an alcohol flame a spectrum having three intense green lines very near together. Let now the alcohol flame be illuminated by the incomparably more vivid oxy-calcium light, and the spectrum before feeble is greatly enhanced in brilliancy, all the light from the latter source, except that corresponding to the three green lines, freely penetrating the flame. It follows that though these green lines are absolutely illuminated as much as at first, yet being relatively illuminated much less they appear as three lines of shadow across the spectrum. It will be apprehended that what has here for distinctness' sake been said of the magnesium spectrum and of three lines in it only, applies equally well to all spectra with all their luminous lines. Here then as Kirchoff intimates, is the explanation of the apparent paradox that while light from all artificial sources is characterized by bright lines, the solar spectrum, as first pointed out by Wollaston and Fraunhofer, is marked by numerous dark lines. It is in fact a negative spectrum. In the words of that author; "the sun possesses an incandescent gaseous atmosphere which surrounds a solid nucleus having a still higher temperature. If we could see the spectrum of the solar atmosphere, we should see in it the bright bands characteristic of the metals contained in the atmosphere. The more intense luminosity of the sun's solid body, however, does not permit the spectrum of its atmosphere to appear; it reverses it; so that instead of the bright lines which the spectrum of the atmosphere by itself would shew dark lines are produced." With these facts in view we are prepared to learn that the attempt has been made, not wholly unsuccessful, though yet incomplete, to analyze the solar atmosphere. The mode of procedure is intelligible enough. Two spectra in close proximity—the one, that of the sun—the other, that of any metal in the electric spark—are viewed simultaneously in the same telescope. If all the bright lines of the latter correspond exactly to certain of the dark lines in the former, it seems a warrantable conclusion that that metal is present in the incandescent solar atmosphere. If this exact correspondence is wanting it may be similarly affirmed that that metal is present, if present at all, in comparatively minute quantities. On such grounds Kirchoff asserts that the solar atmosphere certainly contains Iron, Chromium, Nickel and Magnesium, while if Silver, Copper, Zinc, Aluminum, Cobalt and Antimony are present they are in such small relative proportion as to fail to give any evidence of their presence in the spectrum.

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