mately obtained and was verified by application of the Berkeley Tables for the Hecuba Group.

(104) *Klymene,* 636″: Gratifying results were obtained with the Berkeley Tables.

(106) *Dione,* 625″: The difficulties involved were surmounted by application of the Berkeley Tables.

(121) *Hermione,* 552″: This planet was investigated by various methods and ultimately with the Berkeley Tables. The satisfactory outcome of the work on this planet proves that the tables are satisfactory at the extreme limits for which, theoretically, they were expected to be applicable.

(132) *Aethra,* 845″: The investigations adopted for this planet are by Hartog, who published mean elements from three oppositions, 1873–1924. The planet had been lost for nearly forty years. Hartog also published general perturbations by Jupiter from Bohlin's tables.

(150) *Nuwa,* 690″: General perturbations for this planet were developed by the Hansen-Hill method on the basis of osculating elements by Oppenheim, derived from five oppositions from 1875–1884. The final results are based on seven oppositions, from 1875–1899.

(168) *Sibylla,* 572″: With elements by v.d. Groeben, based on four oppositions from 1876–1883, the general perturbations by Jupiter and mean elements were obtained with the Berkeley Tables.

(175) *Andromache,* 610″: As referred to above, this is the outstanding case as regards magnitude of perturbations of minor planets. It was the motive for constructing the Berkeley Tables for the Hecuba Group, and was successively conquered by their application.

Thus of the planets awaiting publication, six are of the type that required the application of the Berkeley Tables in order to obtain a satisfactory representation of observations from the date of the first discovery in 1857 to the present time. Since there exist several hundred planets of this type, the way is thus clear for the development of their general perturbations as a means of long range prediction of their future positions.

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VITAMIN B_2 (G) AND CANINE BLACK TONGUE[1]

THE cause of black tongue, an acute disease of dogs characterized by stomatitis, diarrhea and frequently by a fatal outcome, remains obscure in spite of the very considerable number of experimental studies of the subject. The disease has been held in turn to be infectious, to be due to an insufficient intake of carotin[2] and to be caused by diets containing inadequate amounts of iron.[3] The most widely held hypothesis, however, has been that advanced by Goldberger and his associates.[4] They were able to cure and prevent the disease by feeding certain foods which are rich in their content of the vitamin-B complex. The effective agent in the materials fed was found to be resistant to autoclaving, a fact which served to differentiate it from the heat-labile, antineuritic vitamin B_1. It was then shown that a similar heat-stable food constituent was required for the growth of rats. Because of the similarity in distribution and resistance to heat shown by these two accessory food factors, it was inferred that they were identical. Furthermore, because of the symptomatic, geographic and etiologic likeness between canine black tongue and pellagra of human beings, the suggestion was advanced that pellagra was caused by a lack of the thermostable food factor, termed at first vitamin PP, and later vitamin B_2 or G.

Experiments have been performed in this laboratory which were designed to test, under standard conditions, the various theories concerning the cause of canine black tongue. The diet described by Goldberger as No. 114 was employed and regularly caused symptoms in from 6 to 8 weeks. Iron and carotin were both found to be therapeutically and prophylactically ineffective, but autoclaved yeast extract was entirely effective. Since Miller and Rhoads[5] had shown that the same extract was not high in its content of vitamin B_2G, and were unable to cause black tongue by feeding diets devoid of that vitamin, a direct test of the vitamin B content of the diet producing black tongue was suggested. Such a test has been made, and results show it is possible to maintain a normal rate of growth in young rats fed only the diet producing black tongue—conclusive proof that it contains vitamin B_2G in considerable amounts.

Since lack of the thermostable vitamin required for rat growth does not cause black tongue, and since the diet producing the disease contains that vitamin, it may be inferred that black tongue is not due to a deficiency of vitamin B_2G, but rather to a lack of some factor as yet unidentified.

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