the diminution of light, it becomes probable that a distinct principle, a new element in fact, is involved in this disturbance of chemical affinity by radiant power. Under this view it might happen that light could be detected over every portion of the space, including the chemical phenomena in question, and yet that the chemical rays were dark and invisible. It has been stated that the chemical rays are cut off, by making the solar rays permeate solutions of sulphate of quinine, &c. We are not prepared to state that the extra spectral rays of the spectrum may not be interrupted, to some extent, by those media which have the power of producing the phenomena investigated by Mr. Stokes, not having as yet had an opportunity of experimenting with the required accuracy. But we know that many varieties of prepared Photographic papers darken as readily behind solutions of quinine, decoction of horse chestnut bark, and blocks of uranium glass as they do when these media are not interposed between them and the sun. On the progress of Photography the discovery of Mr. Stokes must have a most important bearing; but, as we have ever insisted, it is of the utmost importance to the art, as well as to the science, to divest the mind of the influence of pre-conceived theories, and until it can

be shown that the luminous radiations effect these chemical changes under all conditions of illuminating power;—that light and chemical action correspond in intensity; — that the principles producing light and actinism have the same degree of refrangibility,—to regard Light and Actinism as distinct, at least as Light and Heat. It is to the incorrect ideas which prevail upon this question that the imperfection of Photographic lenses are due, and until it is generally learnt that an achromatic lens is not necessarily a good lens for the chemical camera, that instrument will be imperfect. Happily Mr. Ross and some others of our opticians are now correcting their lenticular combinations, with reference to the different refrangibilities of the luminous and chemical rays, setting aside the mere correction for chromatic aberration, as being insufficient for the ends desired.

The stereoscope has greatly advanced the art of Photography, and there is so much that is magical in the solidity of the stereoscopic picture, that numerous attempts have been made to facilitate the means of obtaining the double image necessary for that instrument. In a former article (*Art-Journal*, p. 177) the principles were distinctly explained; by reference therefore to it the conditions necessary will be fully understood. It may not however be without its advantages to state that the pictures required for the stereoscope are in all essentialities those which are seen by the right and left eye respectively, which, by their combination in the instrument, faithfully represent bodies having length, breadth, and thickness. We hear of attempts to render the stereoscope available to the purposes of public exhibition. There are no doubt many difficulties in the way of this, but by an arrangement not very dissimilar from that which was employed in the Cosmorama—at least fifty people might at a time be surveying objects of interest—represented in the perfection which belongs to the solid image, and truth in all the relations of distance. It has become an object of great scientific interest to obtain photographic images of the moon, by which we may be enabled to determine the height of the lunar mountains, the depth of the lunar valleys. To do this effectively it appears necessary to obtain images at the two extremes of the moon's librations: an interval of about eighteen months therefore must elapse between the times of obtaining the two images, but when obtained they would completely exhibit the physical character of the surface of our satellite. The British Association have undertaken the work of examination, and its secretary, Professor John Philips, and a committee of its members, are engaged in devising the requisite apparatus for securing the impression of telescopic images of the moon on photographic plates.

It is no less important to secure by the same means stereoscopic images of the sun. They would enable us to determine with a degree of certainty, not hitherto obtainable, the exact character of the solar spots. We have from time to time noticed the beautiful photographic publications which have been brought out in Paris; we have to add to these some exquisite productions illustrative of various branches of natural history, which are now in course of publication.

Anything more beautiful in minute detail than these can scarcely be conceived, and we learn from some of our most eminent naturalists that the accuracy of these photographic representations of the objects of their study is far greater than that which can possibly be attained by the most skilful artist. The original copy is made either by the collodion process on glass, or the albumen process, and from this original any number of pictures can be obtained, each one of equal excellence in every respect. The price at which these beautiful plates are sold is so very moderate that any one pursuing the study of natural history may without difficulty procure them.

There has been much interest excited recently by the circulation of prints taken from stone—the impressions on the stone having been obtained by the agency of the solar rays. The method which has been employed to obtain these photographic images upon the lithographic stone, is the same as that devised by the elder Niepce, and introduced to the notice of the Royal Society in the year 1830. This heliographic process of M. Nicephore Niepce consists, as now employed, of spreading upon the stone some bitumen of Judea dissolved in essential oil of lavender. This being uniformly spread over the surface forms the photographic surface. M. Niepce observed that all resins when exposed to light became more soluble than when kept in darkness. Many resins, particularly the bitumen of Judea, or as we call it, Jews' pitch, are very sensitive to this influence, and even in the weak light of the camera the change is effected in a few hours. In the present examples the camera picture is first attained by any of the well-known calotype processes, and this being properly fixed, is placed upon the stone pressed close by means of a glass, and exposed to the sunshine. The strong lights in nature being represented by shadows in the original negative picture, and the natural shadows by lights, a positive and correct impression is obtained upon the stone. The sun's rays passing through those parts of the negative which correspond with the shadows in nature, acting powerfully upon the resin on the stone, a well-defined portion of that resin is rendered far more soluble than that which is under the darkened portions of the paper. An exposure to sunshine for a period varying from half an hour to an hour is sufficient; the surface of the stone is then exposed to the action of the solvent—almost any kind of spirit may be used—care being taken that it does not remain sufficiently long to attack the unchanged resin. The stone is then placed under flowing water, and well washed. By this process the stone is left bare over all those parts which correspond with the shadows, the lights being still covered with the resin. The lithographic stone is now treated in the ordinary manner to prepare it for printing, and the resin is removed from the other parts. In this manner it will be seen one portion of the stone is fitted to receive the ink, while the other portion will not take it from the roller, and the impressions are taken in the ordinary manner. We are not certain that the artist has not aided the results which we have seen by some touches subsequently to the photographic action; without these we do not clearly perceive how such nice gradation of tone should have been obtained as that which marks some of the architectural pictures. Photo-lithography promises much already; the results are of the most favourable kind; and if these results are but slightly improved upon, we may expect to see it employed for the purposes of book illustration.

MM. Niepce de Saint Victor and Lemaître have been working by the same process upon steel plates. The elder Niepce having removed the resin from the plates over those parts on which the solar rays had acted, etched those parts with nitric acid; his nephew and M. Lemaître are endeavouring to improve this process. Many pictures produced by this process have been circulated in this country, and although curious they do not appear to promise such complete results as the Daguerreotype etchings obtained by the process of M. Fizeau and of Mr. Grove. They are merely intense whites and blacks, the middle tints being entirely wanting. It will be readily seen that this must constantly be so with this process, since where any resin remains on the plates it must protect the metal from the action of the acid. The only method by which this can be obviated is the very tedious one of alternating the operations of the acid with the action of some spirit as a solvent of the different layers of resin. By this means, and judiciously adopting the process of "stopping out," it appears possible to produce the required middle tints.

In M. Fizeau's process, advantage was taken of the different rates of action, upon those parts of the silver-plate which were left bright, and those which were covered with mercurial vapour, so that the amount of chemical action bore an exact relation to the thickness of those films, which produced the delicate lights and shadows of the Daguerreotype picture. We have seen specimens of this process full of the most minute detail; as, for example, the nervous system of *Aplysia* and of *Tritonia Hombergii*, together with copies of statues and portraits, in which every line was preserved, and each shade most delicately given. This process failed from the circumstance that the silver plates were too soft to admit of many impressions being taken off by the press. It always appeared, however, that it was easy to obtain electrotype copies of these etched plates, and by using these instead of the original, obtain any number of impressions.

In Mr. Grove's process, the Daguerreotype plate was made one of the terminal poles of a voltaic battery; and another plate of equal size formed the corresponding termination of the other pole. These plates were plunged into a solution prepared for etching; and accordingly as the parts of the plates were pure silver, or an amalgam of silver and mercury, so was the degree of electro-chemical action excited. Many exceedingly beautiful results were thus obtained; but, as in M. Fizeau's process, the softness of the silver became the chief objection to its use, so it prevented Mr. Grove's method being employed. The probability is that one, or perhaps both, of these processes will be returned to, as promising a greater degree of effectiveness than any others.

Mr. Fox Talbot has lately been circulating examples of etching upon steel-plates, which have much to recommend them. At present, however, they labour under the defect already described in noticing the resin-process,—the absence of the middle tints.

Availing himself of Mr. Mungo Ponton's process, published in the *Edinburgh Philosophical Journal* for 1840, in which the bichromate of potash is employed, Mr. Talbot proceeds in the following manner:—

A solution of gelatine has some of the bichromate of potash dissolved in it, and this is poured over the surface of the steel plate and dried. There is thus formed a very perfect coating of gelatine, having a fine yellow colour. Upon this is placed the object to be copied, fern leaves, grasses, or pieces of lace; these are pressed closely by a piece of glass and exposed to sunshine. The bichromate of potash is decomposed by this exposure, and the chromic acid, attacking the organic matter, produces a brown and opaque surface. This contrasted with the

portions protected from light by the superimposed objects gives a very pleasing picture. The parts of the gelatine which have remained without change are very soluble; those which have combined with the chromic acid are tolerably insoluble. The plate therefore being placed in water, all the portions corresponding to the objects superimposed are removed, and the steel left bare along these lines, all the other parts being still covered with the gelatine. A solution of the bichloride of platinum is now poured upon the plate, and the lines are rapidly etched in; when this is effected the plate is washed, all the gelatine is removed, and it is submitted to the operations of the copper-plate printer. In this way very delicate copies of grasses, of textile fabrics, and similar objects, have been obtained. It is possible that other processes may be discovered of a more delicate character, by which the images of the camera obscura may be depicted directly on the plates, and that practice and experiment will direct to some method for securing all those gradations of light and shade which are required for the truthful representation of nature.

We might occupy still further space with some notice of the progress making in the application of photography to the microscope, but as we hear of several important investigations being now in hand, promising most satisfactory results, we deem it advisable to postpone our consideration of this portion of the subject to a future occasion.

The Photographic Society has brought the labours of its first session to a close. Most photographers armed with the camera have started, or are starting on their campaigns, and we have no doubt that the Christmas exhibition promised, will furnish ample proofs of well-directed energy and untiring labour.

DRESS—AS A FINE ART.

By Mrs. Merrifield.

PART VI.—REMARKS ON PARTICULAR COSTUMES.

We must now offer a few brief remarks upon certain costumes which appear to us most worthy of our attention and study, for their general elegance and adaptation to the figure. Of the modern Greek we have already spoken. The style of dress which has been immortalised by the pencil of Vandyck is considered among the most elegant that has ever prevailed in this country. It is not, however, faultless. The row of small curls round the face, how becoming soever to some persons, is somewhat formal, and although the general arrangement of the hair, which preserves the natural size and shape of the head, is more graceful than that of the time of Sir Joshua Reynolds, we think it would have been more pleasing had it left visible the line which divides the hair from the forehead. With regard to the dress itself: it is apparent, in the first place, that the figures are spoiled by stays; secondly, that the dress is cut too low in front; and thirdly, that the large sleeves sometimes give too great width in front to the shoulders. These defects are, in some degree, counterbalanced by the graceful flow of the ample drapery, and of the large sleeves, which are frequently widest at their lower part, and by the gently undulating line which unites the waist of the dress with the skirt. The Vandyck dress, with its voluminous folds, is, however, more appropriate to the inhabitants of palaces, than to the ordinary occupants of this working-day world. The drapery is too wide and flowing for convenience. The annexed cut, representing

CHARLOTTE DE LA TREMOUILLE.

Charlotte de la Tremoüille, the celebrated Countess of Derby, exhibits some of the defects and many of the beauties of the Vandyck dress.

Lely's half-dressed figures may be passed over without comment: they are draped, not dressed. Kneller's are more instructive on the subject of costume. The dress of Queen Anne, in Kneller's portrait, is graceful and easy. The costume is a kind of transition between the Vandyck and Reynolds styles. The sleeves are smaller at the shoulder than in the former, and larger

QUEEN ANNE.

at the lower part than in the latter; in fact, they resemble those now worn by the modern Greeks. The dress is cut higher round the bust, and is longer in the waist than the Vandycks, while the undulating line uniting the body and skirt is still preserved. While such good examples were set by the painters—who were not, however, the inventors of the fashions they painted—it is astonishing that these graceful styles of dress should have been superseded in real life by the lofty head-dresses and preposterous fashions which prevailed during the same period, and long afterwards, and which even the ironical and severe remarks of Addison in the "Spectator" were unable to banish from the circles of fashion. Speaking of the dresses of ladies during the reigns of James II. and William III. Mr. Planché, in his History of British Costume (p. 318) says, "The tower or commode was still worn, and the gowns and petticoats flounced and furbelowed, so that every part of the garment was in curl;" and a lady of fashion "looked like one of those animals," says the "Spectator," "which in the country we call a Friesland hen." But in 1711 we find Mr. Addison remarking, "The whole sex is now dwarfed and shrunk into a race of beauties that seems almost another species. I remember several ladies who were once nearly seven foot high, that at present want some inches of five. How they came to be thus curtailed, I cannot learn; whether the whole sex be at present under any penance which we know nothing of, or whether they have cast their head-dresses in order to surprise us with something in that kind which shall be entirely new: though I find most are of opinion they are at present like trees lopped and pruned that will certainly sprout up and flourish with greater heads than before."

The costume of the time of Sir Joshua Reynolds, as treated by this great artist,

AFTER GAINSBOROUGH.

though less splendid, appears to us, with the exception of the head-dress, nearly as graceful, and far more convenient than the Vandyck dress. It is more modest, more easy, and better adapted to show the true form of the shoulders, while the union of the body of the dress with the skirt is effected in the same graceful manner as in the Vandyck portraits.* The material of the drapery in the latter is generally silks and satins; of the former, it is frequently muslin, and stuff of a soft texture, which clings more closely to the form. That much of the elegance of both styles of dress is to be attributed to the skill and good taste of the painters, is evident from an examination of portraits by contemporary artists. Much

* See *ante*, p 105.