

piece of coarse cloth. The box is placed on a slope towards the open end, and it can be made to rock to and fro like a child's cradle. A grating is placed on the open top of the box. The earth containing gold dust is shovelled on to the grating. While the apparatus is being rocked to and fro, it is supplied with a stream of water. The heavier gravel remains on the grating, and the earthy matters and the sand pass through, fall down and roll out, while the gold is kept back by the coarse cloth at the bottom. A miner could wash 1,500 kilograms (23½ cwt.) of sand per day with the rocker. This produced four times as much as with the dish, but the soil had become about six times poorer, and the gold-digger only earned 85 francs per day. The "long-tom" was then invented, with which the miner, by using a quick current of water, could wash 6,000 kilograms (114 cwt.) of sand per day. This was a great advance on the dish; but the progress of invention did not stop here, and the "sluice" method of washing was invented. The invention of the "sluice" marks a complete revolution in the working of gold.

The *sluice* is a canal formed of three planks, one for the bottom and two for the sides. This canal is narrow, being about 0.30 metres (about one foot) broad, but it is very long, as its length must be not less than 100 metres (328 ft.), and it sometimes measures more than 1,000 metres (3,280 ft.).

The bottom is paved with rough, knotty wood. It is set on an incline, varying with the nature of the soils to be washed, and it is traversed by a plentiful and violent current of water. Five or six diggers ceaselessly shovel in the auriferous soil. The water carries away the sand and stone; but the gold, separating itself from the muddy current gains the bottom, where it adheres, being seized upon by the mercury there present. The gold is taken out of the sluice once every week.

The invention of the sluice was of itself a fortune for the miners. Instead of only washing 400 kilogrammes (about 7½ cwt.), as with the dish, they could wash 18,000 kilogrammes (342 cwt.); and they could therefore work with profit soils 45 times poorer.

Tanning Skins with the Wooler Hair on.

First wash the skin in strong soap-suds, to remove the grease and dirt from the wool, then rinse in clean cold water. The skin should now be tacked upon a board (with the flesh side out) and stretched, its edges trimmed, and the whole fleshy part scraped off with a blunt knife. It is now rubbed over hard with as much chalk as it will absorb, or until the chalk falls down in powder. Now take the skin down, fill it with finely ground alum, wrap it closely together, and keep it in a dry place for two or three days; at the end of that time unfold it, shake out the alum, and it will be ready for use, after being again stretched and dried in the air. This method is for white sheep-skins for door-mats. Another mode of treating them consists in applying a strong solution of alum, moderately warm, with a sponge, to the flesh side of the skin, when it is stretched, then allowing it to dry before the chalk is rubbed in. It must always be dried in the open air, or it will turn very hard. Another mode of tanning skins with the hair on, after they are stretched on the frame and scraped, is to employ a warm decoction

of sumac, prepared by boiling one pound of sumac in a gallon of water for about five minutes. The sumac liquor is applied with a sponge to the whole fleshy surface, then the skin is dried in the open air. Three applications of the sumac are given, and when the skin is dried it is laid upon a smooth board or table, and rubbed down with pumice stone. Both alum and sumac combine with the gelatine of the skin, and form leather.—*Scientific American*.

British Navy and Army Estimates.

The sum voted for navy estimates this year by the British Parliament is £10,736,000—about fifty-three and a half million of dollars. This is a reduction of five millions of dollars from the estimates of last year. The total number of steam and sailing ships in the British navy on February 1, 1863, was 669. The number of screw steamers now afloat is 414 paddle steamers 108. Thirteen screw and two paddle steamships are building. The construction of 29 others is suspended. The effective sailing ships afloat are 103. There is also a light reduction in "British establishment of the regular forces," of about 4,000 men, and of about 2,000 on the Indian. The effective force of the former is about 148,000 men, and of the latter about 80,000. There is also in Great Britain a volunteer force, well disciplined and equipped, of about 120,000 men.

The New Copper Paint.

J. Nickles, the Paris correspondent of *Siliman's Journal*, states that M. Audry, who has been so successful in electro-plating with copper the cast-iron monumental fountains in the *Place de la Concorde*, makes his new copper paint from the porous copper deposited by the galvanic battery, mixed with a varnish. The solvent of his varnish is the light and refined petroleum, or what we call benzine. The copper is very pure and easily pulverized, then it is mixed with the benzine varnish and applied either to iron, brass, plaster, or wood. When this copper is mixed with oils, it acquires a green antique hue.

Product of Gold and Quicksilver in California.

The total value of the treasure obtained from all the California mines in 1862 was 42,539,799 dol., of which 4,989,921 dol. were coined in San Francisco. In 1861 the total value was 41,689,077 dol.: in 1860, 45,211,693 dol. The quicksilver product of California mines is prodigious. Last year it amounted to 3,025,875 lbs.; most of this was exported.

Patent Albuminized Paper.

Mr. Sutton has recently patented a method of albuminizing paper, which is stated to give very superior results. It consist in first immersing the paper in a solution of india rubber: this has the effect of keeping the albumen on the surface, instead of sinking into the paper at all, and adds much to the brilliancy of the print.

Height of Obelisks.

Two obelisks erected by Sesostris in Heliopolis, 180 feet high. Obelisk mentioned by Diodorus Siculus; 130 feet high, 25 feet square at base. Lateran; 105 feet, 440 tons weight. Obelisk at St. Peters'; 132 feet, including pedestal. Obelisk of Luxor, Paris, 76 ft. Cleopatra's Needle, 63 ft.