NEW RECORDS OF RODENTIA FROM THE DUCHESNEAN (MIDDLE EOCENE) SIMI VALLEY LANDFILL LOCAL FAUNA, SESPE FORMATION, CALIFORNIA

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ABSTRACT

A large number of isolated rodent teeth have been recently recovered from the Duchesnean (middle Eocene) Simi Valley Landfill Local Fauna of the Sespe Formation during a paleontologic mitigation program at the Simi Valley Landfill and Recycling Center, Ventura County, California. Included in these teeth are new samples of *Metanoiamys korthi*, *Paradjidaumo reynoldsi*, *Simiacritomys whistleri*, and *Simimys landeri*. The discovery of upper and putative lower premolars of *Simiacritomys whistleri* supports it's referral to Eomyidae. New occurrences for the Simi Valley Landfill Local Fauna include Eomyidae (one or more species of uncertain affinities) and *Pareumys* sp.

INTRODUCTION

The middle member of the Sespe Formation, which is exposed along the north side of Simi Valley, Ventura County, California, has previously yielded numerous middle Eocene (Uintan and Duchesnean) fossil mammals (e.g., Golz, 1976; Golz and Lillegraven, 1977; Mason, 1988; Kelly, 1990, 1992, 2009, 2010; Kelly et al., 1991; Kelly and Whistler, 1994, 1998). Kelly (1990, 1992) and Kelly et al. (1991) recognized five superposed local faunas from the middle member, the youngest of which is the Duchesnean Simi Valley Landfill Local Fauna from Natural History Museum of Los Angeles County (LACM) locality 5876 within bed 30A of the locally exposed Sespe Formation. Based on paleomagnetic studies, Prothero et al. (1996) placed bed 30A within Chron 17r of the geomagnetic polarity time scale, or about 38.0-37.8 million years before present (Luterbacher et al., 2004).

A large number of isolated small mammal teeth have recently been recovered from bed 30A by wet screen sieving of bulk matrix during a paleontologic mitigation program at the Simi Valley Landfill and Recycling Center (Lander, 2008; Kelly, 2009, 2010). Kelly (2009, 2010) previously documented two new species in these specimens, the rodent *Heliscomys walshi* and the lipotyphlan *Batodonoides walshi*, along with new records of Marsupialia, additional lipotyphlans, and Primates.

Within the new specimens from bed 30A are numerous additional rodent teeth, including those of species that were previously known from small sample sizes (*Metanoiamys korthi* Kelly and Whistler, 1998, *Paradjidaumo reynoldsi* Kelly, 1992, *Simiacritomys whistleri* Kelly, 1992, and *Simimys landeri* Kelly, 1992). Also, included within these specimens are the first records of *Pareumys* sp. and at least one or more undetermined eomyid species from bed 30A. The purpose of this paper is to document the new rodent specimens from the Simi Valley Landfill Local Fauna.

METHODS

Measurements of teeth were made with an optical micrometer to 0.001 mm and then rounded off to the nearest 0.01 mm. Teeth that had the enamel partially abraded away were not included in the measurements. Because of minor inaccuracies in the calibration of the optical micrometer used by Kelly (1992) and Kelly and Whistler (1998), which resulted in their dental measurements being slightly larger than the actual measurements (by ~ 2%), all measurements of rodent specimens from the Simi Valley Landfill Local Fauna were recalculated for this paper and are included in the dental statistics for each species. Certain rodent M3 specimens (LACM 153836, 153838, 153843, 153844, 153854, and 153855) in the new sample from the Simi Valley Landfill Local Fauna could not be identified because they are so worn that their occlusal patterns are undeterminable. Cheek teeth cusp/crest terminology

follows Wood and Wilson (1936) with additional minor crest terminology for *Metanoiamys* following Chiment and Korth (1996) and for *Simimys* following Lillegraven and Wilson, 1975. Dental formula follows standard usage. Upper and lower teeth are designated by uppercase and lowercase letters, respectively. All specimens were recovered by wet screen sieving of bulk matrix from bed 30A of the middle member of the Sespe Formation (locality LACM 5876) at the Simi Valley Landfill and Recycling Center during a mitigation program directed by Paleo Environmental Associates, Inc., for Waste Management of California, Inc. Walsh (2008) provided preliminary identifications and a cursory summary of the new sample of small mammal teeth recovered during the last phase of the mitigation program for the final (non-peer reviewed) proprietary report prepared by Paleo Environmental Associates, Inc. However, during the detailed study reported on herein, it became clear that a number of Walsh's identifications were incorrect. All specimens are deposited in the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County. Detailed locality data are available at this institution and also see Lander (2008).

Abbreviations and acronyms are as follows: ap, greatest anteroposterior length; CV, coefficient of variation; L, left; N, number of specimens; OR, observed range; R, right; SD, standard deviation; tr, greatest transverse width; tra, anterior transverse width; trp, posterior transverse width.

SYSTEMATIC PALEONTOLOGY
Order Rodentia Bowdich, 1821
Family Eomyidae Winge, 1887
Genus *Metanoiamys* Chiment and Korth, 1996
Metanoiamys korthi Kelly and Whistler, 1998
Figures 1,2

Referred Specimens—dP4, LACM 153865, 153877, 153878; P4, LACM 153769, 153771, 153781, 153783, 153784, 153785, 153874, 153879, 153880, 153883, 153896; M1, LACM 153779, 153884, 153891, 153893, 153894, 153895; M2, 153885, 153892, 153913, 153914, 153915, 153916, 153917; M3, LACM 153929, 153930, 153931, 153932, 153933, 153934, 153935, 153936, 153937, 153938, 153939; dp4, LACM 153866, 154867, 153868, 153869, 153870, 153871, 153872, 153873; p4, LACM 153780, 153789, 153792, 153864; 153875, 153876, 153881, 153882; m1 or m2, LACM 153886, 153887, 153888, 153889, 153897, 153898, 153899, 153901, 153902, 153903, 153904, 153905, 153906, 153907, 153908, 153909, 153910, 153911, 153912, 153918, 153919, 153920, 153921, 153922, 153923, 153924, 153925, 153926, 153927, 153928; m3, LACM 153940, 153941, 153942, 153943, 153944, 153945, 153946, 153948, 153949, 153950, 153951, 153952, 153953.

Description—Kelly and Whistler (1998) provided detailed descriptions of P4-M2 and m1-2, so these will not be repeated here. However, the new sample does provide additional information on the individual variation of these teeth, which is included below. The dP4, M3, dp4, p4, and m3 were previously unknown for *Metanoiamys korthi*, so detailed descriptions of these teeth are also included below. Kelly and Whistler (1998) previously assigned LACM 131059 to m1 or m2, but it actually represents M1.

Three teeth are identified as dP4s. They are very similar in occlusal morphology to P4, but are distinctly smaller (Figure 1A, Table 1). The occlusal outline is almost square. A well-developed anterior cingulum is present that extends lingually from the anterior side of the paracone to the anterocone, where it has a slight indentation, and then continues to the anterolingual corner of the tooth. A small, distinct anterocone and adlophule (crest extending posteriorly from the anterior cingulum at the position of the anterocone and connecting to the protoloph or protocone) are present in all specimens. The primary cusps are well-developed with the paracone and metacone taller than the protocone and hypocone. The protoloph and metaloph are moderately high, complete crests that connect the paracone with the protocone and the metacone with the hypocone, respectively. Mesostyles are lacking in all specimens. A mesocone is lacking in one specimen and represented as a slight swelling or small cuspule near the center of the endoloph in the other two specimens. The endoloph is complete, connecting the protocone and hypocone. A mesoloph is lacking in two specimens, but on the third specimen the mesoloph extends labially from the mesocone as a simple spur of moderate length. The posterior cingulum is a distinct crest that extends labially from the posterolabial side of the hypocone to the posterior base of the metacone.

The new 11 specimens of P4 exhibit very similar occlusal patterns that agree well morphologically with those described by Kelly and Whistler (1998) (Figure 1B-D).

The new 13 specimens of M1 and M2 agree well morphologically with the sample described by Kelly and Whistler (1998). All have a well-developed adlophule, a complete, moderately high endoloph, a distinct anterocone present on the anterior cingulum, and an anterior cingulum that extends lingually from the paracone to the anterocone and then continues to the anterolingual margin of the tooth (Figure 1E-I). Mesolophs are completely lacking in seven specimens, present as very short, simple spurs in five specimens, and in one specimen the mesoloph is moderately short with a slight bifurcation (additional spur) at its labial end. Mesocones are present on all M1-2s that vary
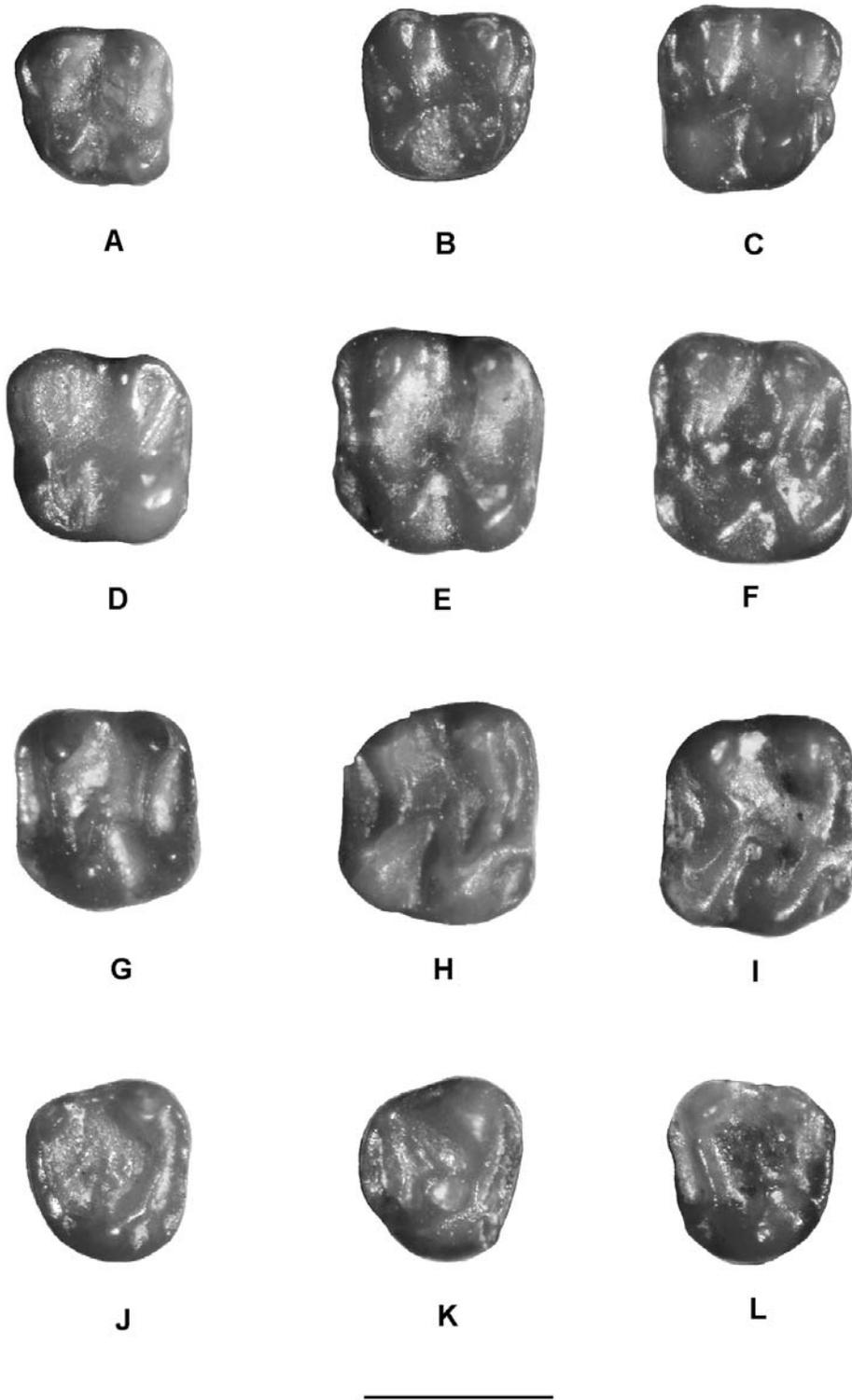
FIGURE 1. Upper teeth of *Metanoiamys korthi*. A, LdP4, LACM 153865; B, RP4, LACM 153878; C, RP4, LACM 153896; D, LP4, LACM 153874; E, LM1, LACM 153893; F, LM1, LACM 153894; G, LM2, LACM 153915; H, RM2, LACM 153916; I, RM2, LACM 153917; J, RM3, LACM 153937; K, RM3, LACM 153936; L, LM3, LACM 153929. All occlusal views, lingual at bottom, scale = 1 mm.
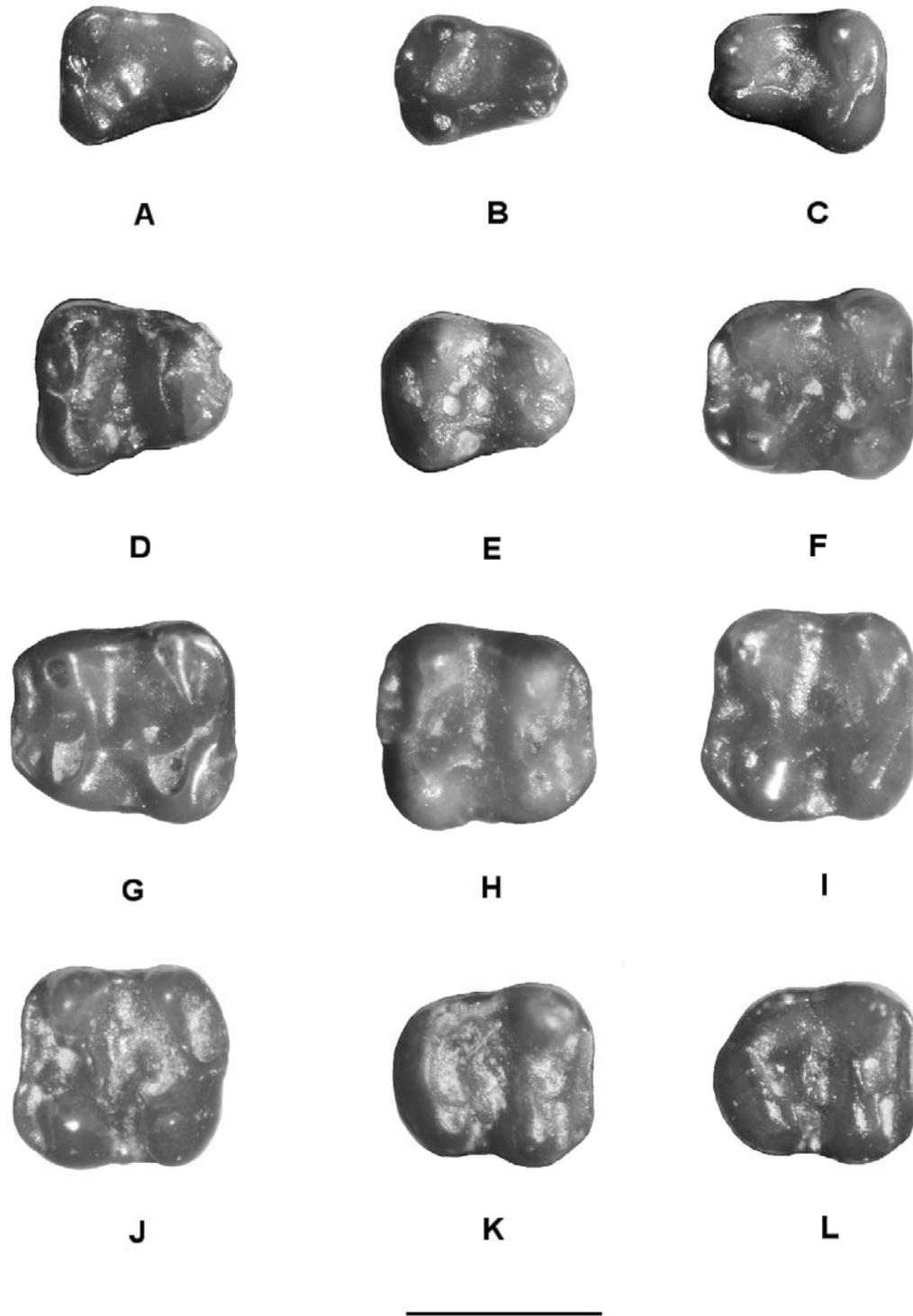
FIGURE 2. Lower teeth of *Metanoiamys korthi*. A, Rdp4, LACM 153872; B, Rdp4, LACM 153871; C, Ldp4, LACM 153868; D, Rp4, LACM 153881; E, Rp4, 153882; F, Lm1 or m2, LACM 153898; G, Lm1 or m2, LACM 153899; H, Rm1 or m2, LACM 153907; I, Lm1 or m2, LACM 153920; J, Lm1 or m2, LACM 153921; K, Rm3, LACM 153952; L, Rm3, LACM 153946. All occlusal views, lingual at top, scale = 1 mm.

from a small distinct cusp (seven specimens) to a small, swelling or bulge on the endoloph (six specimens). Mesostyles are lacking in six specimens and represented as a small bump or swelling along the labial margin of the tooth between the paracone and metacone on seven specimens. In six specimens, a short, simple, crest or spur (= posterior arm of the protocone of Kelly and Whistler, 1998) is present that extends from the anterior side of the endoloph, near its connection with the protocone, towards the mesoloph (two specimens), towards the protocone (two specimens), or directly straight labially (two specimens). This crest is lacking in seven specimens. The M1 is differentiated from the M2 by having the tra and trp more nearly equal in width (less transversely expanded anteriorly), whereas the M2 has the tra relatively wider than the trp (more transversely expanded anteriorly).

Eleven teeth are identified as M3 in the new sample. The occlusal outline is subcircular (Figure 1J-L). The paracone is the largest and tallest primary cusp. The protocone is slightly smaller than paracone and positioned medially along the lingual margin of the tooth. The entoconid is a distinct, transversely compressed cusp that is lower in height than the paracone. The hypocone varies from a relatively distinct, anteroposteriorly compressed cusp to a moderate swelling along the posterolingual edge of the tooth at about the level of the labial border of the protocone. In two specimens, the protocone and hypocone are almost joined, whereas in all the other teeth they are separated by a distinct notch. The anterior cingulum is a well-developed, moderately high crest extending from the anterolabial side of the paracone to the anterolingual corner of the tooth. A small anterocone is present on the anterior cingulum in all specimens. A well-developed adlophule is present in all specimens and exhibits a strong connection with the protoloph in all but two specimens, where the adlophule is slightly constricted at the junction with the protoloph. A well-developed protoloph, connecting the protocone and paracone is present in all specimens. A very low crest (= incipient metaloph) connecting the hypocone and metacone is present in four specimens, whereas it is lacking on all the other teeth. The posterior cingulum, which is only slightly lower in height than the metacone and hypocone, extends in an arc from the labial side of the hypocone to the posterior labial side of the metacone. The small crests and cuspules within the central valley exhibit the most variability. In six specimens, a small, short, low crest is present that extends anterolabially from either the posterolabial corner of the protocone (three specimens) or the anterolingual corner of the hypocone (three specimens) into the central valley and then turns either

slightly more anteriorly or slightly more labially. Of the six specimens exhibiting this morphology, one has a minute mesocone present on the crest. The crest is completely absent in one tooth, but a small, though distinct, cuspule is present in the central valley that appears to represent a mesocone. In the other four teeth, the crest is only represented by a minute, short spur with a small mesocone occurring at the labial end of the spur (3 specimens) or isolated from the spur (one specimen). The M3 of *Metanoiamys korthi* is similar in size to those of *Paradjidaumo reynoldsi*. However, it can be easily distinguished from the M3 of *P. reynoldsi* by having the following: 1) an adlophule is present; 2) an anterocone is present; and 3) the anterior cingulum extends to the lingual margin of tooth. Lacking are a long, well-developed mesoloph and a distinct hypoloph, which are present in *P. reynoldsi* and result in a five crested occlusal pattern.

Walsh (1997) clarified the characteristics that allow dp4 and p4 of *Metanoiamys* to be differentiated from each other, wherein dp4 is smaller, relatively longer anteroposteriorly (more elongated occlusal outline) with the anterior transverse width relatively narrower, and the anteroconid usually relatively larger.

Eight teeth are identified as dp4, which are smaller than p4 (Figure 2A-C). The anteroconid is a moderately well-developed cusp that is positioned anteriorly and medially relative to the metaconid and protoconid. It is distinctly lower than the metaconid and protoconid. No anterior cingulids are present on any of the dp4s. The metaconid and protoconid are distinct cusps that are separated by a shallow valley and, with wear, this valley disappears to allow formation of a short metalophid connection between the cusps. The entoconid and hypoconid are well-developed cusps with the entoconid higher than the hypoconid. The hypolophid is a distinct crest. A complete, but low, ectolophid extends from the hypoconid to the protoconid on all of the dp4s. A distinct, small mesoconid is present on three dp4s, whereas on the others it varies from incipient to weakly expressed, that is from a slight to moderate swelling on the ectolophid. On two teeth a very short mesolophid extends lingually from the mesoconid into the central valley, and on one tooth a low, thin mesolophid extends about three-quarters of the way across the central valley, whereas on the other dp4s a mesolophid is lacking. A mesostylid is lacking on all dp4s. The posterior cingulid is moderately well-developed, extending from the posterolingual side of the hypoconid to the posterior medial base of the entoconid. All dp4s exhibit distinctly narrower anterior transverse widths relative to the posterior transverse widths (Table 2).

TABLE 1. Dental statistics (in mm) of all upper teeth of *Metanoiamys korthi* from Simi Valley Landfill Local Fauna. Includes new sample provided herein plus specimens described by Kelly (1992) and Kelly and Whistler (1998).

Tooth/ Dimension	N	Mean	OR	SD	CV
dP4 ap	3	0.84	0.81-0.90	0.05	—
dP4 tra	3	0.80	0.76-0.85	0.05	—
dP4 trp	4	0.83	0.81-0.84	0.02	3.0
P4 ap	14	1.00	0.95-1.08	0.05	5.0
P4 tra	14	1.01	0.95-1.06	0.04	4.0
P4 trp	14	1.00	0.96-1.06	0.03	3.0
M1 ap	8	1.06	1.03-1.13	0.04	3.8
M1 tra	8	1.13	1.05-1.19	0.06	5.3
M1 trp	8	1.10	1.03-1.16	0.05	4.6
M2 ap	11	1.04	0.95-1.09	0.04	3.9
M2 tra	10	1.15	1.10-1.19	0.04	3.5
M2 trp	9	1.08	0.98-1.12	0.04	3.7
M3 ap	11	0.85	0.80-0.95	0.04	4.7
M3 tra	10	0.94	0.86-0.95	0.04	4.3
M3 trp	10	0.76	0.70-0.84	0.05	6.6

TABLE 2. Dental statistics (in mm) of all lower teeth of *Metanoiamys korthi* from Simi Valley Landfill Local Fauna. Includes new sample provided herein plus specimens described by Kelly (1992) and Kelly and Whistler (1998).

Tooth/ Dimension	N	Mean	OR	SD	CV
dp4 ap	7	0.86	0.82-0.90	0.03	3.5
dp4 tra	7	0.50	0.47-0.53	0.03	6.0
dp4 trp	8	0.71	0.67-0.75	0.03	4.2
p4 ap	8	1.01	0.95-1.08	0.04	4.0
p4 tra	8	0.67	0.62-0.72	0.03	4.5
p4 trp	7	0.85	0.81-0.90	0.04	4.7
m1 or m2 ap	33	1.10	1.00-1.18	0.05	4.5
m1 or m2 tra	30	1.01	0.90-1.09	0.05	5.0
m1 or m2 trp	31	1.06	0.98-1.13	0.04	3.8
m3 ap	13	1.06	1.03-1.10	0.02	1.9
m3 tra	10	0.97	0.90-1.03	0.03	3.1
m3 trp	11	0.85	0.80-0.93	0.04	4.7

The eight teeth identified as p4 differ from dp4 by having a relatively wider trigonid and less anteroposteriorly elongated occlusal outline. The primary cusps (metaconid, protoconid, entoconid, and hypoconid) are well-developed cusps with the entoconid being the largest and highest (Figure 2D-E). A small, distinct anteroconid is present on seven p4s and lacking on one. However on one p4, the anteroconid is very small and connected to the base of the protoconid by a low, short cristid. A similar cristid is present on the p4 that lacks a distinct anteroconid. The metalophid extends from the protoconid to the metaconid and is better developed than that of dp4. The ectolophid is a well-developed, complete cristid that connects the protoconid to the hypoconid and is relatively higher than that of the dp4. A mesoconid, which varies from a distinct triangular shaped cusp to a moderate swelling on the ectolophid, is present on seven of the p4s. On one p4, the mesoconid is incipient; it is only a very slight swelling on the ectolophid. A mesostylid is present between the metaconid and entoconid on three p4s, which varies from a small distinct cusp on one to a small bulge on the other two. The other five p4s lack a mesostylid. A mesolophid is present on five p4s, varying from a very short lingually directed spur from the mesoconid (four p4s) to a very low cristid (one p4) extending lingually about half way across the central valley. On the other three p4s, a mesolophid is lacking. The hypolophid is well-developed on all p4s, connecting the entoconid to the hypoconid. The posterior cingulid is a distinct cristid, slightly lower than the hypolophid that extends lingually from the posterolabial side of the hypoconid to the posterior side of the entoconid.

Confident differentiation of *Metanoiamys* first and second lower molars from samples consisting only of isolated teeth is not possible. The new sample includes 30 m1 or m2s, which agree well morphologically with those described by Kelly and Whistler (1998). A distinct anteroconid, complete ectolophid, and well-developed adlophulid (crest extending posteriorly from the anterior cingulid at the position of the anterocone and connecting with the metalophid or protoconid) are present on all the m1-2s (Figure 2F-J). Mesostylids are usually lacking (26 specimens), but in three specimens the mesostylid is represented by a very small bump or swelling (incipient) on the lingual margin of the tooth between the metaconid and entoconid and in one specimen it is represented by a small, distinct cuspulid. Mesoconids are present on all specimens except one, where it is only a very slight swelling on the ectolophid. A mesolophid is present as a simple cristid that varies from very short to moderate in length and extends from the mesoconid into the central valley in 24 specimens. In two specimens, the mesolophid exhibits a slight bifurcation or spur at its lingual end and in four specimens, a mesolophid is lacking.

Thirteen m3s are identified in the new sample. The occlusal outline is subrectangular with the anterior transverse width greater than the posterior transverse width (Figure 2K-L). The anterior cingulid is robust and extends labially from the anterior side of the metaconid to the anterolabial margin of the tooth. A well-developed adlophulid is present on all but one specimen, where the adlophulid is incomplete, not reaching the metalophid. The anteroconid is present as a small cuspulid along the center of the anterior cingulid in 11 specimens, but is represented by only a slight swelling on the anterior cingulid in two specimens. The metaconid is the largest and tallest primary cusp. The entoconid is a well-developed cusp positioned at the posterior lingual margin of the tooth and is taller than the hypoconid. The metalophid is a complete cristid connecting the metaconid and protoconid in all specimens. The hypolophid is a

complete crest that extends as a posteriorly directed arc from the hypoconid to the entoconid. In unworn teeth, the hypolophid has a slight notch along its lingual half between the entoconid and hypoconid. A mesolophid is present in all specimens, where it exhibits the following variation: 1) a short cristid, extending lingually from the mesoconid straight into the central valley (five specimens); 2) a short cristid, extending into the central valley, but with a slight posterior turn at its lingual end (four specimens); 3) a moderate to moderately long cristid, extending lingually straight into the central valley (three specimens); and 4) a moderately long cristid that extends into the central valley and then turns posteriorly at its lingual end (one specimen). On three specimens, one or two minute posteriorly directed spurs are present on the mesolophids. On all specimens, a mesoconid is present as a small cuspulid or slight swelling along the ectolophid. The ectolophid extends between the hypoconid and protoconid. It is well connected to the hypoconid and almost as tall as the hypoconid along its posterior edge. From the mesoconid, the ectolophid decreases in height anteriorly, where there is a small notch present in unworn teeth at the point where it meets the posterior side of the protoconid. With wear this notch disappears, giving the appearance that the ectolophid is well connected to the protoconid. A mesostylid is lacking in five specimens, incipient in six specimens (represented as a very slight swelling or irregularity in the enamel), and a distinct, small cuspulid in two specimens. On one specimen, the mesostylid has a short labially extending spur. A small posterior cingulid is present at the posterolabial corner of the tooth on two specimens, where it extends a short distance from the posterolingual wall to the posterolabial wall of the entoconid.

Dental statistics for the entire sample of *Metanoiamys korthi* from the Simi Valley Landfill Local Fauna, including those specimens described by Kelly (1992) and Kelly and Whistler (1998), are provided in Tables 2-3. Measurements of the holotype m1 or m2 (LACM 132447) of *M. korthi* are ap = 1.16 mm, tra = 1.09 mm, and trp = 1.13 mm.

Discussion—The newly recovered teeth of *Metanoiamys korthi* significantly increase the sample size for the species and provide additional information on individual variation. Also, the new teeth include the first records of dP4, M3, dp4, p4, and m3 of *M. korthi*.

Genus *Paradjidaumo* Burke, 1934
Paradjidaumo reynoldsi Kelly, 1992
Figures 3,4

Referred Specimens—P4, LACM 153770, 153772, 153773,153774, 153775, 153776, 153777, 153782, 153786, 153787; M1 or M2, LACM 153793, 153794, 153795, 153796, 153798, 153799, 153800, 153801, 153802, 153803, 153804, 153805, 153806, 153807, 153808, 153810, 153817, 153818, 153819, 153820, 153821, 153822, 153827, 153828, 153829, 153830, 153831, 158333; M3, LACM 153835, 153837, 153839, 153840, 153841, 153842, 153846, 153847, 153848, 153849, 153851, 153852, 153853; Ldp4, LACM 153778; p4, LACM 153788, 153790, 153791; m1 or m2, LACM 153811, 153812, 153813, 153814, 153815, 153824, 153825, 153826, 153832, 153834, 153900; m3, LACM 153856, 153857, 153858, 153859, 153860, 153861, 153862, 153863, 153890, 153947.

Description—Without intact dentitions of *Paradjidaumo reynoldsi* for comparison, differentiation of M1 from M2 and m1 from m2 cannot be made confidently from isolated teeth. First and second lower molars are differentiated from first and second upper molars by having anteroposterior lengths that are greater than their transverse widths, whereas in the upper molars, the transverse widths are greater than the anteroposterior widths. First and second lower molars further differ from first and second upper molars by having an elongated anterior cingulid that extends to the labial margin of the tooth connecting with the anterior base of the protoconid, whereas in first and second upper molars the lingual extension of the anterior cingulum connects with the protoloph and does not extend to the lingual margin of the tooth. The lingual/labial connections of the posterior cingulum/cingulid of the first and second upper and lower molars, respectively, differ similarly, but in the mirror image of the anterior cingulum/cingulid connections. Kelly (1992) tentatively referred three teeth (LACM 130841, 131028, 131050) to m3, but with the discovery of definitive m3s in the new sample it is clear that these teeth actually represent m1 or m2. Kelly (1992) provided detailed descriptions of P4, M1-3, p4, and m1-2, so these will not be repeated here. However, the new sample does provide additional information on the individual variation of these teeth, which is included below. The new sample of *Paradjidaumo reynoldsi* also includes the first known examples of dp4 and m3, so detailed descriptions of these teeth are also included below.

Ten teeth are identified as P4 in the new sample. Their occlusal morphology agrees with those described by Kelly (1992). They all exhibit a short, anterior cingulum that extends from the posterolabial portion of the metaloph to the anterolabial corner of the paracone, a small, distinct mesostyle between the paracone and metacone, a small mesocone at about the center of the endoloph, and lack an anterocone (Figure 3A-C). All but one P4 (LACM 153774) have complete, high endolophs connecting the hypocone to the protocone. On LACM 153774, the endoloph is a high crest (about
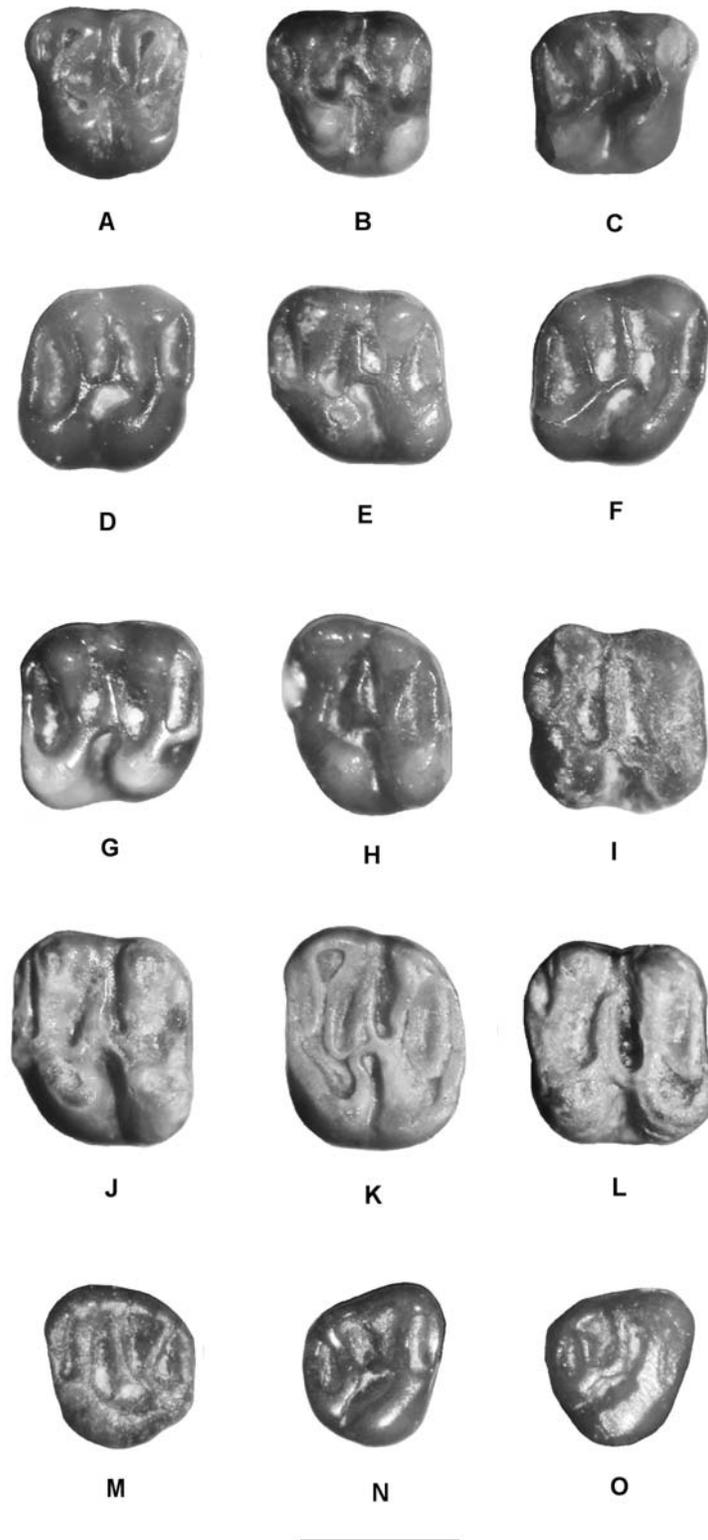
FIGURE 3. Upper teeth of *Paradjidaumo reynoldsi*. A, LP4, LACM 153774; B, LP4, LACM 153782; C, RP4, LACM 153772; D, RM1 or M2, LACM 153808; E, LM1 or M2, LACM 153800; F, RM1 or M2, LACM 153804; G, RM1 or M2, LACM 153820; H, LM1 or M2, LACM 153794; I, LM1 or M2, LACM 153833; J, LM1 or M2, LACM 153801; K, LM1 or M2, LACM 153796; L, LM1 or M2, 153834; M, LM3, LACM 153835; N, RM3, LACM 153848; O, RM3, LACM 153849. All occlusal views, lingual at bottom, scale = 1 mm.
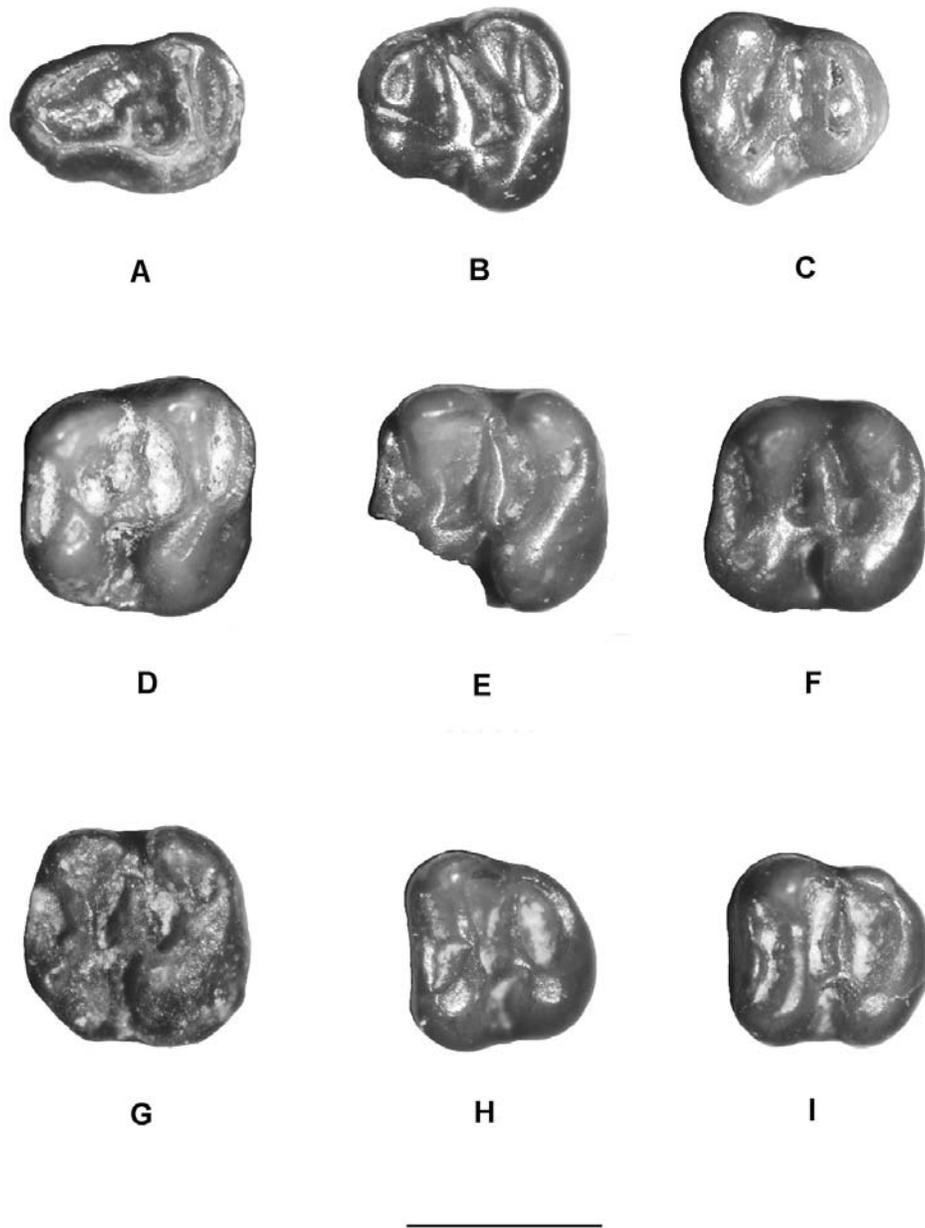
FIGURE 4. Lower teeth of *Paradjidaumo reynoldsi*. A, Ldp4, LACM 153778; B, Lp4, LACM 153788; C, Rp4, LACM 153791; D, Lm1 or m2, LACM 153824; E, Lm1 or m2, LACM 153813; F, Lm1 or m2, LACM 153812; G, Lm1 or m2, LACM 153832; H, Lm3, LACM 153858; I, Lm3, LACM 153857. All occlusal views, lingual at top, scale = 1 mm.

the height of the hypocone) that extends from the hypocone to the posterolabial corner of the protocone, where it is separated from the protocone by a transversely narrow and deep notch. LACM 153775 is unworn and it is apparent that the notch separating the endoloph from the protocone would disappear in late wear resulting in the appearance of a complete endoloph. A mesoloph is present in all specimens,

extending relatively straight labially from the mesocone into the central valley, but exhibits variation in its length. The mesoloph extends across the full length of the central valley to the mesostyle in four specimens, to about three-quarters the way across the central valley in three specimens, and to about one-half the way across the central valley in three specimens. The P4 of *Paradjidaumo reynoldsi* is similar in size to

that of *Metanoiamys korthi*, but can easily be distinguished from those of *M. korthi* by lacking an adlophule, a distinct anterocone, a lingual extension of the anterior cingulum, and an indentation at the middle of the anterior cingulum, along with having a much better developed mesoloph (higher and longer). Except for the notable indentation of the anterior cingulum, these characters can also be used to distinguish the M1-2 of *P. reynoldsi* from those of *M. korthi*.

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TABLE 3. Dental statistics (in mm) for all upper teeth of *Paradjidaumo reynoldsi* from Simi Valley Landfill Local Fauna. Includes new sample provided herein plus specimens described by Kelly (1992).

Tooth/ Dimension	N	Mean	OR	SD	CV
P4 ap	14	1.08	1.00-1.18	0.06	5.6
P4 tra	14	1.06	0.95-1.16	0.07	6.6
P4 trp	15	1.05	0.97-1.18	0.07	6.6
M1 or M2 ap	39	1.13	1.00-1.30	0.07	6.2
M1 or M2 tra	37	1.29	1.10-1.39	0.07	5.4
M1 or M2 trp	35	1.22	1.08-1.38	0.07	5.7
M3 ap	18	0.97	0.85-1.05	0.06	6.2
M3 tra	18	1.01	0.93-1.09	0.04	4.0
M3 trp	18	0.84	0.77-0.92	0.05	6.0

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TABLE 4. Dental statistics (in mm) for all lower teeth of *Paradjidaumo reynoldsi* from Simi Valley Landfill Local Fauna. Includes new sample provided herein plus specimens described by Kelly (1992).

Tooth/ Dimension	N	Mean	OR	SD	CV
dp4 ap	1	1.19	—	—	—
dp4 tra	1	0.67	—	—	—
dp4 trp	1	0.75	0.70-0.80	—	—
p4 ap	8	1.15	1.05-1.29	0.08	7.0
p4 tra	7	0.83	0.75-0.90	0.05	6.0
p4 trp	7	1.11	1.00-1.23	0.09	8.1
m1 or m2 ap	28	1.21	1.07-1.36	0.08	6.6
m1 or m2 tra	24	1.14	1.03-1.26	0.09	7.9
m1or m2 trp	27	1.18	1.06-1.33	0.07	5.9
m3 ap	10	1.00	0.92-1.08	0.05	5.0
m3 tra	9	0.99	0.95-1.03	0.03	3.0
m3 trp	9	0.85	0.77-0.93	0.05	5.9

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The new sample contains 28 teeth identified as M1 or M2 (Figure 3D-L). The occlusal morphology of the first and second molars in the new sample agrees well with those described by Kelly (1992). The mesoloph extends labially across the central valley from the endoloph or incipient mesoconid, when present, to the labial margin of the tooth or mesostyle, when present, on 19 specimens. On six specimens, the mesoloph extends labially three-quarters or slightly more across the central valley and on three specimens, it extends a little over half way across the central valley. A small mesostyle is present between the paracone and metacone on 19 specimens, whereas on four specimens the mesostyle is represented by only a

slight bump or swelling and five specimens lack a mesostyle. A mesoconid is lacking on three specimens, whereas on the other 25 specimens, it is incipient, that is a minute cuspule (unworn teeth) or very slight swelling (worn teeth) on the endoloph.

The new sample contains 13 teeth identified as M3 (Figure 3M-O), which exhibit more individual variation than the original sample of five teeth described by Kelly (1992). The morphology of the anterior cingulum agrees well with those that Kelly (1992) described in all but one specimen, where the anterior cingulum is lacking and the enamel along the anterior edge, where the cingulum would normally be, exhibits numerous small bumps. In this specimen, the posterior cingulum is also lacking, exhibiting also numerous small bumps along the posterior edge of the tooth where it would normally occur. This morphology is probably due to aberrant ontogeny during the development of this tooth. In eight specimens the mesoloph extends labially completely across the central valley to the labial edge of the tooth and in four specimens it extends only about three-quarters of the way across the central valley, giving all of these teeth a five crested occlusal pattern. On one specimen (LACM 153841), a mesoloph is lacking, yet the tooth is otherwise indistinguishable morphologically from the other 12 third molars. In the new sample, the protocone and hypocone are connected in seven specimens (Figure 3M) and separated by a distinct notch in six specimens (Figure 3N-O). A small mesostyle is present in two specimens, whereas in eight specimens it is represented by a small swelling on the enamel between the protocone and metacone and in three specimens it is lacking. The posterior cingulum also exhibits variation in the new sample; in eight specimens the posterior cingulum is well separated from the hypoloph by a relatively wide transverse valley and in five specimens the posterior cingulum and hypoloph are more closely positioned to each other, only separated by a narrow transverse valley.

One tooth is identified as dp4 (Figure 4A). It is relatively narrower transversely and more elongated anteroposteriorly than the p4 of *P. reynoldsi*. The metaconid and protoconid are transversely compressed cusps of about equal height and are connected anteriorly by a very short, narrow cristid (? = metalophulid I). The entoconid and hypoconid are well-developed cusps with the entoconid taller than metaconid, protoconid, and hypoconid. A well-developed hypolophid connects the hypoconid and entoconid. A complete, high ectolophid connects the protoconid and hypoconid. The mesolophid is a tall cristid that extends lingually from the ectolophid to about half-way across the central valley. A cristid extends posteriorly from the metaconid towards the entoconid, although it is separated from the entoconid

by a wide notch. The posterior cingulid extends lingually from the posterolingual side of the hypoconid to the posterior side of the entoconid. An anteroconid, mesostylid, and mesoconid are lacking. The reference of LACM 153778 to dp4 of *P. reynoldsi* could be questioned because it differs from p4 by having a mesoloph that is not as complete and the posterior cingulid connects with the posterior lingual side of the hypoconid instead of near the middle of the hypolophid. However, it is similar to the p4 in having a complete, high ectolophid, high mesolophid, well-developed hypolophid, and lacking an anteroconid. These characters, along with its larger size, also distinguish LACM 153778 from the dp4 of *Metanoiamys korthi*. Furthermore, LACM 153778 appears to be too small to be referable to any of the larger, undetermined genera of Eomyidae described below. Moreover, other investigators have noted considerable variation in the mesoloph/mesolophid length and in the posterior cingulum/cingulid morphology of dp4, P4/p4, and M3/m3 of *Paradjidaumo* (e.g., Black, 1965; Korth, 1980; Storer, 1984). For these reasons, LACM 153778 is tentatively assigned to *P. reynoldsi*.

Three teeth are identified as p4. The anterior transverse widths are narrower than the posterior transverse widths (Figure 4B-C). The occlusal morphology of the new sample of p4s agrees well with those described by Kelly (1992). They all exhibit the following characters: 1) an anteroconid is lacking; 2) a short, low anterior cingulid is present that extends from the anterolabial side of the protoconid to the anterolingual side of the metaconid; 3) a complete short metalophid that is slightly taller than the anterior cingulid and connects the posterolabial side of protoconid to the posterolingual side of the metaconid; 4) a complete, high ectolophid that connects the protoconid to the hypoconid; 5) a complete mesolophid that extends lingually across the central valley from the ectolophid to a small metastylid between the metaconid and entoconid; 6) a well-developed, high hypolophid that connects the hypoconid and entoconid; and 7) a well-developed, high posterior cingulid that extends from about the middle of the hypolophid to the posterolingual side of the entoconid. Two specimens are lacking a mesoconid and one specimen exhibits an incipient mesoconid as a very slight expansion of the enamel at the junction of the mesolophid with the ectolophid.

Eleven teeth in the new sample are identified as m1 or m2 (Figure 4D-G). The occlusal morphology of the first and second lower molars in the new sample agrees well with those described by Kelly (1992). In the new sample, the mesolophid extends completely across the central valley from the ectolophid to the lingual margin of the tooth or the mesostylid, when present, on seven specimens; it extends three-quarters or a little more across the central valley on four specimens. A small, distinct mesostylid is present between the metaconid and entoconid on two specimens and is lacking on nine specimens. An incipient mesoconid, which is expressed as a slight swelling or widening at the ectolophid-mesolophid junction, is present on six specimens. A mesoconid is lacking on the other five specimens.

In the new sample, 10 teeth are confidently assigned to m3. The occlusal outlines are subrectangular with the anterior transverse widths notably wider than the posterior transverse widths (Figure 4H-I, Table 4). The anterior cingulid is well-developed and extends labially from the anterolingual side of the metaconid to the anterolabial side of the protoconid. The metaconid is the largest and tallest primary cusp. The protoconid and hypoconid are well developed and of about equal height. The entoconid is reduced to a transversely compressed cusp that is only slightly taller than the protoconid and hypoconid in unworn teeth and positioned just anterior to the posterolingual corner of the tooth. Following wear, the entoconid is difficult to distinguish on the hypolophid. The metalophid is a complete crest, connecting the metaconid to the protoconid. The mesolophid is a complete crest in all specimens, extending lingually from the ectolophid to the lingual margin of the tooth between the metaconid and entoconid (eight specimens) or to the labial side of the entoconid (two specimens). The ectolophid is a complete crest connecting the anterolabial edge of the hypoconid to the posterolabial edge of the protoconid. The hypolophid is a complete crest extending from the hypoconid in an uninterrupted arc to the entoconid. A posterior cingulid is lacking in all specimens. A mesostylid is lacking in seven specimens and incipiently represented as a slight swelling along the enamel edge between the metaconid and entoconid in three specimens. A mesoconid is lacking in eight specimens and incipiently represented by a slight widening on the ectolophid in two specimens. The m3 of *Paradjidaumo reynoldsi* is similar in size to those of *Metanoiamys korthi*, but it can be easily distinguished from those of *M. korthi* by lacking an adlophulid and having higher, better developed crests (anterior cingulid, metalophid, complete mesolophid, hypolophid) giving them a distinctive four crested occlusal pattern.

Dental statistics for the entire sample of *Paradjidaumo reynoldsi* from the Simi Valley Landfill Local Fauna, including those specimens described by Kelly (1992), are provided in Tables 4-5. Measurements of the holotype Rp4 (LACM 131042) of *Paradjidaumo reynoldsi* are ap = 1.14 mm, tra = 0.90, and trp = 1.10 mm.

Discussion—The newly discovered teeth of *Paradjidaumo reynoldsi* significantly increase the sample size for the species and provide additional information on individual variation. The new teeth include also the first records of dp4 and m3.

Genus *Simiacritomys* Kelly, 1992
Simiacritomys whistleri Kelly, 1992
Figure 5

Referred Specimens—P4, LACM 153758, 153759; p4, LACM 153760, 153766; m2, LACM 153763, 153764; m3, LACM 153765.

Description—Of the two teeth identified as P4, one is in early wear (Figure 5B) while the other is in late wear and missing a portion the labial margin of the tooth (Figure 5A). Because of the worn and broken condition of LACM 153759, the following description is based primarily on LACM 153758. The occlusal outline is subquadrate with a five-crested occlusal pattern. The paracone, protocone, metacone, and hypocone are well-developed conical cusps with the paracone the tallest and largest cusp, the metacone slightly lower in height than the paracone, and the protocone and hypocone of about equal height. The anterior cingulum is a well-developed crest that extends lingually from the anterior side of the paracone to about the midline of the tooth and then turns posteriorly to connect with protoloph, near its junction with the protocone. A very small anterocone is present on the anterior cingulum at this junction. The protoloph is almost complete, connecting the protocone to the paracone, but with a shallow notch or valley present on the protoloph at its junction with the anterior cingulum. A central transverse valley is present that extends from the posterolingual margin of the paracone to the lingual margin of the tooth, where it is open lingually. The metaloph is a complete crest connecting the hypocone to the metacone. From about the center of the metaloph, a slightly lower crest (= posterior portion of the endoloph) extends anterolabially into the central valley to an indistinct mesocone (incipient) and then continues anterolabially as a very small, low spur (= anterior portion of the endoloph) that terminates just short of the protoloph. A short, distinct mesoloph is present that extends labially from the endoloph to a ridge that extends from the posterior side of the paracone. The lingual portion of the mesoloph is narrowed anteroposteriorly, but then as it extends further labially it expands into a thick crest. The posterior cingulum is a well-developed crest that extends from the posterolabial side of the hypocone to the posterolingual edge of the metacone. A mesostyle is lacking. Even in its worn state, the occlusal morphology of LACM 153759 agrees well with that of LACM 153758, including the five crested pattern. The

primary differences seen in LACM 153759 are that the shallow valley or notch is lacking on the protoloph so that it becomes a complete crest and that the anterior portion of the endoloph is connected to the protoloph and interrupts the transverse central valley. These differences are regarded as resulting from the extremely worn condition of LACM 153758 and are not considered taxonomically significant. Well-developed appression facets are present on the posterior borders of LACM 153758 and 153759, but are completely lacking on their anterior borders, confirming that these teeth are P4s and indicating that a small P3 was probably not present in either specimen.

The two upper premolars can be confidently assigned to *Simiacritomys whistleri* because they fit well within the observed range of variation noted by Kelly (1992) for M1-2 and exhibit the following shared characters with M1 or M2: 1) a five-crested occlusal pattern; 2) the paracone, protocone, metacone, and hypocone are well-developed conical cusps; 3) the anterior cingulum connects with the protoloph near its junction with the protocone; 4) the protoloph is interrupted by a shallow valley in early wear; 5) the metaloph is a complete, well developed crest; 6) the posterior cingulum extends from the metacone to the posterolabial edge of the hypocone; 7) the valleys between the crests are deep, including a central transverse valley that essentially separates the protoloph from the metaloph in early wear; 8) a well-developed posterior endoloph and weakly developed anterior endoloph; 9) a well-developed mesoloph; 10) an indistinct mesocone; 11) and absence of a mesostylid. They differ primarily from the M1 or M2 by being considerably smaller in size.

Two teeth are identified as p4 (Figure 5C-D). One premolar is in a moderate stage of wear and has a portion of the enamel margin missing along the posterolingual margin of the entoconid and posterior cingulid. The other premolar is complete, but is heavily worn with the entoconid, hypoconid, hypolophid, and posterior cingulid worn down to a single, merged occlusal surface. Much of the following description of the occlusal morphology is derived from the less worn premolar with additional information provided by the heavily worn premolar. The anterior transverse width is considerably narrower than the posterior transverse width. The protoconid and metaconid are low, compressed cusps of about equal height that are connected by a short, slightly lower crest (? = anterior cingulid). The entoconid is the largest primary cusp and is connected to the hypoconid by a complete hypolophid. The posterior cingulid is well developed and slightly lower in height than the hypolophid, and extends from the posterolingual edge of the entoconid to the posterolabial corner of the hypoconid. In the less worn premolar, a transverse valley extends from the
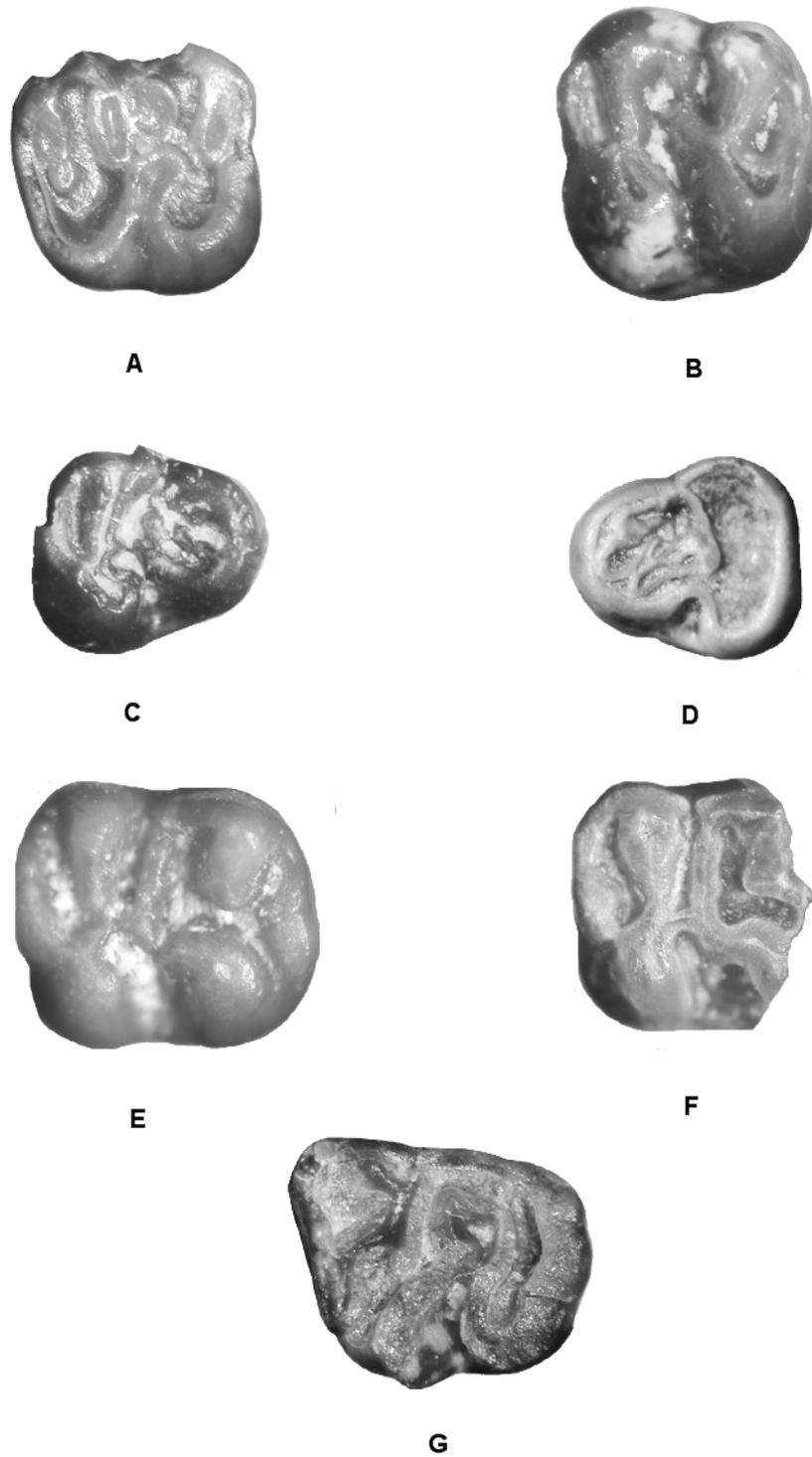
FIGURE 5. Teeth of *Simiacritomys whistleri*. A, partial RP4, LACM 153759; B, LP4, LACM 153758; C, Rp4, LACM 153760; D, Lp4, LACM 153766; E, Rm2, LACM 153763; F, partial Rm2, LACM 153764; G, Lm3, LACM 153765. All occlusal views, A-B with lingual at bottom, C-G with lingual at top, scale = 1 mm.

lingual margin of the tooth to the labial margin, whereas in the worn premolar, only vestiges of this valley remain at the labial and lingual margins. In both premolars, a valley is present between the metaconid and protoconid that extends posterolingually to the hypolophid. In the less worn premolar, two small crests or spurs extend posteriorly from the metaconid, whereas in the worn premolar, one thicker crest extends posteriorly from the metaconid. In the less worn premolar, a moderately developed crest extends posterolingually from the posterior side of the protoconid, where it comes close to the anterior side of the hypoconid and then turns lingually to terminate a little over halfway across the central valley. A very small, low spur extends anteriorly from the labially directed portion of this crest to the base of the anterior wall of the hypolophid. This crest presumably represents the ectolophid and mesolophid. In the worn premolar, this crest extends posterolingually from the protoconid to connect with the hypolophid. In both premolars, a second small crest (lingual to the moderately developed crest) extends posterolingually from the protoconid to connect with the putative mesolophid in the unworn premolar or to the hypolophid in the worn premolar. On the worn premolar, this second crest exhibits a small labially directed spur and a slight connection with the moderately large crest at about midpoint. What is more significant than the minute details of the connections of these small crests in each premolar, which are probably attributable to individual variation and wear stage, is that in both premolars a distinct, relatively deep valley is present that separates the protoconid and metaconid and extends posterolingually towards the lingual margin of the tooth, similar to those seen in m1 or m2. In addition, the morphology of the entoconid and hypoconid, along with the connections of the hypolophid and posterior cingulid, are very similar to those of m1 or m2. Furthermore, a relatively deep transverse valley is also present, before late wear, between the hypolophid and the presumed mesolophid, similar also to those of m1 or m2. The premolars are considerably smaller than the m1 or m2, but this appears to correlate well with the size of the upper premolars, which are confidently assigned to the genus. For all of these reasons, the lower premolars are provisionally referred to *Simiacritomys whistleri*.

Based on the presence of anterior and posterior appression facets, Kelly (1992) identified six lower molars as m2. However, without any intact lower dentitions of *Simiacritomys* for comparison and the fact that P4/p4 are now known to occur in the genus, these teeth should be regarded as m1 or m2. Two teeth are identified as m1 or m2 in the new sample (Figure 5E-F). Their occlusal morphology agrees well with the range of variation noted by Kelly (1992) in the original sample of m1 or m2s and does not provide any new descriptive information.

One tooth identified as m3 (Figure 5G) is very worn and missing the enamel along the anterolabial margin of the protoconid. It can be confidently assigned to *Simiacritomys whistleri* because it exhibits the following characters: 1) the anterior cingulid extends labially beyond the small anteroconid; 2) the metalophid is incomplete, where it is interrupted by a transverse valley that extends from the lingual margin of tooth to the anterolabial margin of the tooth between the anterior cingulid and protoconid; 3) the mesolophid is a well developed, long crest extending from an indistinct metaconid (slight widening of the enamel) on the ectolophid to the labial margin of the tooth; 4) the mesolophid and the anterior portion of the ectolophid are separated from the hypolophid and hypoconid by a transverse valley; and 5) the hypolophid is a well developed, thick crest connecting a distinct hypoconid to a very weakly expressed (incipient) entoconid. It differs from the other m3s described by Kelly (1992) in lacking a distinct posterior cingulid. However, this is probably due to the extreme wear on the tooth because a wide, heavily worn shelf is present along the posterior part of the tooth where a short posterior cingulid would normally occur and the hypolophid exhibits a posteriorly directed protrusion along its posterior border where the posterior cingulid would normally connect with the hypolophid, suggesting that a posterior cingulid may have been present, but has been worn away.

Measurements of the teeth in the new sample of *Simiacritomys whistleri* are provided in Table 5 and the dental statistics of the entire sample of *S. whistleri*, including those reported by Kelly (1992), are provided in Table 6. Measurements of the holotype Lm1 or m2 (LACM 131462) of *Simiacritomys whistleri* are ap = 1.76 mm, tra = 1.70 mm, and trp = 1.72 mm.

Discussion—Based on 17 isolated teeth from the Simi Valley Landfill Local Fauna, Kelly (1992) named *Simiacritomys*. At the time, no upper or lower premolars were known for the genus. Kelly (1992) noted that the molar occlusal morphology of *Simiacritomys* exhibits similarities to those of both Eomyidae and certain members of Zapodidae (= Sicistinae and Zapodinae of Dipodidae *sensu* Flynn, 2008a). Kelly suggested that *Simiacritomys* may be a zapodid because its molar occlusal pattern appeared to be morphologically similar to those of the sicistine zapodid *Plesiosminthus* Viret, 1926, which was followed by Korth (1994). Flynn (2008b) placed *Simiacritomys* in Eomyidae *incertae sedis*, but noted that he was not convinced of this assignment.

P4 and p4 are present and molariform in Eomyidae, whereas p4 is absent and P4 is reduced to a small, single-rooted peg in Tertiary Sicistinae and

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TABLE 5. Measurements (in mm) of new sample of teeth of *Simiacritomys whistleri* from the Simi Valley Landfill Local Fauna.

LACM #	Tooth/position	ap	tra	trp
153758	P4	1.27	1.37	1.26
153759	P4	1.27	—	—
153760	p4	1.21	0.80	1.04
153766	p4	1.21	0.83	1.08
153763	m1 or m2	1.70	1.44	1.54
153764	m1 or m2	—	—	1.49
153765.	m3	1.64	1.41	1.17

TABLE 6. Dental statistics for all teeth of *Simiacritomys whistleri* from Simi Valley Landfill Local Fauna. Includes sample reported on herein and specimens described by Kelly (1992).

Tooth/Dimension	N	Mean	OR	SD	CV
P4 ap	2	1.27	1.27	—	—
P4 tra	1	1.37	—	—	—
P4 trp	1	1.26	—	—	—
M1 or M2 ap	4	1.65	1.60-1.73	0.06	3.6
M1 or M2 tra	3	1.75	1.71-1.81	0.06	—
M1 or M2 trp	4	1.58	1.50-1.62	0.06	3.8
M3 ap	3	1.30	1.27-1.35	0.06	—
M3 tra	3	1.47	1.42-1.52	0.08	—
M3 trp	3	1.29	1.28-1.31	0.03	—
p4 ap	2	1.22	—	—	—
p4 tra	2	0.82	0.80-0.83	—	—
p4 trp	2	1.06	1.04-1.08	—	—
m1 or m2 ap	8	1.73	1.63-1.81	0.7	4.0
m1 or m2 tra	8	1.57	1.43-1.71	0.10	6.4
m1 or m2 trp	9	1.60	1.49-1.72	0.09	5.6
m3 ap	4	1.67	1.55-1.64	0.11	6.6
m3 tra	4	1.43	1.41-1.53	0.08	5.6
m3 trp	4	1.25	1.17-1.35	0.09	7.2

Zapodinae (Korth, 1994; Flynn, 2008a-b). With the discovery that a molariform P4 and putative p4 are present in *Simiacritomys*, its referral to the Eomyidae appears to be confirmed. Without intact dentitions of *Simiacritomys*, the presence or absence of P3 cannot be unequivocally determined, but the lack of a small, anterior appression facet on the two known specimens of P4 suggests that P3 was lacking. The relationship of *Simiacritomys* to other Eomyidae is difficult to determine. It differs from early members of the Yoderimyinae Wood, 1955 (also see Black, 1965; Wood, 1974; Storer, 1987; Emry and Korth, 1993; Korth, 1994; Flynn, 2008b), by having the following: 1) P3 is apparently absent; 2) the P4/p4 are considerably smaller than M1-2/m1-2, respectively; 3) a distinct p4 anteroconid is lacking; 4) transverse valleys are present on the cheek teeth that usually interrupt the endolophs/ectolophids and protolophs/metalophids during early wear; and 5) the

molars are less lophodont and their anterior cingula/cingulids are less developed (narrower). Within the subfamily Eomyinae Winge, 1887, the Namatomyini Korth, 1992, are generally regarded as the most primitive (Storer, 1987; Korth, 1992, 1994). *Simiacritomys* differs from members of the Namatomyini by having the following: 1) relatively higher crowned cheek teeth; 2) P4-M2 and m1-3 exhibiting a five-crested occlusal pattern with much better developed mesolophs and mesolophids, respectively; 3) cheek teeth with more rounded, inflated primary cusps; and 4) a p4 anteroconid is lacking. Of the above characters that distinguish *Simiacritomys* from members of the Namatomyini, numbers one, three, and four are generally regarded as shared derived characters for the subfamily Eomyini (Storer, 1987; Korth, 1992, 1994). *Simiacritomys* differs from members of the Namatomyini and the Eomyini in having transverse valleys present that usually interrupt the protoloph and endoloph on the upper cheek teeth and metalophid and ectolophid on the lower cheek teeth, especially during early wear stages. In addition, if the p4s described herein are correctly assigned to *Simiacritomys*, it differs from all other eomyid genera by its unique p4 anterior occlusal morphology. For these reasons, *Simiacritomys* is herein regarded as an eomyid, but not assigned to any recognized subfamily.

Eomyidae, genera and species undetermined
Figure 6

Referred Specimens—M1 or M2, LACM 153712, 153767, 153768, 153797, 153809, 153816, 153823; M3, LACM 153713, 153845, 153850; m1 or m2, LACM 153761, 153762.

Description—Twelve cheek teeth appear to represent the occurrence of additional eomyid species in the Simi Valley Landfill Local Fauna (Figure 6). In his preliminary identifications provided for the proprietary mitigation report for Waste Management of California, Inc., Walsh (2008) allocated some of these specimens as follows: 1) LACM 153712, 153713, 153714, *Griphomys* sp.; 2) LACM 153767 and 153768, Eomyidae; 3) LACM 153797, 153809, 153816, and 153823, *Paradjidaumo reynoldsi*; 4) LACM 153761, 153762, *Simiacritomys whistleri*. Except for LACM 153767 and 153768, his identifications are not supported by the morphological evidence presented here. In the following descriptions, the teeth are described and, in those that appear to have been originally identified incorrectly, the reasons are given for their new allocation.

The three teeth that Walsh (2008) referred to *Griphomys* sp. are a RM1 or M2 (LACM 153712, Figure 6A) and two M3s (LACM 153713 and 153714).
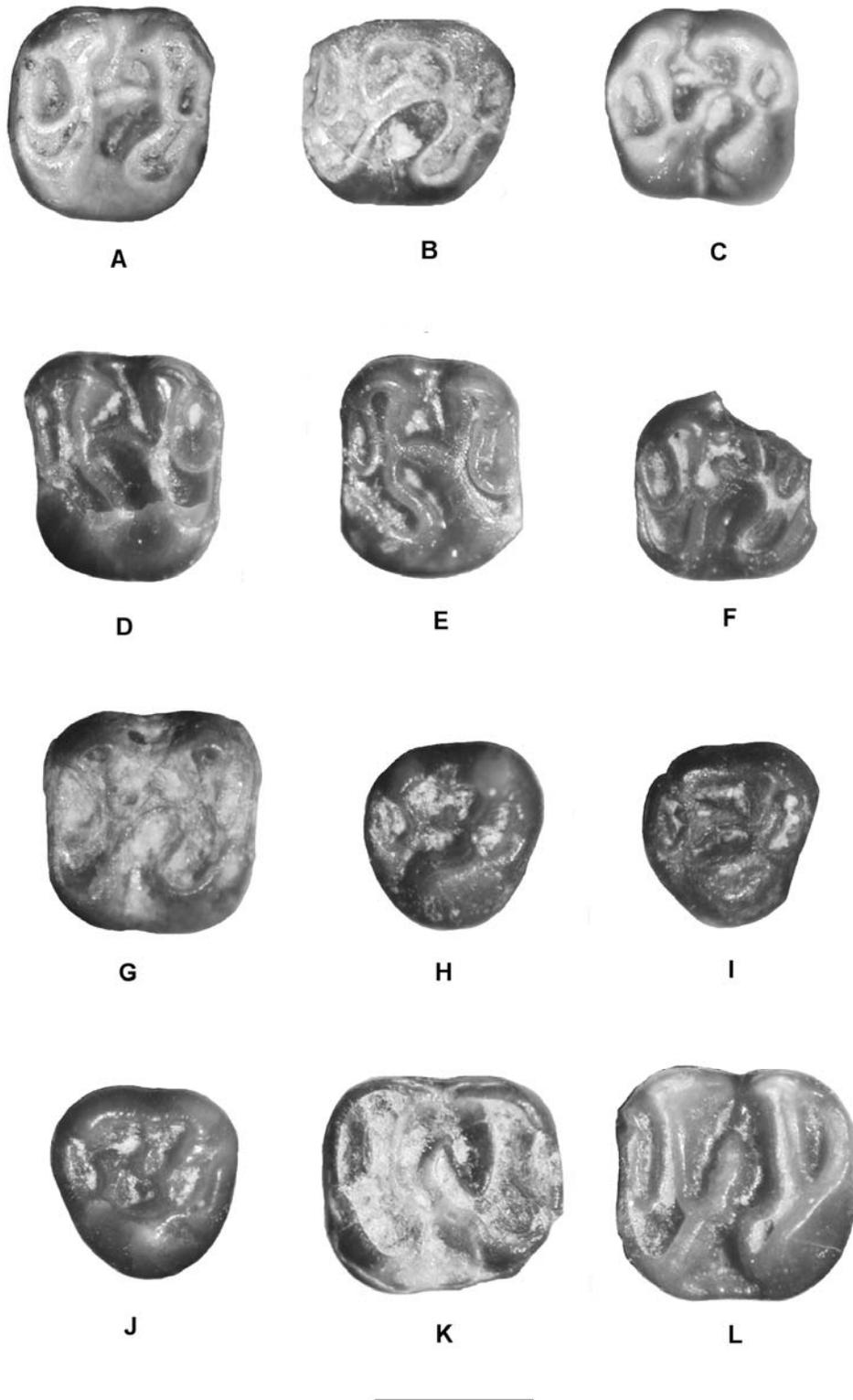
FIGURE 6. Teeth of undetermined species of Eomyidae from Simi Valley Landfill Local Fauna. A, RM1 or M2, LACM 153712; B, partial RM1 or M2, LACM 153768; C, RM1 or M2, LACM 153767; D, LM1 or M2, LACM 153816; E, LM1 or M2, LACM 153797; F, partial RM1 or M2, LACM 153823; G, RM1 or M2, LACM 153809; H, RM3, LACM 153850; I, RM3, LACM 153845; J, LM3, LACM 153713; K, Rm1 or m2, LACM 153761; L, Lm1 or m2, LACM 153762. All occlusal views, A-J with lingual at bottom, K-L with lingual at top, scale = 1 mm.

The M3s do not exhibit the bilophodont occlusal patterns characteristic of *Griphomys* (Wilson, 1940a; Lillegraven, 1977; Kelly and Whistler, 1994), where one actually represents an undetermined eomyid (Figure 6J) and the other *Simimys landeri* (Figure 7D).

LACM 153712 is moderately well-worn and exhibits the following occlusal morphology: 1) an anterocone is lacking; 2) the primary cusps are distinct with the labial cusps (paracone and metacone) taller than the lingual cusps (protocone and hypocone); 3) the paracone has a short crest present that extends posteriorly to a point close to the labial margin of the middle of the central transverse valley; 4) a well-developed, complete protoloph and metaloph are present; 5) the anterior cingulum is a distinct crest that extends lingually from the anterior side of the paracone to the anterolabial side of the protocone, near its connection with the protoloph, thus forming an enclosed, relatively deep transverse valley between the anterior cingulum and protoloph; 6) the posterior cingulum is a distinct, relatively high crest that extends lingually from a point relatively high on the posterior side of the metacone to the posterolabial corner of the hypocone, thus forming an enclosed, relatively deep transverse valley between the posterior cingulum and the metaloph; and 7) a distinct endoloph with a small bulge along its center is present that extends anteriorly from the metaloph to about the middle of the protoloph. In the upper molars of *Griphomys*, the anterior cingulum extends nearly the entire width of the tooth connecting the posterior side of the paracone to the anterior side of the protocone and a protoloph spur (very small, thin crest) is sometimes present that extends posterolabially, usually for a very short distance, from the protocone or the lower portion of the protoloph near its connection with the protocone into the central transverse valley (see Lillegraven, 1977, fig. 21; Kelly and Whistler, 1994, fig. 15B-G). Similar to the upper molars, the lower molar anterior cingulid of *Griphomys* extends nearly the entire width of the tooth connecting the metaconid to the anterior part of the protoconid (see Lillegraven, 1977, figs. 22-24; Kelly and Whistler, 1994, fig. 15K-N). LACM 153712 differs from the upper molars of *Griphomys* in having an endoloph present that extends from the metaloph to the protoloph, and, more importantly, a much shorter anterior cingulum, where the connection of the anterior cingulum forms a Y-shaped occlusal pattern, like those of the Eomyidae.

Walsh (2008) identified two M1 or M2s (LACM 154767 and 153768) as an undetermined eomyid. LACM 153767 is in early wear and exhibits the following occlusal morphology (Figure 6C): 1) the primary cusps are distinct, but somewhat lophate, with the paracone slightly compressed transversely and the protocone compressed anteroposteriorly; 2) a thick, lingually curved ridge or crest extends posteriorly from the posterior side of the paracone to about the middle of the labial part of the central transverse valley; 3) the protoloph and metaloph are well-developed, high, complete crests connecting the protocone to the paracone and the hypocone to the metacone, respectively; 4) the anterior cingulum is a distinct, high crest that extends lingually from the anterior side of the paracone to the anterolabial side of the protocone, near its connection with the protoloph, thus forming an enclosed, relatively deep transverse valley between the anterior cingulum and protoloph; 5) the posterior cingulum is a well developed, high crest that extends from the posterolingual side of the metacone to the posterolabial side of the hypocone, forming an enclosed, relatively deep transverse valley between the posterior cingulum and metaloph; 6) the endoloph is a complete crest that extends anterolabially from the anterolabial corner of the hypocone to about the middle of the metaloph; and 7) an additional cuspule is present in the transverse central valley that is positioned at the anterior margin of the metaloph near its junction with the metacone. LACM 153768 is well worn with the labial portions of the paracone and metacone abraded away (Figure 6B). The occlusal morphology of LACM 153768 is very similar to that of LACM 153767, but differs in having a slightly thicker endoloph with a weak anteriorly directed bulge extending from its center (incipient mesoloph or mesocone) and lacking an additional cuspule along the anterolabial margin of the metaloph.

Walsh (2008) assigned four M1 or M2s (LACM 153797, 153809, 153816, 153823) to *Paradjidaumo reynoldsi* (Figure 6D-G). Except for LACM 153823, the measurements of these teeth are at the high end of the observed range or slightly larger than those of *P. reynoldsi* (Table 3). LACM 154797, 153809, and 153816 exhibit a similar occlusal morphology, including the following: 1) the anterior cingulum, protoloph, metaloph, and posterior cingulum are well-developed crests that give the tooth a four-crested occlusal pattern; 2) the endoloph is a complete, high crest that extends from the metaloph to about the middle of the protoloph; 3) a mesostyle is present near the base of the posterolingual wall of the paracone; and 4) a mesoloph is lacking. These three specimens appear to represent the same species and differ primarily from those of *P. reynoldsi* by lacking a well-developed, long mesoloph and having the endoloph extending from the metaloph to about the middle of the protoloph. In *P. reynoldsi*, the endoloph extends from the anterolabial side of the hypocone to the posterolabial side of the

protocone. LACM 153823 is missing a portion of the anterolabial corner of the tooth, including the paracone, and exhibits the following occlusal morphology (Figure 6F): 1) the anterior cingulum, protoloph, metaloph, and posterior cingulum are well-developed crests; 2) the endoloph extends from the anterolabial side of the hypocone to the middle of the protoloph with a distinct, labially directed spur or cuspule (incipient mesoloph or metacone) present at about the middle of the endoloph; and 3) a distinct cuspule (?mesostyle) is present, abutting the anterior base of the metacone. LACM 153823 is similar in size and occlusal morphology to LACM 153767, but differs by having a cuspule (?mesostyle) present near the anterior side of the metacone and an incipient mesoloph or mesocone present and lacking the small cuspule along the anterior margin of the metaloph. It is possible that LACM 153823 represents the same species as LACM 153767 and 153768.

Walsh (2008) assigned three M3s as follows; LACM 153845 and 153850 to *Paradjidaumo reynoldsi* and LACM 153713 to *Griphomys* sp. However, these assignments are not supported by the occlusal morphology. LACM 153845 and 153850 (Figure 6H-I) exhibit the following characters: 1) a subtriangular occlusal outline; 2) the anterior cingulum extends lingually from the anterolingual side of the paracone to metaloph, connecting near the junction of the protocone and metaloph; 3) the protoloph and metaloph are well developed, connecting the protocone with the paracone and the metacone with the hypocone, respectively; 4) a distinct crest (endoloph) is present that extends anteriorly from the metaloph across the central valley to connect with the protoloph, and a small lingually directed spur or bulge (incipient mesoloph or mesocone) is present near the middle this crest; 5) the paracone and metacone are connected by a lingual crest (ectoloph) that closes off the central valley lingually; 6) the protocone is centrally positioned along the lingual margin of the tooth; 7) a small hypocone is present that is separated from the protocone by a valley; and 8) the posterior cingulum extends lingually from the posterolingual side of the metacone to the anterolabial side of the hypocone. LACM 153713 (Figure 6J) exhibits an occlusal morphology that is somewhat similar to LACM 153845 and 153850, but differs by having a shallow valley present between the labial end of the protoloph and the lingual side of the paracone and lacking a distinct valley between the protocone and hypocone, resulting in a distinct Y-shaped occlusal pattern for the protocone, posterior cingulum, and metaloph.

Walsh (2008) assigned two lower molars (LACM 153761 and 153762) to *Simiacritomys whistleri*. The occlusal morphology of these two molars includes the following (Figure 6K-L): 1) the anterior cingulid,

metalophid, hypolophid, and posterior cingulid are well developed, uninterrupted crests; 2) the anterior cingulid extends almost the entire width of the tooth from the anterior side of the metaconid to the anterior side of the protoconid; 3) the ectolophid extends anteriorly from the posterolingual corner of the protoconid to the anterior side of the hypoconid, where it is either weakly connected (LACM 153761) or separated from the hypoconid by a shallow notch (LACM 153762); 4) a well-developed, moderately long mesolophid is present that ends lingually from one-half to three-quarters the way across the central transverse valley; and 5) the posterior cingulid extends from the posterior wall of the entoconid to the posterolabial side of the hypoconid, near the junction of the hypoconid and hypolophid. LACM 153761 and 153762 differ significantly from the m1 or m2 of *S. whistleri* by having the following characters: 1) an anteroconid is lacking; 2) the anterior cingulid is a continuous crest between the metaconid and protoconid, whereas in *S. whistleri* there is a labial extension of the anterior cingulid that is separated from the protoconid by a valley; 3) a complete metalophid and hypolophid are present, whereas valleys or distinct notches interrupt these crests in *S. whistleri* (compare Figure 5F with Figure 6L); and 4) smaller size. The overall occlusal patterns of LACM 153761 and 153762 are similar to those of m1 or m2 of *P. reynoldsi*, except that the mesolophids are slightly shorter and their size is in the uppermost observed range of *P. reynoldsi* or slightly larger.

Measurements of the Sespe eomyid teeth are presented Table 7.

TABLE 7. Measurements (in mm) of teeth of Eomyidae from Simi Valley Landfill Local Fauna.

LACM #	Tooth/position	ap	tra	trp
153712	M1 or M2	1.21	1.32	1.28
153767	M1 or M2	1.13	1.23	1.08
153768	M1 or M2	1.23	—	—
153797	M1 or M2	1.16	1.41	1.36
153809	M1 or M2	1.28	1.36	1.34
153816	M1 or M2	1.21	1.39	1.36
153823	M1 or M2	—	—	1.08
153713	M3	1.16	1.22	1.03
153845	M3	1.12	1.30	1.00
153850	M3	1.14	1.31	1.08
153761	m1 or m2	1.31	—	1.20
153762	m1 or m2	1.39	1.31	1.35

Discussion—All of the Sespe M1 or M2s described above exhibit an eomyid pattern with four well-developed transverse crests (anterior cingulum, protoloph, metaloph, hypoloph). They differ from those of *Paradjidaumo* in lacking distinct mesolophs and having an endoloph that extends anterolabially

from the anterolabial side of the hypocone or metaloph to about the middle of the protoloph, whereas on M1 or M2 of *Paradjidaumo*, the mesoloph is usually a long, well-developed crest and the endoloph typically extends from the hypocone to the protocone (Burke, 1934; Wood, 1937; Black, 1965; Setoguchi, 1978; Kelly, 1992). They can easily be distinguished from those of *Metanoiamys* in having the following: 1) much larger size; 2) complete, better developed crests (more lophodont); and 3) lacking an adlophule and labial extension of the anterior cingulum. They can also be easily distinguished from those of *Simiacritomys* by their much smaller size and by having a more complete endoloph and protoloph (not interrupted by a valley), and lacking a distinct mesoloph. Two of the specimens (LACM 153767, 153823) are slightly smaller than the other five M1 or M2s and four of the M1 or M2s (LACM 153712, 153767, 153768, 153823) appear to differ from the others by exhibiting slightly more lophodont crests, especially LACM 153767, where the anterior and posterior cingula are relatively taller and connect higher on the paracone and metacone, respectively, resulting in enclosed, relatively deep valleys between the anterior and posterior cingula and the protoloph and metaloph, respectively. These differences suggest that LACM 153712, 153767, 153768, and 153823 may represent a different eomyid species from the other three M1 or M2s. LACM 153797, 153809, and 153816 are similar in size and have very similar occlusal patterns, indicating they probably represent the same species. These teeth exhibit some similarity in their occlusal morphology to those of *P. reynoldsi*, but the differences cited above indicate that they do not represent this species. They also exhibit some similarity in their occlusal morphology to those of *Protadjidaumo* Burke, 1934, and *Cristadjidaumo* Korth and Eaton, 2004. They differ from both of these genera by having the endoloph connecting anteriorly with the protoloph instead of the protocone. They further differ from those of *Cristadjidaumo* in lacking a high, moderately-developed mesoloph.

In most Eocene genera of Eomyidae where the M1 and M2 are known, the endoloph is positioned lingual of the center of the tooth and extends from the hypocone to connect with the protocone (e.g., Wood, 1936, 1937, 1974; Jacobs, 1977; Setoguchi, 1978; Storer, 1984, 1987; Korth, 1989, 1992; Wilson and Runkel, 1991; Korth and Bailey, 1992; Korth and Eaton, 2004). However, in members of the Yoderimyinae, the endoloph is positioned less lingually, often near the center of the tooth, and extends from the hypocone or the lingual portion of the metaloph just above its connection with the hypocone to the protoloph (Wood, 1955, 1974; Emry and Korth, 1993). Interestingly, all of the Sespe M1 or M2s

described above also exhibit more centrally positioned endolophs that extend from the hypocones or metalophs to the protolophs. In addition, on LACM 153767, which is in very early wear, the crests and cusps form a moderately lophodont occlusal pattern, somewhat similar to the early yoderimyid *Litoyoderimys* Emry and Korth, 1993. However, the Sespe eomyid M1 or M2s lack a long anterior cingulum with a lingual extension, a well developed mesoloph, and an ectoloph, which are typical characters observed in the upper molars of the Yoderimyinae (Emry and Korth, 1993). Although the overall occlusal patterns of all of the M1 or M2s are eomyid-like, they do not agree specifically with any recognized eomyid genus and, therefore, are referred to Eomyidae, genera and species undetermined.

Of the three new M3s, LACM 153845 and 153850 (Figure 6H-I) differ from those of *P. reynoldsi* by being much larger in size and lacking well-developed mesolophids. LACM 153713 (Figure 6J) differs from those of *Griphomys* by having the following: 1) an anterior cingulum that extends lingually from the paracone to the metaloph, connecting near its junction with the protocone and resulting in a Y-shaped occlusal pattern for the protocone, anterior cingulum, and protoloph; 2) a well-developed crest in the central valley that extends from the protoloph to the metaloph; 3) an ectoloph is present; and 4) a more centrally positioned protocone (compare Figure 6J with fig. 15G of Kelly and Whistler, 1994). Furthermore, the M3 of *Griphomys* exhibits a prominent bilophodont occlusal pattern and, when present, the protoconal spur or mesocone is represented as a small, low spur or cuspule that is connected to the posterolabial side of the protocone and only extends a short distance into the central valley (Kelly and Whistler, 1994). The differences in occlusal morphology between LACM 154713 and LACM 153845 and 153850 noted above indicate that it represents a different species. The three new M3s do not agree in occlusal morphology with any of the recognized rodent species from the Simi Valley Landfill Local Fauna, but do exhibit a four-crested occlusal pattern, like those of the Eomyidae. They are smaller than those of *Simiacritomys* and *Simimys landeri*, but comparable in size to the other undetermined eomyid M1 or M2s described above. Without intact dentitions for comparison, confident generic assignment is not possible, so these specimens are referred to Eomyidae, genus and species undetermined.

The two lower molars (LACM 153761, 153762) exhibit occlusal patterns that are very similar to those of *Paradjidaumo reynoldsi*, but they are either larger than (LACM 153762) or in the upper limit of the observed range of *P. reynoldsi* (LACM 153761) and,

on one of them (LACM 153761), the mesolophid is less developed (relatively shorter). However, Korth (1980) noted that in large samples of *Paradjidaumo* from Nebraska, although the mesolophid is usually a long crest, its development can be variable. LACM 153761 and 153762 may represent very large m1 or m2s of *P. reynoldsi*, but they could instead represent the lower molars of the undetermined eomyid species described above that has upper molars (LACM 153797, 153809, 153816) that are similar in size to LACM 153761 and 153762. In addition, the lower molars exhibit an occlusal morphology that is similar to those of *Cristadjidaumo*, but differ in the connections of the anterior cingulid and by having a less V-shaped ectolophid. In the Sespe lower molars, the anterior cingulid extends from the anterior side of the protoconid to the anterolingual base of the metaconid, whereas in *Cristadjidaumo* the anterior cingulid connects with the anterior arm of the protoconid and both the labial and lingual ends are free, not connecting with any cusp (Korth and Eaton, 2004). Because the lower molars cannot be confidently assigned to any recognized eomyid genus, they are referred to Eomyidae, genus and species undetermined.

Family Simimyidae Wood, 1980
Genus *Simimys* Wilson, 1935b
Simimys landeri Kelly, 1992
Figure 7

Referred Specimens—M1, LACM 153956, 153957; M2, LACM 153967, 153968, 153969, 153970; M3, LACM 153714, 153976, 153977, 153978, 153979, 153980, 153981; m1, LACM 153958, 153959, 153960, 153961, 153962, 153963, 153964, 153965, 153966; m2, LACM 153971, 153972, 153973, 153974, 153975; m3, LACM 153982, 153983, 153984.

Discussion—The occlusal morphology of the cheek teeth in the new sample of *Simimys landeri* fits well within the variation described by Kelly (1992) and provides no new descriptive information (Figure 7A-H). It should be noted that Kelly (1992) incorrectly stated in the description of *S. landeri*, which was also repeated in the diagnosis, that "the m3 lingual metalophid is bifurcated at its lingual end, with one spur of the bifurcation connecting to mesostylid and other spur to the base of the entoconid." This was a typographical error and should have read m3 lingual "mesolophid." The diagnostic characters that Kelly (1992) used to distinguish *S. landeri* from *S. simplex* (Wilson, 1935a) are supported by the new sample, including much larger cheek teeth with less development of the small accessory crests and stylids, a more prominent M3 hypocone, and a lingually bifurcated m3 mesolophid with one end connecting to

the mesostylid and the other end connecting to the base of the entoconid.

Dental statistics for the entire sample of *Simimys landeri* from the Simi Valley Landfill Local Fauna, including those specimens described by Kelly (1992), are provided in Table 8. Measurements of the holotype (RM1, LACM 131062) are ap = 1.71 mm, tra = 1.45 mm, trp = 1.52 mm.

TABLE 8. Dental statistics (in mm) for all teeth of *Simimys landeri* from Simi Valley Landfill Local Fauna. Includes new sample provided herein plus specimens reported by Kelly (1992).

Tooth/ Dimension	N	Mean	OR	SD	CV
M1 ap	7	1.76	1.64-1.89	0.10	5.7
M1 tra	6	1.45	1.28-1.55	0.09	6.2
M1 trp	6	1.53	1.41-1.66	0.07	4.6
M2 ap	8	1.72	1.51-1.80	0.10	5.8
M2 tra	8	1.54	1.33-1.64	0.11	7.1
M2 trp	8	1.47	1.28-1.58	0.09	6.1
M3 ap	11	1.31	1.23-1.36	0.03	2.3
M3 tra	11	1.22	1.15-1.33	0.06	4.9
M3 trp	10	1.11	1.03-1.21	0.08	5.4
m1 ap	10	1.78	1.67-1.87	0.07	3.9
m1 tra	10	1.03	0.89-1.10	0.08	7.8
m1 trp	11	1.22	1.08-1.32	0.08	6.6
m2 ap	9	1.89	1.75-2.05	0.10	5.2
m2 tra	9	1.35	1.21-1.50	0.09	6.7
m2 trp	9	1.42	1.28-1.56	0.09	6.3
m3 ap	7	1.46	1.34-1.56	0.07	4.8
m3 tra	7	1.16	1.08-1.20	0.05	4.3
m3 trp	7	0.95	0.83-1.08	0.10	10.5

Family Cylindrodontidae Miller and Gidley, 1918
Genus *Pareumys* Peterson, 1919
Pareumys sp.
Figure 8

Referred Specimens—partial M1 or M2, LACM 153955.

Description—The partial upper molar is missing the portion anterior to the protoloph, the anterolabial portion of the paracone, the posterolabial side of the metacone, and the lingual margin of the tooth (Figure 8). Even with the missing portions, the overall occlusal outline appears round or oval in shape. The paracone, metacone, and metaconule are moderately developed cusps with distinct wear facets. The protoloph is a tall, complete loph extending between the paracone and the protocone. A moderately deep valley is present between the protoloph and metaloph that also extends posteriorly and then turns labially, separating the metaloph from the protocone and posterior cingulum. The metaloph extends, in an almost straight line, from the anterolingual corner of the metacone to the metaconule. The partial protocone is represented by a bulge in the enamel at the anterolingual side of the broken tooth. A similar, but smaller, bulge in the
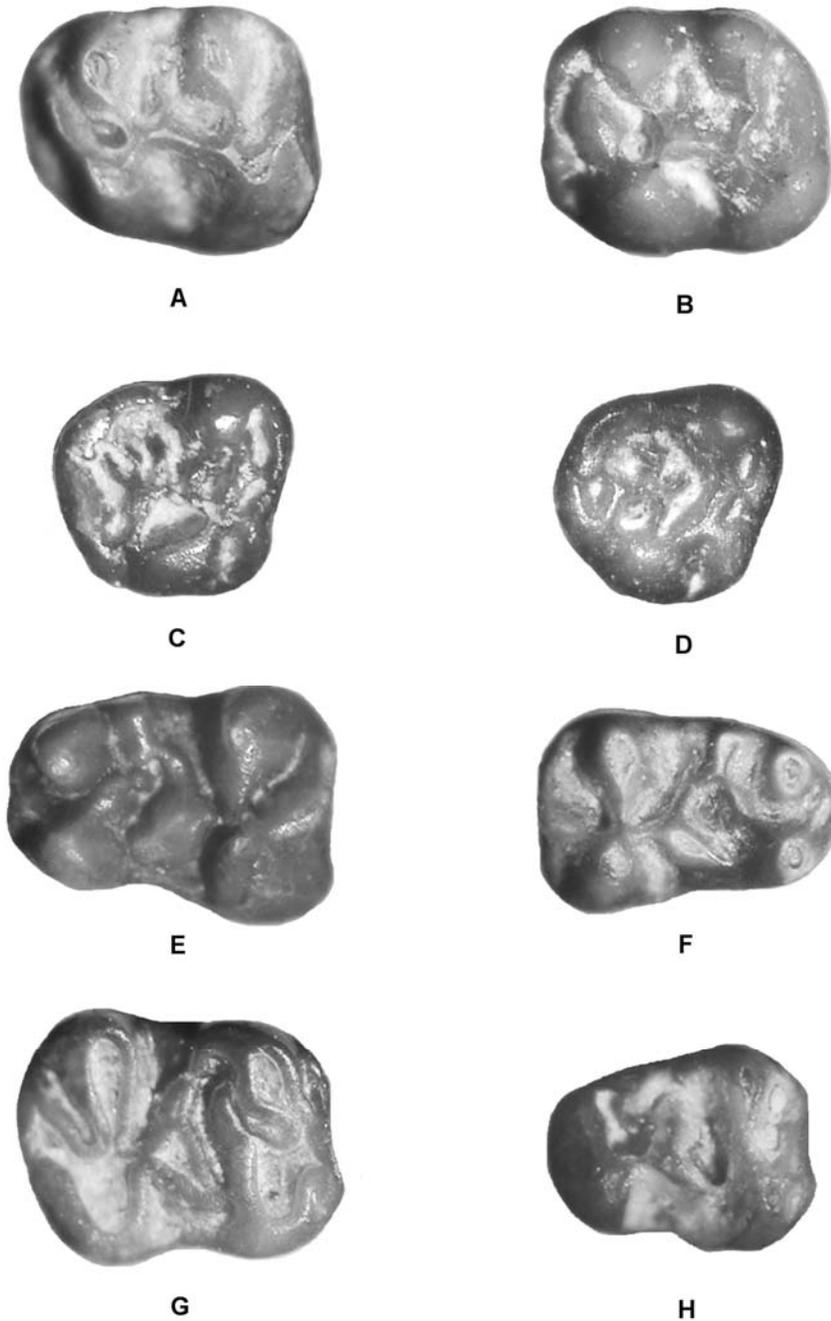
FIGURE 7. Teeth of *Simimys landeri*. A, LM1, LACM 153957; B, LM2, LACM 153969; C, RM3, LACM 153980; D, RM3, LACM 153714; E, Lm1, LACM 153960; F, Rm1, LACM 153965; G, Rm2, LACM 153973; Rm3, LACM 153984. All occlusal views, A-D with lingual at bottom, E-H with lingual at top, scale = 1 mm.

enamel at the posterolingual side of the broken tooth indicates that a hypocone was present. The morphology of the anterior cingulum cannot be determined because

it is broken off from the tooth. The posterior cingulum is a well-developed loph that extends from the posterolingual corner of the metacone to the

posterolabial corner of the hypocone. An endoloph is present between the protocone and hypocone. The endoloph and the posterior cingulum together form a continuous curved arch from the protocone to the metacone. All of the lophs are nearly equal in height, giving the tooth a flat-topped appearance.

Measurements of the partial tooth are ap = 2.10 mm and tr = 2.13 mm.

FIGURE 8. *Pareumys* sp. from Simi Valley Landfill Local Fauna, partial upper molar, LACM 153955, occlusal view, lingual at bottom, scale = 1 mm.

Discussion—LACM 153955 can be confidently assigned to *Pareumys* because it exhibits a flat-topped, lophate occlusal morphology, an incomplete metaloph that is separated from the protocone, an overall circular occlusal outline, and is lacking a mesoloph (Figure 8). *Pareumys* is a relatively rare taxon in the Eocene of California (Wilson, 1940b; Lindsay, 1968; Lillegraven, 1977; Kelly, 1990; Walsh, 1991, 1996). Kelly (1990) provided the most recent summary of the dental characters and known occurrences of *Pareumys* from southern California. LACM 153955 is similar to *Pareumys* sp. near *P. grangeri* Burke, 1935, from the Uintan Friars and Mission Valley formations of the San Diego area (Wilson, 1940b; Lillegraven, 1977) in having a straight metaloph that is well separated from the posterior cingulum, but appears derived relative to this taxon by having much better developed (higher) lophs (protoloph, metaloph, and posterior cingulum) resulting in a flatter topped occlusal surface. It differs from *Pareumys* sp., aff. *P. milleri* Peterson, 1919, from the Uintan Brea Canyon and Duchesnean Pearson Ranch local faunas (Wilson, 1940b; Kelly, 1990) in having a straight metaloph, rather than a posteriorly curved metaloph that joins or nearly joins the posterior cingulum. Although LACM 153955 may represent a new species of *Pareumys*, it is assigned to an

indeterminate species due to its fragmentary nature. This is the first record of the genus in the Simi Valley Landfill Local Fauna.

CONCLUSIONS

This report documents the discovery of a number of additional isolated rodent teeth from the Duchesnean Simi Valley Landfill Local Fauna that were recovered during a paleontologic mitigation program at the Simi Valley Landfill and Recycling Center. Included in these teeth are larger samples of *Metanoiamys korthi*, *Paradjidaumo reynoldsi*, *Simiacritomys whistleri*, and *Simimys landeri*. These larger sample sizes allow a detailed assessment of the individual variation of the occlusal morphology of the cheek teeth in these species, which provides criteria for determining the validity of their specific diagnostic characters. Prior to this report, the dP4, M3, dp4, p4, and m3 of *M. korthi*, the dp4 and m3 of *P. reynoldsi*, and the P4 and putative p4 of *S. whistleri* were unknown. The familial status of *S. whistleri* has been previously questioned (Kelly, 1992; Flynn, 2008b). However, with the discovery that a molariform P4 and putative p4 are present in *S. whistleri*, this species is now confidently referred to the Eomyidae. Additional new records for the Simi Valley Landfill Local Fauna include at least one or more undetermined eomyid species and *Pareumys* sp. A revised faunal list for the Simi Valley Landfill Local Fauna is provided in Table 9 based on the new records provided herein and those of Kelly (1992, 2009, 2010), Kelly and Whistler (1994, 1998), and Kelly et al. (1991).

TABLE 9. Revised faunal list for the Simi Valley Landfill Local Fauna (Kelly, 1992, 2009, 2010, this paper; Kelly and Whistler, 1994, 1998; Kelly et al., 1991).

Reptilia
    Squamata
        Glyptosaurini, gen. and sp. indet.
        Melanosaurini, gen. and sp. indet.
Mammalia
    Didelphimorpha
        Herpetotheriidae
            Herpetotherium sp.
        Peradectidae
            Peradectes californicus Stock, 1936
    Erinaceomorpha
        Sespedectidae
            Sespedectes singularis Stock, 1935
    Soricomorpha
        Geolabididae
            Batodonoides walshi Kelly, 2010
        Oligoryctidae
            cf. *Oligoryctes* sp.
    Primates
        Microsyopidae
            cf. *Uintasorex* sp.
    Rodentia

Ischyromyidae
   Leptotomus sp.
Eomyidae
   Metanoiamys korthi Kelly and Whistler, 1998
   Paradjidaumo reynoldsi Kelly, 1992
   Simiacritomys whistleri Kelly, 1992
   Eomyidae, gen. and spp. undetermined
Heliscomyidae
   Heliscomys walshi Kelly, 2009
Simimyidae
   Simimys simplex (Wilson, 1935a)
   Simimys landeri Kelly, 1992
Artiodactyla
   Camelidae
      Camelidae, gen. and sp. undetermined
   Hypertragulidae
      Simimeryx sp., aff. *S. hudsoni* Stock, 1934

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