

results true hæmoglobinæmia followed by hæmoglobinuria." Parasitic, osmotic, and chemical actions having been excluded as causes, it seems to the authors "most probable that black-water fever is due to some specific hæmolysin arising within the body" as the result of certain conditions, induced by repeated attacks or infections by malaria. The hæmolysin is believed not to be derived from the malarial parasites themselves, but to be thrown out by the cells of the body in response to stimulation, as a result of the constant phagocytosis of red cells. "If hæmolysins are formed against the blood there seems no agent so likely to effect this as the endothelium." The prophylaxis of black-water fever is "simply the prevention, as far as possible, of malarial infection, and the prompt and efficient treatment of this disease." In the palliative treatment of black-water fever the authors wish to show that "there are excellent reasons for believing that good results may be expected from serum-therapy."

The Government of India is greatly to be congratulated on the enlightened manner in which it aids forward the production, and undertakes the publication, of important and valuable investigations of this kind.

ANIMATED PHOTOGRAPHS IN NATURAL COLOURS.

THE production of photographs in colour by means that may fairly be described as photographic is now quite common. Though the simple method of getting pigmentary colours in the picture by the direct impact of the coloured lights proceeding from the object has not been, and may never be, realised, except, perhaps, to a certain extent by very prolonged exposures, the indirect three-colour process in its numerous modifications has thoroughly established itself as a quite practical method. It is natural, therefore, that endeavours to get kinematograph views shown on the sheet in natural colours should follow on the same lines that have made such great successes possible in single photographs.

Three-colour projection involves the taking of three negatives and the making from these of three suitably coloured positive transparencies which may then be superposed to form a single coloured transparency, or, using suitable colours, projected by three lanterns separately upon the screen and superposed there. The latter method would obviously commend itself in kinematography, because of the difficulty, if not the impossibility, of uniting three long strips into one, maintaining correct superposition from one end to the other. Besides, three lanterns would obviously give a good illumination on the screen more readily than one lantern. Many attempts, or at least suggestions, for it is difficult to know whether a verbal description really means anything more, have been made in this direction. Mr. G. Albert Smith, in a lecture recently given at the Royal Society of Arts, described the difficulties he met with in a really practical and persevering attempt, in conjunction with Mr. Charles Urban, to succeed on these lines. There was not only the difficulty of photographing with the necessarily short exposure through the red screen, which was eventually overcome, but the practical impossibility of getting correct, or even passably correct, registration of the three pictures on the screen. This is a very different problem in kinematography from the production of a single three-colour picture. Obviously the three series of photographs must be taken simultaneously, and although the three kinematograph cameras may be synchronised, as they are necessarily somewhat bulky, the three points of view must be separated, and this introduces differences in the pic-

tures analogous to the differences between the individuals of a stereoscopic pair. But this is not the only difficulty. It is comparatively easy to get three pictures on the screen from three lanterns or a triple lantern correctly superposed when the lanterns are quite still; but it is a very different matter in the case of kinematograph projection apparatus, for here the film runs through it in a series of rapid jerks, and the slightest movement of the apparatus produces a very much increased effect on the screen, because of the very considerable magnification necessary. Mr. Albert Smith describes the result of his best attempts as "unbearable confusion."

All the mechanical difficulties of registration, and the dissimilarity of the photographs taken from three points of view, are done away with by using one film only and allowing the three coloured images to alternate. This has, further, the very great advantage of simplification, for the apparatus for taking and projecting is single only instead of three-fold. Of course, the film must pass more quickly through the apparatus, as it requires three pictures to form the single complete impression instead of one. The difficulties of this are obvious in a general sense, and it also means a shortening of the exposure time in taking the pictures, a disadvantage especially with the red and green screens. Still, the method was successful, but Mr. Albert Smith found the colours to be "washy and ineffective." It is not obvious why this must needs be so; probably the defect might have been remedied, but Mr. Smith applied himself to further simplification, and aimed, in spite of theory, at reducing the colour records to two. In this he has been surprisingly successful, as his demonstrations show. It is not easy to follow his reasoning as to the most suitable colours, but as a matter of fact it seems that he uses a red inclining to orange and a green inclining to blue. The two colour screens are on a disc that rotates in front of the lens so that each alternate picture is taken and afterwards projected through the one colour. Thus the ordinary apparatus is available by the addition of the rotating disc that carries the colour screens, there is no difficulty with regard to registration, and the increase in speed of working, as compared with the ordinary kinematography, is doubled only instead of tripled. Doubtless there are imperfections in the colours, but the same may be said of all three-colour work. It has, however, been demonstrated that greys are fairly well reproduced, and that there are no striking errors even in such compound colours as purples. A comparison of the results so obtained with an autochrome slide made of the same view shows practically no difference to the ordinary observer. We may therefore say that Mr. Albert Smith's method is not only very good as a first step towards kinematography in colours, but that it is a really practical method.

PROF. H. G. SEELEY, F.R.S.

THE death of Prof. H. G. Seeley, which took place at his residence on the morning of January 8, makes a big gap in the ranks of the comparatively small body of British vertebrate palæontologists, among whom the deceased professor was entitled to rank as the *doyen*. Born in London in February, 1839, he seems to have acquired literary and scientific tastes at an early age, and in the 'sixties we find him established at Cambridge, where he was taken up by the late Prof. Adam Sedgwick, and employed to work at the fossil vertebrates then being rapidly accumulated in the Woodwardian Museum, and likewise to lecture on geology when the aged professor was incapacitated from doing so by infirmity or illness. It was at this time that the so-called coprolite diggings