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Invertebrate Paleontology

MIOCENE MACROFAUNA ALONG SESPE CREEK, VENTURA COUNTY, CALIFORNIA

Richard L. Squires and A. Eugene Fritsche

Department of Geosciences
California State University, Northridge, CA 91330

INTRODUCTION

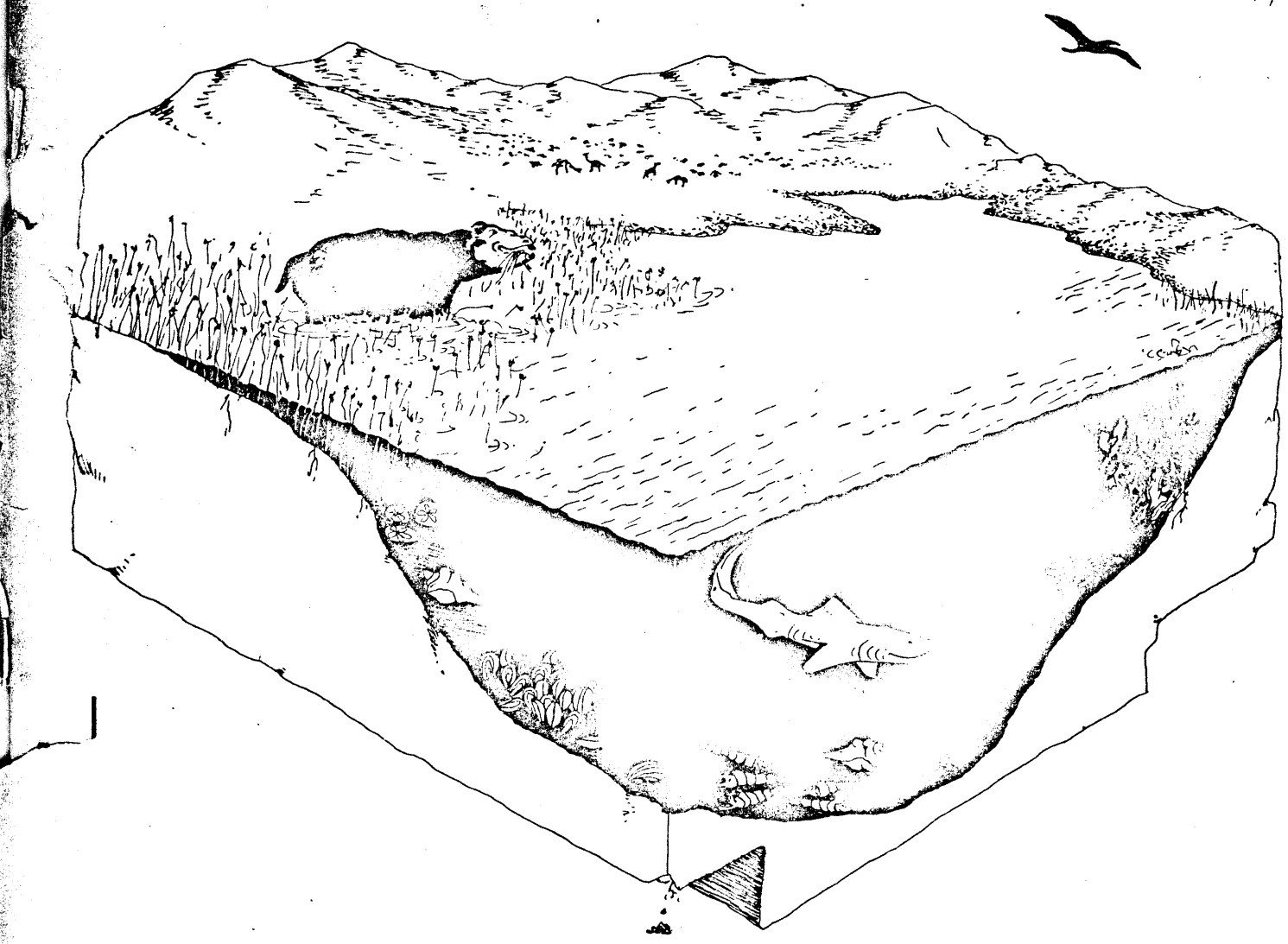
and photographic record of the Sespe Creek Miocene

Squires & Fritsche 1978

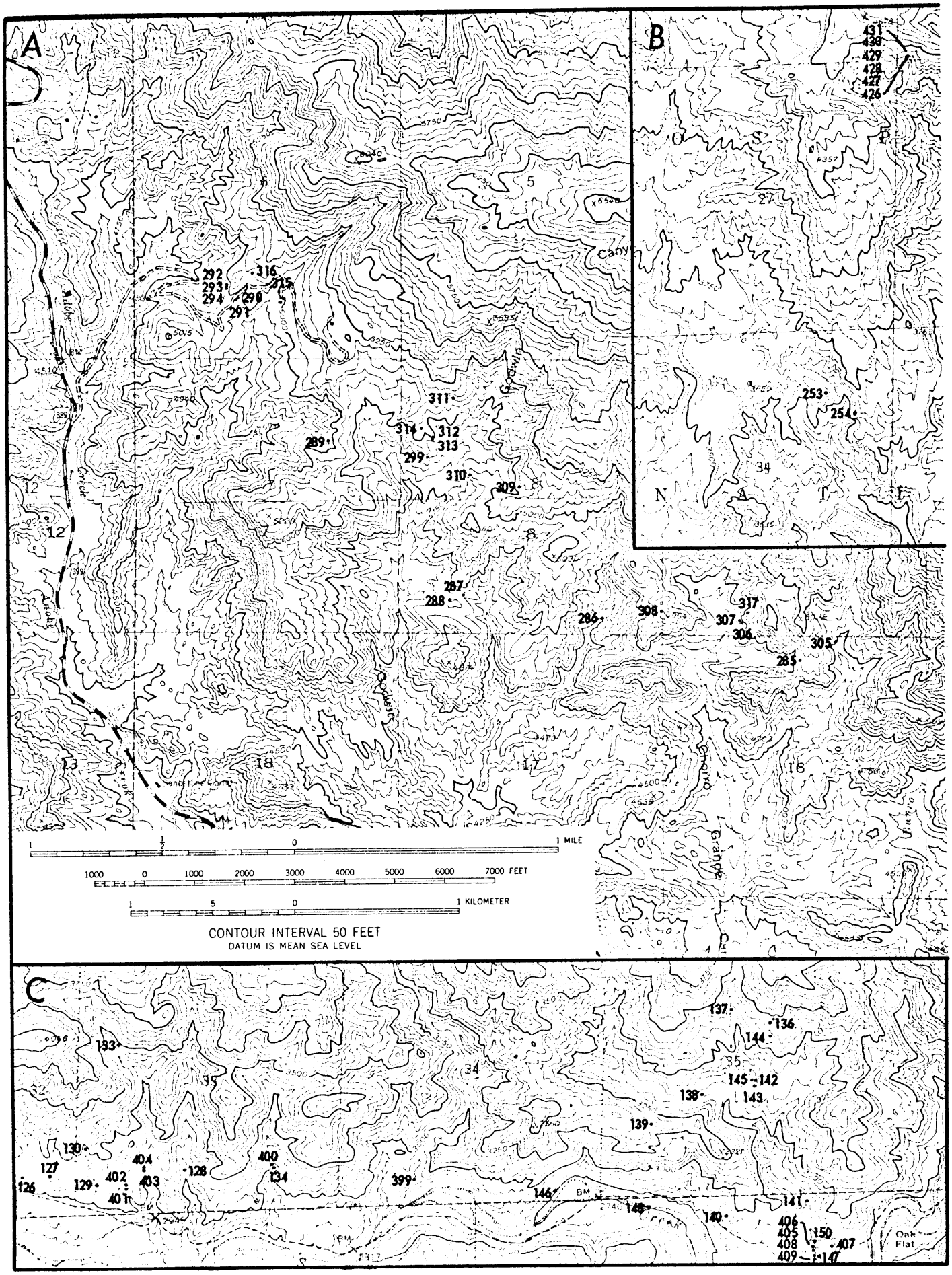
USNM Type Collection

Pacific Coast Paleogeography Field Guide 3

Squires & Fritsche 1978



DEPOSITIONAL ENVIRO


A
B
C
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
CONTOUR INTERVAL 50 FEET
DATUM IS MEAN SEA LEVEL
Cany
Coquille
Grange
Oak Flat

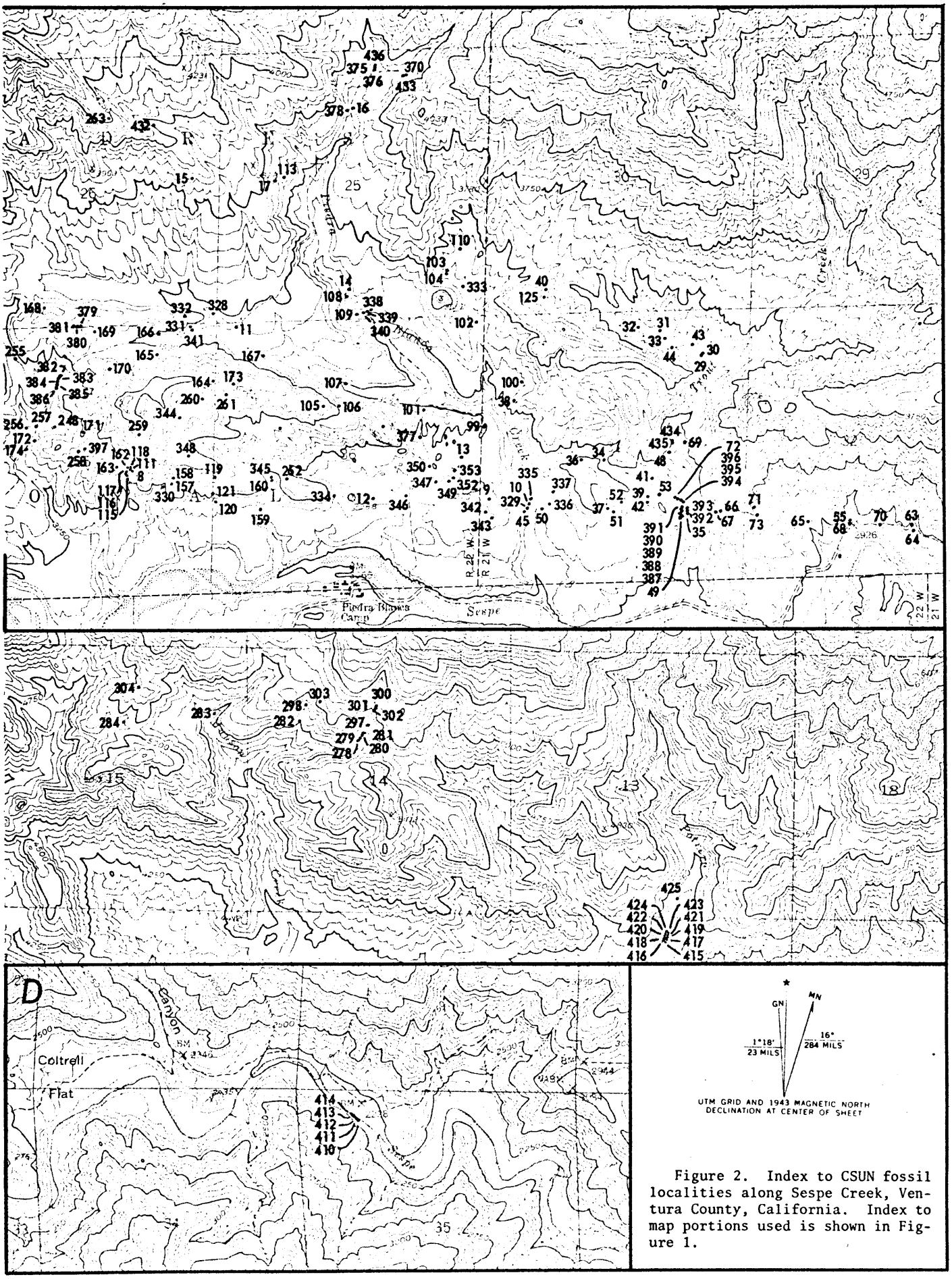


Figure 2. Index to CSUN fossil localities along Sespe Creek, Ventura County, California. Index to map portions used is shown in Figure 1.

Table 1. Checklist of macrofauna from the lower member of the Vaqueros Formation.

SPECIES	CSUN LOCALITIES																																										
	10	14	30	31	33	35	37	42	43	45	49	50	51	64	65	66	67	68	73	108	110	115	116	117	126	128	142	144	145	147	159	163	168	169	174	253	254	255	328	329	330	331
BRYOZOA																																											
unidentified bryozoan																												R									R					
GASTROPODA																																											
Potamides sespeensis																												A			C												
Rapana vaquerosensis				F		C			R			C	A		F	F	C	R	R	F	F	A		R	C	F		R	R	R	R		F			C				A	R	
Turritella inezana s.l.							R												F							C		r															
T. inezana bicarina			F					A																					R														
T. inezana pervulgata	F		A		A										A	A		A												A	C	A		A	F						A	A
Turritella s.p.				R									R																											R		
unidentified gastropods	r					R									R									R				R							f								
unidentified naticid															R																												
PELECYPODA																																											
Anomia vaquerosensis						F						A	A				A		R					A	A	A		C			A	A	F			C	A			A	A	
Clementia sp.																															R												
?Eucrassatella granti		F																																									
Macoma arctata						R																																R					
Mytilus sp.	R											R																					C										
Ostrea howelli			R									a																															
pholadid borings																																											
?Saxidomus vaquerosensis	F	F																															C					C					
unidentified bivalves				C		F				R			F				r	r													F		C					C	C				
unidentified mytilid						F										R	R											R															
unidentified pectinid	r																R							R	R							r								R			
unidentified solenid										R																					R		R							R			
Vertipecten nevadanus																																									R		
Zirfaea sp.																																											
CIRRIPEDIA																																											
Balanus sp.	A			A	R	C			R	F		C	A					R		F	C			C	C			F			C	C	f		C	C	c			A	A	
BRACHYURA																																											
crab parts																																			R								
ECHINOIDEA																																											
Kewia fairbanksi		R		C		C	F		F	R	F		F						R		a		A	F			R	F			R	C											
VERTEBRATA																																											
cetacean vertebrae	F													F																				F									
Galeocerdo sp.																																											
unident. myliobatoid teeth																																											
unident. shark teeth						R																													r								
unident. vertebrate bones																									f																		
TRACE FOSSILS																																											
unidentified burrows																	F							R																			

Symbols defined in "Introduction" section.

and upper members as used in this report is the same as that described by Fritsche and Shmitka (this guidebook), but is different from the three-way division made by Reid (this guidebook).

Fossils from the Vaqueros Formation are presented on Tables 1, 2, and 3, fossils from the Rincon Shale on Table 4, and those from the Santa Margarita Formation on Table 5.

Abundance symbols used on the tables indicate the relative number of specimens that occurred at the locality in the field, not the number collected. Capital letters indicate that specimens are in the collection at CSUN; lower case letters indicate that the fossils were present in the field, but not collected. "R" means that only one or two specimens were found, "F" indicates about three to ten specimens, "C" means that there were more than most people would want to collect, and "A" means that there were enough for a whole S.E.P.M. field trip.

This study was greatly facilitated by the help and cooperation of several people. The authors are indebted to the students at CSUN who helped over the past 15 years in the assembly of this large collection, especially to D. R. Thor and S. A. Reid. Bruce Welton, of the Los Angeles Museum of Natural History, kindly identified the vertebrate fossils. Louella Saul and Takeo Susuki shared their knowledge of Tertiary mollusks and allowed access to the University of California, Los Angeles paleontology collections. Warren Addicott shared his knowledge on the taxonomy of Miocene mollusks. Steve Grupp assisted in the photography of the fossils and in drafting. Theresa Dunn and Patricia Cournoyer typed the manuscript and the tables. Some financial assistance for this project was provided by the CSUN Geosciences Department.

The figured specimens are stored in the Univer-

Table 1. Continued - Checklist of macrofauna from the lower member of the Vaqueros Formation.

SPECIES	332	333	343	370	375	376	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	400	401	402	405	406	408	409	410	411	412	413	414	415	416	417	418	426	427	428	433	436
BRYOZOA																																										
unidentified bryozoan												R																														
GASTROPODA																																										
Potamides sespeensis						A						A										A	A		A				A					A	A		A			C	A	A
Rapana vaquerosensis							R					R					C	F	A	F	C	R									R									R		
Turritella inezana s.l.																																										
T. inezana bicarina																																										
T. inezana pervulgata		C																																								
Turritella s.p.				A																				A																		
unidentified gastropods						R	R																																			
unidentified naticid																																										
PELECYPODA																																										
Anomia vaquerosensis	a		a				A				A	C			A	A	A	A	R			c				C	c				R											
Clementia sp.																																	R									
?Eucrassatella granti																																										
Macoma arctata																						R														R						
Mytilus sp.																															R											
Ostrea howelli		A																																								
pholadid borings	R																																									
?Saxidomus vaquerosensis													R															R														
unidentified bivalves						F			R	C			R			R				R		R								R		R				F		R	R			
unidentified mytilid																																										
unidentified pectinid																			R																							
unidentified solenid																																										
Vertipecten nevadanus																																										
Zirfaea sp.													R																													
CIRRIPEDIA																																										
Balanus sp.	C		C			R		R			R	R	R			R	A		R	R	F	R																				
BRACHYURA																																										
crab parts									A													R																			R	
ECHINOIDEA																																										
Kewia fairbankski											R			R																												
VERTEBRATA																																										
cetacean vertebrae				R	R																																					
Galeocerdo sp.																																									R	
unident. myliobatoid teeth																											R															
unident. shark teeth																																										
unident. vertebrate bones							R																																			
TRACE FOSSILS																																										
unidentified burrows																																										

sity of California, Los Angeles (UCLA) invertebrate paleontology collection. The remaining specimens are part of the CSUN invertebrate paleontology collection.

SYSTEMATIC PALEONTOLOGY

No attempt has been made to write synonymies for the taxa discussed herein. The original reference is given for each species and, where the original reference is inadequate, a supplementary reference is presented which adds pertinent information.

Representative specimens of many of the species from Sespe Creek are figured in Plates 1 through 4 of this article. Species not figured are those for which the specimens were too poorly preserved to allow informative photographs or those that have been figured by others in numerous publications.

Taxonomic classification and arrangement of the brachiopods, cirripeds, and echinoids is based on the systems used in the "Treatise on Invertebrate Paleontology" edited by R. C. Moore. The classification scheme used for the molluscan groups is based on the system used by Keen and Coan (1974). Other groups and their respective classification formats are: desmostylid (Reinhart, 1959), elasmobranch (Phillips and others, 1976), and coralline algae (Bold and Wynne, 1978, p. 464, 499, 508).

Kingdom ANIMALIA

Unidentified fossil fragment

At locality 280, a single specimen was found which consists of a circular depression, 5 mm in diameter, that has shell material around the sides and along the bottom. The shell material along the bottom shows concentric lines.

Table 2. Checklist of macrofauna from the middle member of the Vaqueros Formation.

SPECIES	CSUN LOCALITIES																																						
	8	9	11	15	17	29	32	39	40	41	44	52	53	55	63	70	71	72	103	104	107	109	111	113	118	119	120	121	125	127	129	133	134	136	137	138	140	143	146	148
BRYOZOA																																								
unidentified bryozoan															R																									
SCAPHOPODA																																								
unidentified scaphopod										R																														
GASTROPODA																																								
Calyptraea sp.																		R																						
Conus aff. *C. owenianus*																																							R	
Cylichna sp.																																							R	
Ficus ocoyana											R																												R	
Ocenebra dorrancei?																		R																					R	
Sinum scopulosum																																								
Rapana vaquerosensis							R								R																		R							
Turritella inezana s.l.										R								C							A													A		
T. inezana bicarina		A	C	C	A															A	C			C			A							A					C	R
T. inezana pervulgata																A																								
Turritella sp.						c																										f								
unidentified gastropods				R							R																													
unidentified naticid																																							R	
PELECYPODA																																								
Acila sp.																																								
Amussiopecten vanvlecki											R																													
Anomia vaquerosensis																																								
Anadara santana																				R																				
A. cf. *A. microdonta*																		R																						R
Chione cf. *C. richthofeni*			C	F	C													C		A					A		R												F	
Dosinia sp.																																								
Macoma arctata				R							R							F							R															
Ostrea eldridgei ynezana		A											A																											
O. howelli	A			A		A	A	C	C			A		A	A		A		A			A	A	A				A	A	A	A	A	A	A	A	A	A			
Panopea ramonensis				F																																				
Spondylus perrini																													R											
unidentified bivalves			F		R						F							R		C						F													F	
CIRRIPEDIA																																								
Balanus sp.																																								
VERTEBRATA																																								
unidentified shark teeth																																								
unidentified vertebrate bones																																					R			
TRACE FOSSILS																																								
unidentified burrows																																								

Symbols defined in "Introduction" section.

Phylum BRYOZOA

Unidentified bryozoan

Bryozoa are rare, but occur as encrusting forms on *Anomia vaquerosensis* or *Rapana vaquerosensis*.

Phylum BRACHIOPODA
Class ARTICULATA
Order TEREBRATULIDA

Unidentified terebratulid
Pl. 4, fig. 5

Most specimens are incomplete and/or crushed, but are articulated and have the shell material still intact. Average length of the uncrushed specimens is 2.5 cm.

Phylum MOLLUSCA
Class SCAPHOPODA

Unidentified scaphopod

Preservation of the single 2-cm-long, tapered tube that was found was too poor to allow generic determination.

Class GASTROPODA

Unidentified gastropods

The unidentified gastropods occur as molds or as crushed and/or replaced shell fragments. Internal molds at locality 298 have been phosphatized.

Table 2. Continued - Checklist of macrofauna from the middle member of the Vaqueros Formation.

SPECIES	150	157	158	162	165	166	167	170	171	172	248	256	257	258	334	335	336	337	338	339	340	341	342	394	395	396	397	399	403	404	407	419	420	421	422	423	424	429	430	431
BRYOZOA																																								
unidentified bryozoan																																								
SCAPHOPODA																																								
unidentified scaphopod																																								
GASTROPODA																																								
Calyptraea sp.																																								
Conus aff. *C. owenianus*																																								
Cylichna sp.																																								
Ficus ocoyana																																								
Ocenebra dorrancei?																													R											
Sinum scopulosum			R																																					
Rapana vaquerosensis																											R													
Turritella inezana s.l.				F									A		R		A			R							F					C					C			
T. inezana bicarina			A						A	C											A	R		A					C					C		C			C	
T. inezana pervulgata												A							F																					
Turritella sp.	f																											C			C				c		C			
unidentified gastropods									R										F									R												
unidentified naticid																																								
PELECYPODA																																								
Acila sp.																	R																							
Amussiopecten vanvlecki																																								
Anomia vaquerosensis																																		r			R			
Anadara santana																				R														C	C	c			c	C
A. cf. *A. microdonta*																																								
Chione cf. *C. richthofeni*	R		A	C																A						F	F	R	C						C	C			C	
Dosinia sp.																												R												
Macoma arctata			A																A									R	C		A				c	C				
Ostrea eldridgei ynezana					A		C	A										A																						
O. howelli		A		A		A				A	A					C	A					A	A		C								C					C		
Panopea ramonensis			R																C																					
Spondylus perrini																																								
unidentified bivalves									R										R		F					R		R	R					c	R				R	
CIRRIPEDIA																																								
Balanus sp.			R																							R														
VERTEBRATA																																								
unidentified shark teeth																														R										
unidentified vertebrate bones			R											R																										
TRACE FOSSILS																																								
unidentified burrows															r																								R	

(Column group heading: CSUN LOCALITIES)

Subclass PROSOBRANCHIA
Order ARCHAEOGASTROPODA
Family Turritellidae

Genus *Turritella* Lamarck, 1799

Four taxonomic categories are used for *Turritella* specimens from this area. The category *Turritella inezana* s.l. is used for those specimens that show the two prominent spiral lines of the *T. inezana* group, but which are not preserved well enough to allow subspecies determination. The designation *T. inezana bicarina* is used for those specimens that have two, equally spaced primary spiral lines of equal strength. In better specimens, one or several minor spiral lines occur between these two primaries, and in a few specimens, an anterior sutural spiral line is also present, but is less prominent than the primaries. The *T. inezana pervulgata* category is for those specimens which have a very strong posterior primary and less strong anterior and anterior sutural spirals. In the better preserved specimens, several minor spiral lines occur between the posterior and anterior spirals.

As noted by Loel and Corey (1932), some of the larger *T. inezana pervulgata* specimens have *T. inezana bicarina* ornamentation on the juvenile whorls. For identification purposes, therefore, it was necessary to consider only the larger sized specimens at any one locality. At a few locations large sized specimens of both subspecies were found. Loel and Corey (1932) believed that *T. inezana bicarina* ornamentation was the ancestral form of the *T. inezana* group and was retained in the other subspecies. In this study, however, *T. inezana pervulgata* seems to be the more ancestral subspecies because it is the most common of the two in the lower member and *T. inezana bicarina* is the most common in the middle

Table 3. Checklist of macrofauna from the upper member of the Vaqueros Formation.

SPECIES	CSUN LOCALITIES																																			
		16341		16173		16217																														
	12	16	34	36	38	48	69	99	100	101	102	105	106	130	139	141	160	164	173	259	260	261	262	263	344	345	346	347	348	349	350	351	377	378	425	432	434	435
PELECYPODA																																						
Amussiopecten vanvlecki					R																R				F													
Chlamys sespeensis			F	F																																		
Lyropecten magnolia																								C												F		
Ostrea eldridgei	C	f	C	C		F	A			A	C		A	C	C		C	R		r	C			a		A	C		C								R	
pholadid borings																								R														
unidentified pelecypods		F									R																								A			
unidentified pectinid													R					R		R									R					A		C		
Vertipecten nevadanus																						R		R														
CIRRIPEDIA																																						
Balanus sp.																																		R		R		
ECHINOIDEA																																						
unidentified spatangoid?		R																																				
unidentified echinoid parts																				C				a														
VERTEBRATA																																						
Carcharodon angustidens									R																					R								
Carcharodon sp.									R																													
Desmostylus sp.								R																														
Galeocerdo sp.									R																													
Isurus sp.								C	F			F				R				R			C					C		R		R						
Odontaspis sp,									R																						R							
unidentified shark teeth																			R										r				R					R
unident. vertebrate bones			F																																		r	

Symbols defined in "Introduction" section.

member.

The category *Turritella* sp. is used for those specimens which were very poorly preserved or for those localities where *Turritella* specimens were seen but not collected.

Turritella inezana Conrad s.l.

Turritella inezana Conrad, 1857c, p. 195, pl. 8, fig. 4. Merriam, 1941, p. 105-107, pl. 23, figs. 1-4; pl. 24, figs. 1, 8-12; pl. 26, fig. 6.

All specimens of *Turritella inezana* s.l. are incomplete and most consist of adult whorls which are heavily coated with well indurated matrix or are partial internal molds. At localities 118 and 143, *T. inezana* s.l. is abundant enough to form distinct beds, and at locality 257, the specimens are oriented.

Table 4. Checklist of macrofauna from the Rincon Shale.

SPECIES	CSUN LOCALITIES			
	13	352	353	
BRACHIOPODA				
unidentified terebratulid		C		
VERTEBRATA				
cetacean vertebrae			F	
Isurus sp.	C		R	

Symbols defined in "Introduction" section.

Turritella inezana bicarina Loel and Corey

Turritella inezana bicarina Loel and Corey, 1932, p. 257-258, pl. 58, figs. 1-5; pl. 59, figs. 1, 3a, 3b, 4-7. Merriam, 1941, p. 110-111, pl. 25, figs. 1, 2.

Most specimens of *Turritella inezana bicarina* are fragmentary adult shells that average 5 cm in length and 2 cm in diameter; no complete specimens were found. Preservation generally is poor to fair; well preserved specimens are rare. At localities 17, 107, 120, and 394, specimens are abundant enough to form distinct beds.

Turritella inezana pervulgata Merriam

Turritella inezana pervulgata Merriam, 1941, p. 108-109, pl. 25, figs. 7, 11.

Most specimens of *Turritella inezana pervulgata* are fragments of adult whorls, 3 to 5 cm in length; one nearly complete specimen, 13 cm in length, was found. Preservation is generally poor to fair; a few specimens are well preserved. At localities 30, 65, and 147, specimens are abundant and form distinct beds. At localities 33, 256, and 331, *T. inezana pervulgata* fragments form coquinoid beds.

Turritella sp.

Specimens of *Turritella* sp. show only the turritellid form and in many cases only a cross-sectional view is present.

Table 5. Checklist of macrofauna from the Santa Margarita Formation.

SPECIES	CSUN LOCALITIES																																						
	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317
GASTROPODA																																								
Calyptrea sp.																															A									
Crepidula sp.																												C												
Scaphander sp.																															R									
Vermetus? sp.																								C																
unidentified gastropods		R																			F						R	C				R				F	R	R		
PELECYPODA																																								
Aequipecten discus	C						C			F		A				C		F	A																					
Anadara sp.		A				C				F							C																							
Crassostrea titan				c								A	A			C										a	C							C	A	F	A		A	
Dosinia sp.								R																																
Lyropecten crassicardo																											C								C		C			
ostreid coquina																														A										
pholadid borings											A																													
unidentified pectinid		R		R																																				
unidentified solenid																												F												
unidentified tellinid										F												F																		
unidentified pelecypods		F		R					A	C		R		F			C	R		C	A	c	A				R	C			A	F		C		A				
CIRRIPEDIA																																								
Balanus sp.																		F									F									F	F	F	
ECHINOIDEA																																								
Astrodapsis antiselli														A	A			A					C			C	C						C							
VERTEBRATA																																								
Isurus sp.																													R											
marine mammal bones					C		A			A																														
unident. vertebrate bones		R									F																													
TRACE FOSSILS																																								
unidentified burrows										A															A									A						F
UNIDENT. FOSSIL FRAGMENTS			R																																					
RHODOPHYCEAE																																								
Corallinaceae																																				A				
FACIES	A																			B			C																	

Symbols defined in "Introduction" section.

Family Vermetidae

Genus *Vermetus* Daudin, 1800

Vermetus? sp.

Specimens of *Vermetus?* sp. occur as closely packed, small tubes whose morphologic details are mostly obliterated by replacement. No spires were seen although the tubes are up to 2.5 cm in length.

Family Potamididae

Genus *Potamides* Brongniart, 1810

Potamides sespeensis Loel and Corey
Pl. 1, fig. 1

Potamides sespeensis Loel and Corey, 1932, p. 253, pl. 46, figs. 16, 17.

At most localities where *Potamides sespeensis* occurs, specimens are so abundant that they form distinct, thin beds that contain very few other associated species. Specimens are mostly complete and, at some localities, growth series are present. Preservation commonly is poor, but a few specimens show the axial nodes.

Family Calyptraeidae

Genus *Calyptraea* Lamarck, 1799

Calyptraea sp.

Specimens of *Calyptraea* sp. from both the Vaqueros and Santa Margarita Formations are internal molds. Most are small and uncrushed.

Genus *Crepidula* Lamarck, 1799

Crepidula sp.
Pl. 4, fig. 6

All of the specimens are internal molds. Most are partial individual specimens, but a few are stacked one atop the other in the living position.

Family Naticidae

Genus *Sinum* Röding, 1798

Sinum scopulosum (Conrad)

Sigaretus scopulosus Conrad, 1849, p. 727, pl. 19, figs. 6, 6a.

Sinum scopulosum (Conrad). Marincovich, 1977, p. 350-354, pl. 33, figs. 13, 14; pl. 34, figs. 1-5.

Only a single, moderately preserved specimen of *Sinum scopulosum* was found. Loel and Corey (1932) also reported only a single specimen of this gastropod from the Sespe Creek region.

Unidentified naticid

Three specimens of unidentified naticids were found, all poorly preserved and crushed.

Family Ficidae

Genus *Ficus* Röding, 1798

Ficus ocoyana (Conrad)

Sycotopus ocoyanus Conrad, 1855, p. 19.

Ficus (Trophosycon) ocoyana (Conrad). Grant and Gale, 1931, p. 743-746, pl. 30, figs. 3, 7, 8a, 8b, 11.

Only two moderately well preserved juvenile specimens of *Ficus ocoyana* were found. Loel and Corey (1932) reported that *F. ocoyana* is rare in the Vaqueros horizon, with only a questionable occurrence in the Ventura-Ojai area and no occurrences in the Sespe Creek region.

Order NEOGASTROPODA
Family Muricidae

Genus *Ocenebra* Gray, 1847

Ocenebra dorrancei? (Loel and Corey)

Tritonalia dorrancei Loel and Corey, 1932, p. 247-248, pl. 47, figs. 17a, 17b, 18a, 18b.

Most of the few specimens of *Ocenebra dorrancei?* are very small and fragmental, but a single large specimen, 2 cm in height, was found at locality 403. Preservation is poor to fair. If the identification is correct, this represents the first recorded occurrence of the species from the Sespe Creek region.

Family Rapanidae

Genus *Rapana* Schumard, 1817

Rapana vaquerosensis (Arnold)
Pl. 1, figs. 2-6

Purpura vaquerosensis Arnold, 1907b, p. 426, pl. 52, figs. 1a, 1b.

Rapana vaquerosensis (Arnold). Loel and Corey, 1932, p. 244-245, pl. 50, figs. 1, 2, 3a, 3b; pl. 51, figs. 2, 3.

Many of the specimens of *Rapana vaquerosensis* are complete or nearly complete and preservation is fair to good. Locally, as at localities 115, 391, and 393, specimens are abundant enough to form *Rapana* beds. At localities 35, 50, 51, 391, and 393, growth series were collected. Typical well developed node ornamentation of *R. vaquerosensis* is shown in all specimens at localities 35, 50, and 51 (Pl. 1, fig. 6). At localities 391 (Pl. 1, fig. 4) and 393, the juvenile specimens are smaller than at the other localities and those less than 2.5 cm in height could be classified as *Solenosteira venturana* Loel and Corey, whereas the adult forms are definitely *R. vaquerosensis*. Loel and Corey (1932) noted that juvenile forms of *R. vaquerosensis* are practically indistinguishable from the *Solenosteira* form, so in this report no attempt has been made to differentiate between these two taxonomic groups.

Plate 1. Fossils from the lower member of the Vaqueros Formation. (Figures are natural size except where noted.)

Figure 1--*Potamides sespeensis* Loel and Corey, hypotype UCLA 58223, CSUN loc. 401; 2--*Rapana vaquerosensis* (Arnold), hypotype UCLA 58218, CSUN loc. 384; 3--*R. vaquerosensis* (Arnold), hypotype UCLA 58219, CSUN loc. 391; 4--*R. vaquerosensis* (Arnold), hypotype UCLA 58221, CSUN loc. 392; 5--*R. vaquerosensis* (Arnold), hypotype UCLA 58201, CSUN loc. 51; 6--*R. vaquerosensis* (Arnold), hypotype UCLA 58200, CSUN loc. 51; 7--*Mytilus* sp., exterior of right valve, catalogued specimen UCLA 58224, CSUN loc. 412; 8--*Anomia vaquerosensis* Loel and Corey, exterior of left (upper) valve, hypotype UCLA 58217, CSUN loc. 383; 9--*Balanus* sp., catalogued specimen UCLA 58220, CSUN loc. 392; 10--Unidentified crab cheliped, catalogued specimen UCLA 58222, CSUN loc. 400; 11--*Kewia fairbanksi* (Arnold), hypotype UCLA 58206, CSUN loc. 142.

Family Conidae

Genus *Conus* Linnaeus, 1758

Conus aff. *C. owenianus* Anderson

Conus oweniana Anderson, 1905, p. 201-202, pl. 15, figs. 58, 59.

Conus (Chelyconus) owenianus Anderson. Addicott, 1970, p. 122-123, pl. 17, figs. 1-8, 32, 37.

Only three excellently preserved spires of *Conus owenianus* were found, all from the same locality. These spires are similar to the stout, low-spired forms recognized by Addicott (1970).

Subclass OPISTHOBRANCHIA
Order CEPHALASPIDEA
Family Scaphandridae

Genus *Cylichna* Lovén, 1846

Cylichna sp.

Although only a few poorly preserved, but complete, specimens of *Cylichna* sp. were found, all from the same locality, *Cylichna* aff. *C. alba* was reported by Loel and Corey (1932) from the Sespe Creek region.

Genus *Scaphander* Montfort, 1810

Scaphander sp.

Only a single, uncrushed, internal mold, 1.5 cm in height, was found.