PROFESSOR KINAHAN, M. D., F. L. S., read—

## NOTES ON DREDGING IN BELFAST BAY, WITH A LIST OF SPECIES.

IN a communication entitled "On *Xantho rivulosa* and other Decapodous Crustacea, occurring at Valentia Island, county of Kerry" (*vide* "Proceedings Dublin Natural History Society," vol. ii., pp. 16 and 33; and *ante*, vol. iv., "Proceedings of Society," pp. 69 and 86), laid before your Society in 1856, I remarked on the fact that of the peculiar species found on the west coast, several were not met with on the Dublin shores, yet are common in the northern portions of the eastern coasts of Ireland; and, founded on this, I suggested that it appeared probable that a portion of this stream of western and southern species would seem to have, as it were, overlapped the northern portion of the island, and to have died out before reaching the Dublin, or, as I called it, the proper eastern district. An examination of Belfast and Carrickfergus Bays during the past summer, whilst affording me several previously unnoticed crustacea, has furnished me with additional proofs of this.

I allude to this theory the more particularly, because I learn that recently doubt has been expressed as to a similar distribution among the shells; and facts adduced by Messrs. Hyndman, Patterson, Waller, and Dickie, attempted to be explained away by supposing either that the southern and western types, quoted by those gentlemen, owed their presence here and in the list to pleistocene deposits, ocean currents, or possibly, as was also suggested, to some "Irish blunder." Now, as regards this latter, it ought to be sufficient that all the critical species had been identified by Alder, Gwyn Jeffreys, and other men of note on the other side of the Channel; and one of the species in dispute, *Odostomia conspicua*, was named by its first discoverer in England, Mr. Alder; and if the objectors, instead of so readily prejudging the matter, had taken the trouble to cross the Channel, even a few days spent at Galway and Belfast would soon have satisfied them that as regards the common typical shells of the two ports, several in the latter places were much commoner and more typical there than further south-east, being in fact either South British or Lusitanian.

*Tapes aurea*, for instance, common in the west, not uncommon in Belfast, is unknown, as far as I can learn, in Dublin. *Mactra subtruncata*, rare in Dublin, common in the west, is also extremely common in Belfast. *Trochus magus*, a common littoral species in the west, unknown as such, as far as I can learn, in Dublin, is by no means rare as a littoral species in Carrickfergus. But it would consume too much time were I to notice all the species which illustrate this point; and there is not the slightest cause for wonder that such shells as *Chemnitzia scalaris*, *Ovula patula*, *Adeorbis subcarinata*, and *Rissoa striatula*, have occurred to the Belfast Dredging Committee.

The distribution of the crustacea affords data confirmatory of this; and Dr. E. Percival Wright, in a recent paper of his on Irish Actinia, has noticed the same point; and there appears to be little doubt that when the other sections of zoology shall have been accurately studied, the

same rule will be found to exist among them. My researches in Belfast and Carrickfergus Loughs included, amongst others, dredging excursions to Ballyholme Bay, Bangor, and Groomsport, in company with Professors Wyville Thompson and Redfern, and Mr. Edward Waller; and to the Gobbins and Blackhead, with the Rev. G. Payne and Professor Andrews. Here, in addition to other species, I met the following, previously unrecorded in the Belfast list, as published:—*Crangon fasciatus*, *C. Allmanni*, *C. sculptus*, *C. spinosus*, and a new species, which I mean to describe more fully at some subsequent meeting, and which I have called *Crangon Pattersonii; Hippolyte Cranchii*, *H. pusiola*, and *Galathea Andrewsii*. This latter occurred here in great numbers.

I should mention that on an examination of the specimens in the Belfast Museum, afforded me by the kindness of Messrs. R. Patterson and Hyndman, I found specimens of *Crangon Allmannii* and *Crangon fasciatus*, but marked in Mr. W. Thompson's handwriting as *C. vulgaris*—some of those obtained as far back as 1838.

Mr. Robert Patterson kindly accompanied me to Cultra and Crawfordsburn, where I found two amphipods, which have been first noticed by me as Irish—viz., *Gammarus palmatus*, which I found two years ago in Dublin, and *Orchestia Deshayesii*, which I had previously found at Carrickfergus. This latter is generally believed to be identical with the Egyptian species described by Savigny.

Floating on the sea, in the cavities of Acalephæ, *Hyperia galba* was met in immense numbers; and a *Lestrigonus*, which appears to be *L. Fabricii* of Edwards, and which I suppose is the species which, owing to its bad state of preservation, W. Thompson failed to identify.

I append a list of the principal species obtained, marking those decapods which do not occur in Dublin; and among the amphipods the species which are recorded there; our information regarding this group is, however, at present so scanty that it were dangerous to dwell too much on this group. I have also inserted here the species of both those and the isopods which I have met in Dublin, not Belfast, as some of them are unrecorded.

### *List of Species of Crustacea obtained in Belfast Lough.*

[N. B.—The decapods of Belfast having been already enumerated by me in full in former papers, from William Thompson's list, and the specimens in the Ordnance Survey collection, I here note only such as require further notice.]

**Thus marked (*) not found in Dublin.**

### *Crustacea Decapoda.*

*Inachus dorynchus.*—Occurred not uncommonly in Ballyholme Bay and off Bangor; no other species occurred to us.

*Eurynome aspera.*—Ballyholme Bay and off Whitehead; does not appear to be rare.

*Portunus puber*.—Bangor.
*Portunus corrugatus*.—Bangor and Ballyholme Bays.
*Portunus arcuatus*.—Bangor.
*Portunus depurator*.—Ballyholme, Whitehead.
*Portunus pusillus*.—Groomsport and Whitehead.
*Portunus holsatus*.—A single specimen off Whitehead.
*Bernhardus streblonyx*.—Common everywhere.
**Bernhardus Prideauxii*.—I did not meet this species. Mr. J. C. Hyndman showed me several typical specimens of it; in my Dublin lists the range given is incorrect; one specimen only occurred to me there, and that imperfect.
*Bernhardus Cuanensis*.—Ballyholme and Whitehead.
*Bernhardus Ulidianus*.—This is the species which, on my discovery of it in Dublin Bay, I called Eblanensis; the examination of W. Thompson's original specimen enables me to correct this error. It is extremely common everywhere.
*Bernhardus Hyndmanni*.—Ballyholme, Bangor, Whitehead, and the Gobbins.
**Bernhardus lævis*.—Not uncommon. Off Whitehead and Bangor.
*Bernhardus Thompsoni*.—Whitehead, Bangor, and the Gobbins; commoner than in Dublin.
*Galathea Andrewsii*.—Extremely common; this is also very common on the south-west coast, where Dr. E. Perceval Wright and Professor J. Reay Greene inform me it occurs as a littoral species. Professor Thomas Bell showed me specimens of the same species from deep water off Madeira; and M. Lucas, Paris, showed me a bottleful of specimens of the same species, captured off the coast of Algiers.
*Munida Rondeletii*.—Occurs not uncommonly in deep water, as Mr. G. C. Hyndman informs me.
*Crangon vulgaris*.—Appears as common here as in Dublin.
*Crangon fasciatus*.—One specimen, very beautifully coloured, occurred near the shore in Ballyholme Bay; several specimens occurred in a black sand off the Gobbins; these latter were in spawn. This species does not occur in the published Belfast list. In the Belfast Museum, however, there are several specimens included under *C. vulgaris*, and bearing the following localities in William Thompson's hand:—"Portaferry, July, 1838, W. T.; Belfast Bay, 1839, E. Getty; and Donaghadee, Dr. Drummond."
**Crangon spinosus*.—Two specimens, same locality as last; does not occur in Belfast list.
**Crangon Pattersonii* (*n. s.*).—Two specimens at the Gobbins. This species differs from last in the smoothness of the first to fourth rings of the abdomen; the fifth ring has a triangular central elevation at its inferior border; the sixth is plane above; the telson sulcate; the rostrum rounded and slightly concave above. I hope to describe it more fully shortly.

The specimens taken were in spawn. I can find no species, either recorded or in the collections in London or Paris, which agrees

with it. The trivial name is intended to commemorate the President of the Belfast Natural History Society, Robert Patterson.

*Crangon sculptus.*—Two specimens at the Gobbins. Not hitherto recorded, save by Professor Melville at Isle Arran, and by me at Bray, where it is far from uncommon.

*Crangon Allmanni.*—Of this species, named by me in 1856, I met several specimens at the Gobbins, on the 20th August, 1858. Subsequently to this, in the Belfast Museum Collection, I detected two specimens put up as *C. vulgaris*, and marked in W. Thompson's hand "Fortwilliam, Belfast."

*Hippolyte varians.*—Common.

*Hippolyte Cranchii.*—Bangor and Whitehead: a single specimen of each.

*Hippolyte pusiola.*—Bangor; Whitehead; the Gobbins: far from uncommon. Not in Belfast Catalogue.

*Hippolyte Thompsonii.*—Common in all the localities. The specimen in the Belfast Collection is marked "Strangford Lough."

*? *Mysis Griffithsii.*—What I take to be this species is in the collection of the Belfast Museum on a card marked as *Mysis vulgaris*, and from the neighbourhood of Belfast. Its occurrence in Ireland is unnoted in our lists. For this and other notes on the Belfast collection I am indebted to the kindness of G. C. Hyndman, who accompanied me in my examination of the stores of the Collection, and supplied much information as to the identification of particular specimens.

### *Crustacea Amphipoda.*

In this list, in addition to my own observations, I avail myself of a list of William Thompson's collection, kindly furnished to me by C. Spence Bate, Esq. This is acknowledged by the reference W. T., S. B. Those species which have occurred in Dublin are also noted: the remarks on the species are my own.

*Talitrus locusta.*—Common at Groomsport, Crawfordsburn, and Carrickfergus. "Newcastle, Down" (W. T., S. B.). Dublin.

*Orchestia littorea.*—Common. Carrickfergus; Groomsport; Crawfordsburn; and Larne; "Strangford Lough" (W. T., S. B.). Dublin.

*O. lævis.*—Rare. Carrickfergus; Larne; not nearly as common as in Dublin.

*O. Deshayesii* (*Savigny*).—This species, new to Ireland, occurs not uncommonly, but very locally, near Carrickfergus. It is less active than either of the others. I met it also at Crawfordsburn. In England, Spence Bate informs me, it is rare as a southern species. I compared my specimens with that in the British Museum, and they are identical. Whether they are identical with the Egyptian species, is still open to doubt, as the type specimen has, I have been informed, been lost.

*Montagua monoculoides.*—Bangor; Belfast Bay (W. T., S. B.).

*Lysianassa Costæ.*—Bangor, one specimen; Belfast Bay (W. T., S. B.). Bray, Kish Bank.

*Lysianassa longicornis.*—Portaferry (W. T., S. B.).

*Anonyx minutus.*—Cod's stomach, Belfast (W. T., S. B.).
*Ampelisca typicus.*—Belfast Bay (W. T., S. B.). Extremely common on the north scallop bed, Kish Bank, Dublin.
*Ampelisca Bellianus.*—Newcastle; Down (W. T., S. B.).
*Westwoodea cæcula.*—(W. T., S. B.)? Belfast.
*Iphimedia obesa.*—By no means rare; Belfast Bay (W. T., S. B.). Dublin, Bray, common.
*Dexamine spinosa.*—Extremely common both in dredge and rock-pools; in the former particularly you generally meet ten of this Amphipod for one of any other. This species occurs in the Thompson list, but it were wasting space to detail localities. Dublin, Kish, and Sandycove, very abundant.
*Dexamine bispinosa.*—Bangor, county Down (W. T., S. B.). I have never met this species in Dublin, though I have looked carefully for it.
*Gammarus locusta.*—Common here, as everywhere. Dublin.
*Gammarus fluviatilis.*—Fresh-water streams near Carrickfergus. Very common in Dublin. Careful comparison of specimens taken by me in Waterford, Clare, Dublin, Tyrone, &c., has resulted in the conclusion that but one species of fresh-water Gammarus occurs in Ireland. The record of *Gammarus pulex*—i. e. a species with the posterior angles of the abdominal rings produced as teeth—has arisen, I believe, from W. Thompson having used this term as applied to *G. fluviatilis* of Roesel in his early correspondence. The true *Gammarus pulex* has not, I believe, been found in Ireland.
*Gammarus gracilis.*—Bangor, county Down (W. T., S. B.).
*Gammarus marinus.*—Carrickfergus, under the Castle; "Newcastle, Down" (W. T., S. B.).
*Gammarus palmatus.*—This species, new to the Irish lists, occurred to me in numbers at the bathing-place between Cultra and the railway station. It occurs under stones covered with enteromorpha and ulvæ, in a spot where a number of small sand-pools break a muddy sand-beach. I had previously met the species in 1856, near Merrion, county Dublin, in a similar locality. Spence Bate informs me it is extremely rare in England, and certainly Montague's species.
*Gammarus Othonis.*—Bangor; Belfast Bay (W. T., S. B.).
*Gammarus longimanus.*—Carrickfergus. Rare, under the Castle.
*Amphitoe rubricata.*—Bangor (W. T., S. B.).
*Amphitoe littorina.*—Newcastle; Bangor, county Down (W. T., S. B.). Howth, county Dublin, extremely common.
*Corophium longicorne.*—Clay, near ship-yard, Carrickfergus. Occurs in hundreds on the muddy shores of the tidal portions of the Dodder, county Dublin.
*Hyperia Galba.*—In thousands in Acalephæ, floating through the Bay; in many instances as many as thirty or forty specimens could be obtained from a single Acaleph; many of the specimens taken had ova attached to them.

*Lestrigonus Fabricii* (?).—This occurred with the last, but in fewer numbers. It is singular that in the supplement to Parry's "Voyage," this is figured as having occurred also along with the last. Can there be any intimate connexion, such as sexual, between them? I find some trifling differences between my specimens and *L. Fabricii* (Milne-Edwards), but await my friend Spence Bate's judgment on the point. I strongly suspect that Gosse has mistaken this animal for *Metoicus medusarum*, the distinction between the genera being such as to easily cause a mistake. This is doubtless the species W. Thompson failed to identify, owing to the bad condition of his specimens.

The two following species, found by me in Dublin Bay, have not hitherto occurred at Belfast:—

*Iphimedia Eblanæ*.—Found in *Rhizostoma Cuvieri*, Dublin Bay.
*Chelura terebrans*.—Extremely common in submerged timber at Kingstown and Howth.

*Crustacea Isopoda.*

I here note only the species actually obtained and identified; several yet await the latter process; this list is, therefore, an approximation only.

*Arcturus longicornis*.—Two specimens, dredged off Gobbins. North Bull, Dublin.
*Idotea pelagica*.—Common in all suitable localities here, as also in Dublin.
*Idotea tricuspidata*.—A more markedly deep-water species than the last; Whitehead; Ballyholme Bay. Dublin Bay, Dalkey Sound, very common.
*Idotea emarginata*.—Specimens in Belfast Museum. Very rare in Dublin, but has been taken in Dublin Bay. Coast of Wexford, Dr. E. Perceval Wright.
*Limnoria terebrans*.—In the piles, ship-yard, Carrickfergus, extremely abundant. Kingstown Harbour, and Howth and Malahide, very numerous. In Dublin this species is always associated with *Chelura terebrans*. I searched carefully for this latter at Carrickfergus, in company with Professor Wyville Thompson, but unsuccessfully. Professor Thompson informed me that he had never succeeded in finding Chelura in Belfast, although he had looked carefully for it. W. Thompson, in his "Fauna," makes the same remark.
*Asellus aquaticus*.—A small stream, near Carrickfergus. Dublin.
*Jaera albifrons*.—Carrickfergus. Dublin (?).
*Sphæroma serratum*.—River Lagan, Belfast. River Dodder, Dublin.
*Sphæroma rugicauda*.—Blackhead.
*Nesæa bidentata*.—Carrickfergus. Loughshinny; Dublin. Cork, on authority of Professor J. Reay Greene. Roundstone, W. M'Calla, *q. v.*

*Porcellio scaber.*—Common everywhere. Dublin.
*Porcellio pictus.*—Carrickfergus; Blackhead; Crawfordsburn. Dublin.
*Porcellio lævis.*—Rare; Carrickfergus. Dublin.
*Oniscus murarius.*—Common everywhere. Dublin.
*Oniscus fossor.*—Common everywhere. Dublin.
*Philoscia muscorum.*—Carrickfergus; Crawfordsburn. Dublin.
*Philougria riparia.*—Carrickfergus; Whitehead; Crawfordsburn. Dublin.
*Ligia oceanica.*—More local than in Dublin; rare about Carrickfergus; extremely common at Crawfordsburn.
*Armadillium vulgare.*—Common everywhere. Dublin.

The following species has not as yet been met in Belfast:—

*Apseudes talpa.*—Sandycove, county of Dublin, in sand-pools, 1857.

The strange admixture of northern and southern forms exhibited by these lists is too strongly marked to require more than a passing notice. I hope to return to the subject at some future meeting.

The President remarked on the importance of the critical study of species in various localities. He had no doubt, from his own hurried researches in the west, that many species yet remained unnoticed. As he saw that the Society to-night was honoured by the presence of Mr. Edward Waller, he hoped that that gentleman would favour the Meeting with his view on the subject-matter of the communication just read, as he believed Mr. Waller had been engaged in researches in the same district.

Mr. Edward Waller said that as the President had called on him, he would state that during the researches of the Belfast Committee, in which he had been associated with Mr. Robert Patterson, Mr. Hyndman, Professor Dickie, and others, the results obtained were confirmatory of the remarks made in the paper just read.

Of the shell *Odostomia conspicua*, previous to the Belfast specimens, but one perfect specimen had been found; the Belfast specimens were submitted to Mr. Alder, the gentleman who first named this species, and all the shells included in the list, on his authority, had been submitted to Mr. Alder and Mr. Gwyn Jeffreys for their opinion, and there could be no doubt that both South British and Lusitanian forms occurred here.

There was another set of shells on which he would make a few remarks. During the past year ten species had occurred to them dead, which they had not succeeded in obtaining living, although the dredging researches had been carried on nearly half way across the Channel, and in both shallow water and up to the depth of 110 fathoms. These species were northern species, and, owing to the difficulty of accounting for the non-occurrence of the living animals, perhaps it was safer to look on them as Pleistocene, though he must say that the shells were just as fresh as the specimens of species still living. Large Pleistocene deposits occur in the neighbourhood, but he should mention that none of these disputed species were as yet recorded as found in them. All