

GOLD IN AUSTRALIA.—The production of gold in Australia seems to have diminished considerably since 1875, when the mines yielded 1,068,418 ounces. In 1870 the quantity sank below one million ounces, or, in exact figures, 969,760 ounces. In 1877 the figure fell to 809,063 ounces, in 1878 to 758,040 ounces, while in 1879 it slightly rose to 758,917 ounces. The year 1880 continued to show a slight improvement, for the yield rose to 839,121 ounces, and 1881 ended with 858,146 ounces.

NEW PROCESS FOR SILVERING MIRRORS.—Prof. Palmieri, it is said, has devised a process for silvering glass by means of the reducing action of glycerine on the salts of silver, which is said to have the advantage of producing a very brilliant metallic deposit. When into an ammoniacal solution of silver is poured, first, a little caustic potash, and then a few drops of glycerine, the reduction begins at once; and this action is accelerated if ether or alcohol be added to the mixture. A moderate heat and darkness are said to increase the brilliancy of the precipitate, and darkness also favors the adhesion of the deposit to the mirror.

NEW THEORY FOR DIAMONDS.—M. Berthelot, in the *Journal de Pharmacie et Chimie* for March states that from peculiar physical relations he is led to suspect that the true element carbon is unknown, and that diamond and graphite are substances of a different order. Elementary carbon ought to be gaseous at the ordinary temperature, and the various kinds of carbon which occur in nature are in reality polymerized products of the true element carbon. It is thought that spectrum analysis confirms this view; and it is supposed the second spectrum seen in a Geissler tube belongs to gaseous carbon. This spectrum, which has been recognized along with that of hydrogen in the light of the tails of comets, indicates a carbide, probably acetylene.

MICA MASKS AND SPECTACLES.—Herr Raphael, of Breslau, has patented mica masks and spectacles in Germany. One special merit is their great lightness. By a subsequent improvement it is possible for any workman to insert a new piece of mica in the spectacle frame when required, the piece costing only about three cents. The frame may thus be used for a long time. The workman gets quite accustomed to these spectacles after a day's use. Herr Raphael further provides gray and blue mica glasses, which are quite transparent, and the color of which is fire-proof. They are very pleasant for workmen at large fires, as they prevent strain of the eye. Masks for half of the face weigh only 40 grams (less than 1½ ounces). Herr Raphael also supplies masks to cover the whole face, and, if necessary, also the neck.

EXCELLENT PROVISION.—There is in Germany a society for the welfare of youth on leaving school, and this along with another society, has recently announced a prize competition having for its subject, "The Choice of an Industrial Calling." The prize is about \$375. Competing memoirs must be confined to the manual occupations and small industries, and should deal with the following questions: What are the peculiarities of such industries (indicating briefly the kind of work involved in various manual

occupations)? 2. What bodily and mental capabilities are assumed on the part of the apprentice? 3. What ways are open to an all-round qualification for the particular industry, and what means hereto are required? 4. What material prospects are offered by the industry, and, especially, what prospects of future independence?

MODERN ORDNANCE.—Gunmaking is almost at a standstill in the Government factories at Woolwich, and orders are anxiously awaited to make up for lost time. The transition of the national armament from muzzle-loading to breech-loading is still suspending new operations and arresting new enterprises, and scarcely a large gun has been made or a heavy coil turned out for five or six months past. The introduction of steel, although only in the experimental stages, has quite supplanted wrought-iron bars, and the rolling and coiling mills are consequently almost closed. The gun factories are, however, busy, owing to the additional labour involved in constructing the fittings for the breech-loading appliances, which require great ingenuity and nicety of construction, and the character of the handicraft which at the present time distinguishes the department has not been equalled since breechloaders went out of fashion twenty years ago. The cost of the new guns must necessarily increase with the amount of skill which they involve, and the newer guns which are coming, built up of solid castings, must also lead to a heavy cost in comparison with the cheap system of gun-building, which is evidently to be suspended at an early date. Very large guns of steel are, however, remote probabilities, as the national factories can cast only eleven tons of steel at one casting, and much more than that will be required for guns of the monster type which appear to be called for by the strength of modern armour. The relative advantages of steel hoops and wrought-iron coils may, however, be regarded as decided in favor of the former, for, though the coils possess ductility and elasticity in a superior degree, the numerous joints are an indispensable weakness, from which the solid steel, with all the faults inherent to every mere casting is free. Trials have been made for combining the two systems by making coils of steel, but they are understood to be the reverse of encouraging.

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