## Modern Views of the Sun

The phenomena of the absorption lines in the solar spectrum, of the reversing layer, upper chromosphere and prominences, as well as of the corona, of which time permits only the mention, are at least as readily explainable on this hypothesis as any other, and the same is true of sun-spots of which a working hypothesis was given above.

What we have hitherto said gives us a clear idea of the mechanism of the sun's outer atmosphere, of its distribution, currents and motions, but tells us nothing as to the fundamental cause of the eruptions which produce spots and prominences, nor as to the reason for the cyclical changes which they go through. Further, the change in the speed of rotation for different latitudes, and, still more remarkable, the variation of this speed, which now seems to be well established, remains a mystery. Various theories by Secchi, Faye, Oppolzer, Halm, Emden and others have been advanced to account for these phenomena, but in view of our absolute lack of direct knowledge of what goes on below the photosphere, it is evident that, even if time permitted, little of definite value could be said of the nature and cause of these deep-seated phenomena.

We have hitherto spoken only incidentally of what is to us certainly the most important function of the sun, its radiating power, by which all life on our globe is sustained. The determination of the quantity of heat reaching the earth from the sun has long interested physicists and astronomers, but it is only within comparatively recent years that accurate measurements of this quantity have been made. It is chiefly to the labors of Langley and his successor in this work, Abbot, that we now know that the average radiation reaching the earth's atmosphere is nearly two calories per square centimetre per minute. Somewhat more than one-third of this quantity is absorbed by the earth's atmosphere and the other two-thirds reaches the surface. More recently Abbot has shown, by the most careful and accurate work, that the mean yearly values of this radiation vary over a range of perhaps five per cent., being greater at sun-spot maximum than at minimum. In addition to this long-period

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