be in some way contrary to the spirit of the Second Law. However, as the averaged behavior of the system is not considered, no such anomaly comes to light in the case considered by them.

The initial assumptions of the problem are contrary to the Second Law for a more obvious reason. It is first assumed that the weighing of the box and the observation of the time of arrival and momentum of the unreflected particle could be carried out before the arrival of the second. It is deduced that "It would then seem possible to predict beforehand both the energy and time of arrival of the second particle . . . ." If so, it would surely be possible, using a shutter and two interchangeable receiving vessels at O to separate the gas escaping from A into two portions having different average temperatures, thus realising the conditions of the Maxwell Demon problem, and permitting a violation of the Second Law.

It is therefore not necessary to go to quantum mechanics for evidence that this original train of assumptions is physically unsound—if it is granted that the Second Law applies to the total behavior of the system.

David L. Watson

Science Service,
Washington, D. C.,
August 6, 1931.

The Emission of Positive Ions from Cu and Ag

By using an electrometer with a sensitivity of 3×10^{-16} amp/mm for measuring the current, it has been possible to detect Cu^+ ions from Cu and Ag^+ at temperatures just below the melting point and above. The results for Cu are in agreement with the findings of L. L. Barnes (Phys. Rev. **37**, 218, 1931). The nature of these ions was determined by a mass spectrograph of the Dempster type. In the earlier work (Phys. Rev. **37**, 467, 1931) when the metals were used as filaments and were heated by electrical conduction, no characteristic positive ions could be detected. This was probably due to the fact that the filaments broke at a temperature below the melting point.

In the present instance the metals were heated in a resistance-wound porcelain vacuum furnace, and a characteristic current was detected. No sudden change in the magnitude of this characteristic current was observed in passing through the melting point.

The current which passed through the slit system of the mass spectrograph was small in each case (of the order of 5×10^{-15} amps for Cu and 10^{-15} amps for Ag at the melting points).

The potassium ion current was several hundred times larger than the characteristic current at these temperatures, and did not decrease appreciably with several hours' heating above the melting point. This may be due to potassium salts from the porcelain passing into solution in the molten metal.

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August 6, 1931.

The Alternating Intensities of Na_2 Bands

It has generally been supposed that the sodium bands do not show any observable alternation of intensities and that therefore the sodium nucleus must have a large spin. This conclusion depends upon the statement by Loomis and Wood (Phys. Rev. **32**, 223, 1928) that there is no evidence of alternating intensities in these bands. The writer examined their published photograph of one of these bands and came to the conclusion that there might be some slight evidence of alternation of intensities. However, the spectrum is rather messed up by the presence of other lines than those belonging to the bands, and also there may be irregularities in the continuous source used for this absorption spectrum, and no certain conclusion could be drawn by visual observation. This apparently was the method of examination used by Loomis and Wood and probably accounts for their conclusion that there are no alternating intensities.

In order to test this conclusion better I have photographed the reproduction which they gave and have run the negative so secured through a microphotometer. (This method of investigation was suggested to the writer by Professor F. A. Jenkins.) The resulting microphotometer curve shows very strong indications of alternating intensities in these bands. It is the odd-numbered lines