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have inhabited this continent, and as in the existing creation *Dicotyles* is the true equivalent of *Sus* in America, the probability of our very distinct fossil species belonging to *Dicotyles* is much increased; this probability is rendered almost certain, when we consider that remains of true *Dicotyles* have been found in Illinois in company with other singular forms, (*Platygonus* and *Anomodon*) which by their great peculiarities would seem to indicate a period anterior to that of the *Mastodon*.

The measurements of the canine are: length of enamelled surface along anterior curvature 2.2; breadth of posterior surface .37; radius of curvature of posterior edge 2.0; of anterior edge 2.1.

The Committee to which was referred Mr. Dana's papers on the Crustacea of the Exploring Expedition, reported in favor of publication in the Proceedings.

Conspectus Crustaceorum, &c. Conspectus of the Crustacea of the Exploring Expedition under Capt. Wilkes, U. S. N. By JAMES D. DANA.

PAGURIDEA, continued, and Subtribe MEGALOPIDEA.

I. PAGURIDEA, continued.

Among the species of the genus *Pagurus*, as restricted in my former paper on the Paguridea, there are still three groups of distinct character; one, having no trace of a beak, the front being truncate, and also having the fingers opening in a vertical plane, the hands being usually compressed, with commonly the left the larger; a second, having a short beak or triangular point in front, and the fingers opening like the preceding, with the hands subequal; a third, having a beak like the last, but the fingers opening in a *horizontal* plane, the hands being subequal and more or less depressed, and never compressed. The first group has *Pagurus punctulatus* for its type; the second, *P. aniculus*; the third, *P. clibanarius*. They form three genera with the following characters:—

1. PAGURUS.—Frons non rostratus, truncatus. Manus anticæ sæpius compressæ, interdum subæquæ, sæpius sinistrâ majore, digitis apice corneis, in plano verticali cludentibus.

2. ANICULUS, D.—Frons triangulatè rostratus. Manus anticæ subæquæ, digitis apice corneis, in plano verticali cludentibus.

3. CLIBANARIUS, D.—Frons triangulatè rostratus. Manus anticæ subæquæ, plus minusve depressæ, digitis apice corneis, in plano horizontali cludentibus. Species *P. æqualis*, *zebra*, *humilis*, *globosi-manus*, *Clibanario* pertinent.

The species *Pagurus aniculus* may hereafter be named *Aniculus typicus*; the *P. clibanarius*, *Clibanarius vulgaris*; and the *P. Bernhardus*, *Bernhardus streblonyx*. The name *Bernhardus pubescens*, (see preceding volume, p. 270,) we propose to change to *B. scabriculus*, as Krøyer* has described a *Pagurus pubescens*, which is probably a *Bernhardus*.

Descriptiones Pagurideorum adhuc ineditæ.

BERNHARDUS OBESI-CARPUS.—Frons medio prominulus, obtusus. Regio carapacis antica paulo transversa, nudiuscula. Oculi crassi et perbreves, aciculo longiores, squamâ basali ovatâ, subacutâ, integrâ. Antennæ externæ nudæ, basi multo longiore quam oculus, aciculo crasso, brevi, apicem articuli 3tii attingente. Pedes toti fere nudi et granulosi, non armati; antichi inæqui; manu majore oblongâ, convexâ, symmetricâ, granulis nitidis partim seriatis, carpo multo crassiore, parce latiore. Pares 2di et 3tii crassiusculi, articulo 3tio supra

* Tidsk. ii, 251, 252.

scabri-rugato et breviter hirsuto, tarso curvato, canaliculato. *Hab.* Valparaiso? *Long.* 2".

BERNHARDUS ÆQUIMANUS.—Carapax sparsim pilosus, regione anticâ non oblongâ, fronte ad medium angulato, vix rostrato. Oculi cylindrici, aciculum antennalem longitudine æquantem, squamâ basali apice productâ et 3—4-denticulatâ. Antennarum externarum flagellum infra elongatè ciliatum. Pedes superficie granulati partim sparsim hirsuti, marginibus hirti; antici æqui, mediocres, manu breviter ellipticâ, parce latiore et longiore quam carpus, non costatâ, marginibus subspinulosis, carpo supra subspinuloso et hirto. Pedum 4 sequentium tarsi bene canaliculati, infra ciliati. *Hab.* Valparaiso. *Long.* 1½".

BERNHARDUS CRINITICORNIS.—Frons medio parce angulatus. Regio carapacis antica non transversa. Oculi mediocres, aciculo antennali paulo longiores, squamâ basali apicem rotundatâ. Flagellum antennarum externarum infra crinitum non ciliatum. Pedes antici valde inæqui, nudiusculi, manu majore oblongâ, paulo longiore et latiore quam carpus, scabriculâ, spinulis subtilissimis 4—5-seriatis, margine inferiore fere recto, carpo minutè spinuloso. Pedes 2di 3tii laxè pubescentes, non spinulosi, tarso non canaliculato. *Hab.* portu "Rio Janeiro." *Long.* 9—10".

PAGURUS EUOPSIS.—*P. punctulato* affinis. Oculi fronte carapacis valde longiores, crassiusculi. Flagellum antennarum externarum nudum, articulis versus antennæ extremitatem latere interno gibbosis; aciculum parvulum. Pedes antici sat inæqui, manu majore carpoque oblongis, extus spinulosis et hirsutis. Pedes 2di 3tii marginibus multo hirsuti, articulo 5to spinulis supra paulo armati, tarsi totis subteretibus, undique divaricatè hirsutis. *Hab.* ad insulam "Upolu" et in freto "Balabac." *Long.* 2¼".

CLIBANARIUS STRIOLATUS.—Regio carapacis antica fere quadrata. Oculi graciles, margine carapacis antico vix breviores, squamâ basali angustâ, acuminatâ, bidentatâ. Pedes antici subæqui, manibus brevibus carpisque supra spini-tuberculatis et pilosis, manu sinistrâ maris paulo majore. Pedes 2di 3tii supra infraque paulo hirsuti, multis lineis brunneis longitudinalibus ornati, tarso subterete, non brevior quam articulus penultimus, sinistro 3tii paris articulo 5to extus parce convexo, acie rectangulatâ superne instructo. *Hab.* insulâ "Tongatabu," et archipelago "Viti." *Long.* 2". *Paguro lineato*, Edw. propinquus.

CLIBANARIUS BRASILIENSIS.—Regio carapacis antica paulo oblonga. Rostrum bene triangulatum. Oculi gracillimi, margine carapacis antico non breviores, squamâ basali valde truncatâ et brevissimâ, pilis longis, margine apicali transverso instructâ. Pedes antici æqui, manu dextrâ parce majore. Pedes 2di 3tiique persparsim hirsuti, subnudi, tarso perbrevis, articulo 5to paris 3tii extus subcomplanato, parce convexo, supra subcarinato. Pedes colore pauci-lineati. *Hab.* portu "Rio Janeiro." *Long.* 1¼".

Clibanarius globosi-manus (*Pag. globosi-manus*, D.) *P. corallino*, Edw. adhuc partim descripto an differt? In specimine globosi-manu non attritâ, pedes 2di 3tii marginibus hirsuti non nudiusculi. Clibanariis aliis totis nobis lectis differt, superficie externâ articuli 5ti sinistri paris 3tii omnino hirsutâ.

II. MEGALOPIDEA.

The question of the maturity or immaturity of the Megalopæ and that of their true place in the natural system, still remain in doubt. Without touching on these points, at this time, I propose to describe some new genera and species pertaining to the group.

The species, however diverse, agree in the structure of the abdomen and its caudal appendages; in the position of the four antennæ *between* the eyes; in the articulations of the outer antennæ; in the inner antennæ folded longitudinally or obliquely either side of the beak; in the general form of the outer maxillipeds; in the large size and lateral position of the eyes without orbits; in the general structure of the legs; and in their habits. The beak is either horizontal or

flexed downward, and has usually a sharp prominent tooth either side of it, exterior to the inner antennæ.

The genus *Megalopa*, *Leach*, as now accepted, embraces two distinct sets of species—the *M. Montagui* and *armata* for which it was instituted by Leach, and the *M. mutica* of Desmarest. The former (the true *Megalopæ*) have the beak nearly horizontal, with rarely a tooth either side, and there is a reflexed spine on the ventral surface of the first joint of the 8 posterior legs. The latter has the beak bent downward vertically, and either side of it there is a prominent spine or tooth; the ventral surface of the base of the legs is unarmed. The *M. mutica* is very closely related to *Monolepis spinitarsus* of Say, the only difference being that the extremity of the posterior legs in this species of *Monolepis* bear 3 or 4 setæ rather longer than the tarsus, while the descriptions of the *mutica* make mention of no such setæ. The posterior legs in *Monolepis* fold up and overlie the carapax: but these legs are otherwise like the preceding, though somewhat smaller, and it is probable that this habit in the *M. mutica* has been overlooked, as these animals almost always swim with the posterior legs extended like the others, when taken and kept in a jar for examination, and they also have them extended when walking. These legs do not resemble at all the posterior pair in *Porcellana* or *Galathæa*. I had examined several species before I discovered this habit with regard to the posterior legs. The animal also throws the fourth pair of legs forward along or over the borders of the carapax, so that the extremity overlies the bases of the eyes and the tarsi hang down in front; and at the same time the two preceding pair are folded up and lie against the sides of the carapax outside of the 4th pair, or the 3d pair may be thrown forward like the 4th. A Sooloo species, and another common off Cape of Good Hope, were observed swimming with the legs thus disposed.

Say's genus *Monolepis** also embraces two groups, alike in the deflexed front and the longish setæ at the extremity of the posterior tarsi. In one division, including the *M. inermis*, the tarsi are flattened styliform, and unarmed, with either lateral edge sparsely furnished with minute hairs; the fossa of the sternum, along which the abdomen lies when inflexed, has a prominent trenchant border; the depression on the carapax for the posterior legs is rather abrupt and somewhat neatly defined; the body is very convex and obese, with the sides high and vertical, and much wider behind than before, being gradually narrowed forward.

The other division has the tarsi unguiform, compressed, and spinous below, the antepenult spine always longest; the fossa of the sternum with flaring borders; the depression of the carapax for the posterior legs shallow concave; the body more flattened above, with the sides more oblique. This division corresponds to *Monolepis spinitarsus*.

Besides the preceding, there is another group of *Megalopidea*, examined by the author, resembling *Megalopa* of Leach, except that the tarsus of the posterior legs is narrow lamellar instead of unguiculate, and edged with longish setæ somewhat shorter than the tarsus.

There is still another group in which the front is horizontal and tricuspidate, the inner antennæ when retracted being exposed in the interval between the beak or inner cusp and either outer, lying in view as in *Plagusia*.

With these explanations we give the characters of the genera.

1. *MONOLEPIS*, *Say*.—Carapax fronte tricuspidatus sed valde deflexus ideoque frons superne visus medio non acutus sed truncatus. Pedes 5ti minores, super carapacem sæpe restantes, depressione ad eos recipiendos abruptâ, tarsi inermibus, depressis styliformibus, paris postici non depressis, apice 3—4 setis longiusculis (tarso paulo longioribus) instructo. Sterni fossa abdominalis marginibus bene prominens et subacuta.—*Monolepis inermis*, *Say*, typus est.

2. *MARESTIA*, *Dana*.—Carapax fronte uti in *Monolepi*. Pedes 8 postici ad basin infra non armati; 5ti minores, super carapacem sæpe restantes, depressione ad eos recipiendos parce concavâ; tarsi styliformibus, unguiculatis, spinis infra

*Journ. Acad. Nat. Sci., Philad., i. 155.

armatis, paris postici apice setis longiusculis instructis.—Typus est *Monolepis spinitarsus*, Say. Hic pertineret quoque *Meg. mutica*, Desm. si ejus pedes postici setis longiusculis confecti; aliter genus alterum instituendum. Verbum "Marestia" clarissimum Desmarest commemorat.

3. MEGALOPA, *Leach*.—Carapax fronte simpliciter rostratus, rostro vix deflexo, acuto. Pedes 8 postici ad basin infra uni-spinigeri: 5ti minores, tarso styliformi.—Typus *Meg. Montagui*, Leach.*

4. CYLLENE, *Dana*.—Carapacis frons uti in *Megalopa*. Pedes 8 postici ad basin infra uni-spinigeri; 5ti minores, tarso anguste lamellato, setis longiusculis partim ciliato.

5. TRIBOLA, *Dana*.—Carapax fronte horizontalis tricuspidatus, rostro (vel cuspide medianâ) tenui, cuspidibus (vel dentibus) externis vix longiore. Antennæ internæ inter rostrum et cuspidem externas apertè inflexæ. Pedes postici minores, tarso unguiculato setisque longis non instructo.

Descriptiones Megalopideorum adhuc ineditæ.

MARESTIA ELEGANS.—Carapax antice angustus et superne visus bilobatus, lateribus fere parallelis, pone oculos vix salientibus. Pedes antici parvi, manu oblongâ, margine inferiore et partim superficie internâ remotè hirsutis. Pedes 2di marginibus sparsim ciliati, tarso infra 7-spinoso, ad basin tuberculum infra non gerente. Tarsi postici infra 6-spinosi, apice unguiculati et 4 setis longis instructi. *Hab.* Promontorio Bonæ Spei. *Long.* Carapacis 4—5". An *Megalopa mutica Kraussii* (Südaf. Crust. p. 54) et *De Haanii* (Faun. Japon. p. 167)? Sed pedes postici extremitate setis tarso paulo longioribus instructi.

MARESTIA ATLANTICA.—Carapax antice angustus et superne visus bilobatus, lateribus postice paulo divergentibus, pone oculos vix salientibus. Pedes antici parvi, manu oblongâ, nudâ aut nudiusculâ. Pedes 6 sequentes nudiusculi, tarso infra quinque spinas tuberculumque ad basin instar calcis gerente. Tarsi postici parvuli, sed setularum duabus paribus infra instructi, non spinosi, apice unguiculati et tribus setis longis armati.—*Hab.* lat. aust. 6°, long. occ. 24°.

MARESTIA PERVALIDA.—Carapax antice latus et superne visus obsolete quadri-lobatus, lobis subæquis, lateribus postice non divergentibus, prope medium unidentatis. Pedes antici pervalidi, manu valde crassâ, tumidâ. Tarsi postici infra spinosi, apice tribus setis longiusculis armati.—*Hab.* lat. bor. 6°, long. orient. 173°.

MONOLEPIS ORIENTALIS.—Sterni segmenta fossam sterni includentia antica margine interiore fere truncata, vix triangulata; segmenta proxima convexa, non tuberculigera. Tuberculum medianum inter aream buccalem et fossam sterni simpliciter subtriangulatum, antice acutus, postice hemisphericus, utrinque depressione deinde septo brevi antice et oblique producto cinctus. Tarsus pedis postici brevis, non unguiculatus, apice tribus setis longiusculis armatus, infra setulis paucis perbrevis necque spinis instructus. *Hab.* in mari Suluensi. *Long.* carapacis 4".—*M. inermis* differt, sterni segmentis anticis intus non subtruncatis sed prominenter triangulatis, proximis unituberculatis, tuberculo mediano inter aream buccalem et fossam sterni tuberculis tribus composito.†

CYLLENE HYALINA.—Rostrum parce prominens. Carapax subovatus, lateribus pone oculos paulo saliens, postice inermis. Thorax infra ad extremitatem pos-

* Malac. Pod. Brit. pl. 16. Leach describes three other species, (not noticed by Edwards,) in Tuckey's Exped. to the Zaire, (London, 1818,) p. 404. The *M. Cranchii* may be a true *Megalopa*; the others have a deflexed beak.

† The author is indebted to Prof. L. R. Gibbes, of Charleston, S. C., for the privilege of examining specimens of the *M. inermis*. They were obtained by him from the stomach of a fish off the Atlantic coast between New York and Charleston, in 1846. See Rep. Crust. in U. S. Collections, by Prof. Gibbes, in Proc. Amer. Assoc. Charleston, 1850, vol. iii. p. 192.

teriolem inermis. Pedes antici mediocres, carpo inermi, manu paulo tumidâ, supra subgibbosâ, digitis hiantibus, apice inflexis et acutis. Pedes 2di 3tii 4tique subæqui, tarsi fere rectis, longis, articulo penultimo longioribus. *Hab.* in mari Atlantico juxta "Rio Negro" Patagoniæ, et in mari Pacifico prope "Valparaiso." *Long.* carapacis 3—4'''.

CYLLENE FURCIGER.—Rostrum elongatum, spiniforme, frontis latitudine non brevior. Thorax infra ad extremitatem posteriorem duabus spinis longis divergentibus postice productis armatus. Pedes antici angusti, carpo articuloque secundo spinâ brevi curvatâ armatis, brachio inermi. Tarsi 2di 3tii 4tique parce armati, styliformes.—*Hab* in mari Suluensi.

TRIBOLA LATA.—Carapax late ovatus non pubescens, paulo longior quam latus, lateribus pone oculos parce undulatis, rostro lineari, dentibus frontis lateralibus rostro remotis, apice acutis et paulo divaricatis. Pedes antici parvuli, tenues, manu pedibus sequentibus vix crassiore. *Hab.* in mari Atlantico, prope insulas "Canary;" e stomacho piscis "Bonito" lecta. *Long.* corporis fere ½''.

TRIBOLA PUBESCENS.—Carapax oblongus, subovatus, pubescens, lateribus pone oculos undulatis, rostro lineari, dentibus frontis lateralibus rostro minus remotis. Pedes toti densè brevissimèque pubescentes; antici rostrum paulo superantes, angusti, inæqui, manu dextrâ non latiore quam carpus. Pedes 8 sequentes fere duplo longiores, 2dis brevioribus quam 3tii. *Hab.* in Archipelago "Paumotu" mari Pacifico.

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MACROURA.

We follow De Haan in placing the genus *Galathæa* with the *Anomoura*; and near it we arrange *Æglea*, which widely differs from most other related species in having penicillate instead of foliose branchiæ.

The *Macroura*, excluding these groups, includes three distinct sections or subtribes.

One, the "Fossores" of authors, or the *THALASSINIDEA*, has close relations on one side with the *Paguri*, and on the other with the *Squillidæ*. They constitute a line of gradation between these extremes, independent mostly of the other *Macroura*, and osculating only with the *Astaci*, although removed from them in general habit and structure. There is a diversity among the legs as to form and position, which is not found in any other *Macroura*, and calls to mind the *Paguri*. Moreover, there is in general a looseness of structure, a length of abdomen, and sluggish habit of body, unlike the trim compact forms of the typical *Macroura*. The anterior feet are thrown directly forward and are thus fitted for the burrowing habits of the species.

The *second* subtribe—the *ASTACIDEA*—is composed of the highest grade of *Macroura*, approaching in some points of structure the *Brachyura*. This is seen in the fact that the sides of the carapax fold under and unite to the epistome, as is well shown in *Scyllarus* and less perfectly in *Astacus*; also in the absence or small size of the basal scale of the outer antennæ. The *Astaci* are the transition species between the other *Astacidea* and the *Caridea*, and in the genus *Paraneuphrops*, White, the antennary scale is not smaller than is common in the latter group. Yet they properly form part of the same section with the *Scyllari* and *Palinuri*, rather than a separate division as made by Milne Edwards; they differ from all the *Caridea* in the transverse suture across the carapax near its middle.

The *third* section—the *CARIDEA*—includes the typical *Macroura*, which have the sides of the carapax not soldered to the epistome, and a large basal scale to the outer antennæ.*

* The *Cumæ* would constitute another section—*Cumidea*—if mature animals. But according to recent researches of Prof. Agassiz, as he has informed the author, they are in some cases, and probably in all, immature forms of *Palæmon*, *Crangon*, and other known *Macroural* genera.