988. Theory of Luminescence. E. Pringsheim. (Phys. Zeitschr. 14. pp. 129–181, Feb. 15, 1918.)—Considering the similarity between the dispersion electrons and Planck’s resonators it is probable that many considerations applicable to the latter also apply to radiant energy from gases, whether that be temperature radiation or luminescence. In vacuum tubes, and in spark and arc discharges, we probably have to do with luminescence due to electrical processes. It is remarkable that here also the relative intensity of the shorter waves increases with the degree of excitation. This is intelligible on the theory of quanta, since with a greater incident energy the cases become more frequent in which a resonator of high frequency receives energy sufficient to lead to the emission of a quantum. Assuming that the emissive and absorptive powers are independent of the density of radiation, the author traces an analogy between luminescent bodies and black bodies on the basis of the quanta theory. He shows that the ratio of emission to absorption for all wave-lengths at which there is emission (owing to the presence of dispersion electrons) changes with the wave-length from one spectrum line to another in the same way as the emissive power of the black body does at the “specific temperature.” The latter (Bauer’s “emission temperature”) is for a given wave-length that temperature at which the emissive power of the black body equals the ratio of emission to absorption in the radiating body. Then the difference between this specific temperature and the true temperature of the radiator gives a measure of the deviation from Kirchhoff’s law and for the degree of luminescence.

E. E. F.