Quicksilver Ores.

Speaking on the character of quicksilver deposits, Prof. S. B. Christie, of the University of California, in his testimony in a recent case in San Francisco, said:

Quicksilver deposits, as a general rule, are very different from those of the ores of other metals. Many other metals occur in well-defined fissure veins, so that there is no difficulty in following the ore, and in many cases of calculating beforehand the amount of ore in sight; but with the exception of the deposit at the old Almaden in Spain, and to some extent the deposit at the Idria in Austria, the quicksilver deposits, particularly those of California, are characterized by a great and persistent irregularity, so that it makes the mining of those ores much more difficult than that of other metals. New Almaden is a striking example of this irregularity. It has often occurred in the history of the mine that there was none or scarcely any ore in sight, and it has often looked as though the mines must of necessity be shut down, and it has only been by the most careful and painstaking prospecting or dead work that it has been possible to keep up the production of the mine. Very frequently large bodies of ore will almost completely run out, and there will be visible in the fall of the works only a slight coloration in the vein matter, which indicates that there is ore left in that particular place, and by following out this little spring of ore carefully it may lead into a large deposit. As a result of this, the workings of the mine are necessarily very irregular, and it requires the greatest skill on the part of the engineer in charge of the works to keep up a regular and steady output of ore.

IMPROVED CUTTER GRINDER.

We illustrate a machine exhibited by Messrs. Hulse & Co., of Salford, at the Newcastle exhibition, and shown in *Engineering*. It is intended for grinding to a cutting edge the teeth of face or edge milling cutters up to 6 inches in diameter and 9 inches in length. Emery wheels are used for grinding the cutters, the face and not the edge being employed, so that wheels of a comparatively large diameter may be employed. Besides ordinary milling cutters, parallel or tapered reamers can be finished at this machine, which will also cut straight or spiral grooves. As will be seen on the engraving, besides the emery wheel for the special work, another for ordinary grinding purposes is attached to the machine, with an adjustable rest for carrying the work.

Manna, the Heavenly Bread.

Mr. Cole, of Bitlis, a missionary of the American Board, in Eastern Turkey, in describing a journey from Harpoot to Bitlis, says:

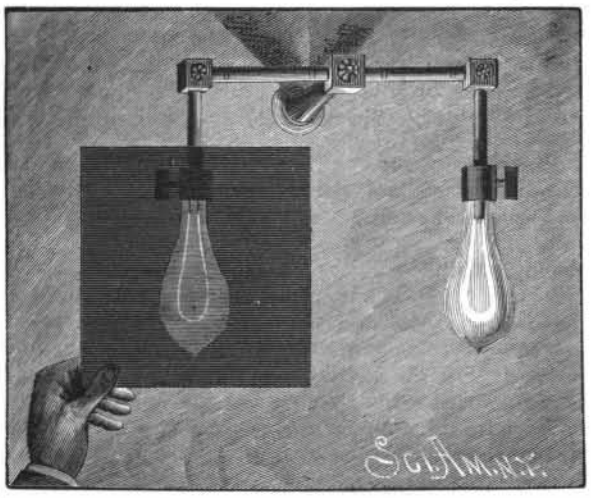
"We traveled for four days through a region where had newly fallen a remarkable deposit of heavenly bread, as the natives sometimes call it—manna. There were extensive forests of scrubby oaks, and most of the deposit was on the leaves. Thousands of the poor peasants, men, women, and children, were out upon the plains gathering the sweet substance. Some of them plunge into kettles of boiling water the newly cut branches of the oaks, which washes off the deposit until the water becomes so sweet as to remind the Yankee of a veritable sugaring off in the old Granite State as he takes sips of it. Other companies of natives may be seen vigorously beating with sticks the branches, that, from having been spread on the ground, have so dried that the glistening crystals fall readily upon the carpet spread to receive them. The crystals are separated from the pieces of leaves by a sieve, and then the manna is pressed into cakes for use. The manna is in great demand among these Oriental Christians. As we were traveling through a rather dry region, the article came in play for our plain repasts."

THE falling off in the catch of shad in the Connecticut River is very great every year. It is most marked, however, in the Thames River. Formerly the fishermen would sometimes take 2,000 shad at a haul. It has decreased in a few years, so that now the total catch reported for the last two years has been but 45 and 27 respectively.

IRRADIATION.

BY GEO. M. HOPKINS.

Brilliantly illuminated white surfaces and self-luminous bodies, when emitting white light, appear to the eye much larger than they really are. In nature examples of this phenomenon are presented by the sun, moon, and stars. The sun, viewed with the naked eye, appears very much larger than when the light is modified by a smoked glass. The crescent of the moon appears to project beyond the moon's periphery; and the stars, which are mere points of light even when viewed through the largest telescope, appear to the eye to have a disk of some size.



AN EXAMPLE OF IRRADIATION.

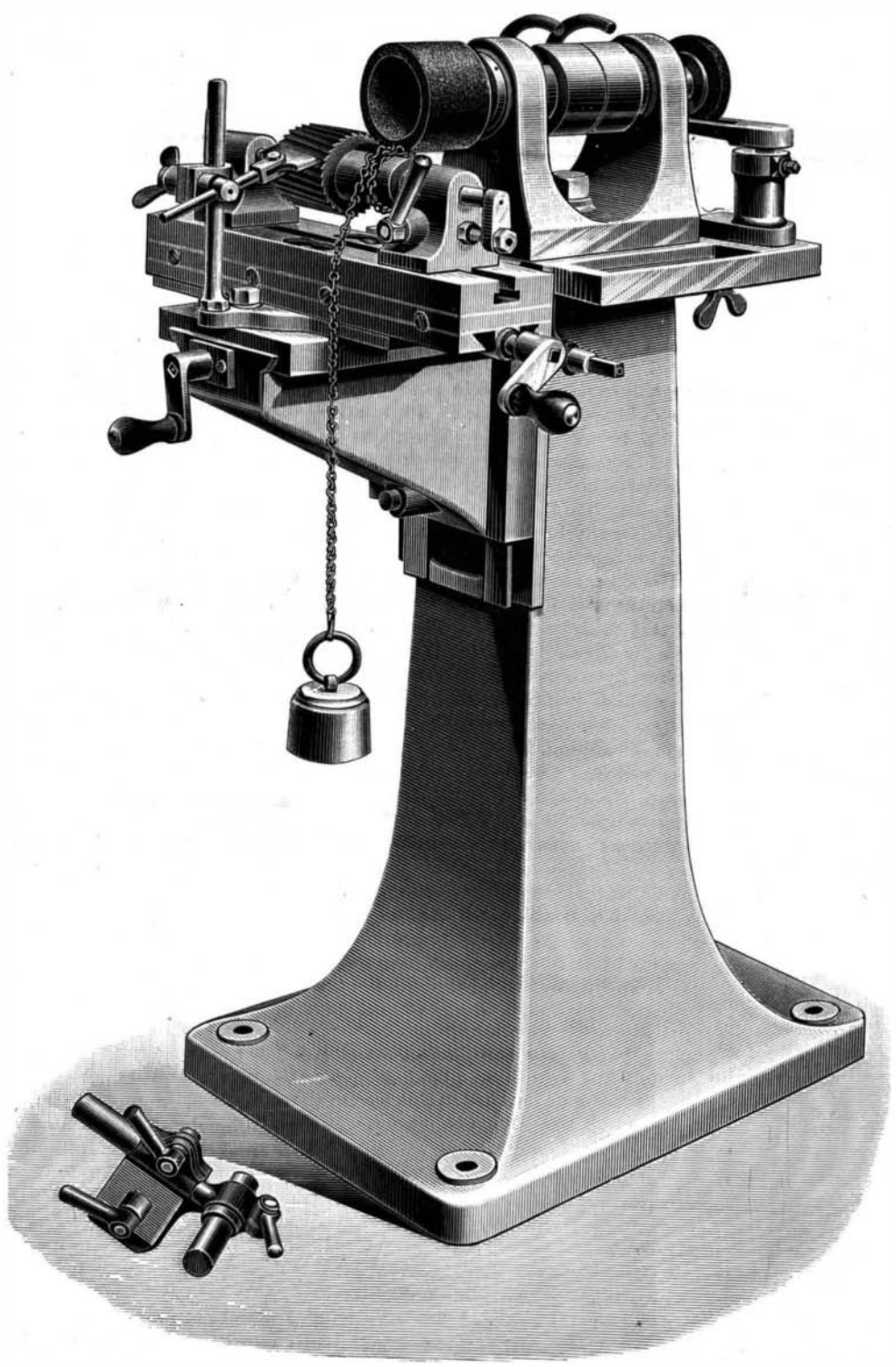
This phenomenon—known as irradiation—is due to the stimulation or sympathetic action of the nerves of the retina adjoining those which actually receive the image.

The ends of pieces of iron heated to incandescence by the blacksmith for welding seem to be unduly enlarged—an appearance due to irradiation.

Without doubt the most striking illustrations of irradiation are to be found in electric illumination. The electric arc, which is no larger than a pea, appears to the eye as large as a walnut; and the filament of an incandescent lamp, which is scarcely as large as a horse-hair, appears as large as a small lead pencil. In viewing an ordinary incandescent lamp, it is difficult to believe that the delicate filament is not in some way immensely enlarged by the electric current or by the heat, but the experiment illustrated by the engraving shows that the size of the filament is unchanged, and proves that the effect is produced in the eye.

The experiment consists merely in holding a smoked or darkly colored glass between the eye and the lamp. The glass cuts off a large percentage of the light, and enables the eye to see the filament as it really is.

The effects of irradiation are different in different persons, and they are not always the same in the same person.



IMPROVED CUTTER GRINDER.

Painting on Cement.

According to the *Bulletin de la Ceramique*, it is known that the caustic lime which is not in a state of combination in cement saponifies the oil used in painting. Consequently, painting on cement is only practicable when, under the influence of the air, carbonic acid has united with the caustic lime to form carbonate of lime. When it is desired to paint cement without delay, attempts are sometimes made to neutralize the lime by acids; but the above named journal recommends in preference the use of carbonate of ammonia, the acid of which combines with the lime while the acid is liberated. The effect produced is, however, only superficial. Various other expedients are referred to, but the solution of the problem would seem to consist in the use of caseine. Fresh white cheese and slaked fat lime are added to the color. This mixture hardens rapidly, assumes the consistency of stone, and is insoluble in water, a formation of albuminate of lime taking place. It is according to this system that the mural paintings at the Berlin War Museum were executed.

To make the composition, three parts of cheese and one of slaked fat lime are stirred, the quantity of color to be added being regulated by practice. Only earth colors or oxides of iron would be used for light red to dark brown shades; for blue, ultramarine or cobalt blue would be used; for white, oxide of zinc or sulphate of baryta; and for black, animal black. Inorganic colors, such as those of aniline, would not be used, nor would Prussian blue, vermilion, blue ocher, and white lead be employed, on account of the injurious effects of the sulphur present in the cheese in combination with these substances.

If the painting surface is too dry, it can easily be damped. The caseous lime should be prepared daily, and the brushes should be cleaned after the application of each coat of paint. The process thus described is recommended for its economy, the walls of a house being painted as fast as the scaffolding is removed. The caseous paint does not easily take fire, and is, therefore, considered particularly suitable for the decoration of theaters and for application to stage carpenter's work generally.

Photographic Printing Board.

J. Stern, of Munich, has invented a new form of printing board, which tends to do away with the heavy and expensive printing presses now employed to obtain paper positives. This instrument is composed of a wooden board, being hinged into two pieces, which has been covered with some soft material—as, for instance, with felt—and against which a glass plate, placed over the sensitized paper, is pressed by means of metal springs or levers. To each corner of the board is attached one of these levers, each of which consists of two arms of different length. The shorter arm presses against the glass plate, while the longer one can be turned and bent by pushing it down to the pin. By reason of the considerable difference of the two arms, a great pressure is exercised on the glass plate, so that the negative and the sensitized paper will be kept tightly in position during the printing process. The idea, though not a quite new one, is well carried out, and the apparatus is likely to prove practically useful.