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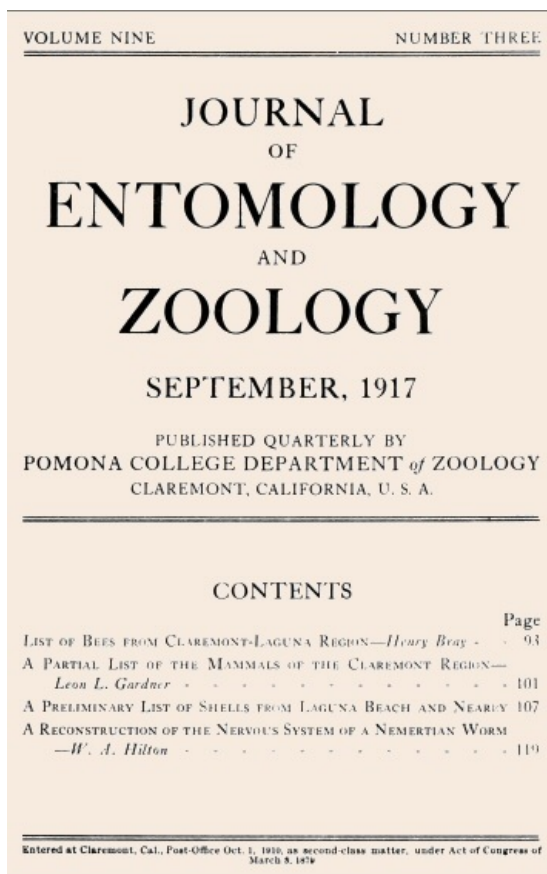
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Journal of Entomology and Zoology

EDITED BY POMONA COLLEGE, DEPARTMENT OF
ZOOLOGY

Subscription \$1.00 to domestic, \$1.25 to foreign countries.

This journal is especially offered in exchange for zoological and entomological journals, proceedings, transactions, reports of societies, museums, laboratories and expeditions.

The pages of the journal are especially open to western entomologists and zoologists. Notes and papers relating to western and Californian forms and conditions are particularly desired, but short morphological, systematic or economic studies from any locality will be considered for publication.

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Manuscripts should be sent by express or registered mail.

List of Bees from Claremont-Laguna Region

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HENRY BRAY

Through the kindness of Prof. T. D. A. Cockerell and several others I have been able to get large numbers of our local bees determined. The basis of the work was the extensive Cook-Baker collection of the college with additional material of my own and others. Many of the species here listed have been collected by me and others, but unless not represented in the original college collection it is not noted in the list. So far as the relations of bees to plants has been noted by me it is given in the list. Many other species remain to be determined and only a beginning has been made in respect to the relation of the bees to plants.

BOMBIDÆ

Bombus sonorus. Say. Det. Vier. Claremont, Cal., Baker. April, Fl., Nemophila.

Bombus californicus. Sm. Det. Vier. Claremont, Cal., Baker. May, Fl., Phacelia tanacætifolia.

Bombus crotchii. Vier. Det. Cr. Claremont, Cal., Baker. May, Fl., Tar weed.

ANTHOPHORIDÆ

Anthophora anstrutheri. Ckll. Det. Ckll. Claremont, Cal., Baker. April, Fl., Lotus glaber.

Anthophora curta. Prov. Claremont, Cal., Baker. April, Fl., Lotus glaber.

Anthophora urbana. Cr. Claremont, Cal., Baker. April, Fl., Cactus and poppy.

Anthophora washingtoni. Ckll. Det. Ckll. Claremont, Cal., Baker.

Anthophora stanfordiana. Vier. Claremont, Cal., Baker. May, Fl., Amsinckia intermedia.

Anthophora pacifica. Vier. Mountains near Claremont, Cal., Baker. April, Fl., Lotus glaber.

Anthophora simillima. Cr. Claremont, Cal., Baker. April, Fl., Lotus glaber.

Anthophora edwardsii. Cr. Det. Ckll. Claremont, Cal., Baker. April, Fl., Phacelia tanacætifolia.

Mellisodes pallidicineta. Ckll. Det. Br. from Coll. Claremont, Cal., Bray. April, Fl., Phacelia tanacætifolia.

Mellisodes maura. Cr. Det. Br. from Coll. Claremont, Cal., Bray. May, Fl., Amsinckia intermedia.

Mellisodes pullata. Cr. Det. Br. from Coll. Claremont, Cal., Bray. April, Fl., Phacelia tanacætifolia.

Mellisodes menuacha. Cr. Det. Br. from Coll. Claremont, Cal., Bray. May, Fl., Phacelia tanacætifolia.

Mellisodes beltragei. Cr. Det. Br. from Coll. Claremont, Cal., Bray. Fl., Amsinckia interm.

Synhalonia atriensis. Smith Det. Br. from Coll. Claremont, Cal., Bray. May, Fl., Phacelia tanacætifolia.

Diadasia crassicauda sp. n. Ckll. Det. Ckll. Laguna, Cal., R. La Follette.

Diadasia bituberculata. Cr. Det. Cr. Claremont, Cal., Baker. April, Fl., Cactus.

Diadasia australis rinconis. Ckll. Det. Ckll. Claremont, Cal., Baker. May, Fl., Cactus.

Diadasia australis opuntia. Ckll. Claremont, Cal., Baker. May. Fl., Cactus.

EUCERIDÆ

Tetralonia actiosa. Det. Cr. Claremont, Cal., Baker.

Tetralonia fowleri. Ckll. Det. Ckll. Claremont, Cal., Baker.

Tetralonia pomonæ sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.

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Tetralonia robertsoni. Ckll. Det. Ckll. Claremont, Cal., Baker.

MELECTIDÆ

Bombomelecta thoracicia. Cr. Det. Cr. Claremont, Cal., Baker. April, Nemophila.

Pseudomelecta californica miranda. Fox. Claremont, Cal., Baker.

Bombomelecta thornica. Cr. Claremont, Cal., Baker. May, Fl., Nemophila.

Zacosmia maculata. Cr. Claremont, Cal., Baker.

Triepeolus ancoratus sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.

Triepeolus callopus. Ckll. Det. Ckll. Claremont, Cal., Baker.

Bombomelecta maculata. Vier. Det. Ckll. Claremont, Cal., Baker.

NOMADIDÆ

Nomada edwardsii. Cr. Det. Ckll. Claremont, Cal., Baker. June, no Fl.

Nomada beulahensis. Ckll. Det. Br. Claremont, Cal., Bray. From Coll. April, no Fl.

Nomada americana. Kby. Det. Br. Claremont, Cal., Bray. From Coll. April, no Fl.

Nomada crotchii nigrior. Ckll. Det. Ckll. Claremont, Cal., Baker.

Nomada civilis. Cr. Det. Ckll. Claremont, Cal., Baker.

Nomada pyrria sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.

Nomada melanosoma, sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.

Nomada subvicinalis. Ckll. Det. Ckll. Claremont, Cal., Baker.

Nomada erythrospila sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.

Nomada odontocera sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.

Exomalopsis velutinus. Ckll. Det. Ckll. Claremont, Cal., Baker.

Exomalopsis melanurus sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.

Exomalopsis nitens sp. n. Ckll. Det. Ckll. Laguna, Cal., R. La Follette.

XYLOCOPIDÆ

Xylocopa varipuncta. Patt. Det. Vier. Claremont, Cal., Baker. April, no Fl.

Xylocopa orsifex. Sm. Det. Vier. Mountains near Claremont, Cal., Baker. April, Wood.

Xylocopa californica. Cr. Det. Friese. Claremont, Cal., Baker. April, Nemophila.

MEGACHILIDÆ

Megachile pruing. Sm. Det. Friese. Claremont, Cal., Bray. May, Fl., Cactus.

Megachile grindeliarum. Ckll. Det. Ckll. Claremont, Cal., Bray. May, Fl., Poppy.

Megachile occidentalis. Fox. Det. Ckll. Claremont, Cal., Bray.

Megachile frugalis. Cr. Det. Ckll. Claremont, Cal., Baker.

Osmia erythrosmia remotula. Des. Ckll. Claremont, Cal., Baker.

Osmia quadriceps. Ckll. Det. Cr. Mountains near Claremont, Cal., Baker.

Osmia atrocyanea. Ckll. Det. Ckll. Claremont, Cal., Baker. May, Fl., *Amsinckia intermedia*.

Osmia propinqua. Cr. Claremont, Cal., Baker.

Osmia kincaidii. Ckll. Det. Ckll. Mountains near Claremont, Cal., Baker.

Osmia bennettæ. Ckll. Det. Ckll. Mountains near Claremont, Cal., Baker.

Osmia integra. Ckll. Det. Ckll. Claremont, Cal., Baker.

Osmia cobaltina. Cr. Det. Ckll. Claremont, Cal., Baker. May, Lotus glaber.

Osmia faceta. Cr. Det. Ckll. Claremont, Cal., Baker.

Osmia clarescens. Ckll. Det. Ckll. Claremont, Cal., Baker. April, Fl., *Phacelia tanacetifolia*.

Osmia granulosa. Ckll. Det. Ckll. Claremont, Cal., Baker.

Osmia regulina. Ckll. Det. Ckll. Mountains near Claremont, Cal., Baker.

Osmia ednæ, female. Ckll. Det. Ckll. Mountains near Claremont, Cal., Baker.

Osmia playtura. Ckll. Det. Ckll. cotype. Claremont, Cal., Baker.
Osmia hypochrysea. Ckll. Det. Ckll. Claremont, Cal., Baker.
Osmia pumila. Frieze Det. Cr. Claremont, Cal., Bray. May, Fl. Mustard.
Osmia cyanopoda sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.
Osmia cyanosoma. Ckll. Det. Ckll. Claremont, Cal., Baker.
Osmia nigrobarta sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.
Hoplitis sambuci. Titus Det. Ckll. Claremont, Cal. April, Poppy.
Hoplitina pentamera. Ckll. Det. Ckll. Claremont, Cal., Baker.
Osmia pogonigera. Ckll. Det. Ckll. Claremont, Cal., Baker.
Alcidamea hypocrita. Ckll. Det. Ckll. Claremont, Cal., Baker.
Osmia melanopleura sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.
Anthidium maculoscum. Cr. Det. Cr. Claremont, Cal., Baker.
Dianthidium illustri. Cr. Det. Ckll. Claremont, Cal., Baker.
Anthidium palliventre. Cr. Det. Br. from Coll. Claremont, Cal., Baker.
Anthidium tricuspium. Prov. Det. Ckll. Claremont, Cal., Baker.
Dianthidium consimile. Ashmead Det. Ckll. Claremont, Cal., Baker.
Dianthidium robertsoni. Ckll. Det. Ckll. Mountains near Claremont, Cal., Baker.
Anthidium angelarum. Titus Det. Ckll. Claremont, Cal., Baker.
Dianthidium provancheri. Titus Det. Ckll. Claremont, Cal., Baker.
Dioxys producta. Cr. Det. Duche. Claremont, Cal., Baker.
Dioxys pomonæ. Ckll. Det. Ckll. Claremont, Cal., Baker.
Coelioxys megatracha sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.
Coelioxys angulifera sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.
Xenoglossa angelica. Ckll. Det. Ckll. Claremont, Cal., Baker.

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ANDRENIDÆ

Andrena porterae. Vier. Det. Ckll. Claremont, Cal., Baker.
Andrena mustelicolor. Vier. Det. Vier. Claremont, Cal., Baker.
Andrena prunorum. Vier. Det. Ckll. Claremont, Cal., Baker and Bray. May, Phacelia tana. and Poppy.
Andrena mimecta. Ckll. Det. Ckll. Mountains near Claremont, Cal., Baker.
Andrena texana. Cr. Det. Br. from Coll. Claremont, Cal., Bray. May, Fl., Poppy.
Andrena bipuntala. Lovell Det. Br. from Coll. Claremont, Cal., Bray. April, Fl., Phacelia tan.
Andrena cerasifolii. Vier. Det. Ckll. Claremont, Cal., Baker. April, Phacelia tanacetifolia.
Andrena carlina Ckll. Ashmead Det. Br. from Coll. Claremont, Cal., Bray. May, Fl., Mustard.
Andrene osmoides sp. n. Cr. Det. Ckll. Claremont, Cal., Baker.
Andrena peratra sp. n. Prov. Det. Ckll. Claremont, Cal., Baker.
Andrena auricoma. Sm. Det. Ckll. Claremont, Cal., Baker.
Andrena plana. Vier. Det. Ckll. Claremont, Cal., Baker.
Andrena opaciventris sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.
Andrena chlorura sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.
Agapostemon splendens. Friese Des. Lange. Los Angeles, Cal.
Agapostemon californicus. Crawford. Claremont, Cal., Baker. May, Poppy.
Agapostemon radiatus. Say. Det. Br. from Coll. Claremont, Cal., Bray. April, Fl., Daisy.
Diandrena beatula sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.
Diandrena chalybæa. Cr. Det. Ckll. Claremont, Cal., Baker.
Diandrena cyanosoma sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.

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Diandrena clarventris sp. n. Ckll. Claremont, Cal., Baker.
Diandrena scintilla sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.
Conanthalictus bakeri. Crawford Det. Ckll. Claremont, Cal., Baker. « 99 »
Conanthalictus macrops sp. n. Ckll. Det. Ckll. Claremont, Cal. Baker.
Augochlora pomoniella. Ckll. Det. Ckll. Claremont, Cal., Baker.
Andrena candida. Sm. Det. Ckll. Claremont, Cal., Baker.
Andrena angustitarsata. Vier. Det. Vier. Claremont, Cal., Baker.
Andrena huardi. Vier. Det. Vier. Claremont, Cal., Baker.
Andrena pallidifæva. Vier. Det. Vier. Claremont, Cal., Baker.
Andrena cyanosoma. Ckll. Det. Vier. Claremont, Cal., Baker.
Andrena nigripes. Prov. Det. Vier. Claremont, Cal., Baker.
Andrena scripta. Vier. Det. Vier. Claremont, Cal., Baker.
Andrena subtristis. Ckll. Det. Vier. Claremont, Cal., Baker.

CERITINIDÆ

Ceratina neomexicana punctigena sub. sp. n. Ckll. Det. Ckll. Claremont, Cal., Baker.

HALICTIDÆ

Halictus incompletus. Craw. Det. Mountains near Claremont, Cal., Baker.
Halictus punctatoventris. Craw. Claremont, Cal., Baker.
Halictus nigrescens. Craw. Claremont, Cal., Baker.
Halictus catalinensis. Craw. Det. Ckll. Claremont, Cal., Baker.
Halictus ligatus. Say. Det. Craw. Claremont, Cal., Baker.
Halictus robustus. Craw. Det. Claremont, Cal., Baker.
Halictus mellipes. Craw. Det. Claremont, Cal., Baker.
Halictus farinosus. Sm. Det. Craw. Claremont, Cal., Baker.
Halictus rhoptoides. Craw. Det. Br. from Coll. Claremont, Cal., Bray. April, Daisy.

COLLETIDÆ

Colletes californicus. Prov. Claremont, Cal., Baker.
Colletes quadialis. Sm. Det. Ckll. Claremont, Cal., Baker.

PROSOPIDÆ

Prosopis episcopalis, female. Ckll. Det. Metz. Claremont, Cal., Baker (Rhus laurina). « 100 »
Prosopis coloradensis. Ckll. Det. Metz. Mountains near Claremont, Cal., Baker.
Prosopis polifolii, female. Ckll. Det. Metz. Mountains near Claremont, Cal., Baker.

PANURGIDÆ

Panurginus atriceps. Ckll. Det. Cr. Claremont, Cal., Baker.

(Contribution from the Zoological Laboratory of Pomona College)

A Partial List of the Mammals of the Claremont Region

LEON L. GARDNER

Since little or nothing has been published on mammals of this region it was deemed advisable to print a list even though very incomplete and based on preliminary and limited collecting in order to have some definite forward step in this much neglected line. Some of the mammals listed below have not been collected by us but are known to occur. Thanks are due Mr. H. S. Swaith for his kind aid in identification of some of the skins collected.

Bears of course have long since disappeared but still have left their reputation among old

mountaineers. The story goes that a bear, perhaps the last one, was killed at Bear Flats on the trail to "Old Baldy," hence the name.

Odocoileus hemionus californicus. (Caton.) California Mule Deer. Fairly common through Upper Sonoran and Transition zones. They have been taken as low as the mouth of San Dimas canyon. The recently established game preserve assures an increase in the future. Already they seem to have sensed the protection for on May 19, 1916, we were surprised to find just 75 feet before us a large doe on the auto road not far above the first power house.

Ovis canadensis nelsoni? C. M. Merriam. Merriam Desert Bighorn. Mountain sheep have lived for years in the higher peaks above Claremont but being very shy and in inaccessible and little frequented parts have escaped attention very successfully. Rumor has it that Mountain Goats are found with the sheep but I believe this to be unfounded, having been originated probably by the sight of the smaller horned females and young. The area occupied by the sheep is a very definite one and comprises the peaks Ontario, Cucamonga, Telegraph, St. Antonio ("Old Baldy"), and Iron Mountain with their high rocky intervening ridges. Of the points mentioned the first three peaks are the favored ones. I found only a few tracks on Iron Mountain and a rumor of a pair of horns found there some five or eight years ago. "Old Baldy" being too often visited is not a frequented spot for the sheep, serving only as a connecting link to Iron Mountain. However signs around Ontario, Cucamonga and Telegraph peaks are abundant and anyone with a little patience and diligent endeavor can readily see the sheep themselves. They travel often in bands, as many as fifty and in summer keep to the highest places. Where they go in winter is as yet a mystery to me, probably lower into canyon heads for I have never found them on the top during this season. This of course is natural for these peaks practically become great ice mountains dangerous for anything to travel over. Besides grass the food consists of twigs and leaves of *Castanopsis sempewirens*, several species of *Ceanothus*, *Rhamnus croceus californicus*, *Rhus trilobata* and a parsnip *Pastinaca sativa*.

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Citellus beecheyi. Richardson. California Ground Squirrel. Abundant in all parts from brush land to 8,000 feet altitude in suitable localities.

Sciurus griseus anthonyi. Mearns. Anthony Gray Squirrel. Very common in the transition zone. In early spring they start working on pine cones on the mountain tops, gradually coming down to more abundant supplies of food until fall finds them down in the oak belt feeding on acorns. They winter as low as Palmers canyon in some cases.

Entomias Sp. Abundant in the pine belt and as high as the top of "Baldy." They are good climbers, exceedingly active and bursting with curiosity.

Onychomys torridus ramona. Rhoads. San Bernardino Grasshopper Mouse. But two specimens of this carnivorous mouse were taken in a period of trapping extending over three months. Both specimens were taken on bait consisting of rolled oats and in the same place, east of Indian Hill in the brush. A good many of my specimens were more or less devoured in the traps in this locality, and I strongly suspect this mouse of the crime. Nowhere else were my mice eaten or were any grasshopper mice taken.

Peromyscus maniculatus gambeli. Baird. Gambel White-footed Mouse. This species was one of the most common forms taken, being abundant in the brushy valley and foothills. There is a great deal of color variation in the specimens taken.

Peromyscus boylei rowleyi. (Allen.) Rowley White-footed Mouse. No specimens were trapped in the valley. However these mice were found not uncommon at the mouth of Palmers canyon, just four miles north of Claremont, in the dry brush land. Within the canyon they were common and were taken as high as the top of Ontario peak along fallen logs. At Camp Baldy they are very common especially along watercourses and fallen logs. Indications are that they ignore zonal limits being taken well down in Lower Sonoran zone and in high transition and not necessarily near water.

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Peromyscus californicus insignis. Rhoads. Chemisal Mouse. Not common. None were taken in the valley and few in the canyons. They were not found along waterways but frequently brushy hillsides. This is a large species of mouse and was almost too much for the little "gee whiz" traps to hold.

Peromyscus eremicus fraterculus. Miller. Dulzura Mouse. Common in the brush land of both valley and foothill, being found in the canyons also.

Reithrodontomys megalotis longicauda. Baird. Long-tailed Harvest Mouse. Common in valley and foothill. Although partial to grassy areas (I took many in the grassy runways made by meadow mice—*Microtus californicus*). I found them not uncommon in the dry brush land east of Indian Hill.

Neotoma fuscipes macrotis. Thomas. Southern Brush Rat. Common from valley to 5,000 feet in the mountains in suitable localities. I took one in the property house at the Greek theatre this June. The large nests are seen very commonly in the canyons and hillsides.

Neotoma intermedia intermedia. Rhoads. Intermediate Brush Rat. There seems to be a curious reversal of conditions between this and the former species. Whereas this species is supposed to be taken only up to 3,000 feet, I took none below 3,000, all being taken at 5,000 feet or more along fallen logs near watercourses, and the former species was limited more distinctly to the

foothills which is not a typical condition.

Microtus californicus californicus. (Peale.) California Meadow Mouse. Common in runways through the grass in damp canyons, at Palmers canyon and in other suitable localities. One was taken as high as Kelly's cabin—on Ontario peak, among fallen logs by a cold mountain stream. While setting trap in the runways I more than once caught glimpses of them darting along the aisles in the grass.

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Thomomys bottæ pallescens. Rhoads. Southern Pocket Gopher. Abundant in the valley, often doing much damage in lawns and orchards.

Perodipus agilis agilis. (Gambel.) Gambel Kangaroo Rats. Abundant from valley to Transition zone. I found them abundant at Brown's Flats where the evidences of their digging and their holes are on every side. I have trapped them in brush country, rocky areas, open brushless places, and at the mouth of ground squirrel holes.

Lepus californicus. (Gray.) Jack-Rabbit. Common in the valley and to a certain extent in the foothills and higher.

Sylvilagus auduboni sanctidiegi. (Miller.) San Diego Cottontail. Abundant in the Lower Sonoran zone. Increasing each year due to the protection afforded by game laws. Considerable damage to young trees is done by cottontails and they are a great pest to the farmer.

Sylvilagus bachmani cinerascens. (Allen.) Ashy Brush Rabbit. Fairly common in the brush. They are not swift runners and rely on escaping by hiding behind clumps of brush. This is more typically an Upper Sonoran form.

Felis oregonensis oregonensis. (Rafinesque.) Pacific Cougar. Numberless reports are always coming in of Mountain Lions and as usual most of them prove to be unfounded. However authentic records of these beasts are not lacking. I have personally inspected a specimen shot in Cold Water Canyon not more than five years ago. Tradition has it that at one time a mountaineer was actually besieged for two days in the little cabin at Browns Flats. Lions have been seen at Browns Flats, Cattle Canyon and the north of Telegraph peak. Mountaineers tell me that they are a great deal more common in the San Gabriel drainage. The specimen which I saw was from one of the tributary canyons to the San Gabriel river.

Lynx eremicus californicus. (Mearns.) California Wild Cat. Common in the mountains and ranging over the valley. About once a year a specimen is brought in to be skinned or identified and great stories are told about them. One of the commonest fallacies is that there are two forms in the mountains, one a "Bob cat" with short tail and ear tufts, and the other a true "Link" or Lynx with longer tail and more prominent ear tufts. It is little wonder, however, that such a notion exists in view of the fact of the great range or variations found in these animals. As for actual records of captures. In the summer of 1911 one was shot in the brushy hillsides of Laguna Canyon (Orange Co.) and brought in to the Marine Laboratory. In the spring of 1912 a ♀ was shot at the mouth of San Dimas canyon and brought to the college. In December 1914 a ♀ in very worn pelage was shot while crossing the Santa Ana river near Prado Beach and brought to me to be skinned. Finally while trapping for foxes in Palmers canyon in March of 1916 I took a male.

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Canis ochropus ochropus. (Eschscholtz.) California Coyote. Common in the brush land above Claremont and in the foothills. The yapping bark is a very familiar cry to any who live near the outskirts of the town and may be heard nearly any evening. Although having camped numerous times in the mountains I have never heard Coyotes above the foothill region.

Urocyon cinereoargenteus californicus. (Mearns.) California Gray Fox. Signs of foxes in the canyons and along mountain trails are always quite common. Fœces containing seeds of manzanita berries are familiar occurrences. They are fond of fruit and are readily trapped with such bait. In March 1916 three were caught one night at the same place in Live Oak canyon.

Procyon psora psora. (Gray.) California Coon. Coons are fairly common in the larger canyons where there is an abundance of water. I have seen their tracks in Palmers, Cucamonga and San Antonio canyons. Three were trapped this winter (1916) just above Camp Baldy at an altitude of about 5400 feet.

Mephitis occidentalis holzneri. (Mearns.) Southern California Striped Skunk. Not very common in this region, found mostly in the Upper Sonoran zone in wooded districts.

Spilogale phenax phenax. (C. H. Merriam.) California Spotted Skunk. Very common in valley, foothills and up to 6,000 feet in the mountains. They are fearless little creatures and will readily enter cabins in the mountains and keep the occupant awake by rattling pots and pans while scrambling around in search of food, needless to say creating an awkward situation for the host. They have been known to take up their abode underneath houses in Claremont and take the liberty of scampering around the parlor floor without regard to the presence of human beings. This was a common occurrence in a certain family I have in mind and on such occasions the unwelcome guest was gently ushered to the door without hurting its feelings and peace of mind restored to the household. They are the easiest of all animals to trap and made considerable trouble and embarrassment for me by continually blundering into traps of mine set for other game. I have found these little creatures as high as 6,000 feet in the canyons.

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Mustela xanthogenys xanthogenys. (Gray.) California Weasel. I had always been interested in weasels as to their occurrence and until this year had taken only one in town with a record of

only two or three seen along the railroad track. Then in one week four weasels were given me and a record of seven others obtained, all these are from nearby orange groves and from below town along the railroad track where for a long time I have known they occurred.

Scapanus latimanus occultus. (Grinnell and Swartz.) Southern California Mole. Moles are occasionally caught in orchards and lawns and the characteristic workings are familiar sights in the mountains up to 8,000 feet. Our specimens were all from the valley.

Antrozous pallidus pacificus. (Merriam.) Pacific Pale Bat. I have taken several of these bats from behind pictures and in the attics of some of the college buildings. I do not know their relative abundance or distribution but they are certainly common on the campus in spring and summer.

Myotis evotis. (Allen.) Long-eared Bat. This form also occurs in the college buildings and I believe to a certain extent in the mountains.

(Contribution from the Zoological Laboratory of Pomona College)

A Preliminary List of Shells from Laguna Beach and Nearby

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For a number of years past students have collected shells from Laguna Beach, these and the Bradshaw collection form the basis for this list, which includes shells not farther than ten or twelve miles up and down the coast. The earlier collections were by Mabel Guernsey and P. R. Daggs. Practically all the shells drawn and photographed are from the Bradshaw collection because the shells were in better condition. Some of the earlier specimens were determined by the United States National Museum. Suggestions and corrections were kindly made by Mrs. T. S. Oldroyd. The photographs are by Robins and Cooper. Many of the drawings are by Miss Margaret Cate. Doubtful specimens are largely omitted in this list, but a few are included and marked by a question.

Plate I, reduced one-half; Plates II and III, natural size; Plate IV, ×10; Plate V, ×6.

BIVALVES

Yoldia cooperi Sabb. [Fig. 1.](#)

Mytilus californicus Conr. [Fig. 2.](#)

M. stearnsii Pils and Raym. [Fig. 3.](#)

Septifer bifurcatus Rve. [Fig. 4.](#)

Modiolus modiolus Linn. [Fig. 5.](#)

M. rectus Conr. [Fig. 6.](#)

Lithophaga plumula Hanl. Rock borer. [Fig. 7.](#)

Pecten (Chlamys) monotimeris Conr. [Fig. 8.](#)

Pecten (Chlamys) æquisulcatus Cpr. [Fig. 9.](#)

Pecten (Chlamys) pastatus Sby. [Fig. 10.](#)

Pecten (Hinnites) giganteus Gray. [Fig. 11.](#)

Lima dehiscens Conr. [Fig. 12.](#)

Ostrea lurida Cpr. California oyster. [Fig. 13.](#)

Chama Pellucida Sby. [Fig. 14.](#)

Phacoides californicus Conr. [Fig. 15.](#)

Phacoides (Lucina californica) californicus Conr. [Fig. 15.](#)

Phacoides nuttallii Conr. [Fig. 16.](#)

Cardium quadrigenarium Conr. [Fig. 17.](#)

Cardium (Livocardium) substriatum Conr. [Fig. 18.](#)

Tivela (Pachydesma) crassatelloides Conrad. [Fig. 19.](#) small specimen.

Chione fluctifrage Sby. [Fig. 20.](#)

Chione succincta Val. [Fig. 21.](#)

Chione undatella Sby. [Fig. 22.](#)

Donax lævigata Desh. [Fig. 23.](#)

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Tagelus californicus Conr. [Fig. 24.](#)
Macoma nasuata Conr. Bent-nosed Macoma. [Fig. 25.](#)
Macoma indentata Cpr. Indented Macoma. [Fig. 26.](#)
Macoma inflatula Dall. Inflated Macoma. [Fig. 27.](#)
Semele rupium Sby. Semele-of-the-Rocks. [Fig. 28.](#)
Cumingia californica Conr. California Cuming-shell. [Fig. 29.](#)
Mya (Cryptomya) californica Conr. False Mya. [Fig. 30.](#)
Spisula planulata Conr. [Fig. 31.](#)
Spisula falcata Sld. (?). Falcate Mactra. [Fig. 32.](#)
Paphia staminea Conrad. Ribbed Carpet-shell. [Fig. 33.](#)
Paphia tenessima Cpr. Finest Carpet-shell. [Fig. 34.](#)
Parapholas californica Conr. California Piddock. [Fig. 35.](#)
Pholadidea penita Conr. Common Piddock. [Fig. 36.](#)
Pholadidea subrostrata Sby. Little Borer. [Fig. 37.](#)
Milneria minima Dall. Last Milner-shell. [Fig. 38.](#)
Aula (Nucula) casternsis Hinds. Camp Nut-shell. [Fig. 39.](#)

FRESH-WATER AND LAND SHELLS UNIVALVES

Physa heterostropha Say. Laguna stream. [Fig. 40.](#)
Physa occidentalis Tryon. Aliso Lake. [Fig. 41.](#)
Limnophysa palustris Mull. [Fig. 42.](#)
Planorbis (Helisoma) trivolvis Say. [Fig. 43.](#)
Helix aspera Mull. [Fig. 44.](#)
Epiphragmophora Sp. [Fig. 45.](#)

MARINE UNIVALVES

Acmaea persona Esch. Mask Limpet. [Fig. 46.](#)
Acmaea spectrum Nutt. Ribbed Limpet. [Fig. 47.](#)
Acmaea patina Esch. Pale Limpet. [Fig. 48.](#)
Acmaea scabra Roe. Tile Limpet. [Fig. 49.](#)
Acmaea incessa Hds. Seaweed Limpet. [Fig. 50.](#)
Acmaea asmi Midd. Black Limpet. [Fig. 51.](#)
Acmaea (Lottia) gigantea. Owl Limpet. [Fig. 52.](#)
Acmaea paleacea Gld. Chalf Limpet. [Fig. 53.](#)
Tylodina fungina Gab. [Fig. 54.](#)
Gadinia reticulata Sby. Netted Button-shell. [Fig. 55.](#)
Crucibulum spinosum Sby. Cup and Saucer Limpet. [Fig. 56.](#)
Crepidula dorsata Brod. Wrinkled Slipper-shell. [Fig. 57.](#)
Crepidula aculeata Gmel. Prickly Slipper-shell. [Fig. 58.](#)
Crepidula adunca Sby. Hooked Slipper-shell. [Fig. 59.](#)
Crepidula nivea Gould. White Slipper-shell. [Fig. 60.](#)
Crepidula onyx Sby. Onyx Slipper-shell. [Pl. II. Fig. 19.](#)
Fissurella volcano Rve. Volcano Shell. [Fig. 62.](#)
Fissuridea aspera Esch. Rough Key-hole Limpet. [Fig. 63.](#)
Fissuridea murina Dall. White Key-hole Limpet. [Fig. 64.](#)
Lucapina crenulata Sby. Great Key-hole Limpet. [Fig. 65.](#)
Clypidella (Lucapinella) calliomarginata Cpr. Southern Key-hole Limpet. [Fig. 66.](#)

Megatebennus bimaculatus Dall. Spotted Key-hole Limpet. [Fig. 67.](#)

Turris (Bathytoma) carpenteriana Gab. Carpenter Turret Shell. [Fig. 68.](#) (Laguna Beach, Jahraus.)

Trophon belcheri Hds. Belcher Trophon. [Fig. 69.](#) (Jahraus.)

Trophon triangulatus Cpr. Three-cornered Trophon. Dredged off Laguna Beach. Bean. [Fig. 70.](#)

Australium undosus Wood. Wavy Topshell. [Fig. 71.](#)

Bullaria gouldiana Pisb. Gold's Bubble-shell. Many collected at Balboa much larger than the specimens shown. [Fig. 72.](#)

Haminea vesicula Gld. White Bubble-shell. [Fig. 73.](#)

Haminea virescens Sby. Green Bubble-shell. [Fig. 74.](#)

Cypraea spadicea Gray. Nut-brown Cowry. [Fig. 75.](#)

Trivia californica Gray. Little Coffee-bean. [Fig. 76.](#)

Trivia solandri Gray. Solander Trivia. [Fig. 77.](#)

Erato vitellina Hds. Veally Erato. [Fig. 78.](#) (Slightly enlarged.)

Erato collumbella Mke. Dove Shell. [Fig. 79.](#)

Marginella varia Sby. Colored Marginella. [Fig. 80.](#)

Marginella jewetti. California Rice shell. Much like the last but white.

Olivella biplicata Sby. Purple Olive Shell. [Fig. 81.](#)

Olivella pedroana Conr. Pedro Olive Shell. [Fig. 82.](#)

Conus californicus Hds. California Cone. [Fig. 83.](#)

Macron lividus A. Ad. Livid Macron. [Fig. 84.](#)

Littorina scutulata Gld. Checkered Littorine. [Fig. 85.](#)

Littorina planoxis Nutt. Gray Littorine. [Fig. 86.](#) Turned.

Purpura (Cerostoma) nuttallii Conr. Nuttall's Hornmouth. [Fig. 87.](#)

Tegula (Chlorostoma) gallina Fbs. Speckled Turban Shell. [Fig. 88.](#)

Tegula (Chlorostoma) aureotincta Fbs. Gilded Turban Shell. Large umbilicus with yellow. [Fig. 89.](#)

Omphalus fuscecens Phil. Banded Turban Shell. [Fig. 90.](#)

Tegula veridula ligulata Wke. [Fig. 91.](#)

Norrissia norrisii Sby. Smooth Turban Shell. [Fig. 92.](#)

Thais emarginata Desh. Rock Purple. [Fig. 93.](#)

Acanthia lapilloides Conr. Pebbly Unicorn. [Fig. 94.](#)

Acanthia elongata Conr. Angled Unicorn. [Fig. 95.](#)

Acanthia spirata Blain. [Fig. 96.](#)

Murex gemma Sby. [Fig. 97.](#)

Murex (Tritonalia) lurida Cpr. Lurid. [Fig. 98.](#)

Murex (Tritonalia) gracillima R. E. C. S. [Fig. 99.](#)

Murex (Tritonalia) circumtexta R. E. C. S. [Fig. 100.](#)

Murex (Tritonalia) poulsoni Nutt. [Fig. 101.](#)

Epitonium hindsii Cpr. White Wentletrap. [Fig. 102.](#)

Epitonium crenatoides Cpr. [Fig. 103.](#)

Actæon puncticælatatus Cpr. Barrel Shell. [Fig. 104.](#)

Mitra idæ Melv. Ida's Miter Shell. [Fig. 105.](#)

Mitra lowei Dall (?). [Fig. 106.](#)

Alectrion (Nassa) perpinguis Gld. [Fig. 107.](#)

Arcularia (Nassa) tegula Reeve. Cover-lip. [Fig. 108.](#)

Turris ophioderma Dall. Pencilled Drill Shell. [Fig. 109.](#)

Potomides (Certhidæ) californica Hold. California Horn Shell. [Fig. 110.](#)
Myurella simplex Cpr. Simple Auger Shell. [Fig. 111.](#)
Amphissa versicolor Dall. Joseph Coat. [Fig. 112.](#) Slightly enlarged.
Calliostoma canaliculatum Mart. Channeled Top Shell. [Fig. 113.](#)
Polynices recluziana Desh (?). Southern Moon Shell. [Fig. 114.](#) under side.
Amalthea antiquata Linn. Ancient Hoof Shell. [Fig. 115.](#)
Amalthea tumens Cpr. Sculptured Hoof Shell. [Fig. 116.](#)
Fossarus fenestratus Cpr. Windowed Isapis. [Fig. 117.](#)
Lacuna unifasciata Cpr. One-banded Chink Shell. [Fig. 118.](#)
Melampus olivaceus Cpr. Olive Ear Shell. [Fig. 119.](#)
Janthina trifida Nutt. Violet Snail. Shell violet. Jahraus collection. [Fig. 120.](#)
Leptothyra carpenteri Pilsb. Red Turban Shell. [Fig. 121.](#)
Leptothyra baccula Cpr. Berry Turban. [Fig. 122.](#)
Calliostoma tricolor Gabb. Three-colored top shell. [Fig. 123.](#)
Haliotis rufescens Swains. Red Abalone. Quite common near Laguna.
Haliotis cracherodii Leach. Black Abalone. More common than the red.

TOOTH SHELLS

Dentalium neohexagnum S. and P. Hexagonal Tusk Shell. Dredged off Laguna.

CHITONS

Mophia hindsii Sby. Hind's Chiton. [Fig. 124.](#)
Mophia mucosa Gld. Mossy Chiton. [Fig. 125.](#)
Ischnochiton clathratus Rve. [Fig. 126.](#)
Ischnochiton magdalensis Hinds. Gray Chiton. [Fig. 127.](#)
Nuttallina scabra Rve. Scaly Chiton. [Fig. 128.](#)
Nuttallina californica Nutt. California Chiton. [Fig. 129.](#)
Trachydermon dentiens Gld. (Pseudodenturus). [Fig. 130.](#)
Lepidopleurus rugatus Cpr. [Fig. 131.](#)
Callistochiton crassicosatus Pilsb. Thick-ribbed Chiton. [Fig. 132.](#)
Tonicella hartwegii Cpr. Hartweg's Chiton. [Fig. 133.](#)

SMALL SHELLS Wash Drawings by Miss M. Cate

Caecum californicum Dall. Common at Laguna Beach. [Pl. IV. Fig. 1](#) ×10.
Vitrinella williamsoni Dall (?). [Pl. IV. Fig. 2](#) ×10. (This specimen in the Bradshaw collection was so determined, probably at Washington.) Arch Beach, Cal., near Laguna.
Columbella chrysalloidea Cpr. Shell white. [Pl. IV. Fig. 3](#) ×10.
Columbella pencillata Cpr. White shell, cross lines brown. [Pl. V. Fig. 1](#) ×6.
Columbella gausapata Gould. Common Dove-shell. Brown mottled. [Pl. V. Fig. 2](#) ×6.
Liotia acuticostata Cpr. Sharp-ribbed Liotia. Pure white. [Pl. V. Fig. 3](#) ×6.
Seila assimilata Cpr. Dark brown. [Pl. V. Fig. 4](#) ×6.
Turbonilla lammata Cpr. [Pl. IV. Fig. 4](#) ×10. Light brown. (Dunkeria).
Tinostoma supralata Cpr. (?). [Pl. V. Fig. 5](#) ×6. Clear white. (Ethalia).
Callistoma tricolor Gabb. [Pl. V. Fig. 5](#) ×10.
Phasianella pulloides Gld. [Pl. V. Fig. 6](#) ×6. Mottled red and white.
Tritonalia barberensis Gabb. [Pl. V. Fig. 7.](#)
Leptothyra baccula Cpr. Pink to gray. [Pl. V. Fig. 8](#) ×6.
Leptothyra carpenteriana Pilsb. Red Turban-shell. [Pl. V. Fig. 9](#) ×6.
Leptothyra paucicosta Dall. White. [Pl. V. Fig. 10](#) ×6.

Jeffreysia translucens Cpr. (?). [Pl. V. Fig. 11](#) ×6.
Pedipes unisulcata J. G. Cooper. Light brown. [Pl. V. Fig. 12](#) ×6.
Mitromorpha aspera Cpr. Brown. [Pl. V. Fig. 13](#) ×6.
Vermetus anellum Morch. White. [Pl. IV. Fig. 6](#) ×10. This specimen is more coiled than some others.
Cerithiopus convexa Cpr. Dark brown. [Pl. V. Fig. 14](#).
Cerithiopus columna Cpr. Light brown. [Pl. V. Fig. 15](#).
Turritella mesalia lacteola Cpr. Pure white. (No figure.)
Bithium aspera Gabb. Brown. [Pl. IV. Fig. 7](#) ×10.
Turbonilla styliana Cpr. (?). [Pl. IV. Fig. 8](#) ×10.
Turbonilla costanea Cpr. (?). [Pl. IV. Fig. 9](#) ×10.
Anachis subturiata Cpr. (?). [Pl. IV. Fig. 10](#) ×10.
Amphissa versicolor Dall. Pink, white, brown. [Pl. V. Fig. 16](#) ×6.
Corbila luteola Cpr. Small bivalve.
Philobrya setosa Cpr. Small bivalve. [Pl. V. Fig. 17](#) ×6.
Acila castrensis Hds. Brownish. [Pl. V. Fig. 18](#) ×6.
Carditanera minima Dall. Brownish-yellow. [Pl. IV. Fig. 11](#) ×10.
Crassatella marginata Cpr. [Pl. IV. Fig. 12](#) ×10.
Lasea rubra Mort. Tinged with red. [Pl. V. Fig. 19](#) ×10.
Arca solida Br. & Sby. (?). [Pl. V. Fig. 20](#) ×10.

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(Contribution from the Zoological Laboratory of Pomona College)

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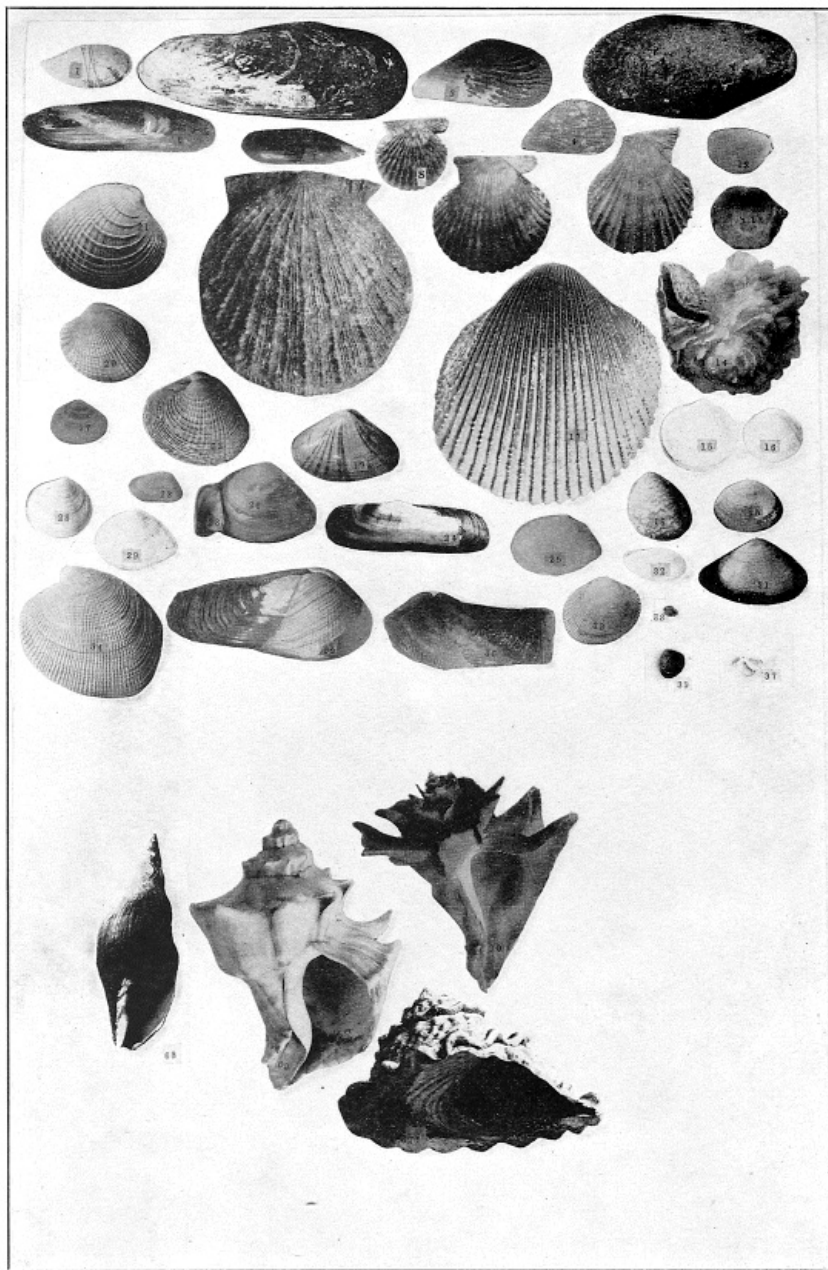


Plate I

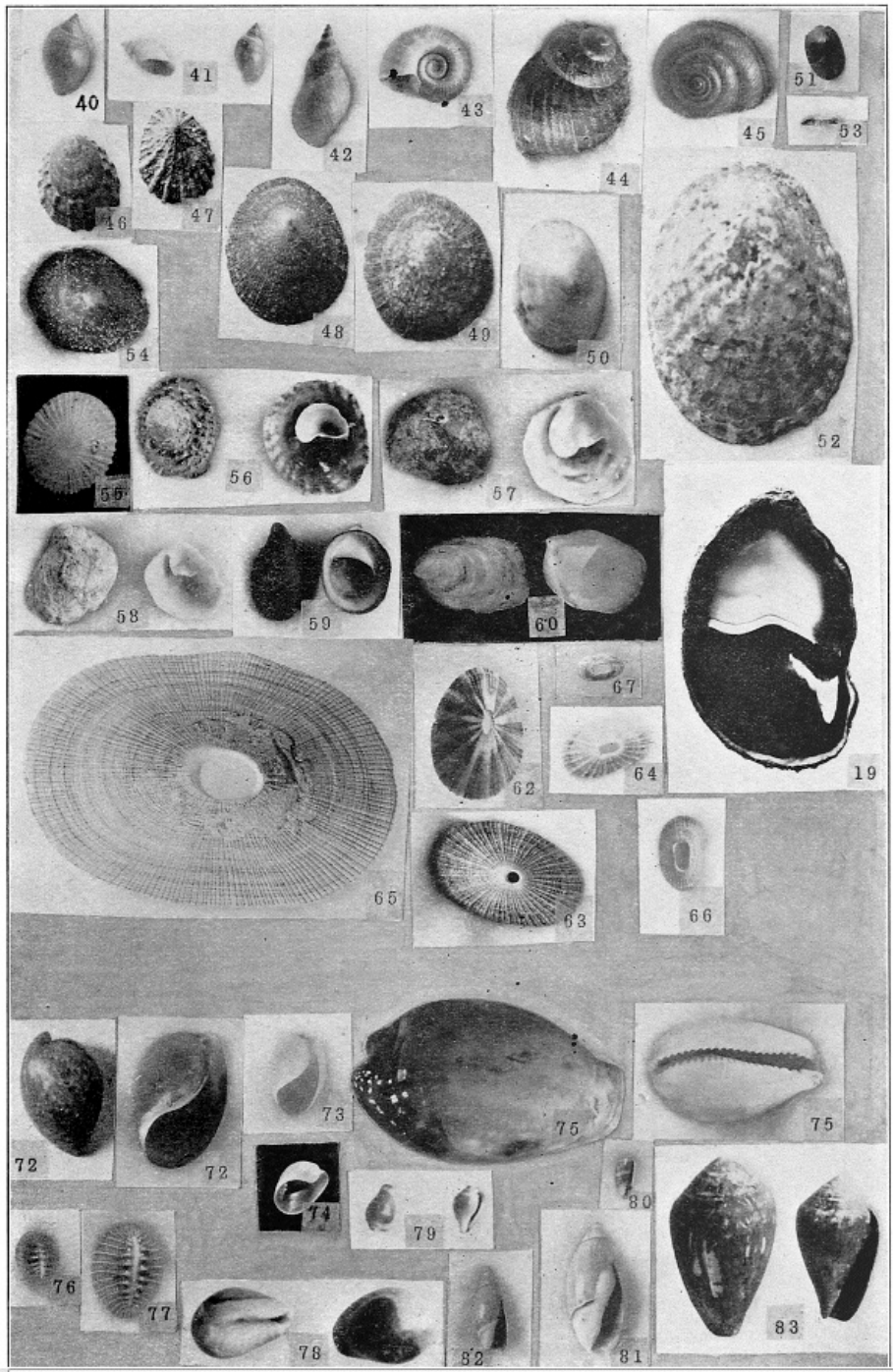


Plate II

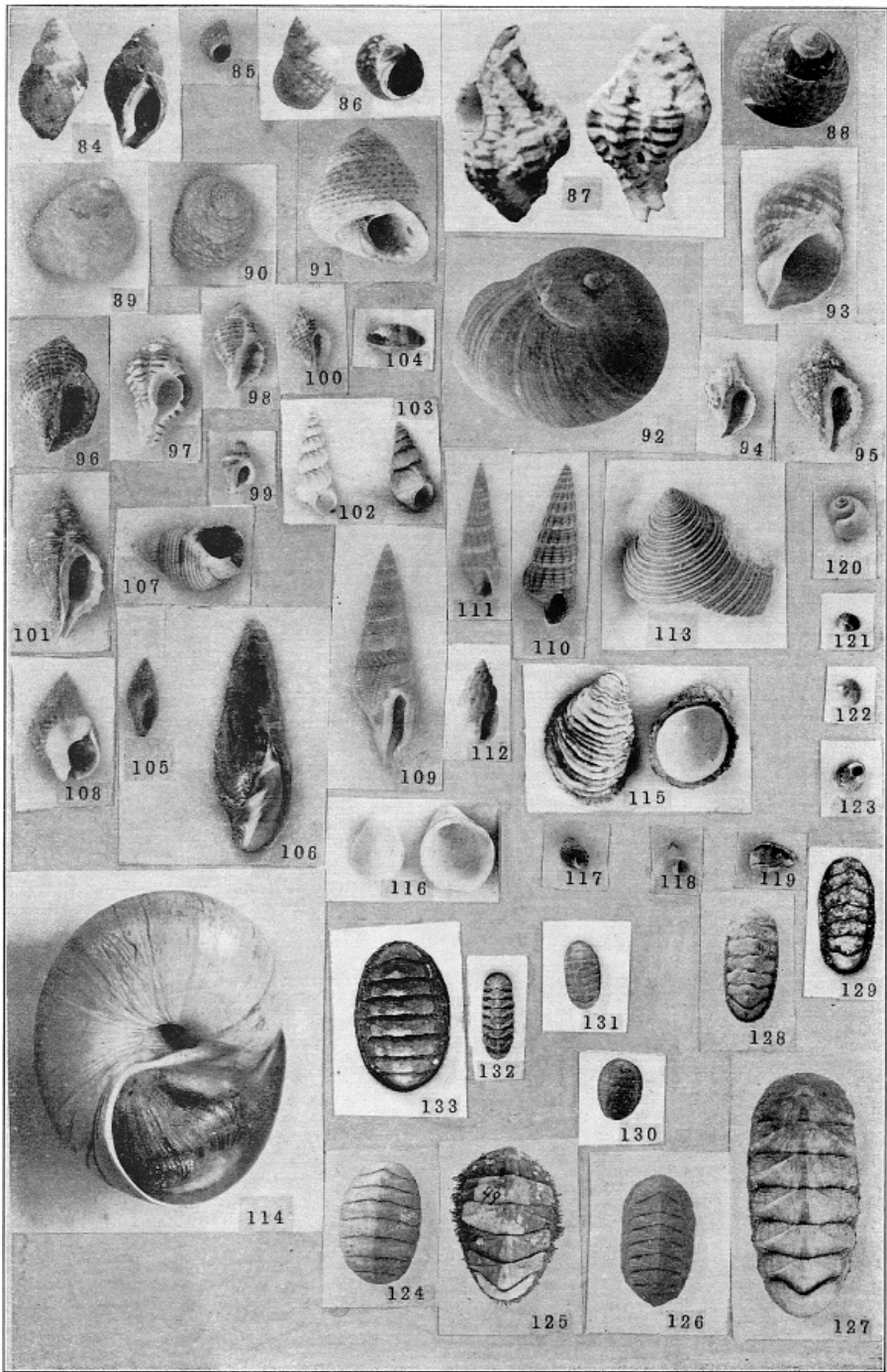


Plate III

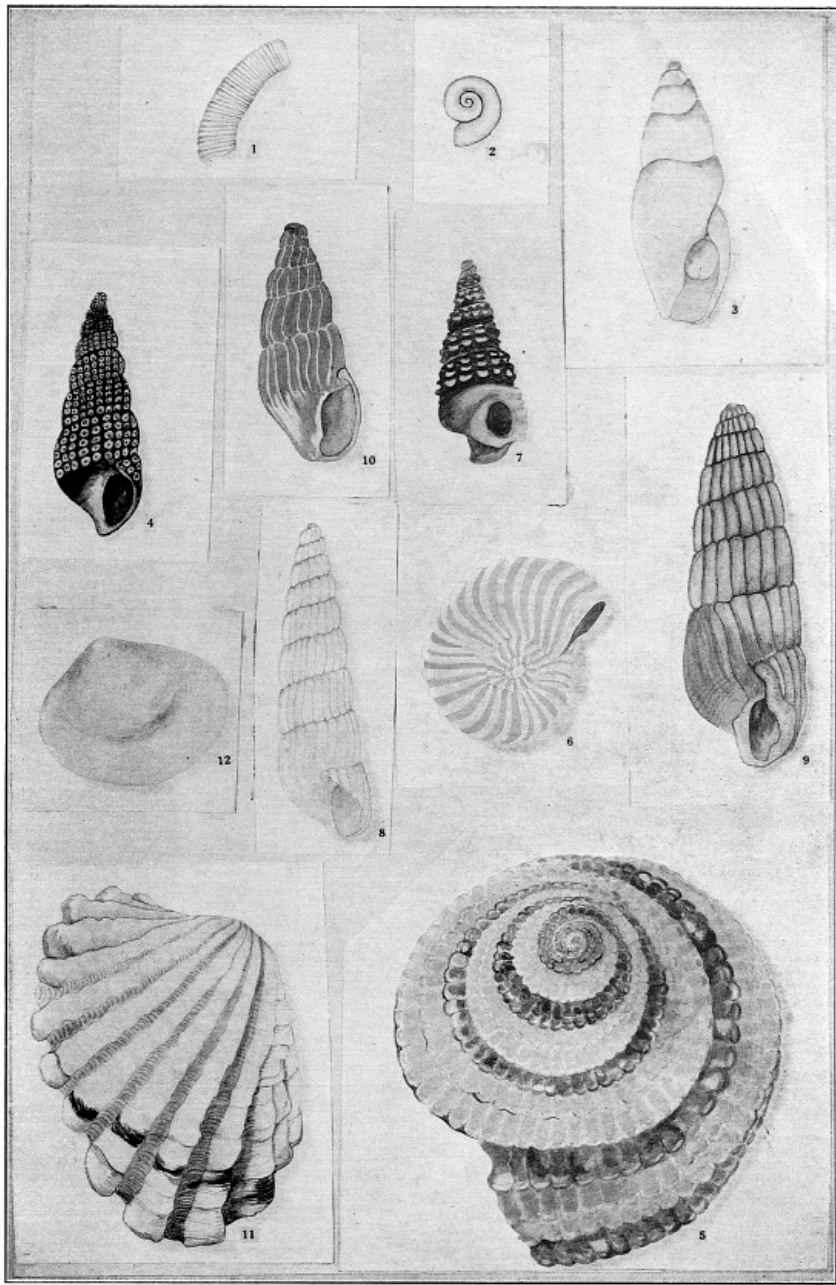


Plate IV

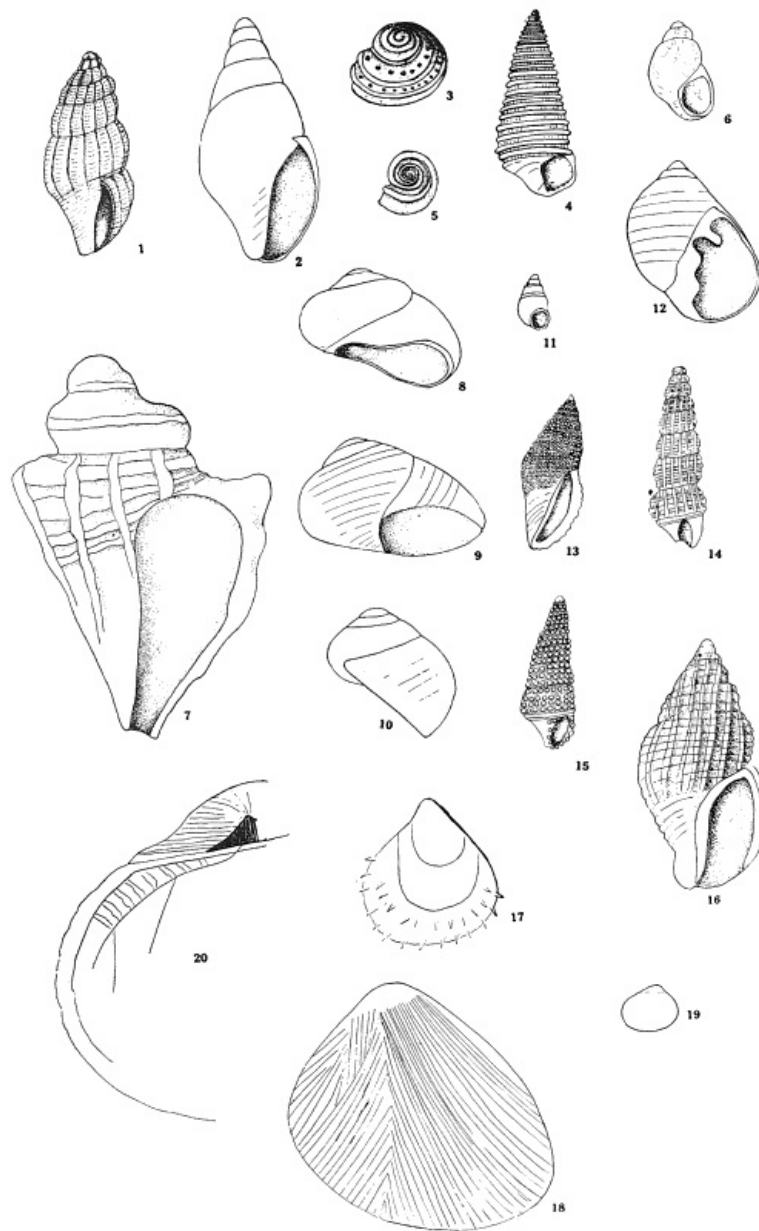


Plate V

A Reconstruction of the Nervous System of a Nemertean Worm

« 119 »

WILLIAM A. HILTON

Small specimens of *Carinella cingulata* Cole were fixed in Mercuric chloride and cut in series. A general hematoxylin stain was very satisfactory for general anatomy. For a study of the finer structure other preparations will be necessary.

No attempt will be made to give a complete review of the literature relating to this group. Almost every systematic paper has something, because of the importance of the nervous system in classification and because in many cases the nervous system may be seen through the body-wall without dissection.

One of the first extensive accounts of these animals which also included quite a consideration of the nervous system was McIntosh in 1874. Several of the genus *Nemertes* were studied and the general form of the nervous system shown. *Amphipheris* is shown in a similar manner with a single lobe of the brain and with the two brain commissures. *Tetrastemma* is shown in a similar manner. Hubrecht in 1887 has an extensive paper in which the details of several nervous systems are shown as they show in reconstructions from sections. *Eupolia girardi* is especially well shown with its small dorsal and large ventral commissure and with three brain lobes. It is in this paper that Hubrecht makes his interesting comparison between the nemertians and cordates. In his paper of 1880 he has shown the structure and position of different parts of the nervous system of nemertians, especially of *Cerebratulus* of which he gives a very good figure. In this he shows a reconstruction of the brain with its chief nerves, ventral and dorsal commissures, general position of the cells, the two lobes of the brain on each side and the chief nerves. He also treats

of nemertian nervous systems of many other forms, but not in so much detail.

Burger in 1890, '91, has extensive papers on the nervous system of the group. He discusses not only the general form, but also the minute structure of the nervous system of a number of different types. In 1895 Burger has another important paper on this group of animals. In it he shows in some forms a marked dorsal ganglion and a ventral ganglion with the typical nerves. Burger showed that all ganglion cells are unipolar, without membranes. Montgomery, 1897, discusses the minute anatomy of the nerve cells. Coe, 1895 and 1910, considers the general anatomy of the nervous system, but nerve details are for the most part not shown.

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In a young *Carinella cingulata* Cole which I have studied by means of reconstructions, I find no unusual features. The nervous system is typical of the group. The brain, however, is not very clearly made up of two lobes on each side. This may be because the specimen used was a young one. This may also be the reason why the brain is not sharply marked off from the lateral nerve cords.

[Figure 1](#) shows the brain and part of the lateral cords from the ventral side. From the two halves of the brain come the nerves to forward parts. The small dorsal commissure is shown with its usual median extension. From the larger ventral commissure come the two nerves to the proboscis, lateral to these are the nerves to the intestine, while from the ridge of the lateral cords the lateral nerves are shown.

[Figure 2](#) in the larger drawing at the right shows the nervous system as viewed from the side with the dorsal side to the left. The central core of the ganglion and cord is to indicate the position of the fiber area. The small drawings at the left show various levels of the nervous system as seen in cross section. The ventral side is up. The drawing at the top is through the brain before the commissures are reached, the next lower is through the thickest part of the brain and the lower two drawings are through one of the lateral cords.

<i>Burger, O.</i>		1891	
	Beitrage zur kenntnis des Nervensystems der Wirbellosen. Neue Unter. über das Nervensystem der Nemertinen. Inst. a. d. Zool. Sta. Neah. 10.		
<i>Burger, O.</i>		1890	
	Beitrage zur Kenntnis des Nervensystems der Nemertinen. Zeit. Wiss. Zool. Bd. L.		
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<i>Hubrecht, A. A. W.</i>		1887	
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	On Pelagonemertes rollestoni. Ann. mag. nat. hist., vol. xv.		

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EXPLANATION OF PLATE

Figure 1. Reconstruction of the nervous system of *Carinella* shown from the ventral side. Explanation in text. ×75.

Figure 2. Figure at the left side view of a reconstruction of the upper portion of the central nervous system of *Carinella*. The figures at the right are from cross sections taken at various levels. The upper and the two lower figures are from one side only. Further explanations in the text. ×75.

Figure 1.

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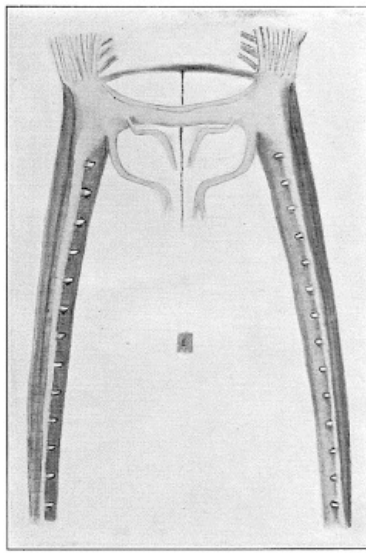
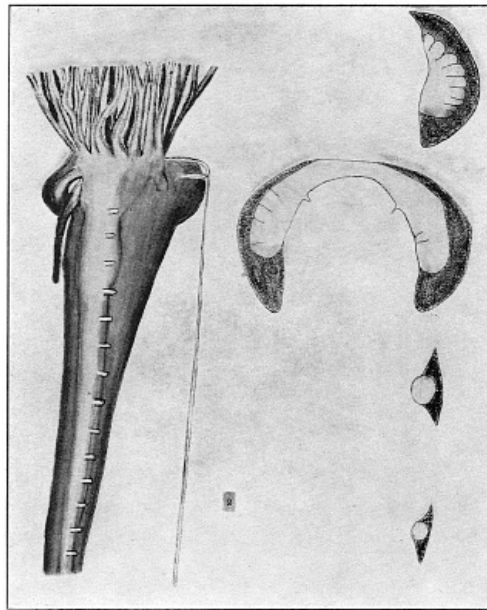


Figure 2.

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« i »

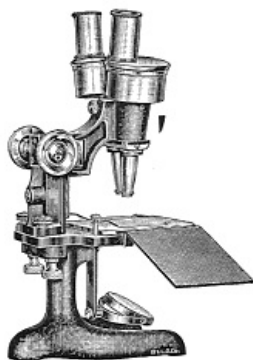
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« ii »

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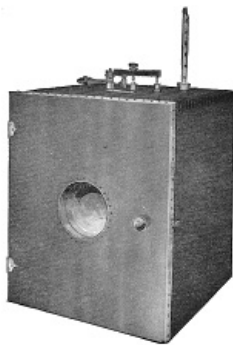
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