

MUMMY OF RAMESES II.

One of the most remarkable and interesting events pertaining to Egyptology was the recent unrolling of the mummy of the ancient monarch, Rameses II., the Pharaoh of the Bible under whose reign the flight of the Jews led by Moses occurred.

The unrolling took place at Boulak, June 3, 1886, under the direction of Prof. Maspero, Director-General of the Excavations and Antiquities of Egypt, by order and in presence of the Khedive of Egypt, and a large company of officials and learned men from various countries.

From the official report of Prof. Maspero we take the following:

MM. Gaston Maspero, Director-General of the Excavations and Antiquities of Egypt, Emil Brugsch Bey, keeper, and Urbin Bouriant, assistant keeper, of the Museum of Boulak, proceeded, in the hall called "The Hall of Royal Mummies," to unbandage those two mummies which, in the printed catalogue, are numbered 5,229 and 5,233, both being among those discovered in the subterranean hiding place at Dayr-el-Bahari.

The mummy (No. 5,233) first taken out from its glass case is that of Rameses II., Sesostris, as testified by the official entries bearing date the 6th and 16th years of the reign of the High Priest Her-hor Se-Amen and the High Priest Pinotem I., written in black ink upon the lid of the wooden mummy case, and the further entry of the 16th year of the High Priest Pinotem I., written upon the outer windingsheet of the mummy over the region of the breast. The presence of this last inscription having been verified by His Highness the Khedive, and by the illustrious personages there assembled, the first wrapping was removed, and there were successively discovered a band of stuff 20 centimeters in width rolled round the body; then a second winding sheet sewn up and kept in place by narrow bands placed at some distance apart; then two thicknesses of small bandages; and then a piece of fine linen reaching from the head to the feet. A figure representing the Goddess Nut, one meter in length, is drawn upon this piece of linen, in red and white, as prescribed by the ritual. The profile of the goddess is unmistakably designed after the pure and delicate profile of Seti I., as he is known to us in the bass-relief sculptures of Thebes and Abydos. Under this amulet there was found another bandage; then a layer of pieces of linen folded in squares and spotted with the bituminous matter used by the embalmers. This last covering removed, Rameses II. appeared. The head is long, and small in proportion to the body. The top of the skull is quite bare. On the temples there are a few sparse hairs, but at the poll the hair is quite thick, forming smooth, straight locks about five centimeters in length.

White at the time of death, they have been dyed a light yellow by the spices used in embalment. The forehead is low and narrow; the brow-ridge prominent; the eyebrows are thick and white; the eyes are small and close together; the nose is long, thin, hooked like the noses of the Bourbons, and slightly crushed at the tip by the pressure of the bandages. The temples are sunken; the cheekbones very prominent; the ears round, standing far out from the head, and pierced like those of a woman for the wearing of earrings. The jawbone is massive and strong; the chin very prominent; the mouth small, but thick lipped, and full of some kind of black paste. This paste being partly cut away with the scissors, disclosed some much worn and very brittle teeth, which, moreover, are white and well preserved. The mustache and beard are thin. They seem to have been kept shaven during life, but were probably allowed to grow during the king's last illness, or they may have grown after death. The hairs are white, like those of the head

and eyebrows, but are harsh and bristly, and from two to three millimeters in length. The skin is of earthy brown, spotted with black. Finally, it may be said the face of the mummy gives a fair idea of the face of the living king. The expression is unintellectual, perhaps slightly animal; but even under the somewhat grotesque disguise of mummification, there is plainly to be seen an air of sovereign majesty, of resolve, and of pride. The rest of the body is as well preserved as the head; but in consequence of the reduction of the tissues, its external aspect is less life-like. The neck is no thicker than the vertebral column. The chest is broad; the shoulders are square; the arms are crossed upon the breast; the hands are small and dyed with henna; and the wound in the left side through which the embalmers extracted the viscera is large and open.

The legs and thighs are fleshless; the feet are long, slender, somewhat flat soled, and dyed, like the hands, with henna. The corpse is that of an old man, but of a vigorous and robust old man. We know, indeed,



MUMMY OF RAMESES II.—3,200 YEARS OLD.

that Rameses II. reigned for 67 years, and that he must have been nearly 100 years old when he died.

The Ignition of Coal Dust.

According to the results of some experiments on the ignition of coal dust and fire damp, which have been published by Mr. C. Hitt in the *Revue des Mines*, coals containing from 16 to 24 per cent of volatile matter appear more dangerous than either richer or poorer qualities. The ignition of coal dust may be induced by an explosion of fire damp as well as by a blast; and the explosion may be occasioned on firing a blast by electricity as well as by a safety match or a port fire. With dynamite there is less danger; and with gun-cotton dissolved in nitro glycerine, practically none, if it is ignited by a cap of sufficient force.

A Mountain Railway.

Messrs. D. H. & G. Haggie, Wearmouth Rope Works, Sunderland, are manufacturing two long ropes for a tramway which is in course of construction at Hong Kong, from the town up to "The Peak," a range of very steep hills, on which are many very fine villa residences, and where the climate is better than at the low level by the harbor. The incline where the ropes have to work is 4,800 feet long, laid with 35 lb. steel rails on steel sleepers, the line being partly single and partly double; the gradients varying between 1 in 2 and 1 in

10, following closely the natural contour of the ground. The total height the carriages have to be raised is 1,300 feet. The ropes run on separate sets of friction rollers, the one a working rope and the other a safety rope. The carriages are attached to each end of the ropes, and as one pair of carriages ascends the incline, the other pair descends. Each car is to contain sixty passengers, the maximum load being $7\frac{1}{2}$ tons at each end of the ropes. The working rope is passed over a pair of drums, 8 ft. in diameter, and the safety rope over one drum, the drums being fixed at the top of the incline and driven by two compound steam engines, 40 nominal horse power each. The speed of the cars is to be six miles an hour.

Cast Iron Girders.

The use of simple cast iron girders for bridges appears to be limited only by the power to make sound castings (which arises chiefly from the difficulty of pouring the metal equally and the inconvenience of handling large masses). Mr. Rastrick, however, would not put any limit to the length. Mr. Hawkshaw considers that they may safely be made more than 50 feet long; in which opinion Mr. Fox and Mr. Grissell concur, but name 60 feet as the limit. Mr. Glynn, Mr. Charles May, and Mr. Joseph Cubitt would make them from forty to fifty feet. Mr. P. W. Barlow, Mr. Fairbairn, Mr. W. H. Barlow, and Mr. Stephenson state forty feet as the limit; and Mr. Brunel names 35 feet, as he does not consider that sound castings can be insured to a greater length. Mr. Fairbairn, however, mentions a girder in Holland 70 feet long cast in one piece. It appears to be universally admitted that the form resulting from Mr. Hodgkinson's experiments on the tension and compression of iron is that which gives the greatest strength; but the actual proportions are generally modified to suit the varying circumstances under which girders are employed. Mr. Stephenson sometimes makes the top flange equal to the bottom one, but usually in the proportion of 3:5, partly to obviate any risk from unequal cooling of the materials, and partly from the necessity of having a large top flange to bolt the flooring to. In preference to using a single girder, Mr. Stephenson recommends two girders to be bolted together, with a balk of timber between, to which the rail is fixed. Mr. Hawkshaw, Mr. Fox, and Mr. Joseph Cubitt recommend

that the top flange be increased beyond the proportions given by Mr. Hodgkinson, in order to resist the lateral torsion. Mr. W. H. Barlow and Mr. Locke would use the arched form of girder whenever practicable, and the former gentleman says that straight girders have been in fashion, and consequently more used than practice actually required. Mr. Fox, in girders subject to dead weight only, would make the proportion of the top flange to the bottom one as 1:6, but in railway bridges he recommends 1:4. Mr. Thomas Cubitt mentions that shoes, or sockets, or any projections cast on girders, have a tendency to create flaws from causing the dirt to accumulate in those places, and he considers that the shape which will insure a sound casting should be as much considered as the theoretical form of greatest strength.

COMPOSITE photography has been applied by Dr. Persifor Frazer to the testing of signatures. Though his experiments cannot yet be said to ensure absolute certainty in discriminating true from forged writing, it is considered that one great point, at least, has been gained, "in the fact that it removes the judgment . . . from the possible bias of personal expert opinion, and allows the testimony of the photograph to be weighed by judge and jury like any other testimony."