



Figure 11. Flow diagram showing the stages in distillation of Irish whiskey.

producers of grain whiskies continue to use a still which, like the original Coffey still, has just two columns: a beer stripper (or analyzer) and a rectifier.

A description of the operation of two column continuous stills in the manufacture of Scotch grain whisky has come from Pyke (1965). In order to obtain whisky of high quality from these stills, they must be operated such that the alcohol concentration of the spirit at the spirit draw tray in the rectifier is not less than 94.17° GL. The manner in which the precise control of still operation can affect the composition of the whisky is shown in Figure 12. As illustrated, if conditions are changed in either direction on the abscissa, the concentration of congeners will alter with a possible adverse effect on final product quality.

MATURATION AND AGING

Freshly distilled whisky of any type is very different from the spirit that is later bottled, either singly or blended. The transformation is brought

about by storing the whisky in oak barrels for periods of time that depend on traditional practice and legal requirements. In general, whiskies are matured for far longer than the legally-required period of time. The raw spirit is taken by pipeline from the distillation plant to the tank house where it is diluted with water to the required strength and then transferred into barrels.

Maturation in barrels is accompanied by a loss of liquid by evaporation, and the relative rates of loss of water and of alcohol determine whether the aged whisky has a higher or lower alcoholic strength than that at filling. In Scotland, where the barrels of whisky are stored in cool, unheated, but humid warehouses, the alcoholic strength decreases (Valaer, 1940). In contrast Valaer and Frazier (1936) reported that in the US storage conditions cause an increase in alcoholic strength. Maturation in barrels is also accompanied by changes in the chemical composition of the whisky. These changes are attributable to extraction of wood constituents from the barrel, oxidation of components present in the original whisky as well as those extracted