

Among the nebulae that have been formerly observed by the author, he refers to seven, which he considers as having approached very near to final condensation; and of these he observes, that we see only a superficial lustre, resembling that of planets, which are opaque bodies, and not such as might be expected if the nebulous matter had no other quality than that of shining, and were perfectly transparent.

The author observes, that the spheroidal form which prevails among nebulae, is another circumstance of resemblance to planetary bodies, from which also their rotation on their axes may be inferred.

That nebulae do really undergo successive changes, the author deduces not only from a comparison of different nebulae with each other, but from a comparison of his own observations, made upon the nebula in Orion at this time, with those which he himself made thirty-seven years since.

The figure of it, at that time, he also then observed to differ from that given by Dr. Smith in his optics; and he now remarks, that it differs from the delineation given by Huygens in his *Systema Saturnium*.

In the course of the gradual contraction of this nebula, Dr. Herschel has also observed certain stars which had appeared nebulous to become distinct by removal of a nebulous covering, and thence infers that this nebula is certainly nearer to us than stars of the seventh or eighth magnitude, and possibly not more distant than those of the third.

Notwithstanding, therefore, the extreme dissimilitude between the appearance of diffused nebulosity and that of a star, they seem to have a natural connexion by the several intermediate gradations that have been described. A nebulosity may be conceived so dilute as to be invisible till partially condensed; a nebulosity may become converted into a planetary nebula. The planetary nebula with uniform light may, by gradual condensation of its centre, be converted into a stellar nebula with bright central nucleus, surrounded by a more dilute bur; and this at last assumes the appearance of a complete star, by condensation of so large a portion of its nebulous matter, that the remainder is no longer visible by the best telescopes.

*Experiments to ascertain the State in which Spirit exists in fermented Liquors: with a Table exhibiting the relative Proportion of pure Alcohol contained in several Kinds of Wine and some other Liquors.*  
By William Thomas Brande, Esq. F.R.S. Read June 13, 1811.  
[*Phil. Trans.* 1811, p. 337.]

An opinion having been entertained by many persons, that alcohol which has been distilled from wine does not exist ready formed in the liquor, but is generated during the process of distillation, Mr. Brande undertook a repetition of Fabroni's experiment, on which this opinion is principally founded; but when he added four ounces of dry subcarbonate of potash to eight fluid ounces of port, no alcohol was separated, although some of the same wine had previously been

ascertained to yield one fifth part of alcohol by distillation. When the same experiment was repeated on the same wine, to which one seventh part of alcohol had been previously added, still none was separated by subcarbonate of potash : but when so much as one third part had been added, then a very small proportion was found to float upon the surface after it had stood twenty-four hours.

When madeira or sherry were employed instead of port, the results were nearly the same. Since the method of Fabroni failed of detecting the presence of alcohol, unless the quantity was very considerable, it became necessary to have recourse to some other method of proving or disproving the presence of it as a product of fermentation ; and Mr. Brande conceived, that if it were formed by the heat applied in distillation, the quantity should in that case be different when the same liquor was distilled at different temperatures.

In the first of four processes of distillation, port wine was made to acquire the heat of  $200^{\circ}$  by addition of muriate of lime, and one half was quickly distilled over ; and in the last, an equal quantity of port was kept for five days at the temperature of  $180^{\circ}$ , till half the quantity had passed over into the receiver ; but in all these experiments the specific gravities of the products were so nearly the same, that there did not appear to be any difference in the quantity of alcohol obtained.

Mr. Brande also attempted to separate alcohol from different kinds of wine by freezing ; but the cake of ice produced was spongy, and would not allow any portion of alcohol to separate from it.

The author having thus, to his satisfaction, proved the existence of alcohol ready formed in fermented liquors, undertook, in the next place, to ascertain the relative strength of different kinds of wine ; and he concludes the present communication with a Table, in which is expressed the proportion per cent. of alcohol contained in a given measure of the several liquors that he has examined.

In this table the alcohol obtained from Port varies from 21 to nearly 26 per cent. ; Madeira 19 to 24 ; Sherry not so much as 20 per cent. ; Claret from 13 to 16 ; Lisbon 19 ; Marsala nearly 26 ; Champagne from 11 to 13 ; Burgundy 12 to 14 ; Hock 9 to 14 ; Raisin wine  $25\frac{3}{4}$  ; Currant wine  $20\frac{1}{2}$  ; Cider and Perry nearly 10 ; Ale nearly 9 per cent. ; good rum and brandy containing 53 per cent. of alcohol at the same standard of  $\cdot 825$  specific gravity.

*Account of a Lithological Survey of Schehallien, made in order to determine the specific Gravity of the Rocks which compose that Mountain. By John Playfair, Esq. F.R.S. Read June 27, 1811. [Phil. Trans. 1811, p. 347.]*

Norwithstanding the skill with which Dr. Maskelyne conducted the astronomical observations upon Schehallien, and the accuracy with which he may be presumed to have measured the deflection of his plumb-line from the perpendicular, whereby he discovered the actual attraction of that mountain ; and although great ingenuity