

photography have ever had success, if it had not succeeded in obtaining the exposure to a moderate light. This was obtained by the invention of a new lens—the double objective portrait lens of Professor Petzval, of Vienna.

This new lens was distinguished by the fact that it produced a much clearer picture than the old lens of Daguerre, because it was now possible to take impressions from less dazzling-lighted objects. This lens was suggested by Petzval in 1840. Voightlander ground the lens according to his directions, and soon one of the Voightlander's lenses became indispensable to every Daguerreotypist. For this production, among the many other distinctions bestowed upon them, may be mentioned the silver medal of the Society for the Encouragement of Arts in Paris, which established the priority of their manufacture of portrait objectives over all others, and a similar honour at the Paris International Exposition of 1867, the report of the jury placing them at the head of all opticians who had exhibited photographic instruments, and regarding their lenses as unexcelled.

Soon after the production of this lens, Mr. Benjamin French, of this city, recognizing its marvellous worth and accuracy, introduced it into America, where its advent was hailed with joy. From time to time, acting upon many valuable suggestions received from Mr. French, Messrs. Voightlander and Son continued to improve in their specialities, shortening the focus, increasing the field of vision, and continually keeping in advance of all others in the production of a lens of superior illuminating power and accuracy, until in the improved Euryscope they gave to the world a lens whose excellence has been abundantly tested by the foremost photographers of Europe and America.

For the purpose of landscape photography, copying, for architectural subjects and for groups, in the studio as well as outside, it is considered unrivalled. It is entirely free from distortion and difference between chemical and visual focus, and the picture produced by it is mathematically correct. The most important advantage of this lens in comparison with others of a similar kind consists in the great power of light it commands, and for this reason it is commended especially for groups, the pictures produced by it being most brilliant, the light also being spread equally all over the plate.

A quality which the Euryscope shows in common with Voightlander's portrait lens is in single portraits and large heads especially, where it works with much sweetness in flesh, and discriminates nicely in gradation, giving delicacy of detail in high light, and working with wonderful softness and transparency in shadow; in short, yielding what is so much desired—flattering portraits.

For either amateur or professional there is something in these lenses which every photographer becomes intensely interested in. The amateur possessing an ordinary Euryscope, in connection with a wide-angle Euryscope, will have a very superior outfit, that cannot be excelled; for he will then possess an instrument of great mathematical accuracy, that will do wonderful things, will never deceive, and will become more and more appreciated every time it is used. Landscape or interior, portraiture or copying, nature in repose or in motion, are grasped in its power of vision, effecting results such as can be produced by no other lens. With this lens the operator can focus all points with the same degree of sharpness, thus doing away with the blur and indistinctness common to other lenses.

Under certain circumstances, particularly in making reproductions, it is important to obtain the greatest possible angle of view; in such cases a modification of the ordinary Euryscope—whose chief aim is illuminating power—is necessary, so as to secure a picture of good size and flatness of field, an advantage obtained only at an expense of illumination. In confined situations, where the ordinary Euryscope is not available, these wide-angle Euryscopes are most excellent, as they embrace objects not accessible with the former.

Those who have had experience in copying line-work with the more expensive lenses, whose flatness of field is relative rather than absolute, know the embarrassment and difficulty in focussing the image satisfactorily in all respects. And especially in focussing is the trouble most felt, for, if the middle of the field is made sharp, the corners will be out; and if the corners are focussed, the centre field will be out; and, finally, to split the difference and focus a point on the diagonal, somewhere near midway between the centre and a corner, stopping the lens down very small to secure planimetry, and thus prolonging the exposure, to find that, after all, the negative, on very close examination so far as planimetry, shows only a split-the-difference kind of result, very unsatisfactory, especially when compared with

the same work done with the Euryscope, whose flatness of field may be said to be absolute. As each instrument is subjected to a severe and accurate test by Voightlander, both optically and photographically, before being delivered, it is impossible for any but perfect instruments to get into the market.

Next in importance to the Voightlander come the Darlot lenses, which are universally acknowledged to be superior to those manufactured by any other French optician, Darlot having received a large number of awards wherever he has exhibited them, the latest being a medal at the Vienna Exhibition of 1873, being the highest award given for photographic lenses. The view lens is a single combination, and good only for landscapes. The Darlot wide-angle hemispherical lens is excellent for taking of buildings, interiors, &c., in confined situations, where those of longer focus cannot be used to advantage. The rapid hemispherical view lenses embrace an angle of from sixty to seventy degrees; are quick-acting, perfectly rectilinear, and provided with central stops. They are capital for landscapes, out-door groups, instantaneous work, copying, engraving, architectural subjects, &c. If the amateur can afford it, let him get the Euryscope by all means; if not, do the next thing, and get a Darlot Rapid Hemispherical lens.—*The Boston Times*.

PHOTO-LITHOGRAPHY AND PHOTO-ZINCOGRAPHY.

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CHAP. XIII.—ASPHALT PROCESSES.

ALTHOUGH the earliest practical process of photo-lithography was based on the use of asphaltum as the sensitive agent, its employment for this purpose has always been very restrained in face of the superior rapidity and conveniences offered by the collo-chromate methods. In spite of its slowness and uncertainty, asphaltum has, however, two special advantages over the latter methods in superior clearness and sharpness of line, especially in close fine reductions, and its power of resisting acid, which renders it peculiarly suitable for typographic etching on zinc and other etching processes of photo-engraving. It is chiefly in this direction that its use is now extending, though it is possible that now that a ready means of increasing its sensitiveness has been found, it might also be turned to more useful account in the direct methods of photo-lithography and photo-zincography than has been the case heretofore. It has the further advantage for this purpose that the bituminous photographic image is in immediate contact with the stone; while, as was shown in the last chapter, the collo-chromate image, though receiving the ink, prevents it from coming into actual contact with the stone or zinc, and the impressions soon become worn.

The great difficulty in working the asphaltum processes is the fact that scarcely any two samples possess the same chemical properties or sensibility to light and suitability for photographic work; so that it is impossible to lay down fixed rules for exposure and working, and the only way of ascertaining the photographic properties of any particular specimen is by actual trial. Different specimens of asphaltum vary very much also in their behaviour with solvents. By eliminating the insensitive constituents of the asphaltum with ether, as recommended by Dr. Kayser, it seems possible to attain more rapidity and certainty in working.

The properties of asphaltum and the principles of its use in photography have already been briefly noticed in Chap. V; but since that chapter was written, the writer has seen Dr. Kayser's researches, and as they considerably modify some of the old views on the composition and photographic working of this substance, and largely increase our hitherto very meagre knowledge of it, it seems desirable to give some account of them before proceeding to the working details of the asphalt processes.

The title of Dr. Kayser's little work is "Untersuchungen über die natürliche Asphalte mit Berücksichtigung ihrer Photochemischen Eigenschaften" (*Researches on the*