sampling, differences in genetic constitution of the stocks examined in these two studies, or both.

We conclude that the Akhissar gene and the recessive piebald gene probably reside at one and the same locus. Because the range of expression is the same for these two characters and their manifestation in corresponding crosses is alike, we conclude that they are identical allelomorphs of the same gene.

Summary.—A wild gray house mouse (Mus musculus) bearing a small ventral spot was captured at Akhissar, Turkey. A genetic analysis has shown this spot to be due to the gene which produces the recessive piebald variation so commonly found in laboratory mice.

* This mouse was collected by the author under an appointment from Harvard University as Sheldon Traveling Fellow in Zoölogy.

** We wish to thank Miss Lynch for permission to cite her unpublished data.

[1] Keeler, C. E., *Proc. Nat. Acad. Sci.*, **17**, 101–102 (1931).

[2] Immer, F. R., *Genetics*, **15**, 81–98 (1930).

[3] Snell, G. D., *Ibid.*, **16**, 42–74 (1931).

A MIACID FROM THE SESPE UPPER EOCENE, CALIFORNIA

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Communicated March 18, 1933

In addition to three distinct types of hyænodonts now known from the Sespe Upper Eocene[1] (Locality 150 Calif. Inst. Tech. Vert. Pale.), there remains to be recorded another creodont, namely, a representative of the family Miacidæ. At Locality 150 skull and jaw materials of this form occur nearly as abundantly as do those of the Hyænodontidæ. Special interest attaches to this miacid in view of its relationship to *Pleurocyon*, a genus described by Peterson[2] from the Upper Uinta (Uinta C).

Pleurocyon (Simidectes) merriami, n. subgen. and n. sp.

Type Specimen.—Left ramus of mandible with C, $P\overline{3} - M\overline{3}$, No. 1139 C.I.T. Vert. Pale., plate 1, figures 1, 1*a*.

Paratype.—A maxillary fragment with C, $P\underline{4} - M\underline{2}$, No. 1212, plate 1, figures 2, 2*a*.

Referred Specimen.—Right ramus of mandible with canine but without cheek-teeth, No. 934, plate 1, figures 3, 3*a*, 3*b*.

Locality.—Sespe Upper Eocene, north of Simi Valley, Ventura County, California; Locality 150 C.I.T. Vert. Pale.

Subgeneric and Specific Characters.—Larger than *Pleurocyon magnus* and with dentition decidedly more robust than in the Uinta species. Shorter diastema between C and $P\bar{1}$ than in *P. magnus.* Heel of $P\bar{4}$ without inner ledge. Upper molars with single internal cusp. This species is named for Dr. John C. Merriam in appreciation of his many contributions to the vertebrate paleontology of the Far West.

Description of Material.—The fundamental resemblances between the type from the Sespe and that described by Peterson from the Uinta are seen in (1) one-rooted $P\bar{1}$, (2) two-rooted $P\bar{2}$, but with roots situated close together or fused, (3) $P\bar{3}$ with anterior principal cusp and posterior basal cusp, (4) $P\bar{4}$ with large principal cusp and with posterior basal cusp which is elongated anteroposteriorly and (5) $M\bar{1}$ and $M\bar{2}$ with trenchant heels but with cuspule present on inner border of talonid. The positions of the mental foramina are similar in the two types for the anterior foramen is situated below the posterior end of $P\bar{2}$ and the posterior below the posterior end of $P\bar{3}$.

The crowns of $P\bar{3}$ and $P\bar{4}$ are tilted backward slightly in *P.* (*Simidectes*) *merriami.* A paratype $P\bar{4}$ of *P. magnus* figured by Peterson[3] shows also an inner ledge along the side of the heel, in which respect this specimen agrees with the corresponding tooth of the type of this species. At the anterior base of the principal cusp in this specimen is a style or cusp which is better developed than in the corresponding tooth of *P.* (*Simidectes*) *merriami.* It is separated from the external face of the base of the principal cusp by a vertically directed furrow.

Our type differs from *Oödectes* and *Vulpavus* not only in decidedly larger size, but also in the considerable reduction of $P\bar{2}$ and in the characters of the crowns of $P\bar{3}$ and $P\bar{4}$. The heels of $M\bar{1}$ and $M\bar{2}$ are essentially trenchant, in which respect *Pleurocyon* resembles *Oödectes,* as noted already by Peterson in the comparison of the Uinta material. Although a conule is present at the forward end of the inner side of the heel, the talonid is not basined as in *Vulpavus.* The trigonid region in these teeth is not so high as in *Oödectes* and resembles more that in *Vulpavus.*

No less than seven rami are now known from Locality 150. These specimens exhibit considerable variation in size. Possibly more than one species is represented by this material. The resemblances in the dentition or in the ramus between individual specimens makes it un-

DESCRIPTION OF PLATE 1

Pleurocyon (*Sespecyon*) *merriami,* n. subgen. and n. sp.

Figures 1 and 1*a*, type specimen, No. 1139, left ramus, lateral and superior views; figures 2 and 2*a*, paratype, No. 1212, maxillary fragment with superior dentition, lateral and inferior views; figures 3, 3*a* and 3*b*, referred specimen, No. 934, right ramus, lateral, superior and posterior views. All figures $\times {}^3/_4$.

California Institute of Technology Collections. Sespe Upper Eocene, California.

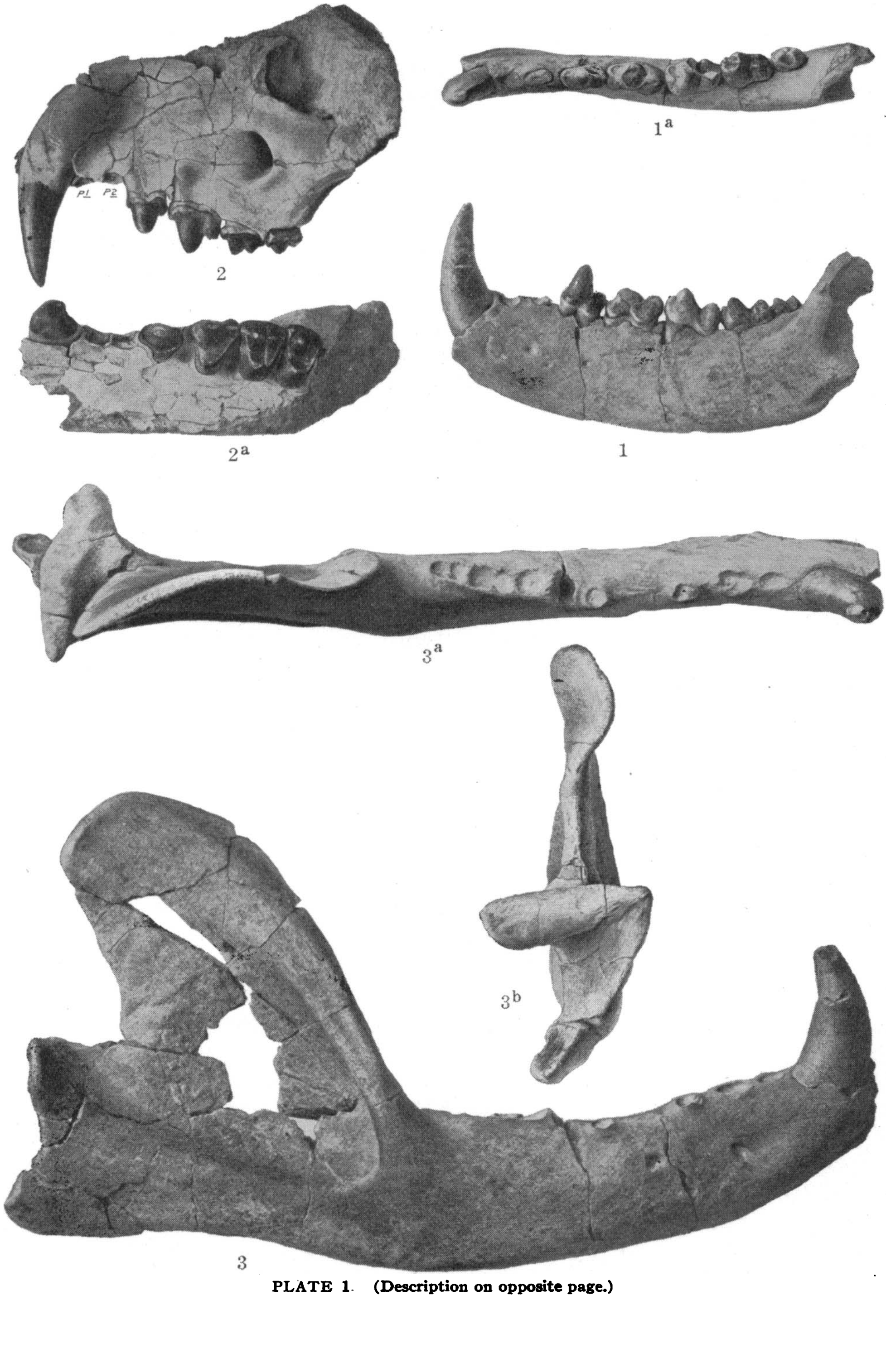

PLATE 1. (Description on opposite page.)

desirable, at least for the present, to recognize more than one type. The referred specimen, No. 934, plate 1, figures 3, *3a* and *3b*, belongs to a distinctly larger and probably considerably older individual than the type.

The cheek-teeth have dropped from the alveoli and only the canine remains of the lower dentition. Some reduction in the root regions of P$\overline{3}$ and P$\overline{4}$ has occurred in No. 934 for only the socket for the anterior fang of P$\overline{3}$ and that for the posterior fang of P$\overline{4}$ remain. A low ridge extends between these two alveoli.

The symphysis extends backward to a point below the anterior root of P$\overline{3}$. The jaw displays broad development of the coronoid process and the forward end of the masseteric fossa is deep and well defined. The anterior base of the process is likewise broad laterally. At the upper posterior end the process curves outward. From the outer end of the condyle the posterior border of the jaw extends downward and noticeably inward. The inward deflection of the angle is clearly shown in plate 1, figure *3b*. In lateral view the angle is seen to be formed by a relatively broad plate of bone which reaches behind the level of the condyle.

The lower canine in both the type and referred specimen possesses a relatively slender crown.

Several skull fragments are likewise available from Locality 150. The upper dentition as characterized by the structural details displayed in individual cheek-teeth of these specimens is clearly the complement of that shown in the lower jaws of *P.* (*Simidectes*) *merriami*. In no instance, however, have we found an upper and a lower jaw in direct association.

In the paratype, No. 1212, the canine and P$\underline{3}$ – M$\underline{2}$ are present. The canine possesses a slender crown, somewhat compressed transversely. Alveoli for P$\underline{1}$ and P$\underline{2}$ indicate that these teeth were single-rooted and the crowns were doubtless considerably reduced. As a matter of fact, additional specimens referred to *P.* (*Simidectes*) *merriami* definitely indicate that this was the case. P$\underline{3}$ is three-rooted with the principal external cusp situated for the most part anterior to the middle transverse line of the tooth. A posterior basal tubercle is present. In addition, a well defined cingulum extends along the inner side from in front of the base of the principal cusp to the inner side of the posterior basal tubercle. At the point where the cingulum passes over the inner root a rudimentary cuspule is formed.

In P$\underline{4}$ the outer half of the crown comprises, in addition to a well developed principal cusp, an anterior ledge or basal cusp and a posterior basal cusp. The inner lobe of this tooth is likewise strongly developed, curving slightly forward in its inward projection. At its inner end the lobe supports a well defined cusp which is separated from the principal cusp and the posterior basal cusp by a broad valley. This tooth differs from P$\underline{4}$

in *Oödectes* in greater reduction of metaconid and in larger size and more posterior position of the inner cusp.

M1 is broader anteroposteriorly than M2 but the transverse diameter is a trifle shorter than that of the latter tooth. The arrangement of the cusps is essentially the same for both teeth. Both molars in *P.* (*Simidectes*) *merriami* possess a single inner cusp (protocone), in which respect the Simi form resembles *Oödectes* and differs from *Vulpavus*. The intermediate conules are present and are clearly shown in M2. In M1 abrasion has evidently obliterated the forward conule. In the illustrations given by Matthew[4] the anterior molars in *Oödectes proximus* possess a forward conule but no metaconule, while in *Vulpavus profectus* both conules are present. In each molar of the paratype of *P.* (*Simidectes*) *merriami* the outer cusps are situated well to the inner side of the outer margin and an external cingulum is absent. The metacone is more subdued than the paracone. A parastyle is present and possesses a slightly more external position with reference to the paracone in M2 than in M1. A third molar of smaller size than M2 is present in the Simi species, but the tooth is not preserved in specimen No. 1212.

The skull fragment represented in No. 1212 indicates that the orbit was evidently of small size. The antorbital foramen, on the other hand, is of relatively large size. The postero-external rim of this opening is situated above the posterior end of M1. The position of this opening is not so far forward as in *Vulpavus profectus*. The expanse of bone lying between the external border of the antorbital foramen and the lower anterior border of the orbit is much less extensive in *P.* (*Simidectes*) *merriami* than in V. *profectus*.

A single upper molar of the paratype of *Pleurocyon magnus* from the Uinta is not completely preserved. This tooth differs from the first or second molars of the Simi species in smaller transverse diameter and in the division of the inner crescent into two cusps of subequal size. Moreover, an external cingulum is well marked in the specimen from the Uinta but is absent in the upper molars of *S. merriami*.

Relationships.—The resemblances between the miacid from the Simi and *Pleurocyon magnus* in lower jaw and lower dentition emphasize their close relationship. The fourth lower premolar and upper molar in the Uinta species display the more important structural characters in which this type differs from the Simi form. *Simidectes merriami* is noticeably larger than the type from the Uinta.

In stratigraphic position, large size, and in the structural characters of the dentition, *S. merriami* represents the most advanced stage of development known to occur within the so-called cercoleptoid division of the Miacidæ. As may be expected, its relationship with the Bridger representatives of this group is much closer than with modern *Cercoleptes*.

Notwithstanding the long period of time separating *Cercoleptes* from *Pleurocyon*, the differences in structural characters known to prevail between these genera are of such magnitude as to obviate the possible derivation of the former type from the latter. *Oödectes* and *Vulpavus* are not so advanced as the Simi form, as shown by their smaller size and by less reduction in the anterior premolar teeth. *Oödectes* resembles our form more closely than does *Vulpavus* in the absence of the hypocone in the upper molars and in the trenchant character of the talonids of the lower molars. In *Pleurocyon magnus* and in *P.* (*Simidectes*) *merriami* the height of the trigonid region of the lower molars is distinctly less than that in *Oödectes*, in which respect these later Eocene forms are more like *Vulpavus*. *Oödectes*, rather than *Vulpavus*, resembles more nearly the ancestral type from which *Pleurocyon* may have evolved.

[1] Stock, C., *Proc. Nat. Acad. Sci.*, **18**, 518–523 (1932).

[2] Peterson, O. A., *Ann. Carnegie Mus.*, **12**, 52 (1919).

[3] Peterson, O. A., *Ibid.*, plate 35, figures 12, 13 (1919).

[4] Matthew, W. D., *Mem. Amer. Mus. Nat. Hist.*, **9**, 344 (1909).

EFFECT OF METHYLTHIONINE CHLORIDE ON PHYTOTOXIC REACTION OF NORMAL AND PATHOLOGICAL BLOOD

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Communicated April 14, 1933

Introduction.—The present investigation was prompted by the brief publications of Matilda Brooks[1,2,3,4] and P. J. Hanzlik.[5] These writers found experimentally that methylthionine chloride, or methylene blue, counteracted the toxic effects of cyanide in animals; and they suggested the use of this dye in cyanide poisoning. Matilda Brooks also suggested the use of methylene blue in monoxide poisoning; and J. C. Geiger[6,7] actually employed this method successfully in cases of both cyanide and carbon monoxide poisoning.

For the past ten years the present writer has been engaged in a study of the effects of normal and pathological blood and of various drugs and toxins on living plant protoplasm. These studies were made particularly on the growth of seedlings of *Lupinus albus* in plant-physiological solutions, with and without blood or other toxic substances studied.[8] In this way it was found that a one per cent solution of normal blood serum from human beings produced an inhibition of from 25 to 30 per cent in the