The *Mining and Scientific Press*, of California, gives some very useful and interesting information regarding the cost and success of the lixiviation process at Lake Valley, New Mexico, of which the following is an abstract: "The successful treatment of these ores has always constituted one of the most difficult metallurgical problems ever met. Smelting, raw milling, and concentration have each in their turn failed to give satisfactory results; and it has remained for the leaching process alone to meet the requirements of economy and high percentage of extraction." This company's property is under the management of Dr. F. M. Endlish, a gentleman whose name is familiar as a chemist and mineralogist; and the process that he adopts for the treatment of the ore is that known as Russell's process. The unusual difficulties presented by the Lake Valley ores called for mechanical and chemical treatment of an almost extraordinary character, and the present mill-extraction of 87 per cent. has been reached only after numerous changes and the treatment of over a thousand tons of ore. The rate of increase in the percentage is now about 1 per cent. for each hundred tons treated, and in the treatment of the next 500 tons will probably reach 92 per cent., although the ore is crushed through a 16-screen and chloridized with only 7 per cent. of salt. The mill is probably the most automatically arranged of any so far constructed. With the exception of a small amount of flue-dust there is no handling of the ore from the time it enters the Blake crusher until it appears on the cooling-floor. By a contrivance of Dr. Endlish even the flue-dust from the dust-chambers of the chloridizing-furnace is delivered at the lower end of the furnace mixed with the coarse hot ore. From the cooling-floor the chloridized ore is conveyed by three elevators, starting from three different points under the cooling-floor, to the bins over the ore-tubs, each holding twenty tons. The apparatus of the leaching-department consists of six ore-tubs, each 12ft. in diameter and 5ft. deep; five precipitating-tanks, each 9ft. in diameter and 9ft. deep, and three storage-tanks of the same size; also a Johnson 15in. filter-press, and a small Knowles's pump for handling the solution. Each ore-tub is also provided with an Allen lead-lined siphon-pump. These are on the ejector principle, and serve to maintain a constant vacuum underneath the filters, and so increase the speed of leaching, and also deliver the solution at any desired point. The ore-tubs are loaded to a depth of 4½ft., which is equal to twenty tons for each tub, or 120 tons in all. By means of the bins the loading of 120 tons can be accomplished in three and a half hours. The total cost of treating the ore by the new leaching-process after it leaves the cooling-floor is 74c. (3s. 1d.) per ton for chemicals, and from 25c. to 40c. (1s. 0½d. to 1s. 8d.) per ton for labour; the last item varying according as the number of tons treated per day. The total cost of treatment, including crushing, roasting, and leaching, is $5 (£1 0s. 8d.) per ton.

Climo and Bawden Machine.

This machine was only in course of construction when I was at the Thames, and therefore nothing was known as to its capabilities. The patentees have high expectations concerning it, and in order to enable me to give a description of it they handed me plans showing the design.

The machine is a circular trough 9ft. in diameter, having a cone in the centre. The top of the cone is provided with a bush or bearings, which support a vertical shaft, while the sides of the cone have openings for the discharge of the slimes. It is similar to Railey's pans, only it is twice the diameter. The bottom, and flange round the bottom-side, are cast-iron, to which is bolted or riveted wrought-iron sides, which stand 2ft. high. The width of the trough in the bottom is 2ft., having false bottoms occupying a space of 1ft. 4in. in the centre. The false bottom fastened on in twenty-four sections, with dovetailed joints, which leaves a space of about 4in. on the outer and inner sides of the false bottom as a receptacle for quicksilver. The driver is a conical piece of cast-iron, made in two pieces corresponding to the shape of the inner cone of the pan, terminating at the bottom in a flat circular ring corresponding to the false bottom in the pan. This ring is provided with holes for the purpose of fastening and carrying the grinding-shoes. Before the grinding-shoes are put on there is a false shoe with a joint at the inner side, to which is attached a rod of iron, and which is screwed for, say, 6in. long on the upper end to allow for a nut on the under side of each flange. The end of the rod passes through a flange which projects on the side of the driver, and between the lower side of this flange and the bottom nut a strong spiral spring is placed. Underneath these false shoes the grinding-shoes are placed, and fastened together by means of dovetail catches and bolts which come up through the circular ring on the bottom of the driver; only the false shoes have a certain play between them and the circular ring of the driver to allow them to move up and down by the pressure of the spiral spring. On the top of the circular flat ring of the driver there are several guides fixed to cause the pulp to travel from the outer to the inner side of the trough, and bring the stuff underneath the grinding-surface, and on the side of the cone of the driver there are eight openings to allow the pulp to get through and down to the grinding-surface, so that the appearance of the driver is like a part of a cone with eight arms.

The grinding-shoes are twenty-four in number, and are placed about 1in. apart, so that with having a spring attached to each of them they have a uniform pressure on the false bottom, and grind independently of each other. On the top of the driver there is a strong boss, flanged and bolted to the driver, and this boss has a flat-threaded screw cut to form a nut.

The vertical shaft coming up through the central cone has a corresponding flat screw cut for some distance on the upper end to fit the screw in the boss on the top of the driver; the shaft and boss having also a keyway cut, so that when the driver is sufficiently low down a key is put in, and grinding commenced. It is not intended to grind up the quicksilver, but merely to have it in the circular well on the outer and inner sides of the trough.

The patentees intend to use an electric current among the quicksilver by having the negative pole in the quicksilver-well and the positive one in the water covering the quicksilver, for the purpose of keeping the mercury from "sickening;" but chemical amalgamation will be first used as a trial.