the greater importance in connection with their relative merits as lighthouse illuminants.

The final conclusion of the experimenters was, that, for the ordinary necessities of lighthouse illumination, mineral oil is the most suitable and economical illuminant, and that for salient headlands, important land-falls, and places where a very powerful light is required, electricity offers the greatest advantages.

METAL-WORK OF THE BURMESE.

BOTH Burmans and Shans are expert blacksmiths, says the Journal of the Society of arts. The latter forge all the *dahs* ('native hatchets') used by themselves and their neighbors in the Hotha valley; and they annually resort to Bhamo, and the villages in the Kakhyen hills, for the purpose of manufacturing them. Their bellows are of the most primitive stamp, consisting of two segments of bamboo, about four inches in diameter and five feet long, set vertically, forming the cylinders, which are open above and closed below, except by two small bamboo tubes, which converge and meet at the fire. Each piston consists of a bunch of feathers, or other soft substance, which expands and fits tightly in the cylinder while it is being forcibly driven down, and collapses to let the air pass as it is being drawn up. A boy perched on a high seat or stand, works the two pistons alternately, by the sticks serving as piston-rods. Charcoal is used for fuel.

The casting of large and small articles in brass, bronze, and other alloys, is much practised, always adopting the method known as *à cire perdue*. First a clay model is made, and coated with beeswax to the thickness of the intended cast, and again covered with an outer skin (two inches thick) of clay mixed with finely chopped straw; this latter coat is provided with funnel-like holes, for pouring in the molten metal, at intervals of four inches, and with straw-holes for letting out imprisoned air. Holes are also provided at the bottom for the escape of the melted wax.

THE GREAT SILVER-MINES OF THE WEST.

VALUABLE indeed have been the scientific results which geology has incidentally received through the great mining undertakings of the west. The studies of von Richthofen, of King, and of Zirkel, on the rocks of the Washoe, have been equally welcome to geologists at home and abroad as contributions to the general principles of their science.

The importance of a thorough and detailed geological investigation of regions possessed of great mineral wealth is at once apparent. The geologist may afford the prospector and the capitalist just that information which is most needed; while, in turn, the shafts and tunnels of the latter supply him with sections and exposures of the rocks, which he could never otherwise hope for. How keenly the advantages of such a combination are appreciated by the government geological survey is abundantly proven by the recent elaborate monographs by Becker on the geology of the Comstock Lode, and by Irving on the copper-bearing rocks of Lake Superior; while others of a similar nature are now in course of preparation on the silver districts of Eureka and Leadville by Messrs. Hague and Emmons. Nor may we pass without mention, in this connection, the extremely important contribution recently made by Messrs. Hague and Iddings to what we know of the influence of heat and pressure in conditioning the structure of an eruptive rock. No such conclusive evidence that the holocrystalline structure of an igneous mass depends upon the slowness with which it solidifies, had ever before been discovered as that which they found in the microscopic study of the rocks displayed in the hundred and eighty miles of shafts and galleries at the Comstock.[1]

But the value of such technical papers can at most be appreciated only by a few. Specialists in the same field of scientific inquiry, or the prospector or miner who consults them in hope of some practical suggestion, will be their only readers, even though the results which they contain are broad and far-reaching in their significance.

Nevertheless there is connected with the development of a vast mining industry very much to awaken a popular interest. The accidental discovery of rich mineral treasures in the heart of a mountain wilderness; the rushing thither in hordes of men of every type, all eager to secure the largest prize; the human ingenuity and energy displayed in overcoming the vast obstacles which nature has placed in the way of transportation; the story of successes and disappointments, of fortunes made and lost, — all this gives scope for the display of the strongest human passions, and contains the elements of a tale whose truth is more romantic and more exciting than fiction.

In a volume[2] quite different in its character

[1] *Bulletin No.* 17 *of the U. S. geological survey.* On the development of crystallization in the igneous rocks of Washoe, Nevada.

[2] *Monographs of the U. S. geological survey.* Vol. iv. Comstock mining and miners, by ELIOT LORD; vol. vii. Silver-lead deposits of Eureka, by J. S. CURTIS. Washington, 1883, 1884. 4°.