

been found gilded, and statues, also, which had evidently been covered with plates of beaten gold. Modern chemistry has not given us a most important piece of information relative to the knowledge of the Egyptians. Mr. Heapath, of Bristol, has lately observed upon the face of a mummy which has been unrolled at Bristol a name written in a metallic ink. Upon analysing this, it proved to be silver, and, from the action upon the flux *flavus*, there is very little doubt but nitric acid was used as the solvent. Now nitrate of silver (the lunar caustic of commerce) is the preparation employed in the indeleble inks of the present time. This discovery proves that three thousand years ago the ladies of Thebes, and the other Egyptian cities, were in the habit of employing a marking ink of the same chemical composition as that which the ladies of the cities of England now employ. We may by deduction advance a step further; the Egyptians obtained this acid no doubt from their nitre—nitrate of potash—of which there are even now large deposits. To separate this acid, either strong heat, sufficient to decompose the salt, must have been employed, or another acid, the sulphuric, must have been added, and a process of distillation adopted; however, here was the step necessary for obtaining muriatic acid from the muriales of soda, or ammonia (sal ammoniac, which exists abundantly near the temple of Jupiter Ammon). Muriatic acid being obtained, they had but to unite it with nitric acid to form the aqua regia, or true solvent of gold, and, as Moses was learned in all the learning of the Egyptians, have we not a clue by which to explain the operation by which the great law-giver destroyed the golden calf? "And he took the calf which they had made, and burnt it in the fire, and ground it to powder, and strawed it upon the water, and made the children of Israel drink of it."

"Great men were living before Agamemnon," and every advance which we make in the discovery of the manners and customs of those men to whom we assign a high antiquity, appears to prove a far greater amount of knowledge than formerly the moderns were disposed to allow them. The use of beaten gold in Greece was common; we learn in the days of Pericles that the statues of the Parthenon were gilded, or, as it is expressed by the historian, "overlaid with plates of gold."

Pliny, in his "Natural History," gives us a very accurate description of the mode of working amongst the Roman gold-beaters. The thin piece of gold to be beaten out was placed between pieces of parchment, which had previously been rubbed over with some ochre (oxide of iron), and he also details, with equal accuracy, the process of gilding by the amalgamation process. Pliny states, that an ounce of gold could be beaten into seven hundred and fifty leaves and more, each four square inches in size, and we are informed by a subsequent author, that they produced gold leaf from fifty to seventy times this degree of thinness. Beckmann, in his "History of Inventions," has an interesting chapter on gilding, to which we refer our curious readers.—During the progress of the Art, it being found that parchment was too thick and hard for the purpose, the workmen sought a thinner material, and at length discovered that the skin of an unborn calf was the most convenient. By means of this improvement gold was made much thinner; but the Art was brought to the greatest perfection by employing that fine pellicle which is detached from the gut of an ox, or a cow. In the time of Beckmann, the art of preparing this skin was kept a secret, being only known in a few families, and even to the present time the preparation of skin

for the gold-beater is made a matter of much mystery.

The preparation of gold leaf is now carried on in the following manner. The metal is first reduced into long thin strips or strands, by means of steel rollers; it is then cut into little pieces, which are beaten on an anvil, and afterwards annealed. One hundred and fifty of these pieces, now an inch square, are laid two together between leaves of vellum about four times that size, and laid twenty thicknesses on the outside, the whole being enclosed in a parchment envelope. In this state the mass is beaten with a heavy hammer on a smooth block of marble, till the gold is extended out to the size of the vellum, after which the whole is taken out, and the pieces are cut into form with a knife. The six hundred pieces thus produced are interlaid, as before, with pieces of ox-gut, prepared in a peculiar manner, and called gold-beaters' skin. The beating is now repeated with a lighter hammer, until the leaves have reached the extent of the skin, that is, four inches square. The whole is then divided into four parcels, interlaid with membrane, and beaten until they are extended for a third time.—After the last operation, the gold leaves are placed upon a leather cushion, cut into the proper sizes, and placed between the leaves of a book, the paper having been previously rubbed with bole to prevent adhesion. It is stated by Mr. Holland that there are about eighty gold-beaters in London and about twenty in other parts of the country. Two ounces and two pennyweights of gold are delivered by the master to the workman, who, if very skilful, returns 2000 leaves or eighty books of gold, together with one ounce and six pennyweights of waste cuttings; hence, the elements of one book weighs 48 grains, and as the leaves measure 3 3/4 inches, the thickness of a leaf is 1,282,000 part of an inch.

By extensive inquiry we discover that the quantity of gold leaf employed each week in this country, is—London, 400 ounces; Edinburgh, 35 ounces; Birmingham, 70 ounces; Manchester, 40 ounces; Dublin, 12 ounces; Liverpool, 15 ounces; Leeds, 6 ounces; Glasgow, 6 ounces.—The quantity used in other parts of the kingdom will give a weekly consumption of not less than 650 ounces of gold employed in gilding picture frames, the names of tradesmen above their doors, gilding the edges of books, and the numerous other ornamental purposes to which it is applied in this form. This will amount to nearly 200,000 worth per annum in this country only, and the consumption on the continent very greatly exceeds this. In addition to this, a very large quantity of gold is employed in what is commonly called water gilding. The gold is dissolved in mercury, and being applied in a liquid form, this very inappropriate term is given to it. The article to be gilded is well cleaned and then rubbed with the liquid amalgam of gold; exposure to the fire volatilises the mercury, leaving a fine film of gold behind. By repeating the process, any thickness of gold can thus be deposited. Electro-gilding has, however, to a very great extent, superseded this method. The process of electro-gilding is very simple; a solution of the oxide of gold in cyanide of potassium is made, and the article to be gilded being connected with one pole of a voltaic battery, a piece of fine gold is connected with the other; both being placed in the solution, gold is precipitated from the solution on the article to be gilt, and dissolved off from the other termination of the voltaic battery. By this means are now gilded a great variety of metal ornaments, silver services, steel pens, &c., consuming an immense quantity of gold, not less, certainly, than 10,000 ounces each year, and the demand

for these articles is rapidly increasing. In the provinces, for painting porcelain with reds and purples, and for gilding the various kinds of porcelain services, it is estimated that from 7000 to 10,000 ounces are annually employed, and with the rapidly increasing demand for English porcelain, this must very considerably increase. In the manufacture of gold chains, 1000 ounces of gold are used every week in Birmingham alone, and the quantity employed in this country for the manufacture of watches and jewellery is something enormous. The best accounts of the use of gold for other general purposes, throughout the continent of Europe, will be found in Jacob on the precious metals, and the excellent treatise by Chaptal, "L'Industrie Francoise."

According to his statement, the number of gold and silver watches is now equal. The metal in the watches he values at fifty-seven francs for the gold, and six francs for the silver, making the whole amount of the two precious metals appropriated to this branch to be nine million four hundred and fifty thousand francs. Besides these, three were manufactured five thousand pendulums, or cabinet clocks, partly of gold, partly of silver gilt, and partly gilded on inferior metal.—He remarks, that the price of watches has fallen, and the progress of luxury and the easier circumstances of the country have so increased, as to extend the use of watches, and the consequent fabrication of them. It appears that the weight of gold and silver, respectively, in the watches made in France, is not more than half the average weight of those made in England.—It is rare to see double cases to French watches; whereas, in England, it is nearly general with those of silver, and very extensively the case with those of gold. Besides this, the English watches with a single case are much more substantially framed than those which are manufactured in France.

The labour employed in making the large articles by the gold and silversmiths in France is stated to be no more than an eighth of the cost of the precious metal; whilst on the jewellery, the gilding, and the embroidery, "the fabrication of which, in Paris, is immense, the cost of the gold is not more than one-fifth of the price of the finished goods." All the statements obtained from official sources, or from the manufacturers, induces him to conclude that the gold and silversmiths in France employ annually of the two metals to the amount of sixteen millions of francs, and the jewellery appropriates annually to the amount of four millions; of this, about three-fifths is used in Paris alone.

According to these representations, it is seen that the watchmakers, goldsmiths, and jewellers together, must apply gold and silver in their several fabrics to the amount of twenty-nine million four hundred and fifty thousand francs, or one million two hundred thousand pounds sterling.

Although the use of gold and silver in so small a country as Switzerland can have but little influence on the mass of those substances, which the consumption of the whole of Europe demands, yet every statement marked with accuracy assists the estimation which it is necessary to make in those countries where few facts can be collected, and those only of a general or loose character.

It appears that the annual quantity of the two precious metals used in the trade of Geneva and the whole of Switzerland may be taken at the value of about 350,000 sterling, supposing either the estimate to refer to gold and silver of the fineness of our standard. There is good reason to believe that this is the case, because it has been asserted by some persons well acquainted with the fact, that the greater portion of the gold is obtained by melting English sovereigns. This is said to be most advantageous for the manufacturers, because ours is almost the only gold coin on which no charge is made for seigniorage.

In those countries which contain nearly one-fourth part of the inhabitants of Europe it is deemed fair to