

40 to 54 pounds. The stamping is proceeded with, the ore being damped from time to time to prevent loss by ejection; the ore is then passed through brass sieves, and that portion coarser than sand is returned to the stamps. It is then conveyed to a mill, the running stone of which is kept in a box and nothing but the admission funnel being left open. The mill stones were made of porphyry. The ore being ground fine enough was taken to the furnace to be roasted. The furnaces apparently were modified, double-hearthed reverberatories as far as I can gather from the description. When the furnace was at the proper temperature, about 30 quintals was spread evenly over the hearth and the required amount of salt and lime—the amount required being previously determined by assay—was spread over, then the whole turned with crooks and rakes until thoroughly mixed; the process then proceeded as calcination in double-hearth roasting furnaces of to-day. If during the calcination the material clagged, grinding and sifting were again resorted to. The ore was then, if properly calcined, conveyed to the boilers or amalgamators constructed according to the "recommendation" of Alonzo Barba, the stirring apparatus being put in motion by the crank of a water wheel and a horizontal rack with cogs, which being properly fixed in a groove by cross-bars, slid backwards and forwards on brass rollers and casters, the cogs of the rack catching in the perpendicular trundle and spindle of the stirrers which turned round twice by a three and a half ($3\frac{1}{2}$ ft.) foot motion of the sliding rack. The stirrers were circular segments corresponding with the sides and bottom of the boiler. The ore was mixed with sufficient water to make it fluid and the amount of mercury required being gauged from appearance; if the ore was light and voluminous more mercury was required than if it was heavy and compact, the presence of antimony or lead in the ore necessitating an excess of mercury to provide for the neutralizing effect of these metals on the mercury. The residuum or tailings were then washed in tubs provided with stirrers. The amalgam was then freed from excess of mercury by compressing small portions in the hand at a time, as the deerskin was considered too expensive a process. The distillation was then performed "per descensum" in iron pots; the under one standing up to the middle in cold running water, which passed under the hearth, the upper part appearing about two (2") inches above it. The amalgam made into balls and placed in an iron cullender fixed to an iron tripod was set in the bottom pot, covered on the inside with a coarse cloth. The upper pot was then inverted on the lower one and luted; fire then being put about it the mercury was sublimed and condensed in the bottom pot kept cool by the water; a strong red heat being kept up