fermentation. The liquor from the last mash is used as mashing liquor for the next lot of malt. The general scheme of opera­tions subsequent to mashing is illustrated by fig. 7, which depicts the process at one of Messrs Buchanan’s distilleries.

After the wort has been drawn off it is run through a refrigerator, and then passes to the wash backs. the latter arc large wooden vessels corresponding to the fermenting backs of the brewer. Here the wort is pitched with yeast, the fermentation starting as a rule

at something over 70° F. The maximum temperature attained at some distilleries frequently exceeds 90° F., but in the opinion of the author this is excessive. Fermentation proceeds until the whole of the saccharine matter is converted into alcohol, and when this is the case the gravity of the fermented wort—now termed wash— should be equal to, or a little lower than that of water. The wash from the various wash backs is now collected in the wash charger, which is an intermediary vessel serving for the mixing of the contents of the different wash backs, and also for the purpose of enabling the revenue officer to ascertain the total volume and strength of the wash. In this way he obtains a check on the quantity and gravity of the wort as taken prior to fermentation. From the wash charger the wash passes to the wash still, which is a copper vessel varying in size in Scotland from about 3000 to 8000 gallons. The usual size is about 5000 to 6000 gallons. This still is heated either by direct fire (as shown in the illustration), or frequently by means of a steam jacket or steam coil. The wash still is provided with rakes or chains actuated from outside for the purpose of preventing the solid contents of the wash from being charred. The whole of the spirit is drawn off in one fraction from this still, and is condensed by means of a copper coil cooled by running water. The distillate so obtained is termed " low wines," and the strength is generally about 50 u.p. The next stage in the process is the redistillation of the low wines. This takes place in the low wines still, which is a vessel similar to the wash still, except that it is rather smaller. The distillate from the low wines still is collected in three separate fractions termed respec­tively and in the order of their collection, (*a*) foreshots, (*b*) clean spirit or whisky, (*c*) feints. The quantity of each of these three fractions collected will vary somewhat according to the nature of the spirit being made, the quality of the material employed, and to other circumstances into which it is not necessary to enter. As a rule the foreshots will be run from the starting of the still down to 25 to 30 o.p. Whisky will be collected from about 25 to 30 o.p. to proof, the remainder, namely the residual fraction, from proof down to water, being feints. In collecting the various fractions the distiller is mainly guided by the alcoholic strength of the spirit coming over, by its flavour, and by its behaviour on mixing with water. It is the object of the distiller to obtain a clean spirit or whisky which gives as little “ blueing,” that is opalescence, when mixed with water as possible.. The foreshots and feints are run into the feints receiver, the whisky to the spirit receiver. The dis­tiller is able to divert the spirit coming over into either of these receivers at will by means of a movable arm contained in the spirit safe. The spirit safe is a closed vessel containing two or more broad funnels each of which is connected with a pipe leading to a feints or spirit receiver as the case may be. The movable arm fixed on to the pipe leading from the condensing coil can be. actuated from without by the distiller. In this way the distiller is able to regulate the distillation at will without having access to the spirit. The quality of the spirit coming over is judged by means of the apparatus contained in the sampling safe. This is another closed vessel containing hydrometer jars fitted with hydrometers, and with a water supply. A small part of the spirit coming from the coil passes through this box into the hydrometer jars, where its strength is taken by means of the hydrometers and its behaviour towards water ascertained by mixing with a known volume of the same. The strength of the whisky collected varies at different distilleries, but it is generally from 25 to 30 o.p. The quantity and strength of the spirit are gauged in the spirit receiver by the revenue officer, and the spirit is then run into casks and placed in store. The residue in the wash still is termed “ pot ale ” or “ spent wash,” the residue contained in the wash, and secondly to rectify it. Part of the volatile by-products, pass out in the spent wash and spent lees; another part is eliminated by the modification which some of these products undergo during storage in the feints receiver.

2. *Irish Pot-still Whisky.—*Both as regards the raw material employed and the manner of manufacture, Irish pot-still whisky differs very appreciably from the Scotch variety. There are a few distillers who work with malted barley only, but the great majority employ a mixture of from (generally) 25 to 50% of malted barley and 50 to 75% of a mixed grist of “ raw ” *(i.e.* unmalted) rye, wheat, barley and oats. The malt is not peat cured. The distillation is carried out in a type of still radically different from the Scotch pot-still. The stills (of which there are generally three as against two in the Scotch process) are very large, ranging up to 20,000 gallons. A characteristic feature of the Irish pot-still is the great length and height of the “ lyne- arm,” *i.e.* the pipe connecting the still with the condensing coil. This lyne-arm generally runs up vertically from the still for a distance of 10 to 20 ft., then horizontally for another 30 or 40 ft., again vertically for 10 to 20 ft., and is then connected to the condenser. The horizontal portion of the lyne-arm lies in a shallow trough fitted with a water supply, and the temperature of the spirit vapours prior to their passing to the condenser may thus be regulated at will. According to the length and height of the lyne-arm and the temperature of the water jacket, more or less of the vapours condense and are carried back to the still by means of a pipe running back from the horizontal portion of the lyne-arm to the still. The return pipe is fitted with a cock, which enables the distiller to regulate the return flow. Occasionally there is a further return pipe for the condensing coil, but this is not usual. The result of this form of plant is that it is possible to work up far greater quantities of wash and