

way marred if a strong light comes through the negative. By reducing to $3\frac{1}{2}$ by $2\frac{1}{4}$ we are able to cut away an eighth of an inch at each end of the transparency—no great loss—whilst we can retain the full width of $2\frac{1}{4}$ inches. In practice, it will be found most convenient to make the transparencies upon glass $4\frac{1}{2}$ by $3\frac{1}{4}$, afterwards cutting the picture down to $3\frac{1}{2}$, thus being able to cut all the excess off one end of the picture, or a bit off either end, according to which appears most advantageous or prudent, for sometimes one end of a negative may be in bad focus or embrace some object which may very properly be left out of our lantern slide.

Assuming the conical extension to have been made, we take it and fix it neatly and firmly on to a piece of board about two feet long, so that the negative end shall be at right angles with the baseboard; this, of course, will throw the smaller end of the cone somewhat above the board, where it must be fixed with a simple chock of wood, on edge, and a screw or two will make the whole firm. Take a negative and place it in one of the dark slides, upside down, and film side towards the lens; push the slide into the groove of the conical extension, and draw both the shutters. This allows daylight to pass through the negative only. Then take the little camera and rack it out to about $6\frac{1}{2}$ inches; approach it towards the small end of cone, and look for the picture. As soon as the focus is got, the camera should be supported in such a position as will place the lens on the axis of the centre of the negative, which any one may do with a few simple tools, a few pieces of wood, and a few screws. Thus the camera and the negative are all upon one base, and the whole affair can then be tilted to such an angle as will clear all chimney pots or other obstructions, the light entering the negative being from the sky or clouds, which would be completely out of focus. A north or north-east sky is the best to work upon, unless the operator possesses premises where he could work all round the horizon, according to the time of day.

Some workers prefer to keep the apparatus quite horizontal, and throw the light through the negative by reflection from off a piece of silvered looking-glass; but in addition to the extra cost and bulk of such an arrangement, we find that it is liable to cast unequal illumination upon the negative, is liable to injury by rain falling on it, and has constantly to be kept clean. Nothing is much cheaper than the direct light of the sky, and for our purpose in this respect we believe that nothing can equal a well-lit north-eastern sky.

It is a very great convenience to have this piece of apparatus always ready for work. Its compactness is in its favour in this direction, which would not be the case if it was as big as a four-post bedstead. There are no reasons why the operator should not fit up this apparatus in the dark-room itself, a hole of the exact size being made in the screen which blocks up his window, and the whole operation might then be performed in the one room; otherwise the camera needs to be in a room adjoining the dark-room.

THE ECLIPSE EXPEDITION.

BY C. RAY WOODS.

Monday, March 19th, 1883.

WE are now nearly towards the end of the first part of our journey, and to-morrow shall be in Callao. Several days will be spent in preparations for a few weeks' sojourn on what is at present a desert island, and then we shall be on board the vessel of our American friends. Though our journey down the South American coast has been somewhat uneventful, it has been by no means without interest, photographic and otherwise. For instance—; but stay, the last intelligence (?) you received from me only took our journey as far as Colon; and as I am industriously trying to give you the history of a scientific expedition, even to matters relating to incidents of ordinary travel, I

must go back to the point at which I left off. After transacting such affairs as required attention in Colon, receiving the greatest consideration and assistance from the agents of the Royal Mail Company and from the British consuls on the Isthmus, our instruments were got safely under way for transmission to Panama by rail. There was little to attract us in Colon. It is a most unhealthy place, and no wonder, when some of the houses are built on piles over stagnant water, when a few tons of rubbish would leave them high and dry. We were by no means sorry when we found ourselves in the train starting on the journey; and the American style of travelling in long open cars, while it has its disadvantages, is, on the whole, very comfortable. Before we had proceeded many miles we found ourselves traversing a narrow space cut through the thick vegetation that covers the Isthmus. A moist, rank smell—which at home would conjure up thoughts of bog and fen, but which, out here, brought only visions of miasma—saluted our olfactory organs; but our sense of sight suggested totally different ideas. It seemed strange that that herald of civilization—steam—should be brought so closely into contact with tropical marsh and jungle; and at times it was difficult to realize, with that tangled mass of tree and shrub before us, that we were on what is becoming a highway of commerce. The line of cars wending its way along the road through this close and luxuriant vegetation seemed singularly out of place; and at times one was inclined to feel aggrieved for its intrusion on the domain of palm and fern. Occasionally we would emerge into an open space, and see the river, with here and there a long canoe, and a few thatched huts along its banks, with their Indian, negro, or half-caste owners standing at the doorways watching the train go past.

All this and more we could observe at leisure, for the speed at which the train moved seldom exceeded ten or twelve miles an hour. At one time we would be rattling over a bridge, the cleanness and brightness of its paint looking almost unnatural to the dweller in the great city of fog and smoke; at another time the train wound its way like a long serpent round a hill and up a steep incline, the valley below us, and the neighbouring thickly wooded hills, seeming, through the clearness of the atmosphere, close at hand. Once or twice a stoppage was made, seldom, however, at an interesting point—on one occasion in the midst of a small village where the different types of many a nationality furnished an interesting study to the eye and the mind, possibly to the camera, could that at the time have been brought into use. As we approached nearer to Panama, signs of life and habitations became more frequent. In addition to the thatched houses, were painted wooden structures reared by the Canal Company at the different bases of its operations. Sometimes a whole tract of land was cleared of its vegetation by axe and fire, laying bare the general character of the scenery. Train lines, rows of trucks—some empty, and others laden with tools and engineering plant—appeared, and for some considerable distance where the railroad and the future canal were to run side by side, little flags at frequent intervals marked out the path of the projected water-way. Canal labourers, hired in large numbers by the Company, were seen busy at their different employments, and, in places, excavations had already been commenced. Near our journey's end, a moderately high hill, somewhat resembling Primrose Hill in shape (I trust Columbia will pardon the comparison) from the point at which we first saw it, appeared, and skirting round it for a short distance the train came to a standstill; we were at Panama. Picking our way up the narrow streets, we reached the hotel. The only hotel that was good for much has been bought as offices for the Canal Company. Very inferior accommodation was all we could obtain, but getting the best we could, we sat down to a pretentious but poor repast, took a walk through the town (it was then dusk), and at last, tired with the ride and the heat of the day, retired for the night. Next morning we were somewhat at a loss what to do. There seemed little work for our cameras in the town, the day was cloudy,