Such a law involves three constants N, which gives the seriousness or destructiveness of the epidemic, σ which representing a time-spread gives one measure for sharpness or explosiveness (really an inverse measure), and m which is a location constant for fixing the time of the epidemic. The peak is at $t = m$ with a value $p = N/(\sqrt{2\pi}\sigma)$. Hence $N = \sqrt{2\pi}p\sigma$. Now if more generally, one could write the curve of new cases (or correspondingly, that of deaths from all causes in Pearl's case) as $y/p = f[(t - t_0):T]$, where p is the peak or proportional to it, t_0 is a constant which merely locates the epidemic in time, and T is like σ some estimate of the time of rise, say from the lower quartile to the median case, then the destructiveness must be proportional to the product $p\,T$ and each of these variables must come out positively and to the first power, or $\log N = \text{const.} + \log p + \log T$. (Actually $\log D = 0.646 \log p + 0.102 \log T + \text{const.}$ so that D is by no means proportional to the product of p and T.) By definition $I = p/T$ or $\log I = \log p - \log T$. We could therefore write

$$\rho_{ID} = \frac{\sigma^2_{\log p} - \sigma^2_{\log T}}{\sqrt{(\sigma^2_{\log p} + \sigma^2_{\log T})^2 - 4\,\rho_{pT}\sigma^2_{\log p}\sigma^2_{\log T}}}$$

and the value ρ_{ID} could be calculated from the standard deviations of $\log p$ and $\log T$ and from the correlation between them. In this case $\rho_{pT} = -0.324$, i.e., the shorter the time of rise to the peak, the higher the peak and ρ_{ID} figures by the formula as 0.542 instead of as 0.746 as computed. This analysis shows that no three parameter family of curves of the type specified can give a representation of the epidemics in the 34 cities in a satisfactory manner.

SESPE EOCENE DIDELPHIDS

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Introduction.—In segregating a number of tiny insectivore and primate jaws from the Sespe deposits of California, several specimens were noted that clearly belong to marsupials. These are all incomplete but possess interest because they record didelphids for the first time in the North American upper Eocene and secondly because this group of mammals has not been known heretofore in Tertiary faunas west of the Rocky Mountains except for a single occurrence in the upper Oligocene John Day assemblage of north-central Oregon.

Description.—Simpson[1] has referred the known North American Eocene didelphids to the genus *Peratherium* and in the absence of any recognizable characters to the contrary the material from the Sespe is likewise referred to this genus. Lower jaw specimens are available from two localities in the Sespe deposits north of the Simi Valley, California, namely, one from Locality 180 and two from Locality 202.

Two sizes of individuals are represented by this material, a smaller by No. 1943 from Locality 202 and a larger by No. 1942 from Locality 180 and by No. 1944 from Locality 202. Possibly two species are present, although the size difference may be indicative merely of a variation in this character within a single species. Probability that the latter is the case is suggested

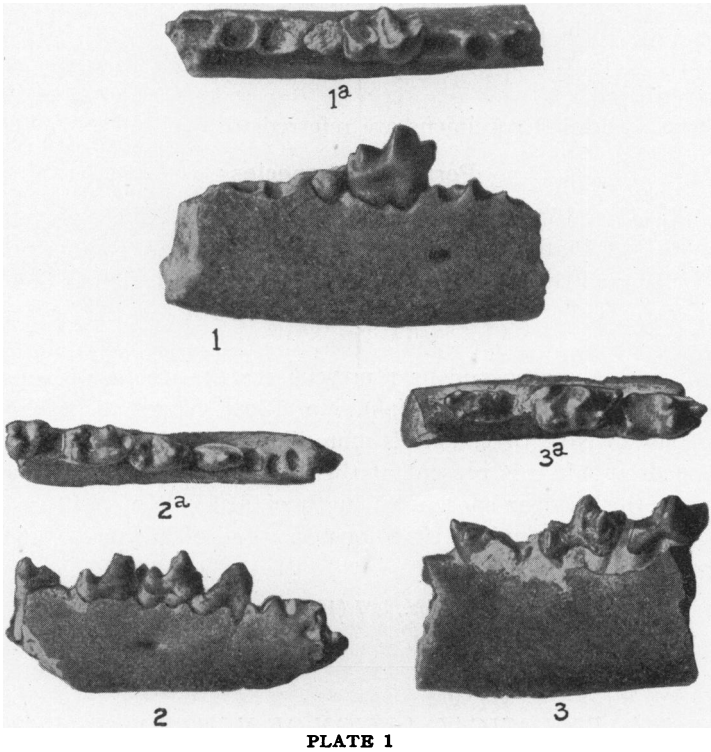

PLATE 1

Peratherium species

Figures 1, 1*a*, No. 1942; figures 3, 3*a*, No. 1944; lateral and occlusal views, × 6.

Peratherium californicum, n. sp.

Figures 2, 2*a*, No. 1943, type specimen; lateral and occlusal views, × 6. Calif. Inst. Tech. Vert. Pale. Coll. Sespe Upper Eocene, California.

at least by the occurrence of a large and a small form at one locality (202). However, until more is known concerning the Sespe didelphids it seems desirable to recognize two distinct types. The smaller of the two is here designated:

Peratherium californicum, n. sp.

Type Specimen.—No. 1943 Calif. Inst. Tech. Vert. Pale Coll., a frag-

ment of ramus with $P\bar{3}$, $M\bar{1}$, $M\bar{2}$ and the posterior portion of $M\bar{3}$, Plate 1, figures 2 and 2*a*.

Locality.—Sespe upper Eocene, Locality 202.

Characters.—The individual represented by the type specimen is smaller than *Peratherium innominatum* and is distinctly smaller than *P. marsupium*. Both of these species are known from the Bridger Eocene of Wyoming. The trigonids of the molars in the Sespe specimen are low and the talonids are relatively short. Length from anterior end of $P\bar{3}$ to posterior end of $M\bar{3}$ is 5 mm.

The two additional specimens are referred to:

Peratherium species

Material.—No. 1942 Calif. Inst. Tech Vert. Pale. Coll., a fragment of ramus with $M\bar{2}$, Plate 1, figures 1 and 1*a*. No. 1944, a fragment of ramus with $M\bar{2}$, $M\bar{3}$ and the posterior portion of $M\bar{4}$, Plate 1, figures 3 and 3*a*.

Locality.—No. 1942 is from Locality 180 and No. 1944 is from Locality 202.

Characters.—These specimens represent smaller animals than that of the species *Peratherium marsupium*, No. 13046 Amer. Mus. Coll. The depth of jaw in Nos. 1942, 1944 is more like that in *P. innominatum*. No well defined cingulum is present at the base of the protoconid-paraconid blade as in the Bridger species. Length of $M\bar{2}$ in No. 1942 is 1.8 mm. Length from anterior end of $M\bar{2}$ to posterior end of $M\bar{4}$ in No. 1944 is 5.5 mm.

[1] Simpson, G. G., *Amer. Mus. Nov.*, 307 (1928).

THE BIOLOGICAL ACTION OF NEUTRON RAYS

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Introduction.—Neutron rays have the property of penetrating dense substances such as lead more readily than light substances containing hydrogen. This behavior arises from the circumstances that, being uncharged particles, neutrons pass unimpeded through electron clouds of atoms and are slowed down or absorbed only when they encounter the much more dense atomic nuclei.

The collision of a neutron with the nucleus of an atom is understandable in very simple terms; for both neutron and nucleus behave as tiny, very