Demon versus Photon

Following Planck's opening address on *Radiation Theory and Quanta* at the 1st Solvay Conference on Physics in 1911 (the "witches Sabbath in Brussels" as Einstein described it), the indefatigable Marie Curie (1867-1934) noted that the emission of energy was instantaneous in Planck's theory and this implied that Maxwell's equations would not hold even in vacuum. She further asked how the emission of energy in Planck's theory could be interrupted and suggested a parallel to Maxwell's Demon [404, p. 39]:

> *See the print edition of The Quantum Measurement Problem for quotation.*

Both comments were intuitively perceptive. The Photoelectric Effect semi-classically does not conserve energy. At short times, the energy that has fallen on the photo-detector cannot exceed the work function. However, a discrete photon is annihilated and circumvents the energy problem [405, pp. 20-22]. Gregory Wentzel (1898-1978) presented his semi-classical theory of the photoelectric effect at the 1927 Solvay Conference where Einstein would have heard him. At that time, Einstein was confronting the apparently conflicting issues of energy conservation, nonlocality and a photon that does not split at a beam splitter.