siderable gold-amalgam when battery-amalgamation is practised, flow over an amalgamated copper plate, or silver-plated copper plate, on which the most of the quicksilver-alloy is caught. This plate is as wide as the battery-screen, and usually from 3ft. to 5ft. long, and is called the apron. From the aprons the tailings flow into the sluices, in which are also amalgamated-silver or copper plates, alternating with boxes, or riffles, or boxes for catching the quicksilver, and finally reach the sluices, in the bottom of which blankets are laid. On these blankets the sulphurets, which are usually rich in gold, are caught. After leaving the blanket-sluices the tailings sometimes run into a concentrator, in which further valuable contents are recovered from them. The Hendy concentrator, the one mostly employed in California, is usually placed after the plate-sluices and before the blankets. Buddles are often used, as well as the Frue vanner. The blankets used are generally 20in. wide, and are manufactured for the purpose by the woollen-mills in San Francisco. The arrangement of amalgamating and concentrating apparatus in gold-mills varies greatly, however. At the Idaho Mill, for example, there is no battery-amalgamation, and the pulp from the battery is immediately concentrated on blankets. The concentrations are treated in pans, and the tailings from the blankets pass over riffles and other amalgamating apparatus to buddles.

Weathering of Concentrations.—Concentrations are allowed to weather from three months to a year, salt sometimes being added to assist the decomposition, when it is the custom to work them in pans.

Percentage recovered from Concentrations.—The Plattner chloridization process and its modifications save 90 per cent. and upwards of gold contained in sulphurets; but the percentage obtained by other methods is much less. It depends on the character of concentration, length of exposure to weathering, and the process by which the sulphurets are worked. The yield by other methods of chloridization often falls below 50 per cent., though usually it is higher.

Treatment of Tailings from Silver-ores.—With that class of silver-ores that is treated raw it is rarely possible to extract such a percentage as to render the tailings worthless, and therefore these are commonly saved and allowed to weather, salt sometimes being added to assist the decomposition. As a rule, however, there is enough salt remaining in the tailings after working the ore to produce, in course of a year or two, the required effect. It must be remembered that, no matter how fine a particle of tailings may be, there can still be a particle of silver-mineral in the centre of it so completely enveloped by earthy material that chloride cannot act upon it and quicksilver cannot touch it. When tailings are treated, only that portion of silver is amalgamated which is exposed to contact with the quicksilver. As the outsides of these tailings-particles have already been once subjected to the influence of chloride and quicksilver, the amount of silver which can be recovered by a second amalgamation—of course, taking it for granted that the ore has been properly treated in the first instance—except where long-continued grinding is practised, or where the character of the gangue has been changed by weathering, is exceedingly small. The percentage extracted from tailings does not often exceed 50 per cent. of the assay-value, and generally falls below this point. With the tailings from roasted ore, which are of lower grade than those from raw working, it is still more difficult to obtain the silver.

Slimes.—Slimes sometimes assay more than the ore itself, sometimes less. The percentage of slimes escaping from wet-crushing mills varies from 1 to 15 per cent., according to the character of the ore. Ores containing much iron-oxide generally produce the most slime. The slimes are usually first caught in large tanks, and then in shallow ponds. Eventually very little escapes if proper settling-room is provided.

Samples of Ore.—Samples of ore are sometimes taken from each car-load at the mine. This is the case at the California, where a handful is taken from each car. When the ore of a mine is treated by a custom-mill ore-samples are often taken by the mine-owners as a check upon the working of the mill.

Battery-samples.—Battery-samples are always taken at the mill, and in wet crushing generally in the following manner: Every half-hour or hour a rectangular iron box, or dipper, is passed along the lips of the mortar where the pulp falls into the sluices, and a portion of the slimes and sand is taken, care being preserved to prevent concentration by the overflowing of the box. The sample is put into a bucket with others, and at the end of twenty-four hours the clear water is poured off, and the collective samples for the day are dried and prepared for assay. In dry-crushing mills it is usual to take the sample by passing a box along the lower part of the screen every hour or so. Sometimes the sample is taken from the conveyor, or from the pulp in the bins.

Ore-assays.—Ore-assays are generally made in crucibles, though with very base ores scarifiers are sometimes used. They are seldom corrected for loss in assaying.

Roasting-furnaces.

Systems of Furnaces.—There are many different kinds of furnaces in use for chloridizing ores. Among the more common types may be mentioned the Howell, Brückner, White, Stetefeldt, O'Hara, and ordinary reverberatory. The Howell, Brückner, and White furnaces are revolving cylinders. The axis of the Howell and White furnaces is at an angle of a few degrees to the horizontal, the ore being fed at the higher end and discharged at the lower. In the White furnace the ore and the flame from the fire-box enter the furnace together at the higher end. In the Howell the ore is fed in at the higher and the flame enters at the lower. This constitutes the material distinction between these two furnaces, and the difference is in favour of the Howell. The Brückner is a cylinder of boiler-iron, with ends usually made of the same material, though sometimes they are of cast-iron. In the centre of each one of these ends, or heads, there is a hollow trunnion, through which the flame enters or passes out of the cylinder. The axis is horizontal; but, like the Howell and the White, the furnace revolves on a series of wheels or rollers. The motion is conveyed to all these furnaces by a system of gearing, a belt of cogs passing around the outside of the cylinders, which gears with a small spur-wheel on a counter-shaft below the furnace. By an improvement in