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Lockington, . . .
Remarks on the Crustacea of the West Coast of
North America, with a catalogue of the species in the
Museum of the California Academy of Sciences.
Proc. Calif. Acad. Sci., Vol. VII, -7, pp. 94-110.
8vo Sec. Lib. 1876



Lockington

form of the true European *Bellis perennis*, found by him in Throckmorton's Cañon, growing in moist ground, near the foot of Mt. Tamelpais, in a perfectly wild state, remote from any habitation. It has been duly studied, and carefully analyzed, and is undoubtedly the plant indicated; of course, it only now sports a single series of white rays tinged at the tips with purple; is slightly reduced in size; the floret tubes proper are more hairy; stigmatic appendages not quite so broad, and rather more elongated, when compared with the cultivated plant; the first flowers are on true scapes, later flowers on very short or tufted stems; occasionally a leaf develops on the proper peduncle above the rosulate clustered foliage below.

Nemophila modesta. K.

Slender, weak and prostrate (1-1½ feet); leaves opposite pinnatifid, lobes 3-5, broadly lanceolate entire, sparsely hirsute above and along the veins beneath, subsessile, the narrowing base ciliate; peduncles axillary, hirsute, 3-4 inches long, or 3-5 times the leaves, erect but recurving near the capsule; calyx auriculate and increasing to age, lobes ovate, acute, hirsute; flowers large (6 to 8 lines), blue with deeper blue veins and purple spotted, hirsute within at the base, twice the length of calyx, naked (no scales, folds or ligules at the base of filaments); stamens 3 long and 2 shorter, base hirsute (anthers dark purple); style 2-parted above, hirsute below, stigmas capitate; capsules hairy, 6-seeded, seeds large and rough.

Found by Kellogg and McLean, near the Guadalupe Quicksilver Mine.

Dr. Eisen also collected specimens of a charming little annual Lupin:

Lupinus citrinus. K.

A low, slender annual, barely a span high, erect and ascending, branched from the base, hairy throughout; lower leaves long slender petioled (relatively shorter above, or from about three inches to less than an inch); leaflets linear-spatulate, attenuate at base, somewhat canaliculate, mucronate, 6-8, ½-¾-inch long, 1-2 lines wide, stipules adnate, somewhat membranous, lance-subulate, weakly attenuate, 4-6 lines long; main raceme 4-6 inches, those of the branches 3-4, rather closely flowered from near the base (common peduncle naked below about 1 inch); pedicels short and slender; bracts linear-lance-acuminate deciduous; calyx colored, short, upper lip 2-parted, lobes acute, or subacute, lower about equal, minutely 3-toothed, bracteoles minutely obscure or wanting; flowers bright orange or golden, rounded banner dotted with a few oblong pale bluish spots near the infolded centre; wings obtuse, nearly as broad as long; keel naked; creamy-hued pod, oblong-linear, 7-lines long by 1½ wide, torulose, glabrous, 4-seeded, seeds rhomboid, lenticular, black blotched at the germinal end and black spotted along the ridge of the beveled margin, on a leaden ground.

Owing to the very obtuse inflated wings conforming to the general outline and size of the banner, gives the flowers somewhat the appearance of beads of gold. A charming plant for cultivation.

Dr. Eisen also brings to light a new species of *Clarkia*.

INVERTEBRATE
ZOOLOGY
Crustacea

Clarkia Eiseneana. K.

Stem glabrous and glaucous, 1-1½ feet high, erect, branching above; leaves ovate-lanceolate or ovate-oblong, acute or subacute, repand-denticulate, sessile, lowest leaves subsessile or very short petioled; petals entire, lamina rhombic on a long slender claw, toothed on one side at the insertion; alternate stamens perfect, a broad densely hairy scale at the base of these filaments in front or on the inside, stigma-lobes equal, the very slender linear capsule sessile, 2-3 times as long as the obpyramidal calyx tube, hirsute together with the calyx.

Camping with Mr. Galen Clarke, he brought in the following:

Potentilla Clarkiana. K.

Stem perennial, tufted or dwarfed, and depressed ¼-1½ inches, bearing a single pair of opposite rudimentary leaves, pubescence scanty, at length glabrous; leaves ternate, leaflets nearly orbicular 4-6 lines, coarsely 5-6-toothed (if simple, 7-toothed), terminal leaflets short petiolulate; bractlets half as long as the calyx lobes, subacute; petals yellow, shorter than the calyx; about one-flowered.

REGULAR MEETING, SEPTEMBER 4TH, 1876.

Dr. A. B. Stout in the Chair.

Twenty-two members present.

Wm. G. Kreuger and Thos. Murffen were proposed for membership.

Donations to the Museum: From Mr. W. P. Truesdell, tarantula and nest. From W. J. Fisher and Henry Edwards, specimens of Crustaceæ. Also, ten fish from Mr. Lockington.

W. N. Lockington read the following:

Remarks on the Crustacea of the West Coast of North America, with a Catalogue of the Species in the Museum of the California Academy of Sciences.

BY W. N. LOCKINGTON.

CANCROIDEA.

Family CANCRIDÆ. Sub-Family CANCRINÆ.

No new species of this sub-family appears to have been found since Stimpson described *Cancer antennarius*.

Cancer magister. Dana. U. S. Ex. Exp., I, 151, pl. VII, fig. 1. Stimpson, Crust. and Ech. Pac. S. N. A., 18; Proc. Cal. Acad. Sci., 1, 88. *Cancer irroratus.* Randall (not Say.) Lockington, Proc. Cal. Acad. Sci., 1876.

The localities given by Stimpson for this abundant species range from Sitka to Monterey, and I have two young specimens among miscellanea, collected at Magdalena Bay, Lower California.

No. 25. San Francisco market, dried, male. W. N. Lockington.

Cancer gracilis. Dana U. S. Ex. Exp., I, 153, pl. VII, f. 2. Stimpson, Proc. Cal. Acad. Sci., I, 88; Crust. and Ech. Pac. S. N. A., 20.

The only specimens I have yet seen are those in the museum of the Cal. Acad. Sci.

No. 26. Two females, dried. Locality unknown.

Cancer productus. Randall. J. A. N. S., Phil., VIII, 116. Dana, U. S. Ex. Exp., I, 156, pl. VII, f. 3. Stimp., Proc. Cal. Acad. Sci., I, 88.

Platycarcinus productus. Gibbes. Proc. Am. Asso., 1050, p. 177. Stimpson, Crust. and Ech. Pac. S. N. A., 21.

This species has been found at Puget Sound, Tomales Bay, S. F. Bay, San Diego, and Magdalena Bay, L. C.

No. 27. Several young specimens from Monterey, dried. Dr. J. G. Cooper.

No. 28. Young, dried. San Diego. Hy. Hemphill.

No. 40. Male, in spirits. S. F. Bay. W. N. Lockington.

Not only are the young of this species very different in appearance from the adult, but they are so variously striped and marked that a superficial examination might cause them to be considered the young of several distinct species. The specimen described by Dana was not fully grown, and, like all the immature specimens I have seen, had the teeth of the produced front low and like lobes, with a short suture on the carapax between each lobe and the next. In the adults, the teeth of the front are more separate and more acute, and the central tooth more produced than the lateral ones; moreover, the nine antero-lateral teeth are distinctly separated from each other, and the body near the antero-lateral margins is thicker than in the young.

The prevailing color of the adult is red, becoming darker and more brownish above, and orange or yellowish below. Among four young ones found under stones at Monterey, two are chocolate, with a somewhat darker tint on the elevated parts of the carapax; a third, bright yellow, with irregular blotches of dark red; and the fourth, yellow, with narrow red stripes, giving it a zebra-like appearance.

An examination of young and adult specimens only would lead to the belief that they were distinct species, but a full series of specimens, of all sizes and ages, reveals their specific identity.

This species is common in the bay of San Francisco, but I have never found either it or its young beneath the stones on the beach, as is the case at Monterey. In April of this year, half an hour's search under the stones at Preston's Point, Tomales Bay, procured me twelve fine adult specimens, all or most of them females. I did not observe any ova attached to them, and I

thought it singular that on a second visit paid to the spot in July, I could not find a single female, though at low tide mark I secured an overgrown male who had lost too many limbs to retreat with sufficient quickness.

Cancer antemarius. Stimpson. Proc. Cal. Acad. Sci., 1, 88; Crust. and Ech., Pac. S. N. A., 22.

No. 29. Female, dried. Probably from San Francisco Bay. Wm. Stimpson.(?)

No. 39. Young, between tides. San Diego. Hemphill.

No. 41. Female, with ova. S. F. Bay. W. N. Lockington.

This species appears to frequent deeper water than *C. productus* or *C. magister*, as, though occasionally taken on the lines of the anglers in San Francisco bay, I have never known of its occurrence on the beach between tides. It is found on the ocean shore near Tomales, and occurs as far south as Magdalena Bay, Lower California, where a fine specimen was obtained by Mr. W. J. Fisher.

The sides of the chelipeds are beautifully marbled with dark spots upon a lighter ground in adult recent specimens.

Sub-Family XANTHINÆ.

Until very lately not a single representative of this sub-family had been found upon our western shores, probably because the the first collections were made in the neighborhood of San Francisco.

The species named by Stimpson and Dana were collected at various localities from Monterey northward to Sitka, but the coast southward from the former place to Cape St. Lucas, and the shores of the Gulf of California, have been, and still are, comparatively unknown to carcinologists.

All the species of *Xanthinæ* described or mentioned in these notes have been collected in the last mentioned localities by Mr. Hy. Hemphill and Mr. W. J. Fisher.

Those species which I have previously described from single specimens furnished to the Academy by the former collector are most of them more fully known to me by numerous specimens obtained by the latter during five months spent in dredging and collecting along the uninviting shores of Lower California, while those which are new are in every case the results of the same indefatigable collector's labors.

It is somewhat singular that, so far as I am aware, not a single species of this sub-family has yet been found along the shores of Northern California, Oregon, or Washington Territory, and I cannot avoid thinking that further search may disclose some.

The genus *Panopeus* is represented on the shores of Central America by two or three forms which have not hitherto been found so far north as Lower California.

I own myself unable to perceive any sufficient reason for the separation of *Xantho* from *Xanthodes*, but I have relegated two of the narrowest forms to the latter group.

Atergatis cristatissimo. Lockington. Proc. Cal. Acad. Sci., March 20, 1876.
La Paz, San José Island, Amortiguado Bay.

This pretty little species does not appear to occur on the west coast of Lower California.

The color of the carapax in spirits is the same as in the dried specimen, viz., bright red.

No. 30. Two males, dried. From La Paz. D. E. Hungerford.

No. 42. Male and female, in spirits. W. N. Lockington.

Actæa meandricus. nov. sp.

Front four-lobed, antero-lateral margin without conspicuous teeth; postero-lateral margin highly concave.

Entire upper surface of the carapax covered with involved rugæ; those of each areolet distinct; areolets separated by sulci.

Chelipeds equal, their upper outer surface rugose like the carapax, the rugæ giving way to rows of tubercles on the underside of the manus.

Upper edge of the manus and carpus an acute angle; inner surface of both perfectly smooth; meros smooth on both sides, compressed.

Hinder limbs with compressed joints; the meros smooth on both sides, except in the fifth pair; the remaining joints rugose on their upper and posterior aspects. Meros of fifth pair rugose above. Fingers of chelipeds sulcate, short. Sternum cavernous; abdomen with transverse rugæ. Color, in spirits, dull red.

Locality, Mulege Bay, Gulf of California.

Two specimens, a male and female, are all I have seen of this well marked species.

	♂	♀
	M. M.	M. M.
Greatest length.....	20	19
Extreme width of carapax.....	27	25

This little crab has a peculiarly compact appearance. The rugosities of its limbs are so arranged that when they are folded up close to the carapax not a portion of smooth surface can be seen either above or below, the only smooth portions being lateral and hidden.

Heteractera. nov. genus.

Form of carapax as in *Actæa*, but with an external hiatus to the orbit, and its lower margin divided into two lobes. Abdomen of male, five-jointed.

I am loth to form a new genus for a species which resembles an *Actæa* so closely in its general aspect and form, which, in my belief, afford far better evidence of the real affinities of any animal than are afforded by variations in the form of the orbit or the length of the basal joint of an antenna; but I have no choice in the matter, as the genus *Actæa* is defined as "without an external hiatus to the orbit," while the genera with the lower margin of the orbit divided into teeth have a seven-jointed abdomen in the male.

Heteractera pilosus. nov. sp.

Aspect that of an *Actæa*, but the orbit with an external hiatus, and its lower margin divided into two separate lobes. Front two-lobed, upper mar-

gin of orbit a long thick, sinuate tubercle. Teeth of front, upper and under margins of orbit, and a small tooth just external to the outer hiatus of the orbit, red, smooth, shining, and naked. The remainder of the upper surface of the carapax thickly tomentose. Antero-lateral margin with three sharp teeth projecting beyond the tomentosity. Regions of carapax distinct. Chelipeds tomentose, the carpus and manus covered with tubercles arranged in regular series on the outer side of the manus. Right cheliped larger than left; fingers sulcate. Tubercles of manus and carpus red, the red predominating at the distal end of the manus. Longer hairs scattered at intervals among the tomentosity of the carapax; hinder limbs thickly pilose.

Localities, San José Island, Amortiguado Bay; and Port Escondido, both in the Gulf of California.

Several specimens. The largest pair measure as follows:

	♂	♀
	M. M.	M. M.
Greatest length.....	19	15
Greatest width.....	27	20

No. 43. Male and female, in spirits. Fisher and Lockington.

Xantho tenuidactylos. nov. sp.

Front declivous, antero-lateral margin without distinct lobes or teeth, thick; anterior portion of carapax somewhat negose, granulate; carpus and manus thickly covered with large granulations above and externally, the granulations extending on to the upper and outer surface of the fingers; fingers sulcate, those of the right cheliped (which is the larger) rather short; those of the left cheliped exceedingly long and thin. Hinder legs somewhat tomentose.

Color reddish-brown; fingers black.

One specimen only, a female, taken at low tide, on the flats at La Paz, Lower California.

	M. M.
Length of carapax.....	15
Width of carapax.....	11

Xantho grandimanus. nov. sp.

Carapax transverse, antero-lateral angles not prominent. Front four-lobed, the central emargination running back as a deep sulcus across the frontal regions of the carapax. Upper margin of orbit tumid, backed by a deep sulcus, giving off at a right angle, a sulcus separating the median from the lateral regions of the carapax. Antero-lateral teeth, five; the first two long and low; third low, but somewhat shorter; fourth much shorter and pointed; fifth very small. Areolation indistinct; frontal and antero-lateral regions granulated. Right cheliped very large, smooth, meros hollowed out throughout its posterior upper surface so as to fit closely to the under surface of the carapax; carpus large, heavy and rounded; manus broad, rounded above and without crests or tubercles; movable finger with a very large tubercle at its inner base; fixed finger with three or four tubercles. Left cheliped similar, but much smaller; fingers much smaller proportionately to the manus than

in the larger cheliped; fingers with numerous tubercles on inner surface. Hinder limbs rounded; the two last joints tomentose.

Color reddish-brown; fingers slaty.

Locality, La Paz, L. C.

The dimensions of a large specimen of each sex are as follows:

	♂	♀
	M. M.	M. M.
Greatest width of carapax.....	71	60
Greatest length of carapax.....	50	41
Length of larger hand.....	65	50
Length of smaller hand.....	47	39
Greatest width of larger hand.....	27	22

No. 31. Male and female and young. Identity of donor unknown.

Xantho multidentatus. Lockington. Proc. Cal. Acad. Sci., Feb. 7, 1876.

No. 38. Male, dried. Mazatlan. Hy. Edwards.

PARAXANTHUS.

Xantho novem-dentatus. Lockington. Proc. Cal. Acad. Sci., Feb. 7, 1876.
San Diego; San José Island, Amortiguado Bay.

Four or five specimens only. Color of carapax in spirits, whitish, with a tinge of red, and with red markings. The front is much more produced than usual in this species.

No. 32. Male, dried. San Diego. Hy. Hemphill.

All but one of the specimens from Lower California are smaller than the type specimen which was procured at San Diego, and the carapax is proportionally narrower, yet I believe them to be younger individuals of the same species, founding my belief on the prominent, narrow, entire part, curved outline of the antero-lateral margin, without perceptible angle at its junction with the postero-lateral; and on the character of the left cheliped, the fingers of which are sulcate, and devoid of prominent tubercles on their palmar surface.

Xantho spini-tuberculatus. Lockington. Santa Rosa Island, Monterey, San Diego, Magdalena Bay, San José Island.

This species appears to be of common occurrence along the coast from Monterey southward to Magdalena, but to disappear, or at least become rare, in localities further south.

Dimensions of the largest specimen:

	M. M.
Greatest length of carapax.....	30
Greatest width of carapax.....	40

The right hand in this large specimen (a male) is very much larger than the left, but this is not universally the case.

Color, in spirits: carapax greenish, with maroon cloudings; tubercles of first pair and front of carapax bright red; hinder limbs crossed by maroon bands; fingers black.

No. 33. Monterey. Dried. J. G. Cooper.

Xantho Hemphilliana. Lockington, Proc. Cal. Acad. Sci., Feb. 7th, 1876.

The only specimen I have seen of this species is the one in the possession of the Academy of Sciences, San Francisco. Some small crabs from the Gulf of California, which I at first believed to be young specimens of this form, differ in their less transverse form and more perfect areolation, and I now think them distinct, yet this can only be proved by the examination of a complete series of the Monterey form.

No. 35. Large male, dried. Monterey. Hy. Hemphill.

Xanthodes leucomanus. Lockington, Proc. Cal. Acad. Sci., Feb. 7th, 1876.

Carapax rather narrow; areolation very distinct, cardiac region circumscribed; three antero-lateral teeth (the three posterior ones) usually distinct, and directed laterally, the space usually occupied by the first two antero-lateral teeth forming an almost straight line. Basal joint of outer antennae reaching the front; lower margin of orbit two-lobed; inner hiatus wide; front sinuate, a process meeting the basal joint of the external antennae. Internal antennae stout. Chelipeds sub-equal, manus broadly ovate, stouter than the carpus, smooth, shining, with a slightly raised upper edge; dactylus and pollex alike, short and stout, conical, toothed inside; furrowed. Carpus often with a roughened upper surface. Ambulatory feet almost free from setae, but the dactyli thickly covered with very short tomentosity.

	♂	♀
	M. M.	M. M.
Length of carapax.....	9	8
Width of carapax.....	11	9.5

Numerous specimens of this species were brought from La Paz, Port Escondido and Mulege Bay, Gulf of California, by W. J. Fisher. They show great variation in color, areolation, and other characters. In some the posterior portion of the carapax is much less distinctly areolated than in others; many individuals have the upper surface of the carpus, and even that of the manus, more or less rugose; some have black fingers with white tips, others have colored fingers, and the general tint of the carapax varies considerably. The original specimens from which my previous short description of this species was written, were lost in removing our collection, and I cannot, therefore, feel certain of the identity of the Gulf form with the one first described.

Xanthodes? angustus. nov. sp.

Carapax narrow, front wide, slightly sinuate; antero-lateral margin shorter than postero-lateral, three-toothed; teeth pointed forwards; the posterior margin of the hindmost teeth in a line with the postero-lateral margin. Upper margin of the orbit two-lobed, excluding the post-orbital, which is lower than the two succeeding antero-lateral teeth. Upper surface of the carapax smooth, shining, without areolation, except in the frontal region, and near the antero-lateral teeth. Chelipeds smooth, shining, without areolation, hairs or tubercles, hands rather broad, equal in size, fingers of right hand tuberculate

on the palmar surface, those of left hand with a cutting outer edge. Hinder pairs of limbs slender, slightly pilose. Color reddish brown (in spirits), chelipeds bright red.

Localities—Magdalena Bay, west coast Lower California; Mulege Bay, Port Escondido, San José Island, Gulf of California.

Width of carapax.....	M. M. .14
Greatest length.....	10

These dimensions are from one of the largest specimens.

The *extreme* narrowness of the carapax and shortness of the antero-lateral margin make me doubtful of the propriety of placing this species in the subgenus *Xanthodes*. Its aspect is much that of a *Pilodius*, but the fingers are not spoon-shaped. There are a few scattered setae on the two last joints of the ambulatory feet. There is considerable resemblance between this species and *X. latimanus* from San Diego, but the hands of the former are wider and the antero-lateral teeth more robust. The difference in size between the present form and the single male of *X. latimanus* in the Mus. Cal. Acad. Sci. is great, but it is not unlikely that it is either the young or a small variety of that species, but as the gulf species are in most cases distinct from those of the west coast of Lower California, I do not venture to unite them.

Xantho latimanus. Lockington, Proc. Cal. Acad. Sci., Feb. 7, 1876.

No. 34. Male, dried. San Diego. Hy. Hemphill.

Panopæus purpureus. nov. sp.

Carapax convex both longitudinally and transversely, branchial regions tumid, sulcus between gastric and cardiac regions distinct. Surface finely granulated, the granulations with a tendency to form beaded ridges. Intra-medial and extra-medial regions distinct from each other and from the antero-lateral. First two teeth of antero-lateral margin coalesce, forming a prominent bi-lobed tooth; third and fourth teeth curved forwards, the fourth shortest; fifth thick and rounded, directed forwards. Sub-hepatic spine prominent. Inferior margin of orbit three-lobed; interior lobe inconspicuous; middle lobe narrow, thick, projecting; outer lobe long, low, thin, highest on its outer angle. Outer hiatus of orbit deep and narrow. Superior margin of orbit with slight indications of a division into three lobes. Chelipeds smooth, unarmed, the right the larger; propodi and dactyli of hinder limbs beset with short bristly hairs. Color of carapax and upper surface of chelipeds bluish purple, becoming darker in the older specimens. Irregular spots and blotches of a dark brownish purple are conspicuous in the younger specimens, but become indistinct in the older, except upon the chelipeds. Fingers brown, with white tips.

	σ	ρ
	Inches.	Inches.
Greatest length of largest specimens.....	1.30	.95
Greatest width of largest specimens.....	1.75	1.30

Localities—Magdalena Bay, west coast Lower California; La Paz, Gulf of California. Apparently rare, as Mr. Fisher obtained but few specimens.

No. 44. Male and female. Magdalena Bay. W. J. Fisher.

Panopæus transversus? Stimpson, Am. Lyc. Nat. Hist., N. Y., vol. VII, p. 210.

Numerous specimens of a small species of *Panopæus* from Lower California do not agree at all with any of the species described by S. I. Smith, in the Proc. Boston Soc. Nat. Hist., vol. XII, Feb. 3, 1869, and from their transverse shape and the small size of the sub-hepatic spine, may probably be the *P. transversus* of Stimpson. As, however, I have no access to Stimpson's description, I think it well to subjoin a short description, as it may possibly prove to be a distinct species. Front slightly sinuate, antero-lateral teeth four, the two first long and low, the last two more pointed, with the points turned forwards. Right cheliped slightly the larger, both chelipeds smooth, shining, whitish, except on the upper surface, where the tint deepens to a reddish brown, which is the general color of the carapax. Hinder pairs of legs tomentose. Two of the largest specimens measured as follows:

Length of carapax.....	♂	0.65	♀	0.56
Width of carapax.....		0.92		0.80

Numerous specimens were obtained in San Bartolomé and Magdalena bays, and Santa Maria Bay, all on the west coast of Lower California; also, at La Paz, Gulf of California, where it was dredged at (so far as I can make out the label, which was unfortunately torn) a depth of three fathoms. The veritable *P. transversus* was found at Corinto, Nicaragua, by J. A. McNeil (*vide* S. I. Smith, *loc. cit.*).

No. 45. Several specimens, in spirits, from Magdalena Bay. Fisher and Lockington.

Panopæus validus. S. I. Smith, Proc. Boston Soc. Nat. Hist., 1869, 273.

Panama and Acajutla. External opening of orbit broad and deep.

Panopæus Bradleyi. S. I. Smith, *loc. cit.*, 281.

Panama. External opening of orbit a deep notch rather than a groove.

Panopæus planus. S. I. Smith, *loc. cit.*, 283.

Panama. Sub-hepatic tubercle not prominent. Antero-lateral margin with four slight incisions, as in *P. transversus*.

Acanthus spino-hirsutus. Lockington, Proc. Cal. Acad. Sci., Feb. 7, 1876.

The range of this species is much more extensive than that of most of those described in the paper above referred to. The first specimen obtained was brought, with specimens of several other species, from San Diego; but whereas most San Diego forms extend down the western coast of Lower Cali-

fornia, but do not appear—judging from present knowledge—to inhabit the Gulf of California, the present species has been found in abundance at La Paz, Mulege Bay, Port Escondido and San José Island, all within the Gulf. One peculiarity of this form is the bright red tint of the prominent transverse ridge in front of the buccal area. None of the specimens I have seen from Lower California exceed in size that brought from San Diego.

No. 36. Male, dried. San Diego. Hy. Hemphill.

Menippe obtusa. Stimpson, Notes on N. Amer. Crust. (Annals Lyc. Nat. Hist., N. Y., 1858), p. 7.

Panama.

CHLORODINÆ.

No species of this group is mentioned by Stimpson, either in Crust. and Echi. Pac. Shore N. Amer., or "Notes of North American Crustacea." I have here described three species, all of which were brought from Lower California by Mr. W. J. Fisher. Although distinguished as a sub-family on account of the more or less perfect spoon-shaped tips of the dactylus and pollex of the chelipeds, the *Chlorodinæ* are so closely related to the *Xanthinæ* that it would be more natural to intercalate their genera among those of that sub-family; for instance, *Chlorodius* next to *Xantho*, and *Actæodes* next to *Actova*.

Actæodes mexicanus. Lockington, Proc. Cal. Acad. Sci., March 20, 1876.

Mazatlan, Magdalena Bay, La Paz, where a few were dredged in thirteen fathoms; Port Escondido, Gulf of California; San José Island, Amortiguado Bay, Mulege Bay. The carapax of the largest specimen obtained measures 33 millimetres in width, and 21 in length. The color ranges from dark reddish brown, sometimes tinged with green to almost white, and in some cases even the fingers are whitish. Females with ova were collected from July to August. This species is found at low tide, under stones and in coral.

No. 37. Male, dried. Mazatlan. H. Edwards.

No. 46. Male and female, in spirits. Magdalena Bay. W. J. Fisher.

Actæodes xantho. nov. sp.

Carapax broadly transverse, without teeth on antero-lateral margins or front, which slightly curve outwards in front of each arcelet. Areolation complete, middle region with nine areolets. The hinder posterior areolet (2*P.* Dana) entire, long and narrow, four smaller areolets between this and the median region, and ten areolets on the antero and postero-lateral regions of each side. Chelipeds short, the meros hidden beneath the carapax, manus and carpus about equal in length, their upper surface covered with tubercles about as large as those of the carapax. All the raised portions of the carapax, and tubercles of areolets covered with granules, the sulci between tomentose. Dactyli of first pair very short, obtuse at end, the tips somewhat hollowed out, but the hollows not circumscribed within. Hinder feet short, compressed, their upper surface with elongated tubercles less distinctly granulated than

those of the carapax and chelipeds, the sulci and terminal joints tomentose. Abdomen tomentose.

	M. M.
Length of carapax.....	11.5
Width of carapax.....	18

A single specimen, female, from San José Island, Amortiguado Bay, Gulf of California. In spirits, the areolets are of a bright yellow color. There are five tubercles on the carpus, and as many on the hand. The genera *Actea* and *Acteoles* are usually placed in separate sub-families, but the artificiality of this separation is evident to any one who compares the species belonging to the two genera. In this species, as in *A. speciosa* and *A. caripes*, Dana, and *A. mexicanus* (*nithi*), the tips of the fingers are but imperfectly excavate, and the forms belong as truly to *Actea* as to *Acteoles*. The two genera form, in fact, a continuous series of closely allied species.

Chlorodius Fisheri. nov. sp.

Similar in proportions to *C. sanguineus*, Edwds, but the carapax is widest between the posterior teeth of the antero-lateral margin. Front 4-lobed; a deep emargination between the long central lobes. Teeth of antero-lateral margin five in number, acute, sub-equal, and directed forwards. Areolation less distinct than in *C. sanguineus*; areolets well-defined anteriorly, but not posteriorly. Pre-medial areolets joined to the extra-medial; intra-medial separated from the posterior or cardiac by a distinct sulcus; areolets of antero-lateral region six in number; postero-lateral and posterior regions without distinct areolation. Chelipeds equal, smooth, except a tooth on inner angle of carpus; all the fingers spoon-shaped, but the cavity not circumscribed within. The fingers are sulcated. Posterior legs slightly setose, claws sharp.

Color. Carapax, greenish red; chelipeds, marbled with purplish red, white beneath; fingers, black. Length of carapax of largest specimen (male), 0.78 in.; greatest width, 1.06 in.

Numerous specimens from the West coast of Lower California, collected by W. J. Fisher, also from La Paz, San José Island, Mulege Bay and Port Escondido, all in the gulf of California. It is found on the flats at low tide.

No. 47. In spirits, Magdalena Bay. W. J. Fisher.

Family ERIPHIDÆ.

27. *Ozius vorreauxii*. De Saussure. Revue et Magasin de Zoologie, V, 359, pl. XII, f. 1.
Mazatlan.
28. *Xanthodius sternbergii*. Stimpson. Notes on North American Crust. 6.
Panama.
29. *Pilumnus limosus*. S. I. Smith. Proc. Bost. Soc. Nat. Hist, XII, 286,
1869.
Panama. Peru.

30. *Eriphia squamata*. Stimpson. Notes on North American Crustacea, p. 10. (Annals Lyceum Nat. Hist., N. Y.)
Panama. Corinto, Nicaragua.
31. *Trapezia formosa*. S. I. Smith. Proc. Bost. Soc. Nat. Hist., Feb. 3 1869.
Pearl Islands, Bay of Panama, among *Pocillopora capitata*, Verrill.
32. *Trapezia cynodoco?* Guerin. Dana. U. S. Ex. Exp., p. 257, pl. XV, Fig. 5. S. I. Smith, *loc. cit.*
Locality the same as the preceding species.
33. *Quadrella nitida*. S. I. Smith. *loc. cit.*
Locality, Pacheca, one of the Pearl Islands, 6 to 8 fathoms, among pearl oysters.

When Stimpson, in 1857, published his "Crustacea and Echinodermata of the Pacific Shores of North America," not a single species of the large family *Portunidae* had been discovered. The same naturalist in his "Notes on North American Crustacea," published in 1859, mentions one species, *Lupa bellicosa*, Sloat, MS., but gives no description, remarking that it "agrees with *L. has'ata* in almost every character, except that the last two joints of the abdomen in the male are broader and more flattened."

In February of this year I described a second species, a specimen of which had been procured the preceding year at Mazatlan by Mr. Henry Edwards; and I shall in this paper describe a third, of which many individuals have been collected by Mr. W. J. Fisher at various points on the Western and Eastern shores of Lower California. At Magdalena Bay Mr. Fisher procured several very specimens of a *Lupa*, which I take to be the *L. bellicosa* of Sloat and Stimpson, but as Sloat's MS. is not on hand, and Stimpson gives no figure, my sole reason for this belief is that the other two known species from Lower California, belong to the genus *Amphitrite*, as defined by Dana.

That there may be no confusion I append a description of this *Lupa*.

Lupa bellicosa? Sloat, MS. Stimpson. Notes on N. Amer. Crust., p. 11.

Carapax regularly arched in its longitudinal and transverse directions; exceedingly wide, the post and antero-lateral outlines forming a long ellipse; no areolation except a sulcus between the median and posterior regions. Central tooth of front placed low down, between the internal antennæ, and separated by a short, somewhat pilose, space from the front proper, which has two lateral spines separated by a sinuous central portion. Upper margin of the orbit consisting of two long teeth, an ante and post-orbital; the former highest above the outer antennæ, and separated by a deep notch from the latter, which is two-lobed, the anterior lobe low, and the posterior long and pointed. Antero-lateral teeth nine, including the posterior lobe of the post-orbital, which exceeds in height any of the others except the ninth. 2d, 3d,

4th, 5th, 6th, 7th and 8th antero-lateral teeth equal, all broadly triangular. Ninth tooth much the largest, its upper ridged edge continuing across the carapax for some distance. Lower margin of the orbit pilose, rising into a conspicuous tooth immediately below the outer antennæ. Underside of carapax and sternum without hairs, except below the hinder part of the antero-lateral regions. Meros of first pair trigonal, with four sharp spines on its upper anterior edge and two blunt teeth at the distal extremity of its posterior edge. Carpus with two or three ridges exteriorly, and some short, blunt spines anteriorly. Manus with a triangular tooth next the carpus on its upper anterior edge, and also a blunt tooth at the distal extremity of its upper posterior margin. Dactyli only slightly sulcate; the teeth of the inner margins in groups of three; the central one largest. Second, third, and fourth pairs of limbs stout; the two last joints compressed and sulcate, pilose posteriorly. Fifth pair stout, without sulcations on the last two compressed joints.

Several fine specimens of this species were brought from Magdalena Bay, by Mr. W. J. Fisher.

The dimensions of a large individual, of each sex, are as follows:

	♂	♀
	M. M.	M. M.
Length of carapax.....	6.	5.3
Greatest width of carapax.....	11.5	10.2
Length of right manus.....	7.	5.

The color is almost brown above, cream-colored below, the tubercles and ridges of the manus tinged with red.

No. 22. Male, in spirits; fine specimen. Fisher and Lockington.

Lupa dicantha. M. Edwards. Hist. Nat. des. Crust., tom. 1, p. 451. Dana. U. S. Ex. Exp., 1, 272, pl. XVI, fig. 7, T. Hale Streets. Proc. Acad. Nat. Sci., Phil., 1871, p. 239.

Amphitrite Edwardsii. Lockington. Proc. Cal. Acad., March 20, 1876.

On looking over a number of Amphitrites from Lower California, I found one only, a large female, that can be referred to this species.

It presents all the characters of the type in the Academy's museum, but in a more marked degree from its larger size. The nine spines of the antero-lateral margin are alternately large and small, the ninth no larger than the first, third, fifth, and seventh; and the points of all are black. The meros of the first pair of legs has five black-tipped spines, that nearest the carpus smaller than the central three and equal to the proximal one. The inter-orbital teeth are eight in number, and the ridges across the carapax well defined. The spines of carpus and manus agree exactly with those of the smaller specimen, previously described, and all are tipped with black.

The general color of the carapax and limbs, in spirits, is red, with lighter marblings. The tips of the fingers are black.

	M. M.
Extreme width of carapax.....	51
Extreme length.....	32
Length of movable finger.....	13

The upper part of the carapax is thickly tomentose, except upon the ridges. This species is well marked, and readily distinguished from the following.

No. 23. Female, dried. Mazatlan. Hy. Edwards.

Amphitrite paucispinis. Lockington.

Inter-antennal front four-lobed; pre-orbital spines slightly two-lobed. Antero-lateral spines were nearly equal in size, except the ninth, which is twice the length of the others. The outline of front portion of carapax between the last antero-lateral spines, on each side, is a regular ellipse. Posterior to the last antero-lateral spine the carapax contracts suddenly in width, so that the postero-lateral margins are L-shaped. Meros of first pair with four spines on its anterior margin, the proximal smallest. Carpus with one spine on the interior upper margin, and two on the exterior. Manus with one spine only, on its upper margin, forming the extremity of a carina. Four slightly beaded ridges on the outer side of the manus. Fingers sulcate, tubercular on the palmar margin, the movable finger with a large tubercle at the base. Second, third, and fourth pairs of limbs slender; penultimate joint of fifth pair sulcate and surrounded, as is also the last joint, with a regular fringe of hairs. Areolation of carapax very distinct; the summits of each region granulated.

The dimensions of two of the largest specimens, both female, are as follows:

	M. M.	M. M.
Extreme width from tip to tip of spines	40	54
Greatest length.....	23	30

Localities—Angeles Bay, Mulege Bay, both in the Gulf of California; Magdalena Bay, West Coast Lower California.

The specimens were collected at low tide in August and September, and many of the females have the ova attached.

No. 24. Two males, dried. Magdalena Bay, West Coast Lower California. Fisher and Lockington.

Arceneus bidens. S. I. Smith. Report Peabody Acad. Sci., 1869, p. 90.

Callinectes sp? "Agrees with Ordway's *C. arcuatus*. Bost. Jour. Nat. Hist. VII, p. 578, except that there is only one distinct spine on the carpus of the chelipeds." S. I. Smith. *loc. cit.*

In my last paper upon this subject, two species of Maioid crabs mentioned in a "Catalogue of Crustacea from the Isthmus of Panama," by T. Hale Streets, was included, viz.: *Homalucantha hirsuta* (T. Hale Streets), and *Mithraculus coronatus* (Stimpson). Mr. Streets does not state on which side of the Isthmus the various species enumerated in his catalogue were collected; therefore, although I am aware that in some cases the same species occurs on both sides, I shall not in future include in this catalogue any but undoubtedly Pacific species.

Mr. Streets describes the following new species, giving Isthmus of Panama as their locality:

Mithraculus coronatus.
Aniculus longilarvis.
Cenobita intermedia.
Gebia longipollex.
Alpheus bispinosus.

The following species included in his list are Atlantic forms, some of which may possibly occur in the Pacific, also:

Mithraculus coronatus, St. Gulf of Mexico, Brazil.
Carpilius corallinus, M. Edwards. Antilles.
Actea labyrinthica, St.?
Menippe mercenaria, St. Atlantic.
Lupa rubra, M. Edwards Brazil.
Ocypoda chombea, M. Edwards. Antilles, Brazil.
Uca lewis, M. Edwards. Antilles, Brazil.
Hippa emerita, M. Edwards. Antilles, Brazil.
Cenobita diognes, M. Edwards. Antilles.
Panulirus guttatus, Latn. M. Edwards. Antilles.
 " *americanus*, Lamk. M. Edwards. Antilles.

The following probably reach as far north as Panama, and are therefore referred to in their order:

1. *Panopaeus chilensis*.
4. *Ocypoda Gaudichaudii*.
2. *Lupa bicaudata*.
3. *Eriphia gonagra*.

W. N. Lockington read the following:

Notes on Californian Fishes.

BY W. N. LOCKINGTON.

Raia batis. Linn.

Uroptera binoculata. Girard.

Dr. A. Gunther, in the Cat. Fishes Brit. Mus., Vol. VIII, p. 465, states his belief that the latter of these fishes may be regarded as a climatic variety of *R. batis*. He goes on to say that "young examples have a round obscure spot on each pectoral fin."

Had Dr. Gunther seen the fish alive, or in a fresh condition, I think that his opinion would have been different, but, as the Catalogue shows his only specimens were young, one from San Francisco, presented by Dr. W. O. Ayres, the other a skin only, presented by J. Keast Lord, from Vancouver Island.

I have myself seen specimens of large size in which the spot is as distinct as in the young, and though I cannot say I have measured them, I feel assured that one I saw in the aquarium at Woodward's Gardens about a year ago was two feet across the fins; and that the one now there is about eighteen inches.

Moreover, the eye-like spot in the centre of the pectoral is anything but obscure in the recent fish, it is most conspicuous.

But this is not all. We have in our possession a fish (caught in San Francisco Bay,) which agrees in every respect with the description of *R. batis* in the Brit. Mus. Cat.

I subjoin the dimensions—

	INCHES.
Width across pectorals.....	18.38
Tip of snout to centre of posterior jaw.....	4.12
“ “ “ anterior edge of anus.....	12.75
“ “ “ orbit.....	4.12
Tail to back of ventrals.....	8.75
Inter-orbital space (width of).....	1.37
Width across ventrals.....	7.50

Body and fins of a uniform slaty brown color. The difference in aspect between this fish and the *Uroptera* or *Rain binoculata* is very great.

Centropomus. Sp.?

Body oblong, compressed; head contained four and a half times in the total length; outline of top of head nearly straight, slightly concave, ridges of upper surface prominent; depth increasing to origin of first dorsal, thence nearly equal to root of second dorsal, thence decreasing gently to peduncle of tail. First dorsal with eight spines—the first minute; the second about one-sixth the length of the third; third, longest, very stout; fourth, fifth, sixth and seventh rapidly decreasing; eighth, prostrate. Pectorals small, extending to little more than the half length of the ventrals, which exceed them in size. First spine of anal very small; second, long and stout; third, slender, but slightly the longest. The orbit is slightly elliptical. Lower jaw protruding beyond the upper; maxillary, when the mouth is closed, extending to a perpendicular from the centre of the pupil. Teeth nominal. Pre-operculum strongly serrated. Color, when fresh, back to lateral line dark green, becoming lighter below, and whitish on the belly. Snout, green, yellow on the sides. Iris, golden. Pectorals, lead-color, with green centre; ventrals, the same. Caudal, lead-color in centre, with green margins. Dorsal, green, with bluish stripe, and tipped with golden. Fin-formula, D. $8 + \frac{1}{6}$; A. $\frac{3}{6}$. Branchiostegals, 7. The following are the principal dimensions of the specimen presented:

	Ft.	In.
Total length, from tip of lower jaw to end of tail.....	1	5.5
Length of head, from tip of upper jaw.....		3.88
Tip of snout to origin of first dorsal.....		5.5

Origin of first dorsal to origin of second dorsal.....	3.35
Length of third dorsal spine.....	2.25
Length of base of first dorsal.....	2.75
Length of base of first anal.....	1.5
Eye to tip of snout.....	1.3
Circumference at origin of spinous dorsal.....	7.5
Width of inter-orbital space.....	0.63

The single specimen was taken by Mr. W. J. Fisher, off Asuncion Island, Lower California, at a depth of eight fathoms.

The proportions and coloration of this fish agree very nearly with those of *Centropomus undecimalis*, Cuv. and Val; and I strongly suspect its identity with that species, which is, however, not known to me from specimens or figures.

C. undecimalis is a native of the Atlantic shores of tropical America; but Dr. Gunther queries its occurrence at Lima. If it should prove, on further acquaintance, to be a distinct species, I propose to name it *Centropomus viridis*.

Dr. Kellogg submitted the following:

On some New Species of Californian Plants.

BY DR. A. KELLOGG.

Dr. G. Eisen's specimens of *Carpenteria Californica* in full flower enable us to record some further items of interest. In these the flowers are pure white, fragrant, 2-2½ in expansion; bracteoles ovate, acute, instead of "subulate," only ¼ inch below the flower, and as the central peduncle has none, under high culture, it is fair to presume these would prove only reduced normal leafy bracts; the petioles are connate at base, often shortly sheathing. The flattened cymosely-pinnicled masses of flowers show it to be a more compact bloomer than our *Philadelphus* species, which it so much resembles; the intermixture of buds with the open flowers also indicate a lengthened period of bloom. This must prove a most valuable ornamental acquisition.

In Dr. Eisen's collection we also find a new species of Blazing Star, or *Mentzelia crocea*. K.

Annual (?) stem branching two feet or more high, bark white, ashy puberulent and scabrous, hirsute with rather long white simple hairs above, leaves oblong, pinnatifid, lobed, upper ovate-lanceolate, acuminate, sessile, sinuate-pinnatifid or toothed; flowers axillary and terminal; subtending bracts ovate-acuminate, coarsely toothed or sub-lobed. (1-2 on each side.)

Capsule, slender, clavate or gradually enlarging above to the truncate top; sessile, hirsute, an inch or more long; immature seeds, flat. Calyx segments ovate-lance-acuminate—half the length of the stamens, or about ¼-½ the petals; hairs on the back from conspicuous elevated gland-like bases; petals, five, oval or oval-oblong, abruptly short-acuminate, golden satiny yellow, on a very short saffron-colored claw; flowers large (2-2½ inches across); stamens