formulæ not exactly the same as Professor Powell, found also an agreement between these and Fraunhofer's observations.

It may be observed, that the refractive indices observed and employed in these comparisons, were not those determined by the color of the ray, which is not capable of exact identification, but those more accurate measures which Fraunhofer was enabled to make, in consequence of having detected in the spectrum the black lines which he called B, C, D, E, F, G, H. The agreement between the theoretical formulæ and the observed numbers is remarkable, throughout all the series of comparisons of which we have spoken. Yet we must at present hesitate to pronounce upon the hypothesis of finite intervals, as proved by these calculations; for though this hypothesis has given results agreeing so closely with experiment, it is not yet clear that other hypotheses may not produce an equal agreement. By the nature of the case, there must be a certain gradation and continuity in the succession of colors in the spectrum, and hence, any supposition which will account for the general fact of the whole dispersion, may possibly account for the amount of the intermediate dispersions, because these must be interpolations between the extremes. The result of this hypothetical calculation, however, shows very satisfactorily that there is not, in the fact of dispersion, anything which is at all formidable to the undulatory theory.

11. *Conclusion.*—There are several other of the more recondite points of the theory which may be considered as, at present, too undecided to allow us to speak historically of the discussions which they have occasioned.[24] For example, it was conceived, for some time, that the vibrations of polarized light are perpendicular to the plane of polarization. But this assumption was not an essential part of the theory; and all the phenomena would equally allow us to suppose the vibrations to be *in* the polarization plane; the main requisite being, that light polarized in planes at right angles to each other, should also have the vibrations at right angles. Accordingly, for some time, this point was left undecided by Young and Fresnel, and, more recently, some mathematicians have come to the opinion that ether vibrates in the plane of polarization. The theory of transverse vibrations is equally stable, whichever supposition may be finally confirmed.

We may speak, in the same manner, of the suppositions which, from

[24] For an account of these, see Professor Lloyd's *Report on Physical Optics.* (Brit. Assoc. Report, 1834.)