Within the last few years, it has been proved that the occurrence of the remains of fishes in many of the western groups of rocks, is by no means rare. In the Clinton group at the base of the Upper Silurian, as developed in the Lake Superior district, we have detected markings similar to those in the same group in New York, made by some vertebrated animal, probably a fish. Mr. Joseph Sullivant has observed the remains of fishes consisting of teeth, scales and fins in numerous instances in the Cliff limestone of Columbus, (Upper Silurian,) and Prof. Agassiz, in a recent visit to the quarries, was enabled to collect numerous specimens, and we may hope, ere long, to receive exact information as to the character of these ancient species.

Dr. Norwood found a well-preserved jaw in the same group, at Madison, Ia. Messrs. Whittlesey and Brainard of Cleveland have brought to light well-preserved specimens from the Devonian, or perhaps subcarboniferous system of Northern Ohio; while at Zanesville and Cambridge, we have indisputable evidence of their occurrence in the true carboniferous.

4. *Sulphate and Carbonate of Copper of Bristol, Conn.*—On page 222 we failed to state that the copper ore contains both sulphuric and carbonic acids, but the fact of their chemical combination remains in doubt.

III. Zoology.

1. *On the Classification of the Crustacea Grapsoidea;* by James D. Dana.—The Grapsoidea, in the system here explained, correspond to the Cyclometopa of Edwards, excepting that we separate the Telphusa, group and place it with the Cancroidea.*

A few of the species have the fourth joint of the outer maxillipeds articulated by the inner angle with the third, as in the Cancroidea: of these we make the family Gonoplacidæ, or the Grapsoidea Cancridica.

In all the other species, this articulation is remote from the inner angle, being either near the middle of the apical margin or at the outer angle. The near universality of this character among the Grapsoidea is proof of its importance, and sustains us in removing from along side of the Gonoplacidæ the Macrophthalmi.

The Macrophthalmus and Ocypod groups are closely related, and with Doto make our *second* family the Macrophthalmidæ,—characterized by the great length of the eye-peduncles, the very narrow front, and the 2nd joint of the male abdomen narrower than the corresponding part of the sternum.

The Grapsus family—the third has the same limits as in the system of Milne Edwards. The form is subquadrate, with the lateral margin anteriorly more or less acute; the front broad; the eyes of moderate length or short; the second joint of the male abdomen usually not narrower than the corresponding part of the sternum. We give more importance than has hitherto been done to the fact of the outer maxillipeds having an oblique piliferous crest on the surface or not; and we make this characteristic the basis of a subdivision of the Grapsidæ (exclusive of the Plagusinæ) into the subfamilies *Grapsinæ* and *Sesarminæ*,

* This volume, p. 130.

the former characterized by the absence of this crest. A survey of the groups will at once show, we believe, that we follow natural lines in this subdivision. The *Plagusinæ* are distinguished by longitudinal sinuses in the front of the carapax for the inner antennæ.

The family GECARCINIDÆ—the fourth—is the same in limits as the "Gecarciniens" of Edwards,—the species are remarkable for their thick obese forms, high rounded front and antero-lateral margin, and for having the second joint of the male abdomen but slightly narrower than the corresponding part of the sternum.

The family PINNOTHERIDÆ—the fifth—differs from the "Pinnotheriens" of Edwards in the removal of the genus *Doto*, closely related to Ocypod, and also the genus *Myctiris*, an aberrant form between Pinnothera, Doto and Helœcius, but very peculiar in being narrow anteriorly, and having no distinct orbits for the retraction of the eyes. The genus *Myctiris* constitutes the last or sixth family MYCTIRIDÆ. In the Pinnotheridæ, the male abdomen is much narrower than the sternum behind, which character separates them from the Gecarcinidæ.

We do not believe in a properly lineal order in classification; yet the succession we have given to the families is a natural succession, as nearly as can be made. The *first*, Gonoplacidæ, link the Grapsoidea with the Cancroidea, and the genus Eucrate is very near Eriphia and Panopæus in form. The *second*, Macrophthalmidæ, is closely allied to the first, so much so that Marophthalmus and Gonoplax have been arranged in the same group. The *third*, Grapsidæ, are again very near the Macrophthalmidæ, and the genus Helice is almost as correctly placed with one as the other. Thence the transition is as gradual also to the *fourth* or Gecarcinidæ, and from the fourth to the *fifth* or Pinnotheridæ, and from the fifth to the *sixth* or Myctiridæ. Still, there are other relations of somewhat less prominence which this order does not exhibit. That of *Elamena* to Inachus has long been recognized.

The Gonoplacidæ are placed in the Cancer group by DeHaan, who neglected the important distinction based on the male verges. The other genera, exclusive of Pinnothera and the species related, he divides into two groups, the *Ocypus* and *Grapsus* groups, the former having the fourth joint of the outer maxillipeds articulated with the outer angle of the third, and the latter, articulated with the middle of the apical margin;—a distinction difficult to carry out and dividing natural groups, as the Gecarcinidæ, Grapsidæ, &c. His genera of the OCYPUS group, are, Doto, Scopimera, Myctiris, Gelasimus, Macrophthalmus, Cleistostoma, Cardisoma, Chasmagnathus, Helice, Uca, Ocypoda, Acanthopus (a division of Plagusia); those of the GRAPSUS group, are, Gecarcinus, Philyra (division of Plagusia), Plagusia (another division), Grapsus, Trichopus, Eriocheir, Pachysoma, Goniopsis, Platynotus, Brachynotus, Nautilograpsus, Cyclograpsus, and in his "Decas Septima," published in 1849, he unites with the group, Pinnotheres and Hymenosoma.

We add a few words on the genera of GRAPSIDÆ. Both De Haan* and Randall† have divided the Grapsus of authors into two genera, according to the *short* or *oblong* form of the third joint of the outer max-

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* Faun. Japon., p. 33, 1833.

† Jour. Acad. Nat. Sci., Philad., viii, 124, 126.

illipeds. The former are De Haan's *Grapsi*, and Randall's *Pachygrapsi;* the latter De Haan's *Goniopses* and Randall's *Grapsi.* But the length of this joint, as we have shown in many other cases, is a characteristic of small importance, and such a basis for subdivision is therefore wrong. There are two natural groups; one with arcuate sides, like *G. pictus*, and the other with straight sides like *G. cruentatus* and *G. messor;* and in each, this joint may be short or oblong. *G. variegatus*, like *G. pictus*, has the joint oblong; yet a species every way similar and hitherto referred to the *variegatus* has the same joint not longer than broad.* We hence reject this subdivision and adopt two others, viz: *Grapsus*, having arcuate sides, and *Goniograpsus*, having straight sides. The latter forms the transition to *Sesarma* and *G. cruentatus* is like the *Sesarmæ* in habit.

The genus *Cyclograpsus* of Edwards is characterized by its author as having a piliferous crest on the outer maxillipeds, though exceptions are admitted. Subsequently, M'Leay made his genus *Gnathochasmus* on the same type. Some recent authors have taken M'Leay's name for these typical species and restricted *Cyclograpsus* to the exceptions. We find no authority in the rules laid down by the British Association, or in the nature of the case, for thus perverting Cyclograpsus from its true type as first established, and we therefore make Gnathochasmus a synonym of it, and adopt a new name for the species without the piliferous crest. This we believe is due to M. Edwards.

The following is a synopsis of the Families, Subfamilies and Genera of Grapsoidea:—

CRUSTACEA GRAPSOIDEA.

1. Articulus maxillipedis externi 4tus angulo 3tii interno articulatus.

Fam. I. GONOPLACIDÆ.

Carapax transversus. Frons quartâ parte latitudinis carapacis longior, paulo deflexus, lamellatus. Antennæ internæ transversæ. Articulus abdominis *maris* 2dus sterno contiguo angustior.

G. 1. Eucrate, *De Haan.*†—Carapax antice arcuatus, parce declivis, *Panopæo* formâ antennisque affinis. Appendices *maris* sexuales e sterno ortæ abdomineque tectæ. Pedes *maris* antici breves, crassi. Oculi breves. Abdomen *maris* 5-articulatum, versus basin sterno contiguo vix angustius.

G. 2. Curtonotus, *De Haan.*‡—Carapax antice arcuatus, parce declivis, margine antero-laterali rotundato. Appendices *maris* sexuales e basi pedum ortæ, in canaliculo sterni ductæ, deinde abdomine tectæ. Oculi breves. Pedes *maris* antici prælongi.

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* The species referred to is one from Valparaiso. The *G. variegatus*, according to its description by Edwards, and the figure by Guerin, has the joint quite oblong. The Valparaiso species, which we name the *Grapsus planifrons*, has this joint no longer than broad.

† Crust. Faun. Japon., p. 36. *Geryon*, Kröyer, Tidskrift, i, (1837,) p. 15, pl. 1.

‡ De Haan, Crust. Faun. Japon., p. 20. *Pseudorhombila*, Edwards, Crust. ii, 58.

G. 3. Gonoplax, *Leach.*—Carapax latus, trapezoidalis, antice elongatè transversus, angulis anticis acutis. Appendicibus *maris* sexualibus *Curtonoto* affinis. Oculi longi. Pedes *maris* antici prælongi.

2. Articulus maxillipedis externi 4tus angulo 3tii interno non articulatus.

Fam. II. MACROPHTHALMIDÆ.

Oculi tertiâ parte latitudinis carapacis non breviores. Carapax subquadratus, sæpissimè transversus, antice latissimus, angulis anticis acutis, lateribus non arcuatis. Antennæ internæ sive transversæ sive longitudinales. Articulus abdominis *maris* 2dus sterno contiguo angustior. Articulus maxillipedis 3tius costâ obliquâ piliferâ nunquam ornatus.

1. MACROPHTHALMINÆ.—Antennæ internæ transversæ, sub fronte insitæ. Antennæ externæ basi frontem appressæ. Articulus maxillipedis externi 4tus apertus.

G. 1. Cleistostoma, *DeH.**—Carapax subquadratus, paulo transversus. Frons quartâ parte latitudinis carapacis vix brevior. Oculi longiusculi. Pedes antici *maris feminæve* breves. Articulus maxillipedis externi 3tius 2do vix minor, quadratus.

G. 2. Macrophthalmus, *Latr.*—Carapax latus, transversim rectangulatus. Frons angustissimus. Oculi longissimi. Articulus maxillipedis externi 3tius 2do multo minor.

2. OCYPODINÆ.—Antennæ internæ longitudinales, juxta frontem utrinque insitæ. Antennæ externæ fronte paulum remotæ. Articulus maxillipedis externi 4tus apertus, 3tius 2do minor.

1. *Articulus maxillipedis externi 2dus 3tio valde major.*

G. 1. Gelasimus, *Latr.*—Oculi graciles, corneâ parvulâ, parce oblongâ. Pedes *maris* antici portentosè inæqui. Manus minor debilis, digitis sæpissimè instar cochlearis excavatis aut spatulatis.

G. 2. Helœcius, *Dana.*†—Oculis habituque *Gelasimo* affinis. Pedes antici subæqui. Abdomen versus basin sterno contiguo vix angustius. Maxillipedes externi sulco lineari fere longitudinali superficie notati.

G. 3. Ocypoda, *Fabr.*—Oculi crassi, corneâ longâ, fere ad pedunculi basin productâ. Pedes *maris* antici inæqui, minoris digitis acuminatis. Abdomen basi angustum. Carapax transversus.

2. *Articulus maxillipedis externi 2dus 3tio parce major, non oblongus.*

G. 4. Scopimera,‡ *DeH.*—Corpus globoso-cubicum. Pedes *maris* antici subæqui, non crassi. Habitu *Gelasimo* affinis.

3. DOTINÆ.—Articuli maxillipedis externi 4tus et sequentes 3tio celati.

Genus Doto, *DeH.*§—Corpus subquadratum.

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* Crust. Faun. Japon., p. 26.—From κλειστος, *shut*, and στομα, *mouth*—not *Cleistotoma.*

‡ Crust. Faun. Japon., p. 24.

† Includes *Gelasimus cordiformis.*

§ Crust. Faun. Japon., p. 24.

Fam. III. GRAPSIDÆ.

Oculi tertiâ parte latitudinis carapacis breviores. Carapax subquadratus, sæpius depressus, lateribus aut rectis aut arcuatis. Antennæ internæ transversæ. Articulus abdominis *maris* 2dus sterno postico sæpius vix angustior. Articulus maxillipedis externi 3tius sive inornatus sive costâ obliquâ ornatus. Palatum lineâ elevatâ viæ efferentis limite instructum.

1. GRAPSINÆ.—Antennæ internæ fronte tectæ. Articulus maxillipedis externi 3tius costâ obliquâ in 2dum productâ non notatus.

1. *Maxillipedes externi vix hiantes.*

G 1. Pseudograpsus, *Edw.*—Articulus maxillipedis externi 3tius orbiculato-cordatus, aut subquadratus, 2do brevior. Frons dimidio latitudinis carapacis vix brevior. Carapax lateribus arcuatus.

G. 2. Eriocheir, *DeH.**—Articulus maxillipedis externi 3tius uti in *Pseudograpso*. Frons dimidio latitudinis carapacis multo brevior. Carapax subpolygonatus.

G. 3. Platynotus, *De H.*†—Articulus maxillipedis externi 3tius 2do longior, margine postico valde obliquo.

G. 4. Trichopus, *De H.*‡—Articulus maxillipedis externi 3tius latior quam longior, extus dilatatus. Pedum articuli 5tus 6tusque posticorum compressi denseque ciliati.

2. *Maxillipedes externi rhomboidicè hiantes.*

G. 5. Grapsus, *Lamk.*—Carapax transversim lineolatus, lateribus plus minusve arcuatis. Frons dimidio latitudinis carapacis brevior. Antennæ externæ juxta frontis latera oblique exsertæ. Tarsi spinulis armati.

G. 6. Goniograpsus, *Dana.*§—Carapax transversim lineolatus. lateribus rectis, postice sæpe convergentibus. Frons dimidio latitudinis carapacis longior. Antennæ externæ sub frontis margine sæpius exsertæ. Tarsi spinulis armati.

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* Faun. Japon., p. 32, 59.—The genus *Utica* of White, (Ann. Mag. Nat. Hist., xx, 206, and Crust. Voy. Samarang, 52, pl. 13, fig. 6,) appears to have the essential characteristics of Eriocheir, and like Eriocheir differs but little from Pseudograpsus. The front is narrow, the form subpolygonal, and it lives like E. Japonicus, in freshwater. The bushy hair on the hand of the Japan species is not necessarily a generic character. The name Eriocheir is therefore unfortunate, and it would be better for the science to substitute the name given by White.

The *E. penicillatus* of De Haan, (p. 60, pl. 11, f. 6,) appears to be a true Pseudograpsus.

† Faun. Jap., p. 34.

Brachynotus is the name of another genus by De Haan based on a Mediterranean species described by Risso, Hist. Nat. de l'Eur. Merid., v, 13. The male abdomen is but 4-jointed, the female 7-jointed; 2d and 3d joints of the outer maxillipeds of equal length, and the 3d truncate at either extremity.

‡ Faun. Jap., p. 32.—*Varuna* of Edwards, Crust. ii, 94.

§ In part, *Goniopsis* of De Haan, F. Jap., p. 33, and *Pachygrapsus* of Randall, J. Acad. Nat. Sci., Philad., viii, 126.

G. 7. PLANES, *Leach.**—Carapax non lineolatus, lævis, fere quadratus, parce oblongus. Frons rectus. Articulus maxillipedis externi 3tius latior quam longior, cordatus. Tarsi spinulis armati.

G. 8. HEMIGRAPSUS, *Dana.*†—Carapax non lineolatus, fere lævis, lateribus plus minusve arcuatis. Frons rectus aut rectiusculus, antennis internis tranversis. Articulus maxillipedis externi 3tius fere orbiculato-cordatus. Tarsi inermes.

G. 9. CYRTOGRAPSUS, *Dana.*—Carapax gibbosus, subhexagonus non lineolatus. Frons sursum sinuosus, antennis internis obliquis, inplicis frontis insitis. Articulus maxillipedis externi 3tius subor-biculato-cordatus. Tarsi inermes.

2. SESARMINÆ.—Antennæ internæ fronte tectæ. Articulus maxillipedis externi 3tius costâ obliquâ in 2dum productâ notatus.

1. *Articulus maxillipedis externi 3tius apice rotundatus.*

G. 1. SESARMA, *Say.*‡—Carapax quadratus, sæpe partim lineolatus, lateribus rectis, fronte rectè prærupto. Abdomen *maris* versus basin sterno contiguo vix angustius. Tarsi sæpe armati.

G. 2. SARMATIUM, *Dana.*—Carapax subquadratus, lateribus arcuatis, fronte curvatim declivi. Abdomen *maris* versus basin sterno contiguo vix angustius. Tarsi inermes.

2. *Articulus maxillipedis externi 3tius apice truncatus et sæpe excavatus.*

G. 3. CYCLOGRAPSUS, *Edw.*§—Carapax lævis, medio planus, ad margines anteriores declivis, lateribus arcuatis, integris. Abdomen *maris* versus basin sterno contiguo vix angustius.

G. 4. CHASMAGNATHUS, *DeH.*‖—Carapax convexus, subquadratus, lateribus arcuatis et antice emarginatis, fronte curvatim declivi. Oculi breves. Abdomen *maris* versus basin sterno contiguo parce angustius.

G. 5. HELICE, *DeH.*¶—Carapax quadratus, lateribus parallelis, rectis. Oculi longiusculi. Abdomen *maris* versus basin sterno contiguo multo angustius.

3. PLAGUSINÆ. Antennæ internæ sinubus frontis longitudinalibus apertæ.

G. 1. ACANTHOPUS, *De H.***—Corpus valde depressum. Articulus maxillipedis externi 3tius oblongus, parvus, apice 2di multo angustior. Ramus maxillipedis 1mi internus apice angustus et not transversus.

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* Mss. Mus. Brit.; the genus is recognized in Bowdich's "Madeira and Porto Santo," p. 151; and more lately in Bell's Brit. Crust., p. 133.—*Nautilograpsus* of Edwards, Crust. ii, 89.

† *Grapsus* (subgenus) of De Haan, F. Jap., p. 31; *Cyclograpsus*, in part, of Edwards, Crust. ii, 77.

‡ Jour. Acad. Nat. Sci., i, 76, 1817. *Pachysoma*, of De Haan, Faun. Japon., p. 33.

§ Crust. ii, 77.—Gnathochasmus, of M'Leay, Smith's Illust. Zool. S. Africa, and Cat. Crust. Brit. Mus. by A. White, 1847, 40.

‖ Faun. Japon., p. 27.

¶ Faun. Japon., p. 28.

** Faun. Japon., p. 29. Corresponds to *Plagusia clavimana.*

G. 2. Plagusia, *Latr.**—Corpus minus depressum, crassius. Articulus maxillipedis externi 3tius apice 2di vix angustius, raro longior quam latior. Ramus maxillipedis 1mi internus apice transversus.

Fam. IV. GECARCINIDÆ.

Oculi breves. Carapax obesus, paulo transversus, antice latus, curvatim declivis, lateribus arcuatis poneque oculos large rotundatis, vix dentatis. Antennæ internæ transversæ. Articulus abdominis maris 2dus sterno contiguo vix angustior. Articulus maxillipedis externi 3tius costâ obliquâ piliferâ non ornatus. Palatum lineâ elevatâ viæ efferentis limite non instructum.

1. UCAINÆ. Articulus maxillipedis externi 4tus apertus.

1. *Maxillipedes externi non hiantes.*

G. 1. Uca, *Leach.*—Articulus maxillipedis externi 4tus angulo 3tii externo insitus.

G. 4. Gecarcinucus, *Edw.*†—Articulus maxillipedis externi 4tus marginis medio apicalis 3tii insitus.

2. *Maxillipedes externi rhomboidicè hiantes.*

G. 3. Cardisoma, *Latr.*—Articulus maxillipedis externi 4tus apice 3tii externo insitus.

G. 4. Gecarcoidea, *Edw.*—Articulus maxillipedis externi 4tus marginis medio excavato apicalis 3tii insitus.

2. GECARCININÆ. Articuli maxillipedis externi 4tus et sequentes 3tio celatus.

G. 1. Gecarcinus.

Fam. V. PINNOTHERIDÆ.

Oculi breves, orbitis insiti, raro non retractiles. Carapax sive obesus sive depressus, raro paulo oblongus et interdum parce rostratus, lateribus valde rotundatis. Antennæ internæ aut transversæ aut obliquæ. Abdomen *maris* angustum, versus basin sterno contiguo valde angustius. [Species omnes parvæ.]

2. PINNOTHERINÆ. Articulus maxillipedis externi 2dus parvulus aut obsoletus. Corpus sive obesum sive depressum.

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* *Plagusia* and *Philyra* of De Haan, Faun. Japon., p. 31; the latter genus in his system including *Plagusia depressa* of authors, and the former the *P. squamosa*. The distinction between his two genera consists in this; the palpus of the outer maxillipeds in *Plagusia* has a flagellum, and that of *Philyra*, none. The name *Philyra* belongs to another genus of earlier date, instituted by Leach; moreover, the resemblance between the species of these groups is so close in other characters, that we hardly consider the distinction important as a generic character.

† Jacquemont's Voy. dans l'Inde, plate 1.

1. *Oculi approximati. Fossæ antennales conjunctæ.*

a. Pedes 8 postici sat graciles, subæqui.

G. 1. PINNOTHERA, *Latr.*—Corpus obesum. Carapax superficie integerrimus, nunquam areolatus. Oculi normales.

G. 2. FABIA, *Dana.*—Corpus obesum. Carapax superficie anticâ pone orbitas suturâ divisus. Oculi normales.

G. 3. XENOPHTHALMUS, *White.**—Corpus obesum, fronte incisionibus duabus profundis oculos gerentibus instructo.

G. 4. XANTHASIA, *White.*†—Corpus depressum, supra fere planum margineque elevato utrinque instructum, fronte paulo producto. Oculi normales.

b. Pedes 4ti longiores et multo validiores.

G. 5. PINNIXA, *White.*‡—Corpus portentosè transversum.

2. *Oculi sat remoti. Fossæ antennales septo latiusculo sejunctæ. Articulus maxillipedis externi 2dus fere dimidii 3tii longitudine.*

G. 6. PINNOTHERELIA, *Lucas.*§—Pedes 8 postici sat graciles, subæqui. Corpus suborbiculare.

2. HYMENICINÆ. Corpus sæpius parce rostratum, depressum. Articulus maxillipedis externi 2dus dimidio 3tii major.

G. 1. HYMENOSOMA, *Leach.*—Carapax suborbiculatus, angulo extra-orbitali acuto. Frons angustissimus, non lobatus, oculis valde approximatis.

G. 2. HALICARCINUS, *White.*‖—Carapax suborbiculatus, angulo extra-orbitali nullo. Frons tridentatus, antennis internis inter dentes se porrigentibus, oculis remotioribus. Articulus maxillipedis externi 3tius 2do paulo major.

G. 3. HYMENICUS, *Dana.*¶—Carapax suborbiculatus, angulo extra-orbitali nullo. Frons productus, simplex aut lobatus, antennarum basin celans, oculis remotioribus. Articulus maxillipedis externi 3tius 2do paulo major. Pedes gracillimi.

G. 4. ELAMENA, *Edw.*—Carapax subtriangulatus, paulo oblongus, paulo rostratus, fronte antennas internas celante. Articulus maxillipedis externi 3tius 2do minor.

FAM. VI. MYCTIRIDÆ.

Corpus obesum. Carapax fronte perangustus, orbitis carens; antennæ internæ longitudinales.

Genus MYCTIRIS, *Latr.*

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* White, Ann. Mag. Nat. Hist., xviii, 178, and Voy. of Samarang, p. 63. The genus *Fabia* forms a transition from Pinnothera to Xenophthalmus; it includes the *P. chilensis.*

† Ann. Mag. Nat. Hist., xviii, 176.

‡ Ann. Mag. Nat. Hist., xviii, 177. Includes Say's *Pinn. cylindricum*, Jour. Ac. Nat. Sci., Philad., i, 452.

§ Crust. of D'Orbigny's S. Amer., p. 24. The genus forms a transition to the Gecarcinidæ.

‖ Ann. Mag. Nat. Hist., xviii, 178.

¶ The genus *Hymenosoma* belongs to the Cape of Good Hope, *Halicarcinus* to the extremity of S. America, and *Hymenicus* to New Zealand.

2. *Note on the genera Hexapus and Arges of De Haan;* by J. D. DANA. —The genus *Hexapus* of De Haan, in his first publication of its characters, (in Decade I. and II. of the Fauna Japonica, pp. 5 and 35,) is arranged near Pinnothera, which it resembles in its short obese form and small size. But in his last Decade, published in 1849, which contains his final remarks on classification, at p. xiv, the genus is referred to the vicinity of Pilumnus.—The outer maxillipeds are as in Pilumnus. The genus is peculiar in the 5th pair of legs being obsolete. The species is the *H. sexpes*, (Jap., p. 63 and pl. 11, f. 6, *Cancer sexpes* of Fabricius, Ent. Syst., Suppl., p. 344, f. 37.)

The genus *Arges* of De Haan, (Faun. Japon., p. 21,) includes only a fossil species. It is Cancroid in its outer maxillipeds and near Pilumnus and also Menippe. The abdomen in both sexes is 7-jointed; in the male oblong-trigonal, in the female ovate. The lateral margins of the carapax are parallel and entire, and the general form is much like that of *Cyclograpsus Audouinii* and the allied. Distance between the eyes one-fifth the breadth of the thorax.—Sp. *A. parallelus* (F. Jap., p. 52, and pl. 5, f. 4) from Japan.

3. *On the Resuscitation of Frozen Fish;* by Prof. O. P. HUBBARD. —With a previous notice on this very interesting subject in the Am. Journal, vol. x, p. 132, I made a request that correspondents would communicate other examples of the kind. In reply I have received the following letter from Prof. J. P. Kirtland, M.D., which details a remarkable instance of resuscitation.

To Prof. O. P. HUBBARD, *Dear Sir:*—In accordance with your request, as expressed in the foregoing article, I will communicate in detail some facts in regard to the resuscitation of frozen fish.

To persons familiar with the locality, it is known that a brook or small rivulet arises from springs, among the granite hills between Durham and Haddam in the state of Connecticut and ultimately discharges itself into Connecticut river a little south of the city of Middletown. In its passage among the high bluffs, it in one instance winds its way through a marsh of several acres in extent, immediately below which, a high dam is thrown across it from bluff to bluff. This raises the water some eight or ten feet over the marsh and forms a reservoir for the purpose of supplying a series of mills on the stream below, during the droughts of summer. At the approach of winter the artificial outlet is usually closed by a gate and the water collects till it is wanted during the following season.

In this pond or reservoir had accumulated large numbers of the common eel and as they were usually restrained from descending the stream at the approach of winter, as is their habit when left to themselves, many of them had attained a large size.

The autumn and winter of 1819–20 or of the succeeding year (which, I am not certain,) was distinguished for the scanty supplies of rain and the low stages of water in the streams in that section of country. Winter set in with heavy and repeated falls of snow, the drought still continuing. A heavy body of ice formed on this pond and upon it rested eighteen inches or more of snow. About mid-winter the mill owners drew off all the remaining water and the ice rested on the soft mud at the bottom. The immense pressure seemed to incommode the eels in their winter quarters and they commenced collecting in the