The unknown history of Schwarzschild's equation

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ABSTRACT: The origin and evolution of theories involving one aspect or another of radiative transfer through the atmosphere is the least known part of the few extant general accounts on the history of meteorology. When in 1904 V. Bjerknes set out his ideas on rational weather prediction, from a "physical and mechanical vantage point", he only could hint vaguely at the possibility of determining the heating or cooling of the air by absorption and emission of radiation: It was not until the influential work of Emden in 1913, on the role of those processes in establishing the vertical temperature profile, that differential equations in terms of a vertical coordinate became available. Emden's work was based on Schwarzschild's 1906 article, the differential equations of which, through the good offices of Emden, entered the meteorological literature, where they were and are ever more often named after Schwarzschild. However, such practice seems to be peculiar only to meteorologists. At the same time, neither meteorologists nor astrophysicists or engineers seem to be aware that the radiative transfer equation that meteorologists call Schwarzschild's equation was established at least as early as 1835. It is this unknown part of an altogether poorly known history that my talk will address.