the heat—the kettle-bottoms being about 2ft. above the bottom of the flue. A stout three-ply crossed and battened wooden floor, rising 1 in 12, is then laid down on each side of the flue at a distance of 4ft. from the mason-work. This floor is thus laid down to intercept any leakage of the lye. On these floors are built eight rough wooden bins, known as 'leaches,' of 60 to 70 cubic feet capacity each, four on each side of the flue, hopper-shaped, with a batter of 2in. to the height for sides and backs, the bottom having the same slope as the floor. The whole breadth of the front of each leach is cut away for 1in. above the bottom—some making the upper edge of the opening serrated. These openings permit the escape of the lye into a rough wooden trough made of hollow logs, split in half, or of lumber, the cross-section measuring 48 square inches. These troughs terminate in large cast-iron receivers sunk in the earth. The ashes, without exception 'domestic,' having been hauled by the 'ashery' wagons, are stacked in immense mounds on each side of the building for convenience in filling the leaches. Finally a hand-pump and hose are connected with the water-supply.

"In commencing operations the first step is to lay down in the bottom of each leach a rough filter consisting of two layers crossed of inch splints; on these is laid a 2in. layer of straw, over which is spread evenly and and loosely two bushels of dry air-slaked lime. Commencing with the bins known as No. 1 tier on the left of the flue, the ashes are thrown into the leaches to a depth of 1ft., and then tramped down till solid. A second layer 2ft. in thickness is similarly treated, the bins are then filled up and tramped for the last time, the ashes being then within 4in. of the top of the bins. Water is then pumped in till they are full. In the course of a few hours the lye begins to flow into the receivers, and when good ashes are being treated should stand at 20° Baume; water is added from time to time to the leaches till the lye stands at 5° Baume. As soon as the receivers are full, the lye is ladled into the kettles, commencing with No. 1, till they are half filled and the fire is kindled. Fresh lye is added as evaporation proceeds, care being taken to prevent the kettles boiling over by the addition when required of a little resin or a tablespoonful of pine-tar. The receivers being emptied, water is added to the ashes till the resulting lye stands at 0° Zero of the scale. This weak lye is pumped into No. 2 tier of bins already filled, the ashes in No. 1 tier being thrown out and the bins refilled with a fresh supply.

"The spent ashes fetch from 4s. to 6s. per ton, are eagerly sought by fruit-growers, are largely advertised in American agricultural papers, and, after being carried seven hundred miles by schooner and canal-barge, are retailed in car-load lots at 1s. 3d. per bushel to the market-gardeners on Long Island, New York. They still contain potash sufficient for making soft-soap.

"The lye in the kettles having boiled for a period varying from six to nine hours, according to the strength of the lye and the intensity of the fire, black salts begin to collect at the bottom of the kettles. These salts have a thick syrup-like appearance, and are dipped out from time to time into coolers. As soon as sufficient salts are on hand those in Nos. 3, 4, and 5 kettles are ladled into Nos. 1 and 2. A little water is added, and when this is evaporated the salts collected in the coolers are cautiously added a little at a time to the mass, which in a short time melts. In about three hours' time the contents of the kettles are of a rich yellowish brown tint, and present an appearance not easily described. A little fat is thrown into the kettles, which, catching fire, burns off the impurities, which, owing to their lighter specific gravity, form a scum on the surface. Ebullition ceases, and the contents of the kettles are at once dipped as rapidly as possible into cast-iron coolers, where it stands for twenty-four hours, when it is fit to barrel. Immediately the potash is ladled out of the kettles, the fire is drawn, and spent ashes thrown into the furnace, the kettles being refilled when cool.

"Great caution is necessary during the process to prevent injury to the kettles while at a red heat, and to avoid being splashed with the fiery alkaline liquor, weak acetic acid or vinegar being kept at hand for use in case of need. There should be three receivers to every five kettles, and the coolers should be in duplicate sets; in addition there should be several long-handled iron dippers 6in. by 8in. Any potash which before barrelling may be exposed for any length of time to the action of the air should be covered with unslacked lime to prevent the access of moisture. The furnace-door should be 18in. by 20in., a plate of sheet-iron hanging by a chain from the roof serving both as door and damper, a single horizontal bar across the furnace-door 1ft. above the bottom answering as a grate-bar.

"Good wood ashes, such as hickory or maple, turn out 5lb. potash to the bushel; that from black ash, 6lb.; very good ashes, 7lb.; that from swamp elm, 9lb. This last explains why elms attain their greatest dimensions when growing over shales rich in potash.

"The time required for converting 250 bushels of ashes will average forty hours, the consumption of fuel being three cords (384 cubic feet) of good hard wood. The output of such a plant as I have described, working night and day, will be 36cwt. per week. The barrels are of oak with oak hoops, air-tight, and weigh from 85lb. to 100lb., holding about 6cwt. of potash. The spot cash price at 4¼d. per lb. averages about £5 15s. per barrel, the freight per barrel by rail to Montreal, distant about four hundred miles, being 7s.

"All of which is respectfully submitted.

"T. Kirk, Esq., Chief Conservator, State Forests." "Henry D. Twohy.