Although the above reductions of a series of self-contained observations on atmospheric extinction yield a determination of n_0 to an order of accuracy not very much less than that of the best existing determinations, their chief interest lies in the fact that they constitute as rigorous an experimental test of Rayleigh's law as may be expected in view of the practical impossibility of securing absolutely perfect atmospheric conditions. From the value of γ may be calculated the fraction of radiant energy converted per cm. of path into thermal molecular agitation; taking a value of $\gamma_0=0{\cdot}032$ for air under standard conditions, it is easily shown that in a stream of radiation corresponding to the solar constant the rate of increase of temperature amounts to 0·015° C. an hour.[14] As the above value of γ, even for the comparatively dust-free air above Mount Wilson, includes to a certain extent the effect of volcanic haze, it follows that in a pure gas partition of energy cannot take place at a rate greater than is represented by the above-mentioned rate of increase of temperature. We have in this case an excellent illustration of two interpenetrating dynamical systems (the æthereal system of electromagnetic waves and the molecular gaseous system) allowing of partition of energy, if at all, at an excessively slow rate compared with the rate of equalisation of energy distributions which is capable of being realised in each system considered separately. It is interesting to notice also that this rate is enormously increased by the presence of constrained molecular systems (matter in the solid or liquid state, such as dust-particles, water droplets, etc.).

Further, the experimental verification of Rayleigh's law to a high degree of accuracy is interesting in that its final expression is a result of classical dynamics and continuous absorption and re-emission of energy; from this point of view it seems to the writer that the hypothesis of emission by "quanta" cannot be universally applied to radiating molecular systems.

In this connection it is interesting to notice that in the recent theory of specific heats as proposed by Debye,[15] Born and Kàrmàn,[16] and now generally recognised as an adequate interpretation of experimental results, the interpretation of Planck's constant h has been transferred from association with the individual atom to the process whereby energy is interchanged between molecular systems vibrating under those intramolecular forces and constraints which in their integrated form determine the elastic properties of the solid state. Similarly in view of the above-mentioned verification of Rayleigh's law it is difficult to see how Planck's "quantum" can be associated with the individual molecule, at any rate for that system of vibrations which enter into the forced oscillations with consequent re-emission of radiant energy thus constituting the phenomenon of molecular scattering. In the opinion of the writer one might with advantage seek for the interpretation of Planck's h in the problem of "black-body" radiation in the fact that the radiating units probably perform vibrations under the intramolecular forces and constraints which determine the solid state, while at the same time the reaction of the total aggregate of radiating systems must profoundly modify the character of the radiation from the original sources before it emerges from the interior of the solid into free space for experimental examination.

LOUIS V. KING.

McGill University, June 6, 1914.

[14] King, *loc. cit.*, p. 394.
[15] Debye, *Ann. der Phys.*, iv, 39, p. 789. (1912.)
[16] Born and Kàrmàn, *Phys. Zeitschr.*, xiv., p. 15; also p. 65. (1913.)

The Destruction of Wild Peafowl in India.

MAY I direct attention to the subjoined extract from the *Englishman* of Calcutta of June 4 last? It will give some idea of the degree to which wild peafowl are being destroyed in India so long as the open market for foreign plumage exists in the maritime countries of Europe. Of course, there is no objection whatever to the use of peacocks' feathers in any form of art, but sufficient for the purpose should be obtained from the millions of domesticated peafowl in Europe, Asia, America, and North Africa, without pursuing a war of extermination against the wild species still remaining in India. The peacock sheds his wondrously beautiful tail feathers every summer or early autumn, but I have reason to think that the bulk of the peacocks' plumes exported from India are derived from wild birds shot for the purpose. Mr. C. William Beebe, of the New York Zoological Society, has already directed attention to the extent to which the peafowl of India and Burma are being eliminated from the woodland. One would only ask in this case control of the destruction within reasonable limits.

H. H. JOHNSTON.

"On Tuesday, the Calcutta Customs authorities seized forty-four large cases containing peacock feathers on one of the steamers. These cases were to be delivered at Hamburg. By a mere chance, they escaped detection when first presented before shipment at the Customs office, but when they had been placed on board the steamer, information reached the Customs authorities as to their contents. Promptly, Customs officers were sent to bring back the cases to the office, where on examination they were found to contain peacock feathers.

"The feathers will of course be confiscated and the exporter, whose name was not disclosed, will, if found, be fined heavily. This consignment of feathers, in a way, constitutes a record. A feather which costs half an anna in India brings in a very considerable sum in Germany.

"It is stated that cases of smuggling feathers are now again becoming very common, and the Customs officers are almost daily making seizures of the contraband article. In spite, however, of their vigilance in some cases, the smugglers succeed in sending away feathers. The smugglers employ ingenious methods; in many instances they send the feathers under assumed names; then the consignee's name is also very difficult to ascertain and in some cases, where valuable feathers are concerned, the smugglers send them by post in letters or as registered parcels.

"There is at the present moment a large demand for peacock feathers in Europe, and the majority of the consignments detected in Calcutta contained feathers."—The *Englishman*, June 4, 1914.

THE AUSTRALIAN MEETING OF THE BRITISH ASSOCIATION.

MORE than three hundred members of the British Association (including some forty foreign and colonial members) are on their way to Australia to attend the eighty-fourth annual meeting, which begins in Adelaide on August 8. The Australian organisation has found it possible to offer hospitality to the whole party without distinction, and the State Governments are providing all the visitors with passes over their respective railway lines during the time of the official meeting. A number of leading members have already been for some time in the country for purposes of

© 1914 Nature Publishing Group