

consummation of his marriage with a goddess was an essential part of the annual ritual. This ceremony was well known from other sources, but Tell Asmar has afforded on a seal the only known representation of the divine nuptials in early Mesopotamia.

Among a hoard of copper objects enclosed in a pot was a bronze open-work dagger-handle in which was wedged a fragment of the original blade. This has been examined by Dr. C. H. Desch, who pronounces it to be iron of telluric origin. As it belongs to the 28th century B.C., it is by many hundreds of years the earliest example known. The same applies to a fragment of clear glass which has been examined

by Mr. Horace C. Beck, who points out how surprising it is to find in Mesopotamia clear glass dating from 2700 B.C., since in Egypt, although opaque glass was known in the second millennium B.C., clear glass was not introduced before Roman times.

It has been possible to touch only on the more striking points in Dr. Frankfort's report, while the excavations at Khafaje and Khorsabad must be passed over, notwithstanding their interest and importance. The excavations of the Oriental Institute closed for the season in 1933 at a point which promised much in the following season. This expectation was not disappointed and the further reports of the director are awaited with interest.

Three-Colour, One-Exposure Camera

THE customary method of making a set of colour-separation negatives for colour photography is by successive exposures on separate plates through the appropriate colour filters. Usually three negatives are required. This method fails for snapshot exposures of moving objects. For many years inventors have attempted to devise three-colour cameras operating with a single exposure during which all three images are simultaneously recorded. Several of the optical devices which have been used to achieve this end were briefly described by Dr. D. A. Spencer in 1933 (*Photographic J.*, 74, 103; 1934) and a further method was described in 1934 (*ibid.*, 74, 244; 1934) by the late Mr. W. T. P. Cunningham.

One of the less difficult methods depends on the use of two inclined, semi-reflecting, plane mirrors. Light from the camera lens strikes the first mirror and a portion of it is deflected to form an image on one of the photographic plates placed behind its suitable colour filter; the remainder of the light goes on and meets the second mirror, which deflects a portion on to another plate, and the remainder goes on to the back of the camera where the third filter and plate are situated. One objection to this method is that reflection takes place at both surfaces of each

mirror and, if the mirrors are thick, double images may be formed. This has led to the use of thin pellicle mirrors which are said to have been suggested by Geisler so long ago as 1910 (see Spencer, *loc. cit.*) and have recently been made as commercial articles by Mr. H. O. Klein. It is said that other ways of avoiding double images with this general arrangement of semi-reflecting mirrors are also available.

The method has therefore led to considerable practical success and at present there are available two cameras which make use of it. These were both shown at the recent British Industries Fair. One is the Taylor-Hobson three-colour camera (Vivex system) and the other is the Klein tri-colour camera invented by Adrian B. Klein and manufactured by Messrs. Bellingham and Stanley, Ltd. These cameras are said to work successfully to give exposures ranging from 1/25 sec. to 1/10 sec. in winter sunshine. Inquiries about these cameras should be addressed, in relation to the first to Messrs. Colour Photographs (British and Foreign), Ltd., Victoria Road, Willesden, N.W.10, and in relation to the second to Messrs. Farquhar and Moloney, 15-16 Newman Street, London, W.1, or to Messrs. Bellingham and Stanley, Ltd., 71 Hornsey Rise, London, N.19.

A Japanese Scientific Expedition to Manchoukuo*

THE Japanese have lost no time in examining the resources of the new 'independent' kingdom of Manchoukuo, and in October and November of 1934 were published in Tokyo the early sections of a report upon the first Japanese scientific expedition to the country, which carried out exploration work with the aid of motor transport and some aeroplane reconnaissance during the period June to October 1933. Under the leadership of the geologist, Prof. Shigeyasu Tokunaga, of Waseda University, thirteen scientific workers representing geography, botany, zoology and anthropology were dispatched from Japan, largely through the influence of Viscount Toki, Vice-Parliamentary Secretary of the War Office. Never before has a scientific expedition been dispatched abroad from Japan on so big a scale.

* Report of the First Scientific Expedition to Manchoukuo under the Leadership of Shigeyasu Tokunaga, June-October 1933. Section 1: Natural Science Research of the First Scientific Expedition to Manchoukuo. By Shigeyasu Tokunaga. Pp. iii+76+69 plates. Section 4, Part 1: Plantae Novae Jeholenses, I. By Takenoshin Nakai and Masao Kitagawa. Pp. iv+71+20 plates. Section 5, Part 1: The Fresh Water Fishes of Jehol. By Tamezo Mori. Pp. ii+61+21 plates. (Tokyo: Waseda University, 1934.)

The reports now published are in Japanese with a very full transcript in English, which manages to express some of the enthusiasm with which the expedition has undertaken its task, regarded as important both on patriotic and scientific grounds.

Before leaving Tokyo on July 22 the members of the expedition assembled in Tokyo in front of the 'Nijiu Bashi' (bridges at the entrance of the Palace) and worshipped at the entrance of the Palace; by July 30 they were in Hsin-king, the capital of Manchoukuo, and there they met again on October 12 "amidst the tear-prompting, enthusiastic welcome of the Government officials as well as plain people". On October 11 in the presence of Viscount Toki "the expedition drank to the happy completion of the scientific investigations at the risk of lives". During the intervening seventy days, some 5,000 kilometres had been covered in automobiles over trackless country; "the bottoms of the rivers are rather shallow [elsewhere described as "abdomen-deep"]", yet the quagmire-bed so deep. The treacherous rivers!" So far as possible they drove