LANTERN SLIDES.

Second Article.

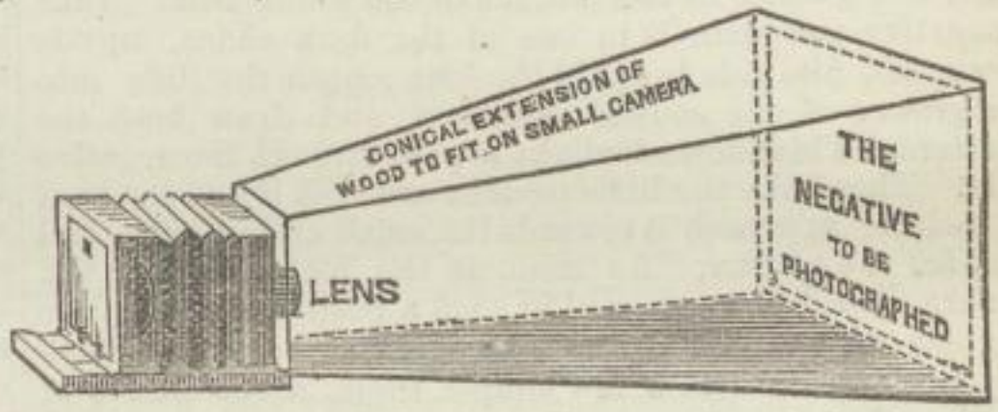
As an almost invariable rule, slides are made by reducing the size of the picture from a negative. The exceptions to this rule are where negatives are taken on plates $3\frac{1}{4}$ by $3\frac{1}{4}$, or $4\frac{1}{4}$ by $3\frac{1}{4}$, or where the negatives are even smaller than lantern slides, such as the pistol or revolver pictures now becoming popular, in which case, of course, enlargement would have to take place; but this is of rare occurrence.

The professional lantern-slide maker has all sorts of jobs to do, from reducing large negatives to lantern slide size, even unto having to copy wood-cuts or pen and ink sketches of such subjects as are not readily photographable. It will, however, be generally found that the work lies in the production of a reduced picture. No matter what the original may be—whether it be a large negative, or a paper or glass positive, or a wood-cut, or yet a sketch or drawing—the camera must be brought into play. We had better take a typical case, and elaborate this, which will carry our meaning with clearness and instruction. Suppose we have by us a number of good negatives of such a size, say $8\frac{1}{2}$ by $6\frac{1}{2}$, and we desire to produce slides therefrom; our first requirement will be a quarter-plate camera, which nearly every photographer possesses, or which is obtainable for a very few shillings, lens and all, from the dealers in second-hand apparatus. An ordinary quarter-plate portrait lens will suffice, but we strongly advise to stop it down to about $\frac{f}{20}$ or thereabouts, in order to get good definition. In our own practice, we generally employ a portable symmetrical of 4 inches focus. Now, bearing in mind that the slides when finished must be $3\frac{1}{4}$ by $3\frac{1}{4}$, and that the clear shown is a trifle under 3 by 3, we have to consider how we are to reduce $8\frac{1}{2}$ by $6\frac{1}{2}$ to 3 by 3. As the boys at school would say of long division, "it won't go;" the $8\frac{1}{2}$ may be reduced to 3, but the $6\frac{1}{2}$ will certainly not make more than $2\frac{1}{4}$, so that the clear of our slide will be 3 by $2\frac{1}{4}$. From this it is evident that if we want a clear square picture, something will have to be sacrificed, and we must content ourselves with reducing $6\frac{1}{2}$ by $6\frac{1}{2}$ to lantern slide size, or we must put up with an oblong picture.

There are even worse sizes than $8\frac{1}{2}$ by $6\frac{1}{2}$—for instance, $7\frac{1}{2}$ by 5, will only reduce to the proportion of 3 by 2, a most ungainly size for the clear of a lantern slide; or we must ignore an inch and a quarter at either side of the negative, and merely photograph the middle—that is to say, 5 by 5—and reduce that to 3 by 3. Other sizes, such as $7\frac{1}{4}$ by $4\frac{1}{2}$ or 8 by 5, are still worse, and whilst they are admittedly excellent landscape sizes, they are very awkward for reducing to lantern size.

It must not be supposed that all this preliminary consideration is of no importance; a little reflection will show that it is of great consequence, for all our optical arrangements hinge upon the conditions we have just put before our readers. Few workers care to copy merely the middles of their negatives, for probably the balance of the picture is not preserved unless the *whole* of the negative be included, and this is but reasonable, because if the photographer has had his wits about him, he has taken good care that the whole of his plate (if its length was even double the width) would be filled with properly-balanced subject. It therefore resolves itself into a question of whether the whole of a negative shall be included in the reduction, and thereby give us an oblong positive, or whether we shall make a square slide, and omit some of the subject in the negative. Upon artistic grounds, we incline to the former, and for the reasons just stated, *i.e.*, that in all probability the negative is full of proper subject, which preserves its true balance as a picture. The public have become so accustomed to the square, or rounded corner, or circular form of mask used to determine the dimensions of slides, that any innovation in shape meets with severe criticism, yet we do not see why the oblong or elliptic mask should not find favour. As already stated, it is simply necessary to decide whether to use only the middle of the negative (a length equal to the breadth), or to mask of a shape, showing (say) 3 by 2, or yet by compromising matters, and showing 3 by $2\frac{1}{2}$.

Under the head of "methods," we have placed first in order the process of photographing the negative in the camera on collodion or collodion emulsion. It is not every one who possesses a copying camera; such an instrument as will go out from a few inches to several feet, and enable one to reduce a 12 by 10 negative down to lantern size. A well-made camera, such as is to be seen in many large establishments where diverse work is done, will cost many pounds. It is, moreover, rather a bulky article, and frequently needs a room, such as is available in an ordinary house, all to itself. Of course such an instrument would answer admirably for slide making, but we doubt very much whether the majority of amateurs would not rather prefer a handy arrangement, such as we here figure.



Following up the typical case we instanced at the beginning of this chapter, and supposing we have a lot of negatives of, say, $8\frac{1}{2}$ by $6\frac{1}{2}$ or $7\frac{1}{2}$ by 5, or any other familiar size, then the difficulties vanish, or are reduced to a minimum, for we have but to make a slight calculation, basing our figures upon the optical instruments in our possession, and taking into consideration the size of the negative we want to make a lantern slide from. Suppose, again, that our stock of negatives is of $7\frac{1}{2}$ by 5, and, bearing in mind what we have remarked about the relative advantages or disadvantages of reproducing the positive in proportionate form, the most suitable lens to employ, and the apparatus actually at hand, we must see how we can combine these for greatest efficiency. The sketch shows an arrangement of a quarter-plate camera, furnished with a lens, as stated, a portable symmetrical of 4 inches focus—such a piece of apparatus as may frequently be found in the outfit of the intelligent amateur. Now, all that is required in addition is a light conical box fitting loosely over the camera, and of such a length as will place the negative at the requisite distance from the lens. The largest end of this conical box must be furnished with grooves into which one of the dark slides of our $7\frac{1}{2}$ by 5 camera will run, and should be a pretty good fit, so as to throw all light through the negative, allowing none to enter elsewhere. This conical box can be very cheaply made of wood, or zinc, or tin, blackened inside, and it and the small camera fixed on to one board which will carry the lot.

When once the scale of reduction is settled upon, and the focus found, everything may remain *in situ*, for by this arrangement every negative will be in correct focus in the small camera. The measurements of distances we find actually to be required to reduce a $7\frac{1}{2}$ by 5 negative down to $3\frac{1}{2}$ by $2\frac{1}{4}$ by means of a 4-inch focus portable symmetrical, are, 13 inches from negative to lens, and $6\frac{1}{2}$ inches from lens to sensitive plate; in both instances measuring to the rotating stop.

Whilst the negative end of the conical box must be made light-tight in relation to the slide carrying the negative, no such precaution is necessary at the smaller end of the cone; indeed, it may be made large enough for the small camera to slide right within it, for in practice merely covering over the junction with the focussing cloth is quite enough to prevent stray light entering, the results not being in any