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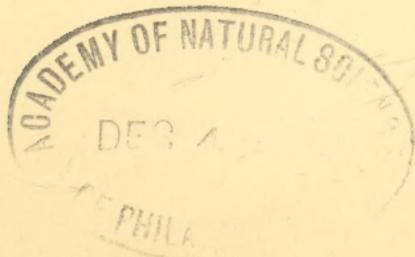
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REPORT AND TRANSACTIONS

OF THE

Guernsey Society of Natural Science.

1882 = 89.



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OFFICERS FOR THE YEAR 1888-89.

Patron :

SIR E. MACCULLOCH, BAILIFF.

President :

MR. THOMAS GUILLE.

Vice-President :

MR. JOHN WHITEHEAD.

Treasurer :

MR. W. A. LUFF.

Secretary :

MR. W. SHARP.

Committee :

Mr. F. M. Allès

Mr. S. G. Hugo

Mr. A. Collenette

Mr. C. G. De la Mare

Mr. G. T. Derrick

Mr. E. D. Marquand

LIST OF MEMBERS.

Sir E. MacCulloch, Bailiff	..	Pollet
Mr. F. M. Allès	.. ..	Bon-Air
Mr. J. L. Bougourd	.. ..	St. Sampson's Road
Mr. Bowie	.. ..	Panorama House
Mr. F. Carey	.. ..	Grange
Miss Cole	.. ..	Canichers
Mr. A. Collenette, F.C.S.	.. ..	Ruettes Brayes
Mrs. A. Collenette	.. ..	Ruettes Brayes
Colonel Collings	.. ..	2, Eaton Place
Mr. H. Crousaz	.. ..	Brock Road
Mr. C. G. De la Mare	.. ..	Mount Durand
Mr. G. T. Derrick	.. ..	Valnord
Mr. Espinasson	.. ..	Hauteville
Miss Guille	.. ..	Union Street
Mr. T. Guille	.. ..	Montauban
Mr. A. E. Hewitt	.. ..	Canichers
Mr. S. G. Hugo	.. ..	Allez Street
Mr. C. E. Juleff	.. ..	Rohais
Rev. G. E. Lee, M.A.	.. ..	Valnord
Rev. F. E. Lowe, M.A.	.. ..	King's Road
Mr. W. A. Luff	.. ..	7, Mount Row
Mr. E. D. Marquand	.. ..	Fermain House
Mr. G. Le Masurier	.. ..	De Beauvoir Terrace
Mr. J. Nicolle	.. ..	Mount Row
Mr. Ph. Nicolle	.. ..	Foulon
Mr. J. B. Nickolls	.. ..	Hadsley House
Mr. J. S. Paint	.. ..	Commercial Arcade
Mr. J. L. Pitts	.. ..	Canichers
Mr. J. B. Randell	.. ..	Allez Street
Mr. Z. Robert	.. ..	St. Andrew's
Mr. F. Rose	.. ..	Valnord
Mr. W. Sharp	Granville House
Mr. R. L. Spencer	Esplanade
Mr. J. Whitehead	Royal Hotel

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TRANSACTIONS

OF THE

SOCIETY.



A public meeting was held at the Guille-Allès Library on Tuesday, October 10th, 1882, for the purpose of forming a Natural History Society, Edgar MacCulloch, Esq., Lieutenant-Bailiff, in the chair. In his opening address, the chairman said that such a Society as was now contemplated had long been a want in the island. An attempt had once been made, but after a time that Society became defunct. There were in the present case, reasons why better success should now be possible—through the kindness and patriotic spirit of Messrs. Guille and Allès the new Society would have a place to meet in, and a large collection of books to consult. The speaker considered that there was nothing more elevating than the study of Natural History, and of this there was in Guernsey a rich field open to students. Its Geology was certainly limited, but in its Fauna and Flora, there was endless work before the members of such a Society. One gentleman present

(Mr Luff) had made himself an authority on the entomology of the island; while good work had been done by Mrs. W. Collings and others in different branches. Ornithology had not been neglected, and he himself had a good collection of shells and would be happy to assist the conchological branch.

After some conversation respecting the object and scope of the Society, it was decided that the name should be the GUERNSEY NATURAL SCIENCE SOCIETY and that the subscription should be 2s. 6d. per annum.

Thirty persons then gave in their names as members of the Society, and it was resolved that the officers of the Society should be, president, Edgar MacCulloch, Esq.; vice-president, Mr. G. T. Derrick; hon. secretary and treasurer, Mr. W. A. Luff.

The following gentlemen were appointed to form the committee and draw up rules for the Society, to be taken into consideration at a meeting to be held Tuesday, October 24th:—Rev. G. F. Bigge; Messrs. H. Crousaz, S. G. Hugo, J. L. Pitts, R. L. Spencer, and J. Whitehead, also it was resolved—that Mrs. W. Collings and Mr. H. M. Gwatkin, having expressed their willingness to assist the Society, be considered honorary members.

A General Meeting was held October 24th, 1882, Mr. G. T. Derrick, Vice-President, in the chair.

The committee submitted to the meeting such rules as they considered suitable. These were taken into consideration, and, after several alterations and additions had been made, were adopted by the meeting; and it was decided to have 200 copies printed.

1.—This Society shall be called the “Guernsey Society of Natural Science.”

2.—The objects of the Society shall be to give mutual aid in the study of various branches of Natural Science, by means of papers, conversations, exhibition of specimens, and excursions; the purchase of any appliances for forwarding the objects of the Society, the drawing

up of correct lists of the various animals, plants, and minerals, indigenous to the Bailiwick of Guernsey, and the publication of proceedings.

3.—The attention of Members shall be specially directed to Natural Science as connected with the Bailiwick of Guernsey.

4.—That the Officers of the Society be a President, Vice-President, Secretary, Treasurer, and a Committee of six Members, to be elected annually at the General Meeting; and of these, three shall form a quorum.

5.—That the same President and Vice-President shall not hold office for more than two years in succession.

6.—All Members of this Society must also be Members of the Guille-Allès Library.

7.—The Annual Subscription shall be 2s. 6d., payable in advance.

8.—New Members of the Society may be elected at any of its Meetings by a majority of votes, notice of such proposal having been previously sent in writing by a Member of the Society to the Secretary at least two days before the meeting.

9.—Strangers visiting the island, introduced by a Member, shall be allowed to attend the Meetings.

10.—Persons not residing in the island, rendering assistance to the Society, may be registered as Honorary Members by a vote of the Society.

11.—The Ordinary Meetings of the Society shall be held at the Guille-Allès Library at 7.30 on the second Tuesday in each month, and the room will be open every Tuesday evening for the use of members.

12.—Notice in writing must be sent to the Secretary, at least one month before the Annual Meeting, of any proposed alteration or addition to the Rules of the Society.

13.—The Annual Meeting of the Society shall be held during the month of October, when a Committee and Officers shall be elected and the Annual Subscriptions become payable; and a financial statement of the affairs of the Society shall be presented.

14.—No resolution for dissolving this Society shall have effect, except it be agreed to by a Meeting called for that special purpose and confirmed by a subsequent Meeting, held at an interval of not less than three calendar months; and such subsequent Meeting shall decide as to the disposal of the property of the Society.

Weekly Meeting, October 31st, 1882.—It was suggested that the following rules should be proposed at the next monthly meeting:—

1.—That lists of all the natural productions of the Bailiwick of Guernsey be drawn up by the Society.

2.—That no name be added to the list unless submitted to a meeting of the Society and confirmed by a subsequent one.

3.—That when possible specimens be always produced.

Weekly Meeting, November 7th, 1882.—Mr. W. A. Luff exhibited a Locust (not identified) captured in Mill Street, last autumn, which was fed for some time on cabbage leaves.

It was recommended that a record be carefully kept of the dates of the arrival and departure of various species of birds. Mr. Derrick had seen the House Martin (*Hirundo urbica*) in Belmont Lane, November 3rd.

Mr. MacCulloch observed that the Heron used formerly to breed in the island—near the house now called “La Heronière” near the foot of Delancey.

A letter printed in *Science Gossip* on the hibernation of swallows, written by the Rev. D. Dobrée, was read:—“In the winter of December, 1845, I was engaged in pulling down the Rectory of my parish of Torteval, which had certainly stood since the time of Charles II. The weather was exceedingly cold, and in pulling down the roof I found six swallows in a torpid state under the old rafters and took them home in my pocket. On arriving at the Forest Rectory, where I lived—I placed them at a certain distance from the fire—to the great amusement of my wife and servants. On the following morning they were all perched on the kitchen grate, chirping as if in spring. I regret to say that subsequently, from the want of flies and other suitable aliment, which I in vain endeavoured to procure for them, they all died. They were certainly not young birds, several of them having the red throat by which an old cock swallow is always distinguished.”

Mr. MacCulloch stated that “henbane” was to be found at Petit Bot Bay and L’Anresse—deadly night shade was also found in Guernsey. Purple hellebore at Grande Mare, Vazon.

The First Monthly Meeting was held at the Guille-Allès Library, Tuesday, November 14th, 1882, E. MacCulloch, Esq., President, in the chair.

Mr. G. T. Derrick read a paper on the Ferns of Guernsey This will be found further on in these pages.

Weekly Meeting, November 21st, 1882.—Mr. Derrick placed a number of flowering plants on the table for examination, which had been gathered during the day. Mr. Hugo exhibited a king-fisher which had been shot in Guernsey, and stated that they were not uncommon.

Weekly Meeting, November 28th, 1882.—Mr. Derrick exhibited a number of flowering plants, including a specimen of Butcher's Broom (*Ruscus aculeatus*) in fruit. Mr. Hugo exhibited living specimens of two water-beetles (*Colymbetes grapii* and *Dytiscus marginalis*), and Mr. Luff showed the following Beetles all captured in Guernsey: *Haliphus ruficollis*, *Hydroporus lividus*, *Pelobius Hermanii*, *Colymbetes fuscus*, *C. grapii*, *Laccophilus hyalinus*, *Hydrous*, *Agabus nebulosus*. The Song Thrush was heard on the 25th, the first time this season.

Weekly Meeting, December 5th, 1882.—A number of Botanical specimens were identified, and added to the Society's list. Dr. Hoskins had forwarded for acceptance a herbarium of local plants, gathered by himself, for which gift a cordial vote of thanks was accorded.

The Second Monthly Meeting was held Tuesday, December, 12th, 1882, E. MacCulloch, Esq., President, in the chair.

Mr. W. A. Luff, read a paper on the Butterflies of Guernsey and Sark, which is inserted further on.

The Third Monthly Meeting was held January 16th, 1883, Edgar MacCulloch, Esq., President, in the chair.

Mr. G. T. Derrick read "Some notes on the comparison of Ansted's list of flowering plants with Hooker's Students' Flora." Miss Guille exhibited a collection of Seaweeds, named and mounted. Mr. Luff exhibited a specimen of the Comma Butterfly (*Grapta C. Album*) captured by Colonel A. H. Collings, in the garden at Clifton. This is the first recorded. Mr. Z. Robert, of St. Andrew's, presented a collection of specimens of local rocks, for which the cordial thanks of the Society were presented. The Sky-lark first heard January 7th.

Weekly Meetings, January 23rd and 30th.—Examination and identification of botanical specimens. Mr. Hugo exhibited several species of water beetles, alive, also caddis worms and their cases. Mr. Luff exhibited more than thirty species of beetles all caught in Guernsey:—*C. Campestris*. *C. Marginatus*. *C. Fuscus*. *S. Caesareus*. *N. Mortuorum*. *C. Lunaris*. *H. Quadrimandatus*. *O. Taurus*. *O. Vacca*. *O. Cœnobita*. *O. Fracticornis*. *G. Typhaeus*. *M. Vulgaris*. *R. Solsitalis*. *C. Aurata*. *C. Aurata*, black variety. *D. Nobile*. *O. modisagœ*. *H. Sabulosum*. *Meloe?* *T. Coriaria*. *C. Lamina*. *C. Arietes*. *C. Sulcirostris*, and numerous other smaller species.

Weekly Meeting, February 6th, 1883.—Mr. Luff exhibited a case of Guernsey Dragon flies, including *Sympetrum flavescens*; two species of *Aeschna*; *Calepteryx splendens*. *Pyrchosoma minimum*. *Agrion pulchellum*. Also a case of Silk-worm moths (4 species) reared in Guernsey, and their cocoons. A number of flowers were examined and identified, and Mr. MacCulloch presented a list of large and rare fishes observed by him in Guernsey.

Scomberesox saurus, Sawry Pike or Skipper, Nov. 1860.

Phycis furcatus, Great forked Hake, Dec. 1877.

Hippoglossus Vulgaris, Holibut, July 1873.

Cyclopterus lumpus, Lump sucker, April 1864, and March 1880.

Orthogaris mola, Short sunfish, Aug. 1825, June 1856.

Lamna cornubica, Porbeagle or Beaumaris Shark, Nov. 1863, June 1881.

Alopias Vulpes, Fox shark or thresher, June 1863.

Squatina Angelus, Angel fish, Monk fish, Oct. 1873.

Scioena Aquila, Maigre, Aug. 1846, Nov. 1867, Oct. 1873.

Dentax Vulgaris, Four toothed Sparus, Dec. 1873. July 1875, July 80.

Auxis Vulgaris, Plain Bonito, Jan. 1889.

Lepidopus argyrens, Scabbard fish, 1840.

Naucrates ductor, Pilot fish, June 1859.

Capros aper, Boar fish, May 1876, March 1879.

Lophius piscatorius (Fishing frog), Nov. 1883.

Torpedo vulgaris (Electric Ray), Sept. 1884.

The Fourth Monthly Meeting was held February 13th, 1883, Mr. G. T. Derrick, Vice-President, in the chair.

Mr. A. Collenette, F.M.S., read a paper on the occurrence of Calcite (Carbonate of Lime) in Guernsey, which is inserted further on.

The Weekly Meetings held February 20th, 27th, and March 6th.—Were spent in the examination and identification of plants.

Meeting of the Committee held March 6th, 1883.—Present Edgar MacCulloch, Esq., President, in the chair; Messrs. Derrick, Whitehead, Pitts, Hugu, Crousaz, Luff, and Rev. Bigge.

Resolved that the Secretary procure a cabinet to hold the botanical and other specimens presented to the Society.

The Fifth Monthly Meeting was held March 13th, 1883, E. MacCulloch, Esq., President, in the chair.

A large number of Geological specimens and fossils were exhibited by Mr. Derrick, many of them picked up on the Guernsey beaches, having been brought by vessels as ballast. Mr. Luff exhibited a collection of Hawk moths, including specimens of *S. Ocellatus*. *S. populi*. *A. Atropos*. *S. Convolvuli*. *S. Ligustri*, and *M. Stellatarum*, all captured in Guernsey. He also exhibited a larva of the Goat moth, living, and preserved specimens of the pupa and the moth.

The meetings were continued through the summer, the members being principally engaged with the botanical list and general conversation on Natural History subjects. The following specimens had been exhibited. The Mole cricket (*Grylloptera Campestris*), Death's Head Moth (*A. Atropos*), Tiger Beetle (*C. Campestris*), and the large Star fish or Spiney cross fish (*Uraster glacialis*). Colonel Jerome exhibited a stone celt he had recently found, also the celt picked up by Captain Lukis at Icart.

An excursion was made to the beach and caves at Icart, March 24th, and one to inspect the raised beach at Capelles, and the Vale, May 15th, an account of these is inserted further on. Another was made on June 26th to the Vazon marshes, of which there was nothing to record of much importance.

The Annual Meeting was held at the Guille-Allès Library, on Tuesday, October 9th 1883, Edgar MacCulloch, Esq., Lieutenant-Bailiff, and President of the Society, in the chair.

The following report was read by Mr. G. T. Derrick:—

The attendance at the preliminary meetings, and the number of members enrolled during this,—the first year of the Society's existence, show that the importance of an acquaintance with Natural Science is well recognised amongst us, and

we must all acknowledge that our knowledge of the subject will be greatly extended by mutual assistance at the meetings of an organised society. The results of observations made by our local investigators are not only important to us here, but owing to the peculiar formation and geographical position of the bailiwick are of interest to the general science student; so that there is special need of a Guernsey Society to investigate and keep records in connection with Natural Science.

As arranged at the last yearly meeting, the room so kindly placed at the disposal of the Society by Messrs. Guille and Allès has been opened weekly, and members have had the opportunity of bringing forward any subject in which they might be interested, or exhibiting any specimen for identification or conversation. Many mineral specimens, and a considerable number of insects have thus been brought under notice; on one evening a number of marine specimens were shown, but most evenings have been devoted to Botany. More than 260 species of our flowering plants have been produced and identified during the year; among these have been nearly all our rarer and peculiar plants, *e.g.* *Draba verna* (Whitlow-grass). *Matthiola sinuata* (Sea stock). *Silene conica* (Striated corn catch-fly). *Ornithopus ebracteatus* (Sand joint-vetch) from Herm. *Sibthorpia Europæa* (Cornish money-wort). *Pyrola rotundifolia* (Round-leaved winter-green). *Centaurea aspera* (Hooker). *C. Isnardi* (Bab.) (Rough knap-weed). *Cicendia pusilla* (Branched Gentianella). *Triglochin maritimum* (Sea Arrow-grass). *Orchis laxiflora* (Loose-spiked orchis). *Orchis apifera* (Bee orchis). *Listera ovata* (Twayblade). *Epipactis palustris* (Marsh Helleborine). *Spiranthes cœstivalis* (Summer lady's tresses). *Allium triquetrum* (Garlic). *Trichonema Columnæ* (Columna's Trichonema). *Gymnogramma leptophylla* (Slender gymnogramma or Jersey fern). *Ophioglossum lusitanium* (Dwarf Adder's tongue). *Isoetes hystrix*, etc. Steps have been taken towards revising and correcting

the published lists of Guernsey plants; and hopes are entertained that in a few seasons the Society may be able to exhibit herbarium specimens of all these plants corresponding with a corrected list.

Special meetings were arranged for the second Tuesday in each month, when papers were to be read on particular subjects set down for discussion. Three such papers have been read, one on the ferns of Guernsey by Mr. Derrick, another on the butterflies of Guernsey and Sark, by Mr. W. A. Luff, and a third by Mr. Adolphus Collenette, F.M.S., on the occurrence of carbonate of lime in Guernsey; each paper was illustrated by numerous specimens, and gave rise to an interesting conversation, and contained valuable information which would be worth preserving in a permanent form, could such papers be regularly produced during the winter, an abstract of them might be printed, and much valuable information collected and preserved.

During the summer months instead of meeting in the hall, members have on various occasions made excursions into the country districts, sometimes to search for specimens, at others to examine the physical features of special localities, as at the Jaonnée, Capelles, L'Ancrese, etc. These excursions proved specially interesting and instructive; we should be pleased to see them more frequently organized, and more largely attended. The Society has been presented with collections of plants and minerals by Dr. Hoskins, Mr. Paint, Mr. Robert and others. Such donations seem to point to the necessity of room for their reception, and would, if encouraged undoubtedly increase into an island museum, but without much larger funds it would be impossible for this Society to undertake the formation and care of this,—so much needed and useful an institution.

At the commencement of the second year, the committee appeal to the members to continue the support of the Society

and invite the co-operation of others who have not joined us; they will be very pleased also if members will bring forward suggestions for increasing the interest and usefulness of the Society, so that the coming year may be one of enhanced vigour and success.

Mr. W. A. Luff, secretary and treasurer, then submitted the accounts, which were audited and approved. The receipts from members' subscriptions being £7 2s. 6d; expenditure, £3 19s. 11d., leaving a balance in hand of £3 2s. 7d.

The officers for the ensuing year were then elected :—Mr. Edgar MacCulloch, president; Mr. G. T. Derrick, vice-president, Mr. W. Sharp, secretary, Mr. W. A. Luff, treasurer. Committee: Mr. A. Collenette, Mr. C. G. De La Mare, Mr. H. Crousaz, Mr. S. G. Hugo, Mr. R. L. Spencer, Mr. J. Whitehead.

LIST OF MEMBERS.—1882—3.

E. MacCulloch, Esq., Lieutenant-Bailiff.	Mr. C. G. De La Mare.
Rev. G. F. Bigge.	Mrs. Le Lièvre.
Mr. Barnes.	Miss Le Mottée.
Miss S. Best.	Mr. S. Le Cocq.
Mr. T. M. Bichard.	Rev. F. E. Lowe.
Mr. A. B. Brown.	Mr. W. A. Luff.
Mrs. L. Lane Clarke.	Mr. Maccabee.
Miss Chant.	Miss Martel.
Mr. E. M. Cohu.	Mr. H. Mauger.
Miss Cole.	Miss Mauger.
Mr. A. Collenette.	Mr. W. W. Marshall.
Mrs. A. Collenette.	Rev. H. Millican.
Colonel Collings.	Mr. J. Mogford.
Mr. H. Crousaz.	Mr. A. S. Mourant.
Miss Dauber.	Mr. Paint.
Mr. G. T. Derrick.	Miss Paint.
Mr. T. Elliott.	Mr. J. Pattinson.
Mr. Espinasson.	Mr. J. L. Pitts.
Miss Grace.	Mr. J. B. Randell.
Miss Guille.	Mr. Z. Robert.
Mr. T. Guille.	Mr. W. G. Robilliard.
Miss Hamon.	Mr. Robin.
Mr. R. Harris.	Mr. W. Sharp.
Dr. Hinton.	Miss E. Shortt.
Mr. G. Hugo.	Miss H. Shortt.
Mr. S. G. Hugo.	Mr. R. L. Spencer.
Colonel Jerome.	Miss Vincent.
Mr. C. Körner.	Mr. C. Vaucour.
	Mr. J. Whitehead.

The weekly meetings of the Society were continued during the year 1883-4, at most of which additions were made to the Botanical lists—but no papers were read. The following objects were exhibited at the monthly meetings.

October.—The Great Green Grasshopper, the Saw Fly (Sirex), and the larva of *Orgyia Pudabunda* (Light Tussack Moth), by Mr. Luff. The Hawfinch (*Coccothraustes Vulgaris*), by Mr. Spencer. Specimen of the small beetle *Agelestica halensis*, by Mr. Luff.

November.—The capture of an Angler fish or Fishing Frog (*Lophius Piscatorius*) was reported, also of a Dab chick. A remarkable display of the Aurora Borealis and several Lunar Rainbows were seen during the first week.

Dr. Hoskins has presented to the Society a large collection of specimens of local rocks with the localities noted.

November 28th.—The Song Thrush first heard.

April 1884.—Specimens of Volcanic Mineral products exhibited by Mr. Robert, and compared with some Guernsey and Sark minerals. A fine specimen of the Mole cricket was shewn by Mr. R. L. Spencer.

Moulin Huet Bay, Ivy Castle, and Fermain Bay were visited during the spring, by botanical students, and specimens of rare flowering plants were exhibited at the monthly meetings by Mr. Derrick.

August.—A fish of the Electric Ray species, was found on the Great Bank.

September 30th.—Specimens of micaceous iron ore from Dielette and of quartz and slate from Carteret, by Mr. Robert. Specimens of Coral from Barbadoes by Mr. Derrick, and various Butterflies by Mr. Norman. Fine specimens of Coralline (*Cellepora cervicornis*), by Mr. Guille.

The Second Annual Meeting was held at the Guille-Allès Library, October 21st, 1884, Edgar MacCulloch, Esq., Lieutenant-Bailiff President of the Society, in the chair.

The following report was read by Mr. W. Sharp, the Hon. Secretary.

At the close of the second year of the Society's existence, the Committee note with pleasure that the research begun so vigorously last year has been continued during the present one. The Society now numbers forty-four members. During the year twenty-six indoor meetings have been held, and during the summer months several outdoor excursions. These latter are at once pleasant and instructive, giving as they do an opportunity of studying the growing of plants, and of noticing the physical and geological features of the country. The old mine workings at Moulin Huet, Ivy Castle and neighbourhood, Fermain, Jerbourg, and L'Anresse, have thus been visited. Several of the winter evenings were spent in examining a valuable set of microscopic objects, which, with two excellent microscopes, were kindly lent to the society by Mr. Guille.

Botany has again claimed the greatest share of the members' attention, and a large number of plants have been identified and added to the list, which now numbers three hundred.

Mr. Luff has at various times exhibited and described many Guernsey specimens of butterflies, moths, beetles and other insects, and to him also we are indebted for an interesting paper well illustrated with specimens on "Some New Zealand insects compared with Guernsey ones." Failing other *original* papers, several essays from scientific works have been read, in each case a discussion following. It is hoped that some members may be led to take up privately the subject of marine zoology, and communicate their researches to the society, as there are difficulties in the way of studying it at indoor meetings.

The committee record with much pleasure the gift by Dr. Hoskins of an extensive collection of specimens of the various

rocks of Guernsey and the neighbouring islands, and they hope that the day may not be far distant, when a suitable room will be provided for the reception of these and other articles of local interest at present hid from public gaze, thus forming a local museum. The utility of such institutions is admitted on all hands, where the young worker in natural science may identify his latest "find" and be urged to renewed research by the sight of what remains for him to do.

During the year the papers on local topics, read before the society since its formation have appeared in the *Guernsey Magazine*, and it is proposed when a sufficient number of such papers have been read to publish them in pamphlet form.

The Committee have again to thank Messrs. Guille and Allès for the use of the room for meetings, and also for the use of their excellent reference library which has been invaluable.

In conclusion the Committee would urge on the members to continue the support of the society, and to endeavour as much as possible to increase its usefulness by inducing others interested in science to join, and also by bringing or sending to the meeting natural objects of any kind for identification.

Mr. W. A. Luff then read the financial report, showing a good balance in hand. This having been duly audited by Messrs. E. M. Cohu and Sausmarez Le Cocq, it was along with the secretary's report unanimously adopted.

The next business was the election of officers, and as the same president and vice-president cannot hold office more than two years in succession, it was necessary to refill both these positions.

The officers for the ensuing year are:—

Edgar MacCulloch, Esq., Lieutenant-Bailiff, Patron.

President, Mr. T. Guille, Vice-President, Mr. C. G. De La Mare; Hon. Treasurer, Mr. W. A. Luff; Hon. Secretary, Mr. W. Sharp. Committee, Messrs. A. Collenette, H. Crousaz, G. T. Derrick, S. G. Hugo, R. L. Spencer and J. Whitehead.

At a Monthly Meeting held April 21st, 1885, Mr. C. G. De La Mare, Vice-President, in the chair.

The Rock-bait, a species of Nereis, having recently been made the subject of an ordinance of the Royal Court, considerable time was spent in discussing its formation and development—but no information was elicited beyond what was already known.

Mr. Derrick showed a collection of more than seventy plants found in bloom in the first fortnight of April, and mostly obtained in a single excursion to the cliffs near Petit Bot.

Nine meetings of members were held during the year—but no formal papers were read, and although the subjects discussed at these meetings were highly interesting and instructive to the members present, nothing transpired worthy of permanent record. No excursions were held during the year. Baillon's Crake (*Gallinula Baillonii*) was found on L'Anresse, June 7th, 1885; not recorded previously. The *Convolvulus*, Death's Head, and other Moths have been abundant this year.

The third Annual General Meeting was held at the Guille-Allès Library, on Tuesday, November 24th, 1885, the President, Mr. T. Guille, in the chair.

Mr. W. Sharp, hon. sec., read the report, as follows:—

Though the third year of the Society's existence has not been marked by very vigorous growth (only two new members having been admitted) nor very important work, yet signs of vitality are not wanting, and the year upon which we have just entered promises to be one of more definite and extended action. A local museum—the value of which has long been acknowledged—is in a fair way of again becoming a reality;

thanks to the untiring zeal and energy of Messrs. Guille and Allès in promoting the interests of Science. Suitable rooms are being provided, and it now remains for the members to assist in furnishing them with specimens of the rich and varied flora and fauna of the neighbourhood. It is not necessary here to enlarge on the advantages of an extensive and carefully arranged collection of natural objects, either to the local collector or to scientific visitors. Several of the latter have visited Guernsey during the past year both from France and England, and though members of the Society have afforded them much assistance in their labours, it is to be regretted that the result of their researches has not yet been communicated to the Society.

Botany has again received a fair share of attention, and the number of plants now identified and entered on the Society's list is 312.

Excursions have been made to several of the gravel and clay pits of the island with a view of studying their character and probable formation. Further examination of the coast has also furnished us with evidence of raised beaches, which have now been noticed all round the island.

Our Entomologists have not been idle, and while the rarer species of Lepidoptera have not escaped capture, it has been noticed that certain kinds have been unusually abundant this year, notably the Clouded Yellow Butterfly (*Colias edusa*), and amongst moths *Sphinx convolvuli*, and *Acherontia atropos*. Larvæ and pupæ of the latter have been abundant, and specimens of both have been taken in all parts of the island. The former has been captured in greater abundance than in any season since 1875. One collector (Mr. Luff) has had as many as fifteen specimens. No doubt the unusually dry summer has been peculiarly favourable to the development of these fine moths. In addition to the above the most noticeable captures are :—*Cosmia affinis*, *Mamestra persicariæ*, *Gonoptera*

libatrix, *Epunda lichenea*, *Epunda nigra*, and *Mania maura*.

The indoor meetings have been devoted to the examination and identification of recent "finds," and in discussions on recent excursions.

The fine specimen of Coralline exhibited by Mr. Guille at the last annual meeting has since been identified by the editor of *Science Gossip* as *Eschara foliacea*.

In conclusion the committee would remind the members that much remains to be done. Beetles, spiders, bees; grasses and mosses; seaweeds and shells; and the various interesting sea creatures which teem in our waters; all demand attention.

Finally the committee gratefully acknowledge their obligations to Messrs. Guille and Allès for the use of the room for meetings, and also their valuable Library of Reference.

Mr. W. A. Luff, honorary treasurer, handed in his accounts, which showed a substantial balance in hand, and were audited by Messrs. A. Espinasson and R. L. Spencer. The report was then adopted, and the accounts passed.

The President then delivered the following address:—

Taking into consideration the many difficulties against which this Society has had to contend since its organization, the report of its work and present position, which we have just heard, is quite as satisfactory as could be expected. The mere fact that 312 plants have been identified as indigenous to our island, is sufficient to prove that its members have not rested satisfied with merely meeting periodically and having a pleasant chat together in these rooms; for many of the plants entered in this long list are not only of extreme rarity but of extreme minuteness, and they could only have been found out in their hidden recesses, by the most diligent search, and a thorough knowledge of structural botany. In judging of its work thus far, it cannot be fairly compared with its older and greatly more favoured sister societies on either side of the Channel. The youth of our association, its paucity of

members, and the very little time which most of them are able to devote to the object it has in view, must be taken into consideration. None of us are, what may be designated, gentlemen of leisure. We all have daily tasks and avocations laid out for us, which sadly interfere with the methodical study of Nature, which is the only one that is sure to bring good results. There is not a better known or truer proverb than that which says that "Time and tide wait for no man." Well, neither do the seasons, with the wonderful creations, transmutations, and transformations of animal and vegetable life which follow in their train; and he who would successfully investigate these phenomena, must be ever on the watch, ready to profit by every opportunity which each successive day or hour may bring forth. Nature will not wait for the student—he must wait on her, at her own appointed time, whether it be at early morn, noon, or dewy eve, or even when she has drawn her sable mantle over the field to be surveyed. With such serious difficulties in our way, we can scarcely expect to win any great prize in a competition to which so many are far better prepared than ourselves. All we can expect to accomplish, until we can qualify ourselves better for the race, is to follow our leaders as closely as we can. Whilst doing this, we may be permitted, however, to benefit largely from their greater success; for there is this advantage to be derived from all discoveries in the realm of Nature, that no one can take a patent for them, or hold them for his exclusive benefit. He who is fortunate enough to have extended the boundaries of science, is amply rewarded in the consciousness of having obtained a nearer acquaintance with the plans of the All-Wise Creator—of having explained one more hitherto obscure passage of the great book that He has opened before us, for our instruction and study.

Again, in measuring our work—and especially if we wish to compare it with that of sister societies abroad—other considerations have to be taken into account. I would not by

any means characterise the narrow geographical field to which we are confined, and which we have set ourselves to study, as a *barren* one; yet it must be conceded that compared to the more extensive, and certainly far richer ones which are of easy access to English and French societies akin to our own, we stand at a great disadvantage. And it is very evident that with whatever zeal or ardour we may cultivate our own circumscribed area, it can never be productive of those important results or discoveries which at once give a name to a society, or launch it to a front rank in the scientific world. Let us refer to the geological formation of our little island for an illustration of our meaning. It must at once be allowed that it is far from affording the same chances for discovery, or the same attractions to the student, as the richer rocks and strata of England and France, where easily accessible localities soon enable the searcher to enrich his collections with minerals reflecting all the colours of the rainbow, crystals of all geometric forms and of exquisite beauty, and fossil remains of animals and plants, as perfectly moulded upon the hard rock, as if impressed thereon but yesterday, although dating from untold ages before the appearance of man upon our planet. If our land Flora and Fauna afford us more scope for investigation, it must yet be acknowledged, that however interesting these branches of study may be, we can scarcely expect to throw any fresh light on what has already been written about them; or to add to the species which have been given by those who have preceded us. One great desideratum, however, remains to be realized in connection with both these studies; and it is one which our Society may profitably take up; and for the carrying out of which, it will deserve, and no doubt will receive the thankful recognition of all true friends of science at home and abroad. I refer to the collection, preservation, and classification of all such local specimens in both these departments of natural history, as can be thus treated,

with a view to their being kept for reference in our local museum. It is sincerely to be deplored—and I may add it is a shame to the intelligence of the island—that so much of the work accomplished in this line, at such an expenditure of time, attention, and means, by the late John Taylor Gallienne, and a few other devoted and zealous workers in the same field, has been left to perish, for want of the little care which a few pounds sterling of yearly allowance by the States, would easily have preserved. Those only who still recollect how extensive and valuable was this collection, are able to form a just estimate of the irreparable loss we have sustained through such culpable indifference.

There is, however, one other branch of our laid-out work, to which I have not yet alluded, and to which the Society has given but little attention, owing no doubt to the difficulties I have pointed out at the onset—namely, the want of suitable time and opportunities,—I mean the study of the Flora and Fauna of our surrounding seas. I hope we shall soon be in a position to organize parties with a view to explore our bays and shores at the time when the lowest spring tides occur. One can scarcely figure what a splendid harvest of marine objects such an intelligent survey of our rocks and pools, and those of the neighbouring islands, would bring forth under such favourable circumstances. A *dredging club*, in connection with our Society, is also a great desideratum. Situated as we are, in the very midst of one of the richest and most accessible fields for the purpose, we may be sure that numerous rare and curious specimens of animal and vegetable life from these ocean beds would soon be obtained, and amply repay our researches. This perhaps might lead to the creation of an aquarium in the neighbourhood of our harbour, which would become an additional attraction to strangers, and a new means of instruction and entertainment for our own people. At any rate such an auxiliary would afford us means of enriching our

museum with numerous specimens difficult to procure through any other source. Duplicates of these could easily be disposed of at a reasonable price to aquaria or museums abroad, or be exchanged for such specimens as we ourselves did not possess.

It will be expected that I should say something on this occasion, in relation to the progress made in view of the better accommodation of the Society, and its present and prospective collection of objects, in this building. Mr. Allès and myself had hoped that a more suitable room than the present one could have been provided for our meetings ere this time ; but the unexpected delay which has occurred in the completion of the extensive additions that are being made to the original building, has rendered this impossible. We hope, however, that in the course of two or three months we shall be so situated as to be enabled to offer the members a room for their meetings, which will be far better adapted for the purpose than the present one. I may here remark, as having a close connection with the objects of the Society, that the Natural History collection of the late Mechanics' Institution, is now being transferred to the upper storey of this building, where it is intended to be placed permanently, with my own and Mr. Allès' private geological and mineralogical collections, as nuclei of what we hope will later better deserve the name of museum. Every single specimen, however, from the largest to the most diminutive of the former collection which has not yet been completely ruined by dust, insects, or atmospheric influences, requires careful cleaning ; and as this operation cannot be entrusted to every one, it will take some time ere the collection is placed where it is intended to remain.

And now, a last word as to another educational department of this Institution, which it is hoped may have considerable influence in developing a taste not alone for that branch of Natural Science which this Society aims at cultivating, but for all useful knowledge generally. I refer to

the large hall, recently finished on these premises, and which is to be devoted to popular and well-illustrated lectures on scientific and literary subjects, history, &c. As the principal staircase which is to lead to this hall is not yet opened, it cannot be used for its intended purpose during the present season; but when another winter comes round, these courses of lectures will be fully organised, and it is hoped that circumstances will warrant their being given twice a week.

May we not hope that all these efforts to substitute a constant supply of really useful information and rational recreation, for the profitless and often debasing amusements and pursuits to which the demoralization and ruin of so large a proportion of our youth can be traced, may be productive of much good to the community at large; and that one of the first evidences of such a desirable improvement may be a large accession of young members to our ranks? Would that a greater number of them understood that in such studies as bring us together here, the mind is trained for a closer and sweeter communion with Nature, and through Nature, with Nature's God; that it is through such studies alone that we are enabled to read the wonderful volume of Creation; to find "tongues in trees, books in the running brooks, sermons in stones and good in every thing," and to gather a pure and lasting enjoyment from its pages, of which those who seek for happiness in the mere gratification of the senses can form no conception.

A hearty vote of thanks was accorded to the President for his address, which the Bailiff said he hoped Mr. Guille would allow to be printed for permanent reference, as it so exactly seized the points which it was necessary the society should keep in mind.

Mr. Guille was re-elected president by acclamation; Mr. De La Mare remains vice-president, and the following gentlemen were unanimously re-elected, and were cordially

thanked for their past services:—Mr. W. Sharp, hon. sec. ; Mr. W. A. Luff, hon. treas.—Committee: Messrs. H. Crousaz, J. Whitehead, G. T. Derrick, R. L. Spencer, S. J. Hugo, and A. Collenette. A hearty vote of thanks to Messrs. Guille and Allès for the use of the rooms brought the business of the meeting to an end. A very pleasant conversation then ensued on various matters connected with the work of the society, and the members adjourned to the large new hall over the library—which was lighted up for the occasion—and inspected the arrangement that is taking place there of the objects belonging to the museum of the late Mechanics' Institute, under the direction of Mr. Whitehead, for the reception of which ample provision has been made.



The Fourth Annual General Meeting was held at the Guille-Allès Library, November 3rd, 1886, the President, Mr. T. Guille, in the chair.

Mr. Sharp, honorary secretary, read the following report, which was unanimously adopted:—

The year just over—the fourth of the society's existence—has been a most uneventful one, as far as the achievements of the society are concerned. We have, unfortunately, had no accession to our numbers, and the hopes of increased interest in scientific research, so ably expressed in our president's address last year, have, we regret to say, not been realised. Now, however, that ample accommodation has been provided by Messrs. Guille and Allès for the reception and preservation of specimens of the products of the animal, vegetable and mineral kingdoms, and that they have contributed so largely to the formation of a local museum, by giving their private collections for that purpose, it is hoped that all members will, to the utmost of their ability, carry on the work so nobly begun.

It is desirable that all departments of natural science should be represented by as complete collections as possible, and that lists of all such collections should be carefully drawn up and preserved for reference. Such a list has been compiled for the flowering plants of the island, and is being added to from time to time as new plants are identified. The total number of flowering plants now on the society's list amounts to 320.

Among the entomological items of interest to be noticed, are the capture, by the Rev. F. E. Lowe, of fine specimens of the rare and beautiful moth, *Deiopeia pulchella*, and the larvæ of the *Aprophylla Australis*. A specimen of the beautiful large American butterfly, *Anosia Plexcippus*, was caught by Colonel Collings, and presented by him to Mr. Luff. An unusually fine specimen of sponge, dredged near the Amphrey post, October 23rd, has been procured by Mr. Guille, for the museum.

During the year fourteen indoor meetings and one outdoor excursion have been held, and the committee gratefully acknowledge the kindness of Messrs. Guille and Allès, in placing a room at the disposal of the society for their meetings, as well as for the use of their valuable reference library.

In conclusion the committee express a hope that members will take a more active interest in the work of the society, by attending its periodical meetings, by getting others who are interested in science to join its ranks, and by adding, whenever they have an opportunity, to its collections.

Mr. W. A. Luff, treasurer, read the financial statement which showed a balance in hand of £11 7s. 6d.

Mr. Guille gave a very interesting address in which he referred to the general work of the society, and mentioned the additional accommodation which he and Mr. Allès would be able to offer to the members when the new buildings are completed at the Library. He also read a letter which he had

received from Mr. Joseph Clark, of Street, Somerset, who had on previous occasions communicated with Mr. Guille respecting the natural history of Guernsey, which the writer has studied during his visits to the island. In the course of the letter Mr. Clark says: "I have been fairly successful in getting slides of the sponges I brought home from Guernsey. I enclose a photograph of part of a small calci-sponge, which I obtained from a rock-pool north of the Salerie Battery." Two photos were sent, which show the structure of the sponge in a very interesting manner. Mr. Guille also adverted to the great educational value of natural history studies, and gave some interesting instances of the successful manner in which microscopic and other researches are prosecuted by ladies in New York.

The election of officers for the ensuing year was next proceeded with, the following gentlemen being appointed:—President, Mr. J. Whitehead; vice-president, Mr. G. T. Derrick; treasurer, Mr. W. A. Luff; hon. sec., Mr. W. Sharp; committee, Messrs. F. M. Allès, J. Paint, A. Collenette, R. L. Spencer, H. Crousaz, and S. J. Hugo.

Several interesting natural history specimens were exhibited at the meeting, and afterwards the members inspected the museum, the re-arrangement of which is rapidly progressing.

At a Committee Meeting held Nov. 9th, it was decided "That in order to encourage a taste among young people for the study of Nature, the Guernsey Society of Natural Science should offer from time to time prizes for the best collections of natural objects, and that three prizes 10s., 6s., 4s., be offered for the best collections of Mosses. The collections are to be sent to the Guille-Allès Library, by Wednesday, Jan. 19th, 1887. The date and locality to be affixed to each specimen.

The Monthly Meeting was held December 15th, Mr. J. Whitehead, President, in the chair.

A paper was read on the Geology of the Island of Guernsey, by the Rev. E. Hill, M.A., F.G.S., with notes on microscopical sections of the rocks by Professor Bonney. An interesting discussion followed, and Mr. Robert showed specimens of several of the rocks referred to. A specimen of *Deiopeia Pulchella* (Speckled Footman) has been captured by Mr. Heaume. The Rev. F. E. Lowe caught two in June. A collection of Indian Butterflies exhibited by Mr. W. A. Luff.

The Monthly Meeting held January 19th, 1887, Mr. G. T. Derrick, Vice-President, in the chair.

Mr. Robert presented a copy of the volume of Transactions of the Geological Society, which contains Mr. MacCulloch's account of the Geology of the Channel Islands, also several specimens of rocks. A very fine specimen of the *Pearly Nereis* having been captured by Mr. Spencer and forwarded to the British Museum, he has received the following acknowledgment from Professor F. J. Bell. "Your bifidly ending *Nereis* is indeed a treasure! It is very curious and I can find no record of such an occurrence with a marine worm. Your shrimp (*Callianassa Subterranea*) is rare, and we should be glad if you could let us have some more."

No collections of Mosses were received in response to the Society's offer of prizes.

The Monthly Meeting held October 18th, Mr. J. Whitehead, President, in the chair.

The Secretary read an interesting paper by the Rev. E. Hill, F.G.S., published in the Quarterly Journal of the Geo-

logical Society, on the rocks of Sark, Herm and Jethou. In illustration of points remarked upon, specimens of the rocks were exhibited by Mr. Robert, and some discussion ensued. Afterwards the secretary read a short description of the Physical Geology of Guernsey.

NOTES.—In September two woodpeckers were shot in Jersey. The winged ant has been found in unusual numbers. A swallow-tailed blue Butterfly (*Lampudes Boætica*) has been captured. Swallows were seen October 18th. Seven Jays and a white tailed Eagle were shot in Alderney. A King Eider Duck and two Snow Buntings were shot in Jersey. A Fire crested Regulus and the Puffin (*Alca arctica*), which is very scarce in winter, were shot in Guernsey this autumn.

The following brief survey of the Geology of the island written by the Rev. E. Hill, is published by permission of Mr. James Gardner, Royal Hotel, for whom it was written.

THE GEOLOGY OF GUERNSEY.

The student of Physical Geology will find in Guernsey unsurpassed opportunities for studying the activities of the sea. Billows from the Atlantic ceaselessly attack its coasts; they batter every point of weakness; they widen every breach. They round the fallen fragments in boulders, they reduce these to pebbles, shingle, sand. The powerful tides and currents then take up the work: these carry away the detritus, and clear a path for further destruction. All stages of decay may be seen around; Icart point is joined to the cliff by a neck which rain and wind are cutting down; after time long enough this will have descended to the sea level. Castle Cornet and Lihou are already islands save at low tides; islets, reefs, and sunken rocks in every direction are relics of masses once most extensive whose destruction is now nearly complete.

The visitor may almost everywhere examine the processes of this action. Every cave, cleft, fissure, rock pillar or natural arch, has had a cause, and this cause can usually be found.

Sometimes a joint or a crack in the rock has given entrance to the waves; more often a vein or dyke is softer than the rock which it traverses, and yielding more easily to waves and weather has caused the beginning of an opening. In several of the caves at Moulin Huet may be seen the dark stripe which indicates a dyke; the Creux Mahie seems partly due to a landslip, while its entrance is choked with fallen blocks and rubbish. A cleft west of the Doyle column is opened in a vein of quartz. The causes of the Bays are less easy to find; most of them are the mouths of long valleys. Down the valley is a rivulet which wears away the rotten rock, the solid rock is so decomposed below the soil that often for some feet down it can be dug with a spade; this may be seen inland in many road cuttings.

Evidences of ancient changes of sea level exist; raised beaches have been found at Lihou, L'Érée and elsewhere.

A student of Rock-structure and Petrology will find an ample field for collection and observation. The table-land of the island is entirely Gneiss which forms the cliffs and shore, from Castle Cornet round the south and west up to Vazon Bay. This is white at Saints Bay and Lihou, red at Petit Bot and the Gouffre, mottled at Castle Cornet and Vazon Bay, while yet other varieties occur. The cliffs again give excellent opportunities for studying this much controverted rock. True Granite is found round Cobo and Grandes Rocques, in l'Anresse Bay, in some knolls and in many dykes. "Granite" is the name locally given to the grey rocks so largely quarried over the northern part of Guernsey, but scientific writers would call these Diorites or Syenites. They make excellent cubes for street paving, and very durable metal for macadamising. A dark rock called by Quarrymen, "Bird's Eye" extends along Belgrave Bay and round St. Sampson's; it also is extensively quarried. This is of very unusual constitution, and has been described scientifically as Horn-blende Gabbro.

In primeval times igneous agencies must have been pro-

digiously active in Guernsey. It has been shattered or torn by earthquakes or upheavals, and the rents filled either at once with molten lava, or slowly by deposits from steam or water. Hence has arisen the network of dykes and veins which seam the sea shores and cliffs, some are of very great size, one at the Gouffre landing is 30ft wide, and there are still larger masses at Bon Repos and Pleinmont. They are principally basalt, diabase, or diorite; Granite and elvans are frequent; a pink felstone occurs at Castle Cornet, and south of that; mica trap, rare in Britain is found in brown rocks on the shore at Moulin Huet. Castle Cornet, L'Érée, and the north point of the island, are localities which offer much variety in a small space.

A student of Palæontology will find nothing to collect, he must content himself with the recent shells of the "shell-beach" on Herm. The rocks of Guernsey all belong to that most ancient of formations, the *Archæan*; no later sediments exist save the latest, those now forming peat-sand and gravel.

In Sark all the phenomena above described may be witnessed in even higher perfection. In addition there are the Creux Derrible and the Pot, shafts on the hillside opening at their bases on to the shore; these originate from sea-caves whose roofs have fallen in. The cliffs of Sark are mainly Hornblende schist; there is some Gneiss at the Pier, and granite on Little Sark; and at the north end. A dyke of mica-trap occurs at Port du Moulin.

In the northern division of the Island of Guernsey, Granite occurs near Grand Havre at Mont Cuet, and l'Ancrese. Syenitic Granite in the Vale Quarries, and through the centre of St. Peter-Port. Elvan veins intrude with the Granite, Red Granite is found from Cobo to Grandes Rocques. On the East from Long Store to Vale Castle are various Hornblendic Rocks, (locally named Bird's Eye). The southern part, from a line drawn from Castle Cornet to Vazon Bay, consists of various Gneissic Rocks traversed by intrusive veins of Trap, Porphyry

and Greenstone. Quartz Rock protrudes in the cliffs at Jerbourg on the side facing Moulin Huet Bay. Intrusive Diorite occurs at Pleinmont, and patches of Slaty Rocks at Rocquaine. In the western portion of St. Saviour's parish at Casteau Roc, L'Érée, and near Rocquaine the Gneiss coming in contact with dykes of Diorite, takes the form of compact Granite. Herm, and Jethou are masses of Grey Granite Rocks.

Sark; Syenites occur in the north of the island and in Little Sark. Trap and Porphyry on the east coast. Various Schistose Rocks along the west coast. Mineral lodes traverse the island.

Alderney; on the south and west are Granite and Syenites, with intrusions of Trap, Porphyry and Diorites covered on the eastern side with overlying Sandstone.

No traces of Fossils or Organic remains are found in any of the Islands.

The Fifth Annual Meeting of the Society was held at the Guille-Allès Library October 31st, 1887, Mr. John Whitehead, President, in the chair.

Mr. W. Sharp, honorary secretary, read the annual report, as follows:—

There is but little of importance to lay before you at this, the Fifth Annual Meeting of the Guernsey Society of Natural Science. It is a matter of some congratulation that the Society is still in existence, and that a small number of the inhabitants are found who continue to take an interest in scientific matters and to fulfil the object for which this Society was founded.

At the beginning of the year the Society, with a view to encourage an interest in nature and her works, decided to offer from time to time, prizes for the best collection of natural objects, but their efforts in that direction met with no response. It is much to be deplored that the youth of Guernsey are grow-

ing up in ignorance of the most elementary facts of natural science or indeed of science of any kind. Let but the interest in the marvels of Nature be aroused in the young mind, and why should not Guernsey produce its Hugh Miller, or Edward, Dick, or Peach : its Watt, or Faraday.

The nucleus of a library of scientific works belonging to the Society has been formed by the acquisition of Vol. I. of the Geological Society's Transactions, which contains MacCulloch's account of the Geology of the Channel Isles (the gift of Mr. Robert); "The Rocks of Sark, Herm, and Jethou," by Rev. E. Hill, presented by the author; "Contribution à l'étude de la Faune littorale des Iles Anglo-Normandes" par le Dr. Kœhler, presented by the author; and "The Geology of Jersey," by Noury.

The Convolvulus Hawk Moth (*Sphinx Convolvuli*) has again been abundant. Among the interesting "captures" of the year may be mentioned, the rare moth *Deiopeia Pulchella* (Speckled Footman); *Lampides Boetica* (Longtail Blue Butterfly); and a curious specimen of the worm Pearly Nereis, by Mr. Spencer. A very beautiful specimen of the Iceland Gull (*Larus leucopterus*) was shot in the vicinity of St. Sampson's, in the beginning of the year. In September last two woodpeckers were shot in Jersey.

Three or four geological rambles have been made during the year to different parts of the island and one to Sark, for the purpose of studying the rocks *in situ*, the Rev. E. Hill's pamphlet on the "Rocks of Guernsey" having roused fresh interest in the geology of the island. And here it will be fitting to record Mr. Robert's gift to the Society of a collection of named specimens of the rocks of Guernsey.

At the August Meeting of the Society, Mr. Clark, of Street, Somerset, exhibited microscopic slides of Guernsey sponges. The number of flowering plants identified is now 321.

In conclusion the Committee gratefully acknowledge the

kindness of Messrs. Guille and Allès for allowing them the use of the room for meetings; and express a hope that members may take an increased interest in the work of the Society during the coming year.

Mr. Luff, the treasurer, read the financial statement, showing a balance in hand of £12 11s. 8½d.

The election of officers for the ensuing year resulted as follows: Mr. J. Whitehead, president, and Mr. Derrick, vice-president, were unanimously re-elected; so also were Mr. Luff, treasurer, and Mr. Sharp, secretary. The members of the Committee elected or re-elected, were: Messrs. C. G. De La Mare, H. Crousaz, Z. Robert, A. Collenette, S. G. Hugo, and R. Spencer.

At a Meeting of the Committee held November 11th, all the members being present, it was resolved that as complete a list as possible of Flowering Plants and Ferns (arranged in Natural order) said to be found in the Bailiwick of Guernsey, be published with notes, local names, etc., distinguishing those identified by the Society, also that Messrs. Derrick and De La Mare be requested to prepare the list, and further that Mr. Luff be requested to prepare a list of the Lepidoptera found in the bailiwick.



Monthly Meeting held May 8th, 1888, Mr. Whitehead, President, in the chair.

Mr. Derrick read a letter from Mr. Naylor, York, describing the manner of fertilization and development of the *Gymnogramma Leptophylla*.

Mr. Whitehead exhibited a number of specimens presented by him to the museum, including Stoat, Marten Cat, Weasel, Hedgehog, Mole, Jerboa, Vole and Fox.

May 13th.—A few of the members made an evening excursion to the neighbourhood of Fort Doyle, making notes of the

local names of the wild flowers they found, and examining the geological formation of the coast. Several Sand Grouse were shot this month at L'Ancrese.

*Monthly Meeting held June 5th, 1888, Mr. J. Whitehead,
President, in the chair.*

Mr. Luff exhibited a specimen of *Gordius aquaticus* (Hair worm) ten inches long, found in the brook at the Rohais, reading a full description. He also exhibited a specimen of the Meloe (Oil beetle), reading an account of its life history.

On the authority of Captain Lukis, it was stated that there existed a band of magnetic iron stone in the island. It had been exposed to view near the Vauxlaurens Brewery, passing north in the direction of Alderney.

It was decided to offer prizes for the best collections of seaweeds and shells. The following are the conditions of competition as settled by the committee:—

*Prizes offered by the Guernsey Society of Natural Science for
collections of (a) Seaweeds and (b) Shells.*

In order to encourage among young people a taste for nature, the Committee of the Guernsey Society of Natural Science have decided to offer prizes for the best collections of (a) Seaweeds and (b) Shells, gathered in the bailiwick of Guernsey. Competitors must be under twenty years of age.

The prizes, five for Seaweeds and five for Shells, will be of the value of 10, 8, 6, 4 and 2 francs respectively. The Committee reserve to themselves the power of reducing the number of prizes, or giving extra prizes, according to the character and number of the collections sent in. The specimens for competition should be mounted in the usual manner, the date and locality marked against each. Not more than two specimens of any one species or variety should be sent in.

In the case of Seaweeds, the number of species and the

neatness of mounting will be taken into consideration in awarding the prizes; and in the case of Shells, the number of specimens, their condition and the arrangement. Collections with the species named will have special consideration.

Collectors must affix a distinguishing motto or word upon each paper or card in their collection, and also upon a sealed envelope containing the name and address of the collector, which shall be delivered with the collection.

The collections must be brought to the Guille-Allès Library on Saturday, September 1st. After examination they will be arranged for exhibition, of which notice will be given.

N.B.—The names of intending competitors must be given to the Librarian on or before August 24th.

September 7th.—A meeting of the Committee was held to examine the collections of Seaweeds and Shells sent in for competition. Three of these were found specially deserving of prizes, but as none of them had complied with all the requirements named in the conditions they were not entitled to the first class, each, however, had special points which were highly commended, and the Committee decided to rank them in the second class, and to give to each a prize of eight francs.

On opening the envelopes the names were found to be C. L. Randell, Allez-street; Ira Ozanne, Church Lane, St. Sampson's, and M. A. Randell, Allez-street.

A prize of three francs was also awarded to E. J. Bichard for a collection of shells.

It was also decided that the prize collections be open for inspection by the public in one of the rooms of the Guille-Allès Library on Wednesday next.

The Sixth Annual Meeting of the Society was held at the Guille-Allès Library, December 18th, 1888, Mr. John Whitehead, President, in the chair.

The Hon. Secretary read the Annual Report, as follows :—

“ But few words will be necessary to record the work of the Society during the past year, the sixth of its existence. Our numbers have slightly decreased, old members have left the island, and others have not been found to replace them. Owing to various circumstances fewer indoor meetings than usual have been held during the past year, and only two excursions have been made.

The Committee made another attempt this year to encourage research among the younger members of the community, by offering on this occasion prizes for the best collection of Seaweeds and Shells gathered in the Bailiwick of Guernsey. Every effort was made to give publicity to the offers. Public attention was drawn to them in the columns of the Local Press Papers giving details of the prizes offered, and also brief directions about mounting the seaweeds were printed and circulated ; copies were sent to the various schools, but very little interest was shewn in the matter. Three very fair collections of seaweeds were sent in, and to each a prize of eight francs was awarded. There seems little, therefore, to encourage the Committee to make similar offers in the future.

The great want seems to be the giving simple but interesting instruction in natural science in our schools. This might easily be done by means of object lessons, illustrated, where possible by the natural objects or by some of the excellent prints and diagrams now published. “ Natural history reading books ” might also be introduced with advantage.

The Committee propose to publish as soon as possible lists of the ferns and flowering plants, and also of the Lepidoptera of the island. These lists (the former prepared by Messrs. Derrick and De La Mare, the latter by Mr. Luff) are almost ready for the press.

It has been decided also to bind up with them a reprint of several papers of general interest which had been read before the Society. During the year the following plants have been added to the list identified by the Society.

1. *Senebiera didyma*. Lesser Wart Cress.
2. *Linaria repens*. Pale blue Toad flax. A new introduction, but found for three years at St. Sampson's, St. Andrew's and the Forest.
3. *Trifolium glomeratum*. Smooth round headed trefoil.
4. *Anthriscus vulgaris*. Common beaked Paisley.
5. *Silene inflata*. Bladder Campion (on Ballast heaps).
6. *Bupleurum aristatum*. Narrow leaved Hare's Ear, or Thorow-wax. A rare plant found only in two places in England.
7. *Triglochin palustre*. Marsh arrow grass.
8. *Origanum vulgare*. Common Marjoram.
9. *Vicendia filiformis*. Least Gentionella.
10. *Aquilegia Vulgaris*. Columbine.
11. *Gunnera scabra*, erroneously called "Wild Rhubarb."

The Committee tender to Messrs. Guille and Allès their best thanks for the use of the room in which they hold the meetings.

The Report being adopted, Mr. Luff, Hon. Treasurer, read the financial statement for the year.

The election of officers for the ensuing year was then proceeded with, the result being as follows:—

Patron : Sir E. MacCulloch, Bailiff.

President : Mr. T. Guille.

Vice-President : Mr. J. Whitehead.

Hon. Treasurer : Mr. W. A. Luff.

Hon. Secretary : Mr. W. Sharp.

Committee :

Messrs. F. M. Allès,
A. Collenette,
G. T. Derrick,

Messrs. S. G. Hugo,
C. G. De LaMare,
E. D. Marquand.

THE FERNS OF GUERNSEY.

*A paper read by Mr. G. T. Derrick, before the Guernsey
Natural Science Society, on November 14th, 1882.*

Every locality in Great Britain and Ireland has been so thoroughly searched for Ferns, that there seems little prospect of any species having been overlooked, and those found in each district are so accurately known, that trustworthy lists are easily obtained.

Ferns are found to abound in some districts and to be comparatively rare in others;—thus, they dislike chalk and as a consequence are scarce in the east and south-east of England: they are much more numerous in limestone regions; they grow freely in the crevices of *this* rock; and on the lower slopes of steep limestone hills, where the side of the valley is covered with loose stony masses, fallen from above, and affording no apparent hold for vegetation, the Limestone Polypody (*P. Robertianum*) shoots its rhizome through the peaty soil beneath, and waves its green fronds over the white stones; ferns are even more abundant in sandstone and slate districts; and our experience in Guernsey proves that few rocks suit them better than those of the Granite series.

But I think the geological formation of a district has less to do with their prevalence than the abundance of situations favourable to their growth. Given shelter, moisture, and a little light loose soil, and ferns will show themselves in almost every district.

Some few thrive in exposed dry situations, *e.g.*, bracken, but it never there attains the size and luxuriance it acquires in valleys by the waterside. Narrow valleys with rapid streams in hilly districts are the favourite haunts of ferns, and so we find Devonshire, North Wales, and the Lake district characterized as Fern Paradises.

In Guernsey, though we have not the high hills, we have in the narrow sheltered valleys, the abundant streams, the copious springs, and the mildness and dampness of the climate all the requisites for the growth and spread of ferns. The banks of the streams and the hedge-rows are covered with them, there is hardly any situation where they do not show themselves. On the hard surface of the granite rock itself, they could find no hold for their roots; but give them a crevice, or a crack so thin that you cannot insert a knife-blade, and there, with no apparent soil, in a sea-side cave the Sea-spleenwort will show itself, on the cliff, the Lanceolate, and anywhere else, the Black Maiden-hair Spleenwort and the Common Polypody will grow; and some in such situations exhibit their most luxuriant forms.

Let a wall even in the smoke and dust of the town be a little damp, having the drip from anything above falling on it; there, especially if it be sheltered from the full glare of the sun, you will have a natural fernery, the Hart's tongue, the Polypody, the Black Maidenhair spleenwort, and others will cover it with glossy greenery.

Even on the sides of the high roads exposed to the full blaze of daylight tufts of fern adorn the banks; and the ugly

walls which are so frequently supplanting the green turf can with difficulty be kept free from them.

What a relief on a hot summer day to leave the broiling high road, and plunge into one of the water-lanes: to pass beneath the overhanging boughs, to hear the murmuring stream at our feet making pleasant music, and to see the ferns in the height of their luxuriance; the bright glossy green fronds of the Hart's tongue hanging in pendulous succession to the water's edge, leaving room only for a narrow fringe of liverwort and golden saxifrage; here may be seen fronds nearly three feet in length; some with their tips so divided as to become a beautiful tasselled variety, an occasional Shield, Male, Lady or Broad-buckler giving a variety of tint to the mass, and having their pinnules so developed as almost to lose their normal character. One could spend hours amid such beauty of form, and return to it with ever new delight.

The graceful outline and elegant drooping of the fronds have been sufficient to cause our native ferns to be appreciated and sought after as much as the most brightly coloured of our wild flowers; the beautiful effect of the pendulous fronds in a bouquet, and the elegance of the growing plants in pots are so universally acknowledged, that there is scarcely a household where they are not cultivated or in constant request. We know that exotic forms are the most in demand, and readily admit that fern-fanciers selecting from all parts of the globe have been able to bring into cultivation many more elegant and majestic forms than any our native country can produce; but most of these are natives of warmer latitudes, where greater development would be expected, and our indigenous species may worthily bear comparison in many particulars with forms obtained from an equally restricted district in any part of the world.

I find that Moore's Book of Ferns gives forty-four species as British; of these we have eighteen in Guernsey. To com-

pare this with other places we should have a complete list of those to be found in some confined area. I have no other list except Professor Ansted's for Jersey and Guernsey ; he gives eighteen species as natives of Jersey, nineteen of Guernsey. I myself have gathered in Devonshire, during about four weeks' stay, seventeen species, and in Ireland in a fortnight fifteen : in both cases these numbers might have been increased by special search for particular kinds, or if one had availed himself of local help : for instance, at Killarney, an offer was made to show me for a consideration the Killarney speciality :— *Trichomanes radicans*, growing in its native habitat, but I declined the offer with thanks ; the plant is so rare that it would have been wrong to remove a root, even supposing my guide had included that privilege in his bargain ; there was the further doubt of its reaching Guernsey in good condition, and the difficulty of getting it to flourish even should it reach its destination.

Guernsey, considering its small area, seems to bear comparison with these favoured districts as far as number of species are concerned. But one of the most charming sights to a lover of ferns is missing in Guernsey, viz. : a whole valley filled with species other than bracken. How delightful it is to stand on the top of a hill overlooking valleys like those at Petit Bot Bay, and see below, both slopes of the hills covered with the greenery of ferns ; the golden tinted Mountain Fern (*Lastrea Montana*) high up the valley gradually giving place to the Broad buckler, Lady and Male ferns. Neither have we the waters of mountain torrents dashing and brawling in mimic whirlpools, cascades, and waterfalls amidst immense boulders of rock throwing into relief the tufts of tall feathery ferns spreading fanlike from their central crowns springing from every spot raised above the raging waters, while the banks crowded with similar luxuriant growth, form a beautiful frame to the picture.

On the other hand, I know of no place where the field banks, and the road-side are so covered with ferns as here: I think we may truly say, that for universal distribution and general luxuriance, and for the number of species compared with the size of the district, Guernsey will hold its own with the best-known haunts of British ferns, and I think we are quite justified in including it as a place which may be denominated a Fern Paradise.

Though they have them so constantly around them, our French speaking population do not appear to have become sufficiently acquainted with ferns as to distinguish between them by special names. I can only find *Largue de Bœuf* for the Hart's Tongue, *La Foile* for the Bracken, or any large enough to be used as fuel; and *Capillaire* for all the smaller kinds, which are supposed to have medicinal properties, being a remedy for coughs.

The following is a list of the eighteen Guernsey species which I have myself found; specimens of all of which can still be obtained in the island:—

1. *Polypodium Vulgare*—Common Polypody.
2. *Gymnogramma leptophylla*—Slender Gymnogram.
3. *Polystichum angulare*—Soft Prickly Shield Fern.
4. *Lastrea filix-mas*—Male Fern.
5. *Lastrea Dilatata*—Broad Buckler Fern.
6. *Athyrium filix-fœmina*—Lady Fern.
7. *Asplenium rutamuraria*—Wall Rue.
8. ,, *trichomanes*—Common Maiden-hair Spleenwort.
9. ,, *marinum*—Sea Spleenwort.
10. ,, *lanceolatum*—Lanceolate Spleenwort.
11. ,, *Adiantum nigrum*—Black Maiden-hair Spleenwort.
12. *Caterach officinarum*—Scale Fern.
13. *Scolopendrium vulgare*—Hart's Tongue Fern.

14. *Lomaria* or *Blechnum spicant*—Hard Fern.
15. *Pteris aquilina*—Bracken.
16. *Osmunda regalis*—Flowering Fern.
17. *Ophioglossum vulgatum*—Common Adder's Tongue.
18. ,, *lusitanicum*—Dwarf ,,

This list differs from that published in Professor Ansted's "Channel Islands" in the following particulars:—

1.—*Lastrea Æmula* is omitted. From the mention made of it in the book, I conclude that a single specimen only is supposed to have been found. This would not justify its being included in the list, especially as the root might have been planted out. There is danger also of mistaking for it a plant of *Lastrea Dilatata*. I have never observed it in Guernsey, nor heard of any other instance of its occurrence.

2.—I have also omitted "*Botrychium Lunaria*." This is a small fern and is easily overlooked, and would be extremely local in its appearance; so that it may yet be found in the island. I have found the plant freely in Derbyshire and should recognise it were I to meet with it; I have heard that it used to be found, but I suggest that unless guaranteed specimens are produced it should be omitted from lists published by this society.

3.—I have added "*Gymnogramma leptophylla*," the slender *Gymnogram*, or Jersey fern, which according to the authorities is abundant in Southern Europe; a Guernsey lady, member of this society, has shown me a specimen from Switzerland; it grows as far north as Jersey, but not in Great Britain or Ireland, I found it in Guernsey first in 1877.

It is an annual and very small, the fronds, which are about three inches in length, begin to develop until about Christmas, and the whole plant dies soon after Midsummer, so that it may be passed over even by a close observer.

During Easter week, 1878, I visited Jersey with the expressed intention of becoming acquainted with the Jersey

fern. A kind friend became the companion of my excursions, and took me to a roadside not far from Beaumont station, where he had seen *Gymnogramma leptophylla* growing. Here we found it, and in the course of our ramble met with it in three or four stations in the same neighbourhood. A pretty sight it is; it grows in masses covering the bank from top to bottom: its golden hue and elegantly divided outline render it a conspicuous object.

It seems very widely diffused in Jersey, for I found it in several other places, especially near St. Ouen's manor, and in one new locality, viz., near St. Catherine's harbour. Having thus become quite familiar with it, I told my friend that it grew in Guernsey, and I would forward him a specimen. Accordingly on the following Saturday, I walked to the St. Saviour's hedge, took my specimen, posted it to Jersey, and published an account of the discovery in the *Star*. Forthwith I was waited upon by half a dozen individuals all anxious to commence the work of extermination; a carriage was at my service, "Would I be kind enough to come and point out the spot where it was to be found." I was hardhearted enough to refuse and keep my own counsel, and the place is, as far as I am aware, known only to myself and the friend who accompanied me on the first two occasions. I have looked at it nearly every year since; this year the crop promised well, though it has never been so luxuriant as on the first occasion.

I have failed to find the plant in any other part of the island. Is it the last remnant of a once common plant, or has it been introduced recently? Any one wishing to introduce it, would most likely have planted a few masses here and there in the hedge; and this must have been done some years ago to give the plants time to be found in every favourable spot throughout the 200 feet of hedge-bank, had it thus spread by its spores and established itself in that space, one would have ex-

pected it to spread to neighbouring hedges, but the closest inspection fails to reveal it; and renewed examinations seem to prove that the plant is dying out, as the crop becomes less yearly. I think it the last remnant of a once more common plant, rather than a modern introduction spreading from new centres. My attempts to spread it have failed. Several specimens have been identified by competent judges, dried and growing specimens have been exhibited to the members of this society, so I think myself justified in adding it to the Guernsey list.

The other seventeen are acknowledged by all to be indigenous.

1. *Polypodium Vulgaris* is very abundant, and is by Professor Ansted mentioned as the characteristic fern of Guernsey. Observe its rigid harsh form on walls and rocks; then see it growing in deep soil on the top of a hedge-bank; and notice how thin and flexible it has become, look at the increased length of the fronds, and observe the frequent tendency to depart from the normal form, the serrated edges of the pinnæ tend to an imitation of the variety "Cambricum."

2. The *Polystichum* found in Guernsey is *P. Angularis*. It is a large fern with fronds three feet in height growing in a circle round a tufted crown. In some parts of England it is the commonest of ferns growing in the hedges among the rough vegetation. In Guernsey it is not so common; it is abundant and has a charming appearance in almost inaccessible places on the cliffs from Fermain to Bec du Nez; it has been barbarously exterminated from the banks in the Moulin Huet water-lane, and near Ste. Hélène, but is still abundant in more than half a dozen places in different parts of the island.

3. *Lastrea Filix-mas*, or Male Fern is a large, well-known and common species. It is the one most frequently planted on the borders of lawns.

4. *Lastrea-dilata* or Broad Buckler fern, is also a large species. It is unfortunately not so common as the last. Its

elegant fronds attaining a height of four or five feet spreading round the central crown are most beautifully divided. I consider it the most elegant of all our native species. It varies greatly in form, yet not sufficiently for us to have constant varieties. Those which grow to the largest size often have their pinules turned back making them appear narrow, and giving a shrivelled appearance to the fronds; others have flat pinules which are excessively developed both in length and in breadth.

5. *Athyrium Filix fœmina* or Lady Fern is the most abundant of our large ferns, being much more frequent than in England. The elegance of the form, the delicacy of the fronds, and the exquisite grace of its habit of growth make it a universal favourite, yet I think it must yield the palm to the lax form of *Dilatata*. Compared with *Dilatata* there is a stiffness about the shape of its pinules, and a sameness in the divisions of the pinnæ, which prevent it taking the first place in my estimation. I think the greater rarity of the *Dilatata* prevents its beauty being so universally recognised as it would be, were it as common as the Lady fern. Both of this and the Male fern we have many varieties, but not named ones, I show a tasselled variety called "*Multifidum*," which I picked years ago from a plant in Grande Mare.

6. *Asplenium Rutumuraria* or Wall Rue, one of the small wall ferns, is rather rare in Guernsey, indeed some books have stated that it is only to be found in the walls of our churches; if that were the case formerly, I am afraid this fern has become less strict in its principles, or perhaps it has changed its profession, for it is very abundant on a certain martello tower, where ammunition is stored; and is also found on walls in various parts of the island.

7. *Asplenium-trichomanes* or Common Maiden-hair spleenwort is an elegant little fern, growing mostly in walls, rather rare in Guernsey, and nowhere attaining the luxuriance it has

in woods in France, or in England or Ireland. It seems to have become more widely diffused in the last ten years. I know quite two dozen stations for it, mostly in the Town parish.

8. *Asplenium-marinum* or the Sea Spleenwort loves the roofs of caves within reach of the spray of the sea. Fortunately there are unapproachable spots on our coast where it can be preserved, but any unfortunate plant having the audacity to grow within arm's reach is soon rooted out, even ladders being pressed into the service of the destroyer.

9. *Asplenium Lanceolatum* or Lanceolate Spleenwort is so called from the shape of the fronds which are narrow at the base, widening above, and then tapering to a point. This species is very rare in England, being confined to the southwestern peninsula. With us, it is very common, growing between the stones in the walls all round the cliffs, as well as in the crevices between the rocky masses along the south coast. It is abundant in the western parishes in the hedge-rows, and where growing luxuriantly the fronds exceed a foot in length.

The variety *Microdon* was found in Guernsey; perhaps the only ones now to be had are those cultivated from the original wild ones, though as this is a distinct and permanent variety not a casual freak, and had obtained so firm a footing as to have spread to a considerable extent (as I learn from one of the ladies who discovered it) there is a great chance of fresh plants springing from the old roots, so that some diligent searcher may yet be able to bring wild specimens and exhibit them to this society.*

10. *Asplenium Adiantum-nigrum* or Black Maidenhair Spleenwort has fronds of nearly a triangular shape, and in some cases the Lanceolate is so much like it as to be distinguished only on close inspection. This species is one of our

*A beautiful specimen was found 1884, growing wild at St. Peter's-in-the-Wood, which proves that this pretty variety has not quite disappeared.

commonest, growing in walls everywhere, but attaining special luxuriance in hedge-banks, where it forms a prominent and pretty object throughout the winter and spring. See its light green tufts now springing from among the decaying foliage of the hedges, and try its effects mingled with primroses, or other wild flowers, and the Black Maiden-hair Spleenwort will always be one of your favourites.

11. *Ceterach officinarum* or the Scale fern is an easily recognised form, harsh in texture, and of no use for bouquets. It is a wall fern, and very rare in Guernsey, though abundant in England and France. For years I only knew one station for it, and that on a newly built wall. I have taken a great interest in the three roots on this wall, but in the ten years I can hardly see any increase, nor does it show in the neighbouring walls. This spring after searching a meadow at the Vale for flowering plants, I crossed a wall into the high road, and was delighted to see several specimens of *Ceterach* in the wall opposite, though as that structure was in an almost ruinous condition, I fear the fern may be exterminated in rebuilding operations. I am pleased to be able to report that I have since discovered it in a neighbour's garden, where it is self-sown. I have heard of it growing in greenhouses in various parts of the island, and I have planted out a great many roots, so that I hope this fern will continue to figure in the Guernsey list.

12. *Scolopendrium vulgare*, Hart's Tongue, or *Langue de Bœuf*, is too well-known to need any description here. Looking at a specimen-frond on a card, one could form no idea of its picturesque appearance in the banks of a shaded lane. I knew no locality in England where they make so splendid a show as in the water-lanes from the Cheyne to Petit Bot, or in the lane at Moulin Huet. It is the luxuriance and graceful appearance of this fern in the banks which make a first visit to these spots have such a lasting and agreeable impression; but the fame of their beauty draws troops of excursionists to

these localities every summer, and many of these show their appreciation of their loveliness by tearing away fronds by the handful, or plant after plant by the roots. Were it not for the chance of recovery afforded by the winter season, their beauty would soon be destroyed.

The Hart's tongue by no means confines itself to damp sheltered spots with deep soil, it is one of the commonest ferns on walls, growing even on those fully exposed to the mid-day sun. In such situations it hardly exceeds six inches in length, though it exhibits some of the most marked varieties of form which however are liable to disappear under cultivation. By the sides of streams, I have measured fronds three feet in height, they are frequently to be found with divided points (multifid. I show some of my own collection, also one from St. Andrew's the fronds of which have assumed a perfectly flat circular shape.

13. *Blechnum Spicant*, or *B. Boreale*, or Hard Fern is common, and often very luxuriant by the side of streams. It is however harsh in texture, and not graceful in habit, except where luxuriant. The two distinct forms of its fronds give variety to the plant, and attract the attention of even a casual observer.

14. There is little need for me to speak of *Pteris Aquilina* the Bracken, or Fish fern, *La Foile* of Guernsey. In places where it has shade and moisture it attains large dimensions, specimens seven feet high are mentioned. It is extensively used as bedding for cattle. It is liable to few variations, but small seedling plants are often a source of doubt to young collectors.

15. *Osmunda Regalis*, the Royal or Flowering fern well deserves its name as the most magnificent of our native species. It is reported to have been at one time very abundant in Guernsey, but from some supposed medicinal virtues in cases of sickness among cattle, it has been dug up

wholesale until almost exterminated. There is only one place where more than a dozen plants can now be found, another where three plants exist. Altogether I know still of six stations where it occurs wild, and fortunately one or two of them are jealously guarded by the owners. Mr. Smith, of the Caledonia Nursery, has been good enough to give me three roots to plant out, if these establish themselves, we shall add two stations to our list.

16. *Ophioglossum Vulgatum* or the Common Adder's tongue, is unlike all the preceding, being a common and uninteresting-looking plant. Consequently it is less sought after, and few know where to find it. I was shown a specimen with the earth attached just as it had been dug from its native spot. A glance at the soil and a knowledge that it inhabits marshy places were indications sufficient to direct me straight to a spot where I found it growing abundantly. It is an unattractive plant; it grows in uninviting situations, among the grass of marshy fields and is to be found all along the strip of damp meadows inside our north-western barrier, the pebble ridge which carries the coast road from the Vale Church to Pleinmont.

Last and least in point of size, but almost unequalled in interest, we have the

17. *Ophioglossum Lusitanicum*, or Dwarf Adder's Tongue. This is the Guernsey speciality; it was discovered here in 1854 by Mr. G. Wolsey. It is not found in Great Britain or Ireland, though it is doubtfully reported from Cornwall lately. Most authorities on the subject say that it is not found nearer us than the shores of the Mediterranean, yet I read in "All the Year Round," that it is often found in Brittany. It has not been observed in any other of the Channel Islands, excepting Sark, which is doubtful.

In Guernsey it is local, there are two distinct districts for it with more than a mile of cliff between destitute (as far as

my search shows) of a root, although there are many favourable sites. It grows only where very short herbage covers the shallow soil, generally close above the perpendicular fall to the water-worn rocks. I hardly think there is much fear of its being exterminated, for three of the patches where it occurs are about sixteen feet square, still it is much sought after to complete the sets of English collectors, and therefore we should not remove roots unnecessarily. Having found it myself years ago by the aid of a map on which its stations are marked, and dug out some specimens, I directed a botanical friend who wished to obtain some plants to the same spot. He followed the general directions I gave him, and told me he immediately recognised the exact place on seeing the holes which I had made there; so he gave me advice which I now repeat to members of this society:—"When you have dug out your specimen, fill up the hole!" Writing on this fern, I find both Moore and Heath appear never to have visited Guernsey, learn about the plant from actual observation. They both state "That it appears early in the year, being fully developed in January." I show you specimens which have attained full growth in November. In fact, the fronds appear almost immediately after the autumn rains, fresh plants rise from that time onward, I think it is most abundant in March, but as soon as the dry hot weather commences it gets dried up and disappears. I have shown fully developed specimens as early as August 25th (in 1886), and as late as April in the same year. The plant often consists of a single leaf spreading close along the ground, sometimes of two similar fronds opposite each other; but the perfect specimens have these two horizontal barren fronds, and the fertile fronds between them rising vertically with a club like form. It requires patient search on hands and knees to find the plant, especially if you do not know the exact spot on which it grows. When told that we have a fern which is not to be found in

England, visitors are very anxious to see it, but when shown a specimen, its minuteness generally causes a feeling of disappointment, and its being so short-lived takes from the interest that might be felt in cultivating it.

Our other speciality, the *Gymnogramma Leptophylla* suffers from the same disadvantage, and is more difficult to preserve in cultivation from its being an annual, but its rare prettiness is a strong redeeming feature, which will always make it a favourite.

I have now gone through the list of Guernsey ferns; but I find that Hooker in the "Flora of the British Islands," states that *Hymenophyllum Tunbridgense* is found in the Channel Islands. It is not given in Ansted, and I have never heard that any one has found it here. I have seen it growing in masses at Killarney, and show a specimen from that place, and should be glad if members of this society would search in likely spots, and add this pretty delicate little fern to our list. Wishing to increase the number of our wild plants, I have planted out two roots, and feel no objection to attempting the introduction of new species. I have also tried *Cystopteris Fragilis*. In the greenhouse it grows like a weed, appearing in such profusion as to threaten to choke better ferns; but in the open air I have not met with much encouragement; never having seen a plant the third season.

I shall be very pleased if my paper of this evening and the specimens I exhibit increase a love of ferns among members of this society, and I feel confident that every one present would be pleased to assist in stopping the wholesale and wanton destruction of our ferns.

No one can object to a farmer shaving his hedge-rows to bring increased land under cultivation, or to his digging the top of the bank to grow furze, nor to owners pointing afresh decaying walls, though one cannot but feel sorry to see ferns and wild plants thus destroyed. We ourselves are trying to

stir up an increased interest in natural objects, but I certainly cannot see why every visitor must prove his interest on ferns by tearing up roots and dropping them along the road. Any one may stand at the slip and watch passengers land from Sark, and learn what ferns that island produces without visiting its shores. I am glad to see it must boast of one good station for Royal Fern, but unless precautionary measures are taken, it will not boast it long. Could the authorities impose a duty of five francs per root? Or impose a license on those who sell them wholesale in the market, or hawk them about the streets. I feel the greatest indignation however against those who employ men or send their own gardeners about the country filling great hampers to send to friends. These are pretended "lovers of ferns," who go in ecstasies over the delicious specimens their friends have sent them, and who in nine cases out of ten allow the beautiful to lie about until they are thrown on the manure heap. It is from these, our hedge-rows suffer most; these are the people whom I blame almost entirely for the decrease in the Multifid Hart's tongues, and the Crested Lady and Male Ferns. I hope every member of this society will raise his voice against these practices, and do his best to check them; so that Guernsey may continue to have reason to be proud of the prevalence of ferns, their variety and luxuriance, and the beautiful effects they produce in what I think is, next to the cliffs, the greatest attraction of the natural characteristics of the island:—the shaded ferny lanes, everywhere so common, but nowhere so charming as on the slopes of our south coast.

THE BUTTERFLIES OF GUERNSEY AND SARK.

A Paper read by Mr. W. A. Luff, December 12th, 1882.

This is the first occasion upon which this branch of Science has been brought under the notice of the members of the Society, and I shall be pleased if our proceedings this evening prove the means of awakening an increased interest in the subject, and enlist some new workers in the most interesting study.

Entomology, the science which treats of insects, is a fascinating pursuit, which will give additional interest to country walks, and afford profitable occupation for leisure hours at home; for the creatures must be captured, and often afford an exciting chase over cliff and field; they must be examined, set up and arranged, or at least a record kept of their species, time and locality of capture, and facts as to their habits and economy associated with them.

The number of insects inhabiting Guernsey is so large, compared with its extent, that there is an immense amount of work to be done in obtaining specimens of those already recorded as occurring here; and while doing this, a diligent collector is nearly certain to identify species not yet regarded as natives of the island, and may even discover varieties, if not species, new to Science.

We are to confine our attention on this occasion to one division of Insects. Butterflies and Moths together form the large class of insects called Lepidoptera (Scale-winged). These are distinguished by having four wings, and are thus called because the wings are covered on both sides with minute scales of various forms and colours, overlapping each other like the slates on the roof of a house.

It is a common notion that butterflies are more gaily coloured than moths. Many butterflies are of dull colours whilst some of the moths are adorned with beautiful and bright markings. This is why the "Jersey Tiger" (*C. Hera*), which is common enough in Guernsey also, is so frequently mistaken for a butterfly; and the mistake is more pardonable because this insect has rather a vigorous flight and is frequently on the wing in broad daylight.

A butterfly always flies in the day and rests at night and in rainy or cloudy weather. When resting it raises its wings, in some instances pressing them together back to back; but a moth turns its wings downwards instead of upwards, folding them round its body. Again, the antennæ or horns of a butterfly have always a club or knob at the tip, whilst those of a moth terminate at a point. But there is another peculiarity of the antennæ which is a still better guide than the knob at their end; and that is, that the owner cannot hide them, they are always stretched out in front or held quite upright. Now a moth, when going to sleep, turns its antennæ under its wings, or in some similar manner conceals them both from observation and injury.

Butterflies as well as most of the moths have a mouth furnished with a long spiral sucker or tubular tongue, by means of which they imbibe the nectar of flowers.

All butterflies, previous to assuming the beautiful appearance which attracts universal admiration, have passed through three distinct stages of existence.

1.—The egg, which is invariably deposited by the parent butterfly on the particular plant on which the caterpillar which will presently emerge from it is to feed.

2.—From the eggs proceed the caterpillars or larvæ which feed greedily on their proper food-plants, increasing rapidly in size, and shed their skin several times to meet their growing requirements during the period from their first exclusion from the egg to their becoming full-grown.

3.—When full-fed they change into a chrysalis, or pupa ; the transformation is a remarkable one that well repays close observation ; and after remaining in this third state a certain time, suspended from a wall or plant, or in other convenient locality, the period varying according to the species, or to the time of year, the butterfly (then called the imago or perfect insect) emerges with all its parts already fully developed, except the wings ; which are at first short and limp, but in a wonderfully short time expand and become fit for flight, the observer may see the wings growing as he watches.

Having thus briefly sketched the various changes through which butterflies pass, I have much pleasure in bringing before you, this evening, the result of many pleasurable excursions in search of our local species.

From Guernsey and Sark I am able to record twenty-seven species of butterflies. The following is the list, arranged according to the classification in “ Newman’s British Butterflies.”

1.—*Argynnis Aglaia* (Dark Green Fritillary). The upper surface of the wings is bright brown, ornamented with black spots ; the under surface of the hinder wings is dark olive-green with silvery spots. This is a large insect, some of my specimens measuring two inches across the wings. The caterpillar feeds upon dog violet (*viola canina*). I have never found it in Guernsey, but have captured many specimens on the slopes of the cliffs in Sark. It appears on the wing towards the end

of June and battered specimens may still be found alive at the end of August.

2.—*Argynnis Lathonia* (Queen of Spain Fritillary). A beautiful species; the upper surface of the wings fulvous brown, the whole spotted with black. The under surface of the hinder wings is adorned with twenty-four beautiful silver spots. Newman gives the time of appearance as September, but in Sark I believe it to be double brooded as I have seen specimens in June and in October. Although common on the Continent this species is of the utmost rarity in England. In Guernsey I have seen it twice and given it chase, but never captured it. I have, however, a beautiful specimen captured by the late Miss Renouf, in her garden in Burnt-lane, and kindly given me for my collection. In Sark it is much commoner and I have taken many specimens.

3.—*Melitæa Cinxia* (Glanville Fritillary). This species is tawny-orange colour above, and the whole surface reticulated (net-like) and spotted with black. The markings of the under side are so varied that any description must fail to give a correct idea of any individual specimen. This exceedingly local British species is very common in all the four Channel Islands.

The whole economy of this species is so interesting that I have copied out in full the graphic description written by the Rev. F. Dawson in 1844.

“As this fritillary is rare in almost every part of the kingdom, some account of its favourite haunts and habits may not prove uninteresting. It cannot be accounted by any means common here (in England) being confined to a few localities only, though where it does occur, it is in general to found in some abundance. It is not to be expected in cultivated districts, but breeds on steep and broken declivities near the coast, which the scythe and the plough never as yet have invaded, and in such spots it may be met with, earlier or later in May according to the season. Near Sandown, Isle of Wight,

on the side of a cliff, there is one of these declivities, occasioned by some former landslip, covered with herbage, which slopes down to the beach. A pathway leads to the base. On the 9th of May, 1844, a hot, sunny day, each side of this pathway was completely carpeted with a profusion of the yellow flowers of the common Kidney Vetch (*Anthyllis vulneraria*, var, *maritima*), when I visited the spot; and these flowers were the resort of an abundance of these fritillaries, which fluttered about them, or rested on their corollas, expanding and sunning their wings and presenting a most charming picture of entomological loveliness. The great abundance of the narrow leaved plantain, which also grows there, affords food for their caterpillars."

"The spring of last year (1845), on the other hand was so very backward, that on visiting that locality at a date some fortnight later than the above, so far from either flowers or butterflies being visible, the caterpillars were still feeding, and I could discover but few chrysalids. The caterpillars evidently prefer stunted plants, for at the base of the declivity, where the plantain grows luxuriantly, not one is to be seen."

"They are black and spiny, with red head and legs; being hatched in August, they pass the winter in societies, under a kind of tent, formed by a compact web, brought round and over the stems of grasses, I have found several of these societies on the 27th of August. The individuals which composed them being about a quarter of an inch long, rolled up like little balls. All these societies occurred at the base of the declivity; where the herbage grows most luxuriantly; and when the caterpillars have attained sufficient strength in the spring, they are invariably seen ascending to the higher parts of the slope. And herein I imagine that I recognise a beautiful instance of natural instinct, both in the butterfly and caterpillar. The former deposits its eggs low down in the declivity where the young brood may rest most

securely, sheltered and least exposed to the wintry storms ; but when the caterpillars are sufficiently advanced in growth, they ascend to the higher part of the steep, and feed, and undergo their transformation."

"Were the chrysalids formed below, they would probably have too much moisture and too little sun, whereas, by being formed higher up they have a sufficiency of both to bring them to maturity. This butterfly is single brooded, but there is a succession of them, varying in duration according to the season. The earliest date on which I have met with it is May 1st, the latest in July ; but in the latter case the specimens were bred in captivity. I never remember to have seen it so late in the state of liberty ; not later indeed than the middle of June."

"They are very difficult in rear from the caterpillars, and those I have bred are not only disclosed much later than in the state of freedom, but are not nearly so fine and perfect. They in general fly slowly and gracefully, except when alarmed, gliding gently from flower to flower."

"I have taken as many as two dozen without moving from the spot where I stood, as they successively visited the stems of the grasses round me. This fritillary was much less plentiful last season than heretofore ; and in some of the former haunts has quite disappeared. It has many foes ; for besides the march of improvement in cultivation, which gradually invades its haunts, the same natural causes which promote its abundance also multiply its enemies. Two necrophagous beetles (*Silpha obscura* and *S. Tristis*), destroy the caterpillar ; and a large ground spider, very numerous in the spots which it frequents, feeds on the perfect insect. It lies in wait until the butterfly alights on the low plants, or on the ground, then rushing forward seizes it by the neck, and holds it captive with such tenacity, that both insects may almost be pulled in pieces ere it will relax its grasp."

This description is quite as applicable to the cliffs of the Channel Islands as to those of the Isle of Wight. The Glanville Fritillary is common on our Guernsey cliffs from Fermain Bay to Pleinmont Point.

4.—*Grapta C. Album*. (Comma Butterfly). A curious looking butterfly with deeply indented wings. The hinder wings have a mark like a letter c on the under side, hence the name.

Mrs. Boley took one specimen in Sark some years ago. It has been but rarely taken of late years in Jersey, although it was once reported as not uncommon there. I have never met with it in Guernsey.*

5.—*Vanessa Urticæ*. (Small Tortoiseshell). The prevailing colour of the wings of this species is bright red-brown, with spots and patches of black, yellow and white. The caterpillar feeds upon the common stinging nettle. It is common in Guernsey and Sark. I have some very fine specimens, also smaller and darker ones, these latter were however bred in confinement. There are evidently two broods in the year, and June and September may be given as the dates for their appearance.

6.—*Vanessa Polychloros*. (Large Tortoiseshell). The pattern of this species is extremely like that of the preceding, but the colours are duller and it may generally be distinguished by its larger size. The caterpillar feeds upon elm and some other trees. This is not at all common here, but I have taken several specimens in both Guernsey and Sark. It is to be caught in July and August and hibernated specimens occur during the spring.

7.—*Vanessa Io*. (Peacock butterfly). So named from the beautiful eye-like spots on each of the wings. The underside

* Since the above was written, Colonel A. H. Collings has kindly given me a specimen, captured by himself in a garden at Clifton during September, 1871.

is jet black. The caterpillar feeds upon the stinging nettle in June and July, and the butterfly appears on the wing in August, some specimens hibernate and appear again in April and May. It is rare in Guernsey, but abundant in Sark.

8.—*Pyrameis Atalanta*. (Red Admiral). Is common in Guernsey, Alderney and Sark. It is known here by the name of the "King Butterfly." It is a beautiful species easily recognised by its intense velvety black wings branded with scarlet obliquely across. The richness of its colouring makes this species a special favourite; a most attractive and common picture is formed in autumn by a group of Red Admirals sporting about ivy, and sucking nectar from its flowers.

The caterpillar is found on nettles in June, July and August, and the perfect insect makes its appearance in August, September and October.

On March 6th, 1875, Mrs. Boley found four large larvæ of this species on nettles in the lane leading to Fermain Bay. These changed into the chrysalis on April 18th, and the first butterfly emerged as early as May 11th. This being so unusual a time for its appearance, I was induced to send a note to the "Entomologist" which elicited the following remark from the editor, the late Mr. Edward Newman. "It is interesting to learn that a butterfly, which in England never leaves the pupa state before August, should in Guernsey emerge as early as the 11th of May."

9.—*Pyrameis Cardui* (Painted Lady). This butterfly is very uncertain in its appearance; in some years scarcely one is to be seen and in others it is extremely abundant. To see the Common White Butterfly sailing over fields of clover or lucerne, stopping occasionally to visit the flowers, is a pleasant picture, but when with these are seen, as may be done in some seasons, a troop of Red Admirals, a few Tortoiseshells, a sprinkling of Painted Ladies, and perhaps one or two Clouded Yellows, all disporting themselves in the same field, forming a rich contrast

of colouring ; the bright appearance and graceful movements of these children of the sunshine impart that additional charm to the landscape, which a touch of life always produces. The caterpillar feeds upon the field thistle (*Carduus Avernensis*), and is to be found in June, the chrysalis in July, and the butterfly from August to October. They then hibernate and appear again in April, May and June. I have taken it in Guernsey, Alderney and Sark.

10.—*Pyrarga Egeria*. (Speckled Wood). The colour of the wings is smoky brown with pale brown spots. Each of the anterior wings near the tip has one black spot with a white pupil, and each of the hinder wings has three or four of these spots with white centres running parallel with the hinder margin.

The caterpillar feeds upon grasses and the butterfly emerges from the chrysalis in April and again in the autumn ; there being two or three broods in the year. It is abundant in Guernsey and Sark, and mostly frequents shady lanes.

11.—*Pyrarga Megæra*. (Wall Butterfly). So called from its habit of settling on stone walls to bask in the sun. This species has also a white pupiled eye spot on each of the anterior wings. A variety with two white pupils instead of one in each of the spots which is of rare occurrence in England is very common here. It is abundant in May and June, and again in August and September, in both Guernsey and Sark.

12.—*Satyrus Semele*. (The Grayling). The male of this species is of a dark brown colour suffused with lighter brown, the female is much brighter, with circular white pupiled black spots. It is common in Guernsey in June and July on the cliffs, flying only when disturbed, and then for a short distance only. It generally settles on the ground or on rocks of a nearly similar colour to the wings. It is found in thousands all over Sark.

13.—*Epinephele Janira*. (Meadow Brown). This is the commonest of our butterflies in all the islands, frequenting every meadow when the grass is ready for cutting. It is of a smoky brown colour with a brighter patch in the centre of the anterior wings, most conspicuous in the female. It has always a black spot on each of the fore wings with a white centre to the spot in the female.

Newman says:—"This species is exceedingly subject to variation in one particular manner, namely in the presence of large blotches or sometimes of an entire wing having the appearance of being bleached, the usual brown colour being absent and a kind of dingy white appearing in its place." I have a specimen of this curious aberration.

14.—*Epenephele Tithonus*. (Large Heath). The colour of the anterior wings is bright rust colour with a marginal band of dark umber brown. There is a conspicuous circular black spot with two white pupils near the tip of each of the anterior wings. This is a common species in Guernsey and Sark, swarming on the blackberry blossoms in July.

15.—*Cænonympha Pamphilus*. (The Small Heath). This is a small butterfly of a delicate fulvous colour, the hinder wings being slightly darker than the fore wings. I have found it during the whole of the summer in Sark very abundantly, and have taken it in Herm; but have never taken it in Guernsey.

16.—*Thecla Rubi*. (Green Hair Streak). The colour of the upper surface of the wings is dark-brown, the under surface bright green. It is one of the earliest of our butterflies, being tolerably common in May and June in both Guernsey and Sark. The caterpillar feeds upon the bramble.

17.—*Polyommatus Phlœas*. (The Smaller Copper.) The colour of the anterior wings is a coppery red, they have a series of black spots forming a zigzag line. The hinder wings are black brown with a copper coloured band on the margin. There are two or three broods in a year, and it is very abundant in both Guernsey and Sark.

18.—*Lampides Bœtica*. (Pea Pod Argus.) Is easily separated from the other blues by the hinder wings having a long, slender, and somewhat twisted tail near the inner angle.

It is of very rare occurrence in England, three specimens only being recorded in Newman's work. The late Miss Renouf captured eight specimens in her garden in Burnt Lane in the autumn of 1859, and she again took one in the same locality at the end of August, 1872.

19.—*Lycæna Ægon*. (Silver Studded Blue.) The colour of the male on the upper side is purple blue shaded to black towards the hinder margin; that of the female smoky black, sometimes tinged with blue, and generally having a series of orange coloured spots diversified in form parallel with the hinder margin; the hinder wings have a series of silver metallic blue spots, it is from this peculiarity that they are named. It is common in Guernsey and Sark, especially on the cliffs.

20.—*Lycæna Medon*. (Brown Argus.) The wings are dark sepia brown on the upper side with a series of orange-brown spots near the hinder margins. The underside is slaty grey in the males and brownish in the females with black, orange red and white spots. It appears twice in the year, May and August, being double brooded. It is common in Guernsey and Sark.

21.—*Lycæna Icarus*. (Common Blue.) This, the commonest and most beautiful of all our blues, is well-known to everybody. It occurs in all the islands throughout the summer. Although the males have delicate lilac blue wings, those of the female are dingy brown more or less glossed with lilac blue reflections.

22.—*Lycæna Argiolus*. (Azure or Holly Blue). The colour of the wings in the male is purplish blue with a narrow black border; the female has this black band much broader on the fore wings. The underside of all the wings is silvery blue grey with black spots. The caterpillar feeds both upon the

holly and ivy. It is double brooded and not uncommon in Guernsey and Sark.

23.—*Colias Hyale*. (Pale Clouded Yellow). The colour of the wings is sulphur yellow, the fore wings having a black band. The caterpillar feeds upon several species of trefoil and clover and changes into the chrysalis in July. The butterfly appears on the wing in July and August. It is not at all common either here or in Sark in ordinary seasons, but in 1868 I found it abundant in Sark.

24.—*Colias Edvsa*. (Clouded Yellow). In this species, the colour of the anterior wings is bright saffron yellow with a broad black hind marginal band, the hinder wings are more of an orange colour. The caterpillar feeds upon the common clover and lucerne, there being two broods in the year. It is very common in some seasons in the clover and lucerne fields of Guernsey and Sark, and single individuals may often be seen flying along the cliffs. There is a variety named *Helice* of a much paler colour which is occasionally met with.

25.—*Rhodocera Rhamni*. (Brimstone Butterfly). The colour of all the wings is bright canary yellow in the male, pale greenish yellow in the female, and near the centre of each wing is a small saffron coloured spot. This is not a common Guernsey species, but I have seen it abundant in Sark in the autumn. It hibernates and flies about again in the spring.

26.—*Pieris Napi*. (Green Veined White). So called from the green veinings so distinctly visible on the underside of the wings. It appears on the wing in May and August (there being two distinct broods in the year) and swarms in damp meadows in Guernsey and Sark.

27.—*Pieris Rapæ*. (Small White). White with black markings, being a variable species as regards the amount of black marking on the upper side of the anterior wings. There is a variety of a yellowish colour which though rare in England has been occasionally met with here.

The caterpillar feeds upon the cabbages and some other plants in our gardens and fields, and in some seasons is quite a pest. It is of universal occurrence in Guernsey and Sark.

28.—*Pieris Brassicæ*. (Large Garden White). Is very similar to the preceding in marking, but is much larger. The caterpillar almost invariably feeds upon our cultivated varieties of cabbage and is often served up cooked with that vegetable. Common in Guernsey and Sark particularly in May and August.

It will be seen from the above list that Sark, although much smaller, can boast of more species than Guernsey, and not only that, but some of the rarer Guernsey butterflies are comparatively common there. It is of the utmost importance to science to obtain correct lists of all the insects of the Channel Islands, but still more important results will be obtained if the lists and insects from each island are kept distinct. In collecting butterflies each specimen should be labelled as soon as dry, with the date and locality of capture.

In Ansted's Channel Islands, the species from Sark are mixed with those from Guernsey. I find *A. Aglaia* (the Dark Green Fritillary) and *C. Pamphilus* (the Small Heath) both indicated in Ansted's lists as Guernsey species, but I have never taken them here, nor have any of the collectors I have met with here. A writer in *Science Gossip*, signing himself E. D. M. says "Two species of butterflies *A. Aglaia* and *C. Pamphilus* I have never met with in Guernsey, while in Sark they are common and many a sharp spin have I had through furze and fern after the former."

P. Alsus (the Bedford Blue) is also named on Ansted's list as a Guernsey species, but as very small specimens of the common blue often occur I think that one of these must have been mistaken for the former. One species of the skipper butterfly is recorded on the same list from Guernsey and another from Sark. This must also be a mistake as from their peculiar flight, they would not escape notice. I have taken both species in Jersey.

ON THE OCCURRENCE OF CALCITE (CARBONATE OF LIME) IN GUERNSEY.

A Paper read by Mr. A. Collenette, F.C.S., before the Guernsey Natural Science Society on the 13th February, 1883.

“My country,” said an American to me, three weeks ago, “is the finest country in the world, and it can produce every known thing.”

In something of the same spirit, we consider our island the finest in the world, and would prove that all things necessary to health and happiness are to be found here.

It is a common thing to hear it said that there is no lime in Guernsey—that the absence of lime in the drinking water produces decay of the teeth and weakness of the bones. Of course we know very well that these things are not said by those who know what they are talking about, but it is sometimes necessary and useful to give information calculated to overcome or counteract the evil tendency of such a popular error.

To-night I have not a single new or unknown fact to bring before you. I simply wish to demonstrate the presence of lime in our rocks in such quantity as is necessary for all the purposes of life.

I cannot show you any limestone or true calcareous rock, but I hope you will all be satisfied before I have done that the rocks we possess are able to supply lime.

The rocks of Guernsey are all of the eruptive kind and are mostly crystalline in their structure. They are chiefly granitic, though perhaps it would be difficult to find true granite here. The bulk of the island is composed of Syenites and Gneiss. The Syenites are of many varieties, some being porphyritic. The Gneiss has many peculiarities and is worthy of separate study.

As you all know we have besides these, a variety of altered eruptive rocks such as Serpentine, Mica Schist, Hornblende Schist, Chlorite, etc., but in all these no calcite appears as a necessary mineral. We therefore must admit that calcite does not belong to the primary rocks found in Guernsey.

But we have also derived rocks—that is rocks which have had their rise in the destruction by natural agencies of the primary rocks and it is in these that we first find carbonate of lime.

In order to account for the presence of lime we must name the rock minerals to be found in the primary rocks. They are 1st. Quartz. 2nd. Mica (of two kinds mostly). 3rd. Felspar (of four kinds mostly). 4th. Hornblende. These four minerals and their varieties form the mass of rocks of the island.

Of these, Quartz contains no Lime, while some varieties of Mica and Felspar do; and Hornblende is chiefly composed of salts of lime.

As a large proportion of our blue rocks are hornblendic it follows that lime must be plentiful, and if we look carefully for it in the derived rocks we shall find it.

By the action of the atmosphere termed “weathering,” the rocks are gradually broken up and decomposed. The lime is first carbonised *in situ*, in which form it is insoluble in water. The continued action of carbonic acid gas and the presence of water produces a soluble bicarbonate, in which form the lime is separated from the rock debris. The water charged with the bicarbonate of lime runs down the crevices

of the rocks, and by evaporation and absorption deposits a portion of lime in the form of a simple carbonate, a kind of calcareous mud, on the walls of the crevices. Such a deposit you have before you in the sample in No. 1 Box.

No. 1 Box.—Specimens of calcareous deposits from Bordeaux Harbour.

Having reached this stage the deposit is ready for resolution and deposition in the holes and crevices of rock masses either as crystals, stalactites or stalagmites, even forming the cementing mass in recent conglomerates.

Calcite or Carbonate of Lime thus formed and deposited, is exhibited for your inspection to-night, every one being a genuine Guernsey specimen.

No. 2 Box.—Crystals from Fort Joli, from Captain Lukis's collection.

No. 3 Box.—Crystals from Bouët and Vale, also from Captain Lukis's collection.

No. 4 Box.—Crystals from Kellow's Quarry.

No. 5 Box.—Specimens from Rouge Rue.

No. 6 Box.—Specimens from a well in St. Julian's Avenue, 70 feet below the surface.

No. 7 Box.—Crystals from side of crevice, from Capt. Lukis's collection.

No. 8 Box.—Crystals with Quartz.

Nos. 9 and 10 Boxes.—Specimens of Lime associated with Metallic Ores.

If these specimens had taken years to collect, and were the only ones obtainable, they would not offer strong evidence of the presence of Lime in appreciable quantities. But it is not so. In the Lukis collection of minerals and rocks, Carbonate of Lime abounds. The specimens collected for to-night's exhibition were collected in about two hours, and the probability is, that among the rubbish thrown aside from the quarries, tons might be found annually.

But we have direct evidence that the drinking water is sufficiently charged with lime in this island. A long experience in Water Analysis proves that the average quantity is not less than seven grains of Lime per gallon of water, while from twelve to fifteen grains is by means unusual. Average spring water as supplied to English towns will not contain more.

We see therefore that the absence of Limestone, is not of necessity a proof of the absence of Lime.

Agriculturally speaking, more free lime in the soil would be an advantage, but this is a small matter, as a farmer who knows his business will be able to charge his soil when he requires it, by the mere addition of suitable forms of manure.

Note on the probable existence of an old beach forty feet below the present level of the Truchot.

By Mr. A. Collenette, F.C.S, at the meeting of the Society held
13th February, 1883.

During recent repairs and alterations of a well at the Truchot (Mr. W. H. Smithard's late Foundry), evidence of the existence of a former beach or the inland extension of the present one has come to light.

The following is a description of the Strata :—

(Totals)	8 feet of hard gravel.
12	4 feet of black earth mixed with gravel.
15	3 feet of yellow clay.
27	12 feet of hard brown gravel.
29	2 feet of black peaty mould.
33	4 feet of loose yellow gravel.
40	7 feet of rolled stony and gravelly beach-like deposit.

This seems to point to important landslips from the Côtils towards the Truchot, and if investigated may lead to interesting discoveries.

AN EXCURSION TO ICART POINT.

*Paper read before the Society by Mr. G. T. Derrick,
April 4th, 1883.*

The members of the Guernsey Society of Natural Science had their first excursion on Easter Monday, March 26th, the district selected for exploration was the western side of the projection which terminates in Icart Point. Here a descent was effected over the rude steps on the almost perpendicular cliff to the rough beach below, which is one of the largest left uncovered at low water on this part of the coast. The track across to the more open beach, which is almost covered with boulders of considerable size, (the remains of masses fallen in recent years from the cliff), passes along a gully between the mainland and some lofty masses of rock. This gully is similar to hundreds which may be seen along the southern shores; they owe their presence to the existence of veins of intrusive rock, appearing from the higher cliffs to be of a black colour. These veins, being of a softer nature than the enclosing walls, have been eroded by the action of the waves. This particular vein is of a dark green colour and slaty structure and contains some carbonate of lime; its surface is in places covered with small circular holes, giving it much the appearance as slag

from a metallic furnace; in other places it appears covered with delicate tracery resembling lace work; this appearance seems to be caused by the action of water and the atmosphere eating away certain constituents of the rock. To the left of the descent are caves of no great depth but very picturesque, for at the entrance of the deepest of them, a stream of water precipitates itself in a mimic cascade on the rocks beneath, being broken into spray, and reflecting all the tints of the rainbow.

Re-ascending the cliff, the party proceeded southwards, passing La Bette, where a descent may be effected over steps more dangerous than those at the Jaonnets, to a beach possessing no special features. The next point gained was the Creux aux Chiens, which is situated to the north-west of, and not far from, Icart, in that arch-like opening so conspicuous from the cliffs bordering on Petit Bot. This spot according to the guide was once worked as a Gold Mine. The floor of the cave is at present raised about fifteen feet above the boulders of which the beach is formed: an immense mass of stones embedded in earth and rubbish resting on the original rock. This detritus has somewhat the appearance of a raised beach; but all the stones are angular. Two small patches of this detritus adhering to the walls of the gully on each side further sea-ward than the main mass, prove that it extended further forward, but the sea has washed away a considerable portion.

The face of this fallen rubbish and of the rock is so vertical that the cave is somewhat difficult of access; but Mr. Lukis and others who entered, reported that they could see no indications of mining operations. The detritus is doubtless a natural formation produced by landslips, evidence of which is plainly seen on the face of the cliff above; but whether the floor has been levelled by human agency remains open to question. The idea of gold seems to have been suggested by small brilliant spots glittering with a metallic lustre here and

there throughout the hard rock forming the south side of the passage towards the cave. These specks have since been tested by Mr. A. Collenette, F.C.S., F.M.S., and found to be Sulphide of Iron.

Hurrying from the Creux aux Chiens, the rising tide threatening every moment to cut off the advance, the party proceeded along the sea-ward edge of the cliffs to the extreme point of Icart; the paths here are very exposed and rather dangerous. The Château d'Icart was the point aimed at, and to reach it the Coupée had to be crossed. The passage is rather dangerous, the width in one or two places is only about two feet, and every winter falls are taking place, threatening to complete the separation, and make the Château an island. On the peninsula marks of artificial work are abundant.

The summit of the rock appears to have served as a battery, and this as well as two paths diverging from the Coupée to right and left, is in some places supported by masonry; but the weather is gradually destroying the marks of human industry. The party made its way along the face of the rock (a very risky undertaking) into the cave situated immediately below the second narrow part of the Coupée. The guide was one of the party which claims to have discovered this cave about thirty years ago; he declared his belief that it was used by the Romans as a prison. He says that when it was first visited, there was a wall across the entrance, in which a wooden gate was fixed: the floor was then level throughout, and formed of that conglomerated mass resembling concrete, of which only detached portions now remain. The horizontal ledges resembling shelves which are on the right and composed of very small pebbles, were then perfect: and between them and the entrance was a remarkable gap resembling in shape the erect figure of a man. Since it has been exposed to the action of wind and weather many of its characteristics have been destroyed.

There is no doubt that the whole cave was filled in every part with pebbles (apparently from the beach below) for small ones, with occasional whole and broken shells, are found adhering to the roof and walls, cemented to them by Secretions of Carbonate of Lime, which forms layers and minute stalactites in many parts. The rock forming the roof of the cave is intersected with veins of calcite, and the floor of the gully beneath the cave towards the sea seems to contain a good deal of the same material. The members of the society who visited the cave on this occasion ; and nearly all who have seen specimens brought from the place, agree that the conglomerate is a natural formation.

My idea is that ages ago this was the innermost part of a long cave opening out to the beach, which may have been from ten to twenty feet higher than at present. At this period the back part of the cave was filled with sand and pebbles, as may be seen on the present beach at Moulin Huet, and elsewhere.

Then a great land-slip took place from the higher cliffs as at the Creux aux Chiens, and thus communication with the sea was destroyed ; perhaps a lifting of the land took place, and during a long period, water percolating from the roof charged with lime from the calcite, formed all the conglomerate, which would be thickest at the roof and along the innermost walls of the cave, especially where a large supply of water tried to force its way through the mass as at the so-called shelves. Gradually the sea would wash away the rubbish which blocked up the entrance, and the cave in its new condition would be exposed to view. The idea of the place having been used as a prison is absurd from the difficulty of access : the supposed walls at the entrance are not in line with each other : and the large masses on the floor in the outer part of the cave may have fallen from the roof. The cave is of great interest geologically, and well repays the risk of visiting it.

The coldness of the season caused the cliffs to be unusually bare of flowers. Thrift, Sea Campion, Danish Scurvy Grass, Butcher's Broom, Naked-stalked Teesdalia and others were found in bloom. *Trichonema bulbocodium* (Columna's *Trichonema*) a small plant of the Iris tribe was in full flower. This pretty little plant is only found at one spot in England, viz., a sandy pasture near Dawlish, but it is very abundant on all our coasts, the guide told us that its roots are frequently cooked and eaten. Fine plants of *Asplenium Marinum* were seen ornamenting the roofs of the caves; and seedling plants covered the floor in the Creux aux Chiens. *A. lanceolatum* flourished in the crevices of those immense rocky masses which rise so boldly through the turf of the cliff; and some of the ladies were surprised when shewn they had all unconsciously been standing on a bed of *Ophioglossum Lusitanicum*.

Mr. Luff drew attention to the curious cone-shaped cases of the larvæ of a small moth, *Solenobia Tabulella* which were feeding on the lichen covering the rocks. These larvæ form their cases of the lichens, and consequently can scarcely be distinguished except when moving. These moths are very abundant on rocks and walls throughout Guernsey and Sark, but are of rare occurrence in England. The female never acquires wings. He also found numerous cases of small Caddis worm attached to the undersides of stones in one of the streams running across the cliff. The cases were of an oval shape and composed of fragments of stone cemented together. The worm is probably the larva of *Philopotamus insularis*, a very beautiful caddis-fly new to science, and only known to occur in Guernsey. But the most valuable find of the day occurred on the return near La Marcherie, where Mr. F. Lukis was fortunate enough to espy a Celt or worked flint among the newly-laid road metal.

CHANGES IN THE RELATIVE LEVEL OF SEA AND LAND ROUND GUERNSEY.

*A Paper read before the Society by Mr. G. T. Derrick, on
May 15th, 1883.*

Changes in the relative level of sea and land have occurred within historic times, and even in our own day in various parts of the world ; such changes are among the well-known results of volcanic agency, but in countries considered to be outside volcanic districts, phenomena can be observed which seem to prove that such movements are pretty generally distributed. These modern movements cannot be compared in grandeur to those which took place in former geological periods which gave rise to the vast series of sedimentary rocks ; they have caused local alterations, but are not sufficient to prevent it being true, that the aspect of the various continents has not substantially varied within historic times.

The attention of the members of the Guernsey Society of Natural Science has from time to time been turned to certain districts of our own island, which appear to prove that it has undergone changes of level.

The existence of peat under the present sea-beach has been known since 1757 ; the beds extend along the low shores of both the eastern and western coasts. It has been dug into in the Town and at St. Sampson's harbours, it can be observed at

about high water mark at Cobo, but the richest deposits are beneath the sands at Vazon Bay, where it has been dug into to a depth of twenty feet. The erect position of the trunks of the trees, and various other indications seem to warrant the conclusion that the plants forming this substance (called "gorban" in Guernsey) must have grown on the spot where they are now found, and this must therefore have been at a higher level than at present. Trunks of full-sized trees occur in the deposit, acorns and hazel nuts are preserved in it, also teeth of hogs and horses, but the presence of pottery and some implements seem to prove that the change must have taken place in comparatively modern times.

Indications of a similar movement exist on the coasts of Jersey: indeed local historians generally assert that a subsidence has taken place within historic times over all the inner part of the Bay of St. Malo.*

But the occurrence of phenomena in this island which prove an opposite movement is not so generally known, and on Whit-Tuesday, 1883, the members of this society made an excursion to two localities which give evidence of an elevating movement.

*Submerged forests are common along the shores of Great Britain and Western Europe. In Geikies' Prehistoric Europe, localities are named showing them on all the English coasts. He states that they occur on the coasts of Scotland and Ireland, also of Holland and France, naming among other localities:—"Along the Western coast of Cotentin, at Dol, St. Malo," etc. With respect to our own district, Geikie says:—"No thorough examination appears to have been made of any of the submarine peat and trees of this district, and we cannot therefore be certain whether or not they are of the same age as that of the Somme and Flemish coast, not so far as I know have they disclosed a succession of beds like that which is furnished by the postglacial deposits of Cornwall. Some antiquarians indeed maintain that the submarine trees that occur along the coast between St. Malo and Cape La Hougue are the relics of a broad belt of forest land which was overwhelmed by the sea in the year 709, although the submergence was not completed till 860. There may possibly enough be some truth in these statements, but it is questionable if the submergence was so great as the antiquarians suppose. . . . At all events we shall probably not err in assigning the growth of the now submerged trees and peat of the Channel Islands and the adjacent French shores mainly to pre-historic times."

The members started from the mill-pond at the Vrangue, and proceeded to the Capelles, and there inspected a section of a "Raised Beach," which has been exposed to view in the process of lowering the road running north from the school-yard. Part of the open school-yard itself appears to be on an ancient beach, while in another part the rock is seen. The section visible on both sides of the road is not an extensive one, nor is the deposit deep; the elevation is about thirty feet from the present high water mark, and distant from the nearest coast one mile, although before the works of reclamation carried out under Sir John Doyle, the tidal waters approached to within a quarter of a mile of the spot.

Thence the party proceeded to an abandoned quarry to the eastward, where is the usual pond, which afforded a most interesting supply of water-beetles, larvæ of dragon-flies, caddis-fly cases, water-snails, and in its immediate neighbourhood several good specimens of tiger-beetles were captured.

Thence to the head of Grand Havre, where the short herbage yielded some fresh botanical specimens. *Rosa Spinosissima*, *Silene Conica*, etc. Then on to the tongue of land dividing Grand Havre from L'Ancrese Bay. On either side of this peninsula is a hill rising about twenty-five feet above high water mark. Between the hills is a slight hollow along which lies the roadway. The hill on the right (north-east) yields fine masses of first class granite. Mr. Bisson who owns the quarry has cut several road-ways into it. Each of these several road-ways slopes down into the various workings, cutting through, and exposing to view a section, of an ancient beach, a mass about four feet in thickness, consisting of water-worn pebbles of moderate size, and larger masses of rock smoothed and hollowed by the action of the waves and moving shingle. It rests on the native rock, and spreads upward, gradually becoming thinner, a slight trace of it being visible under the soil almost to the summit of the hill. The main deposit is probably

but little raised above present high water mark, though it is some distance from the sea. I call it therefore an *ancient*, rather than a *raised* beach. My idea is, that in ancient times without any change of level, the sea at high water might have had a clear passage between the two hills, the part under discussion being thus a sea beach covered as usual with shingle. That pebbles were thrown up sea-ward which gradually accumulated into a bank rising higher than the highest spring-tides (such ridges are common on the west coast). On the part thus enclosed, vegetation sprung up, and spread over it, and so gradually the peaty covering of about four feet was formed. Whether the extension towards the summit of the hill can be accounted for without supposing a former lower level of the land, and a subsequent rising, is rather doubtful, though pebbles are now often carried during gales of wind to a level far above the reach of the tide, so it is just possible that the gradually decreasing layer of pebbles towards the summit of the hill may have been blown there. The pebbles are mostly of Guernsey stone, though flints occur in about the same ratio to the mass as on the present beach. These ancient flints, it is evident, could not have been brought here among ballast, but must have been brought by natural means from some chalk formation.* The formation at the Capelles, being about thirty feet above high water mark is undoubtedly a Raised Beach, but the deposit is not so thick as this at Mont Cuet.

In returning, the party mounted the hill to view the Cromlech, then proceeded on to the lower part of the Common, inspecting the smaller Cromlechs there, digging up a few specimens of *Isoetes*, then to see the Vale Church and churchyard, and back to town after a most agreeable, interesting and enjoyable excursion.

*It seems also a reasonable inference from this, that the flints found so abundantly on our north-western beaches owe their presence there to natural causes.

In the first week of January, 1884, a visit was made to the mine-workings at Mount Durant, Moulin Huet. Under the able guidance of Mr. De Carteret, who brought a ladder and ropes for the occasion; a small party including two ladies descended to the beach at low water, after a rough descent over a serrated vertical ridge of rock to the eastward of the mine. Similar wall-like ridges form a conspicuous feature in the scenery of this portion of the coast. The visitors were then able to walk into the cave above which the workings were carried on. The lower storey of the cave runs back some distance into the rock, and terminates in a wall which was built some forty years ago, upon the complaint of the proprietor of the adjoining estate that his well had been drained by the mine-workings. This wall, it was supposed, would completely dam back the water, but now a copious stream makes its way through, running over the face of the wall and through the cave, leaving an abundant ferruginous deposit. In the roof of the cave is an opening, through which access is had to a second gallery, also penetrating into the face of the cliff, and there appears to be a third gallery above. Here, in the roof of the lower division of the cave, and above it, is an extensive deposit of large boulders, and at the innermost part, of smaller pebbles and sand completely filling up the recesses of the second storey. The whole is evidently part of an ancient sea-beach, distinguished by the large boulders. In elevation, the deposit corresponds very nearly with the cave at Icart, and with some of the pebbles in the walls of the cave close to the eastern side of the slip forming the usual approach to the beach at Moulin Huet, and must have been formed when the sea was at a higher level than at present.

Other observers have noticed similar raised beaches in other parts: Professor Ansted notices one in the island of Lihou, another near the cliffs at Havelet; also in the island of Brechou, in Alderney, and in Jersey. I am unaware of the

existence of any data for deciding when this elevating movement took place, whether it preceded or was subsequent to the depression; perhaps a careful examination might bring to light some worked flints or other artificial construction embedded with the water-worn material.

It may well be asked, "How is it that remains of the same raised beach are not found all round the island?" But the most casual observer must have noticed the constant disintegration and destruction going on everywhere on the cliffs, which in the course of ages would have removed such remains, and the wonder is that any of them exist; but falling masses from above often cover the face of the cliff, burying the real surface feet in depth; where this has happened, the gradual removal of this covering by the action of the weather and the sea has sometimes brought to light the ancient outline of the cliff, and may yet reveal, on other parts of the coast, other specimens of raised beaches than those here referred to.

LIST OF PLANTS.

The following list of the Flowering Plants found wild in Guernsey, based on those contained in Prof. S. Babington's *Primitivæ Floræ Sarnicæ* and Ansted's *Channel Islands*, has been drawn up at the request of the Committee, for the use of the Society, by Mr. G. T. Derrick.

The species actually produced and identified at meetings of the Society are prefixed with a letter "i."

Those marked thus (†) are not natives, but have become naturalized.

RANUNCULACEÆ.

- Myosurus minimus
- i. Ranunculus aquatilis
- i. „ hederaceus
- i. „ sceleratus
- i. „ flammula
- „ lingua
- i. „ acris
- i. „ repens
- i. „ bulbosus
- „ hirsutus vel sardons
- i. „ ficaria
- i. Aquilegia vulgaris

PAPAVERACEÆ.

- Papaver Rhœas
- i. „ dubium
- „ Argemone
- „ hybridum
- i. Glaucium luteum vel flavum
- i. Chelidonium majus

FUMARIACEÆ.

- i. †Corydalis lutea
- Fumaria officinalis
- i. Fumaria pallidiflora
- i. „ confusa

CRUCIFERÆ.

- i. Cakile maritima
- i. Crambe maritima
- i. Raphanus raphanistrum
- Raphanus maritimus
- Brassica sinapis
- „ alba
- „ nigra

Brassica adpressa

- „ oleracea
- „ Cheiranthus
- Diploxaxis tenuifolia
- i. Diploxaxis muralis
- i. Sisymbrium thaliana officinale
- i. „ alliaria
- i. Matthiola sinuata
- i. Cheiranthus cheiri
- i. Cardamine pratensis
- i. „ hirsuta
- i. Arabis hirsuta vel sagittata
- Barbarea vulgaris
- i. Nasturtium officinale
- „ sylvestre
- i. Cochlearia Danica
- i. „ Armoracia
- i. †Draba verna
- i. †Alyssum maritimum
- i. †Thlaspi arvense
- i. Teesdalia nudicaulis
- i. Capsella bursa-pastoris
- i. Lepidium latifolium
- „ ruderales
- i. „ Smithii
- i. „ Draba
- i. Senebiera didyma
- i. „ coronopus

RESEDACEÆ.

- i. Reseda luteola

VIOLACEÆ.

- Viola odorata
- i. „ canina
- i. „ tricolor

POLYGALACEÆ.

- i. *Polygala vulgaris*
 „ *oxyptera*

FRANKENIACEÆ.

- Frankenia lœvis*

CARYOPHYLLACEÆ.

- i. †*Silene inflata*
 i. „ *maritima*
 i. „ *conica*
 i. „ *anglica*
 i. „ *quinquevulnera*
 „ *nutans* (Herm)
 „ *noctiflora*
 i. *Lychnis vespertina*
 i. „ *diurna*
 i. „ *Flos-cuculi*
 „ *Githago*
 i. *Mœchia erecta*
Cerastium tetrandrum
 „ *semidecandrum*
 i. „ *glomeratum*
 „ *triviale*
 i. *Stellaria media*
 „ *graminea*
 i. „ *uliginosa*
Arenaria serpyllifolia
 i. *Honkeneya peploides*
Sagina maritima
 „ *apetala*
 „ *ciliata*
 i. „ *procumbens*
 „ *subulata*
 „ *nodosa*
 i. *Spargula arvensis*
Spargularia rubra
 i. „ *marina*
 i. *Polycarpon tetraphyllum*

ILLECEBRACEÆ.

- Herniaria glabra*
 i. „ *liata*
Scleranthus annuus

PORTULACACEÆ.

- i. *Montia fantana*

TAMARISCINEÆ.

- i. †*Tamarix gallica*

ELATINACEÆ.

- Elatine hexandra*

HYPERICACEÆ.

- i. *Hypericum androsæmum*
 i. „ *perforatum*
 i. „ *tetrapterum*
 i. „ *humifusum*
 „ *linarifolium*
 i. „ *pulchrum*
 i. „ *elodes*

MALVACEÆ.

- i. *Lavatera arborea*
 i. *Malva moschata*
 i. „ *sylvestris*
 i. „ *rotundifolia*

LINACEÆ.

- i. *Radiola millegrana*
 i. *Linum catharticum*
 i. „ *angustifolium*

GERANIACEÆ

- i. †*Geranium nodosum melle*
 „ *rotundifolium*
 i. „ *dissectum*
 „ *columbinum*
 i. „ *Robertianum*
 „ *Robertianum, var. modestum*
 i. *Erodium cicutarium*
 i. „ *moschatum*
 i. „ *maritimum*
 i. *Oxalis corniculata*

ILICINEÆ.

- i. *Ilex aquifolium*

SAPINDACEÆ.

- Acer campestre*

LEGUMINIFERÆ.

- i. *Ulex europœus*
 „ *nanus*
 i. *Sarothamnus scoparius*
 i. *Ononis arvensis*
 „ *reclinata*
 „ *Anthyllis vulneraria*
 i. *Medicago lupulina*
 i. „ *denticulata*
 i. „ *maculata*
 i. *Melilotus officinale*
 i. *Trifolium subterraneum*
 i. „ *pratense*
 i. „ *arvense*

- Trifolium striatum
 „ scabrum
 i. „ glomeratum
 „ suffocatum
 i. „ repens
 i. „ fragiferum
 i. „ procumbens
 „ minus
 i. „ filiforme
 i. Lotus corniculatus
 i. „ major
 i. „ angustissimus
 i. Ornithopus perpusillus
 i. „ ebracteatus
 i. Vicia hirsuta
 „ tetrasperma
 i. „ Cracca
 i. „ sepium
 „ lutea
 i. „ sativa
 i. „ lathyroides
 Lathyrus pratensis

ROSACEÆ.

- i. Prunus communis
 „ insititia
 i. „ cerasus
 i. †Spirœa Ulmaria
 i. Agrimonia Eupatoria
 i. Poterium Sanguisorba
 i. Alchemilla arvensis
 i. Potentilla Fragariastrum
 i. „ Tormentilla
 i. „ reptans
 i. „ anserina
 i. Comarum palustre
 i. Fragaria vesca
 Rubus rhamnifolius
 i. Geum urbanum
 i. Rosa spinosissima
 i. „ canina
 „ „ var. surculosa
 i. Mespilus germanica
 i. Cratægus oxyacantha
 Pyrus Aucuparia
 „ communis
 i. „ Malus

LYTHRACEÆ.

- i. Lythrum salicaria
 i. Peplis portula

ONAGRACEÆ.

- i. Epilobium hirsutum
 i. „ parviflorum

- i. Epilobium montanum
 „ tetragonum
 „ palustre
 i. Oenothera biennis
 i. Cirsœa Lutetiana

HALORAGIACEÆ.

- i. †Gunnera scabra
 Myriophyllum alterniflorum
 i. Callitriche verna
 „ verna, var. pedunculata

CRASSULACEÆ.

- i. Tillœa muscosa
 Sedum album
 i. „ anglicum
 i. „ acre
 „ Fosterianum
 i. †Sempervivum tectorum
 i. Cotyledon umbilicus

SAXIFRAGACEÆ.

- i. Saxifraga tridactylites
 i. Chrysosplenium oppositifolium

UMBELLIFERÆ.

- i. Hydrocotyle vulgaris
 i. Eryngium maritimum
 i. Apium graveolens
 Helosciadium nodiflorum
 „ inundatum
 †Carum petrosilenum
 Ægopodium Podagraria
 i. Conopodium denudatum
 Pimpinella Saxifraga
 i. Sium angustifolium
 i. Bupleurum aristatum
 „ tenuissimum
 Enanthe pimpinelloides
 i. „ crocata
 i. Æthusa Cynapium
 i. Fœniculum vulgare
 i. Crithmum maritimum
 i. Pastinaca sativa
 i. Heracleum Sphondylium
 i. Daucus carota
 „ „ var. gummifer
 Caulalis Anthriscus
 „ nodosa
 Chœrophyllum temulum
 Scandix Pecten-Veneris
 i. Anthriscus vulgaris
 Conium maculatum
 i. Smyinium Olusatrum

ARALIACEÆ.

- i. *Hedera Helix*

CAPRIFOLIACEÆ.

- i. *Sambucus nigra*
i. „ *Ebulus*
i. *Lonicera Periclymenum*

RUBIACEÆ.

- Rubia peregrina*
i. *Galium verum*
i. „ *Mollugo*
„ *saxatile*
i. „ *palustre*
„ *uliginosum*
i. „ *Aparine*
i. *Sherardia arvensis*

VALERIANACEÆ.

- i. †*Centranthus ruber*
i. *Valerianella oliteria*
„ *carinata*
„ *dentata*

DIPSACEÆ.

- i. *Dipsacus Sylvestris*
Scabiosa succisa
„ *columbaria*
i. „ *arvensis*

COMPOSITÆ.

- i. *Silybum Marianum*
Carduus tenuiflorus
i. „ *nutans*
i. „ *lanceolatus*
i. „ *palustris*
„ *arvensis*
i. *Carlina vulgaris*
i. *Arctium lappa*
i. *Centaurea nigra*
i. „ „ var. *decipiens*
„ „ *cyanus*
i. „ *aspera*
i. *Chrysanthemum segetum*
„ *Leucanthemum*
Matricaria Parthenium
i. „ *inodora*
„ *indora*, var. *maritima*
„ *Chamomilla*
i. *Tanacetum vulgare*
Anthemis Cotula
i. „ *nobilis*
i. *Achillea millefolium*

- i. *Artemisia absinthium*
i. „ *vulgaris*
i. *Filago germanica*
i. *Gnaphalium uligenosum*
„ *luteo-album*
i. *Senecio vulgaris*
i. „ *sylvaticus*
i. „ *Jacobœa*
„ *aquaticus*
„ *paludosus*
„ *radiatus*
Inula conyza
i. „ *crithmoides*
i. „ *dysenterica*
„ *Pulicaria*
i. *Bellis perennis*
Aster Tripolium
i. *Tussilago farfara*
i. †*Petasites fragrans*
i. *Eupatorium cannabinum*
i. *Cichorium intybus*
i. *Lapsana communis*
Hypochoeris glabra
„ *do*, var. *Balbisii*
i. „ *radicata*
Leontodon hirtus
„ *hispidus*
„ *autumnalis*
i. *Helminthia echioides*
i. *Taraxacum officinale*
„ *officinale*, var. *lævi-*
„ *gatum*
„ *palustre*
i. *Sonchus oleraceus*
i. „ *asper*
i. „ *arvensis*
i. *Crepis virens*
i. *Hieracium pilosella*
„ *pilosella*, var. *pilosis-*
„ *umbellatum* *simum*

CAMPANULACEÆ.

- i. *Iasion montana*
Wahlenbergia hederacea

ERICACEÆ.

- i. *Erica cinerea*
i. *Calluna Vulgaris*
i. *Pyrola rotundifolia*

JASMINACEÆ.

- Fraxinus excelsior*
i. *Ligustrum vulgare*

APOCYNACEÆ.

- i. †*Vinca major*

GENTIANACEÆ.

- Erythrea latifolia*
 i. „ *Centaurium*
 i. *Cicendia pusilla*
 i. *Cicendia filiformis*
Menyanthes trifoliata

CONVOLVULACEÆ.

- i. *Convolvulus arvensis*
 i. „ *sepium*
 i. „ *Soldanella*
 i. *Cuscuta Epithymum*

SOLANACEÆ.

- i. *Solanum dulcamara*
 i. „ *nigrum*
Atropa Belladonna
Hyoscyamus niger

SCROPHULARIACEÆ.

- i. *Verbascum thapsus*
 i. „ *nigrum*
Verbascum virgatum
 „ *Blattaria*
 i. *Scrophularia Balbisii*
 i. „ *nodosa*
 i. „ *Scorodonia*
 i. *Digitalis purpurea*
 i. *Antirrhinum majus*
 i. „ *Orontium*
 i. †*Linaria Cymbalaria*
 „ *Elatine*
 „ *spuria*
 i. † „ *repens*
 „ *vulgaris*
 i. *Sibthorpia europæa*
 i. *Veronica hederifolia*
 „ *polita*
 i. „ *agrestis*
 i. „ *Buxbaumii*
 i. „ *arvensis*
 i. „ *Serpyllifolia*
 i. „ *officinalis*
 i. „ *Chamædryas*
 „ *anagallis*
 i. „ *Beccabunga*
 i. *Euphrasia officinalis*
 i. *Bartsia Odontites*
 i. „ *viscosa*
Pedicularis palustris
 i. „ *sylvatica*
 i. *Rhinanthus Crista-galli*

OROBANCHACEÆ.

- Orobanche cærulea*
 „ *Hederae*
 i. „ *minor*

VERBENACEÆ.

- i. *Verbena officinalis*

LABIATÆ.

- i. *Lycopus europæus*
 i. *Mentha rotundifolia*
 i. „ *arvensis*
 i. „ *aquatica*
 i. „ *Pulegium*
 i. *Thymus Serpyllum*
 i. *Origanum vulgare*
Calamintha officinalis
Melissa officinalis
 i. *Nepeta Glechoma*
 i. *Salvia verbenaca*
 i. *Prunella vulgaris*
Scutellaria galericulata
 „ *minor*
 i. *Marrubium vulgare*
 i. *Ballota nigra*
Stachys Betonica
 i. „ *palustris*
 „ *ambigua*
 i. „ *sylvatica*
 i. „ *arvensis*
Galeopsis Tetrahit
 i. *Leonurus Cardiacæ*
 i. *Lamium amplexicaule*
 „ *incisum*
 i. „ *purpureum*
 i. *Ajuga reptans*
 i. *Teucrium Scorodonia*

BORAGINACEÆ.

- i. *Echium vulgare*
 i. *Myosotis cæspitosa*
 „ *palustris*
 i. „ *repens*
 „ *arvensis*
 i. „ *collina*
 „ *versicolor*
 i. *Anchusa arvensis*
 i. †*Borago officinalis*
 i. *Symphytum officinale*
 i. *Cynoglossum officinale*

PRIMULACEÆ.

- i. *Primula Vulgaris*
 i. *Anagallis arvensis*

- i. *Anagallis cærulea*
 i. " *tenella*
 i. *Lysimachia nummularia*
Centunculus minimus
 i. *Glaux maritima*
 i. *Samolus Valerandi*

PLUMBAGINACEÆ.

- i. *Armeria maritima*
Statice Limonium
 i. " *binervosa*

PLANTAGINACEÆ.

- i. *Plantago major*
 " *media*
 i. " *lanceolata*
 " *maritima*
 " *Coronopus*

CHENOPODIACEÆ.

- Suaeda maritima*
Salsola Kali
Salicornia herbacea
 i. *Beta maritima*
Chenopodium polyspermum
 " *olidum*
 " *album*
 i. " *ficifolium*
 " *murale*
Atriplex patula
 " *littoralis*
 " *do. var. marina*
 " *angustifolia*
 " *erectæ*
 i. " *deltoidea*
 i. " *arenaria*
 " *portulacoides*

POLYGONACEÆ.

- Rumex conglomeratus*
 " *nemorosus var. sanguineus*
 " *pulcher*
 " *obtusifolius*
 " *crispus*
 " *Hydrolapathum*
 i. " *acetosa*
 i. " *acetosella*
 i. † *Polygonum fagopyrum*
 or
Fagopyrum esculentum
 i. *Polygonum Convolvulus*
 i. " *aviculare*
 " *Raii*
 " *maritimum*

- Polygonum Hydropiper*
 i. " *Persicaria*
 " *lapathifolium*
 " *do. var. nodosum*
 " *amphibium*

EUPHORBIACEÆ.

- Euphorbia Peplis*
 i. " *Helioscopia*
 i. " *amygdaloides*
 i. " *Paralias*
 " *portlandica*
 i. " *Peplus*
 i. " *exigua*
 i. *Mercurialis annua*

URTICACEÆ.

- i. *Parietaria diffusa*
 i. *Urtica dioica*
 i. " *urens*
 i. *Humulus Lupulus*
Ulmus suberosa
 " *montana*

CUPULIFERÆ.

- Fagus sylvatica*
Corylus Avellana
Carpinus Betulus
Alnus glutinosa
Betula alba
Populus alba
 " *tremula*

SALICINEÆ.

- Salix Alba*
 " *repens var. fusca*
 " " *do. ascendens*

TYPHACEÆ.

- Typha latifolia*
 " *angustifolia*
 i. *Sparganium ramosum*

ARACEÆ.

- i. *Arum maculatum*

LEMNACEÆ.

- i. *Lemna minor*
Lemna polyrhiza

NAIADACEÆ.

- i. *Potamogeton plantagineus*
 i. " *crispus*

Zannichellia palustris
 „ pedicellata
 Ruppia spiralis
 i. Zostera marina

ALISMACEÆ.

i. Triglochin palustre
 i. „ maritimum
 Alisma plantago
 i. „ ranunculoides

ORCHIDACEÆ.

i. Orchis muscula
 i. „ laxiflora
 i. „ latifolia
 i. „ maculata
 i. Ophrys apifera
 i. Spiranthes autumnalis
 i. „ æstivalis
 i. Listera ovata
 i. Epipactis palustris

IRIDACEÆ.

i. Trichonema Columnæ
 i. Iris fœtidissimus
 i. „ Pseudacorus

AMARYLLIDACEÆ.

Narcissus Pseudo-narcissus
 Galanthus nivalis

LILIACEÆ.

Asparagus officinalis
 i. Ruscus aculeatus
 i. Scilla autumnalis
 i. „ nutans
 Allium ampeloprasum
 „ do. var. Eabingtonii
 „ vineale
 i. „ triquetrum

JUNCEACEÆ.

Luzula Forsteri
 i. „ sylvatica
 i. „ campestris
 i. „ congesta
 Juncus acutus
 „ maritimus
 „ conglomeratus
 „ effusus
 „ glaucus
 „ acutiflorus
 „ lamprocarpus

Juncus supinus
 „ capitatus
 „ bufonius
 „ Gerardi

CYPERACEÆ.

i. Cyperus longus
 Schoenus nigricans
 Scirpus acicularis
 „ palustris
 „ multicaulis
 „ Sarvii
 „ setaceus
 „ Tabernæ montanæ
 „ maritimus
 i. Eriphorum polystachion
 Carex pulicaris
 „ arenaria
 „ paniculata
 „ vulpina
 „ muricata
 „ stellulata
 „ remota
 „ ovalis
 „ vulgaris
 „ glauca
 „ pilulifera
 „ præcox
 „ pallescens
 „ panicea
 „ lævigata
 „ distans
 „ punctata
 „ extensa
 „ flava
 „ hirta
 „ riparia

GRAMINA.

Spartina stricta
 Chamagrostis minima
 Cynodon Dactylon
 Anthoxanthum odoratum
 Digraphis arundinacea
 Alopecurus agrestis
 „ geniculatus
 „ pratensis
 Phlœum pratense
 „ arenarium
 Gastridium lendigerum
 i. Lagurus ovatus
 Polypogon monspeliensis
 „ littoralis
 Agrostis Spica-venti
 „ alba
 Calamagrostis Epigeios

- Phragmites communis*
Aira flexuosa
 „ *caryophyllea*
 „ *præcox*
Avena elatior
Holcus mollis
 „ *lanatus*
Triodia decumbens
Koeleria cristata
Molinia cœrulea
Glyceria fluitans
Scherochloa maritima
 „ *procumbens*
 „ *loliacea*
Poa annua
 „ *pratensis*
 „ *trivialis*
 i. *Briza minor*
Cynosurus cristatus
 „ *echinatus*
Dactylis glomerata
Festuca sciuroides
 „ *ovina*
 „ *rubra*
 „ *rubra, var. duriuscula*
 „ *elatior*
 „ *pratensis, var. loliacea*
Bromus madritensis
 „ *madritensis, var. rigidus*
 „ *maximus*
 „ *sterilis*
 „ *racemosus*
 „ *mollis*
 „ *arvensis*
Brachypodium sylvaticum
Triticum junceum
Lolium perenne
 „ *italicum*
 „ *temulentum*
- Lepturus filiformis*
Elymus arenarius
Hordeum murinum
 „ *maritimum*
- FILICES.
- i. *Pteris aquilina*
 i. *Lomaria spicant*
 i. *Asplenium Ruta muraria*
 i. „ *Trichomanes*
 i. „ *marinum*
 i. „ *lanceolatum (c. micro-*
 don)
 i. „ *Adiantum-nigrum*
 i. *Athyrium Filix fœmina*
 i. *Ceterach officinarum*
 i. *Scolopendrium vulgare*
 i. *Polystichum angulare*
 i. *Lastrea Filix-mas*
 i. „ *dilatatum*
 i. *Polypodium vulgare*
 i. *Gymnogramme leptophylla*
 i. *Osmunda regalis*
 i. *Ophioglossum vulgatum*
 „ *lusitanicum*
Bctrychium lunaria
- LYCOPODIACEÆ.
- i. *Isoetes Hystrix*
- EQUISETACEÆ.
- i. *Equisetum arvense*
 i. „ *palustre*
 „ *linosum*
 „ *linosum, var. fluviatile*
- CHARACEÆ.
- Chara hispida*

REPORT AND TRANSACTIONS

OF THE

Guernsey Society of Natural Science

AND

LOCAL RESEARCH,

1889.



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Vice-President :

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Mr. E. D. Marquand

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TRANSACTIONS

OF THE

SOCIETY.

*Monthly Meeting held January 25th, 1889, Mr. T. Guille,
President, in the chair.*

Mr. Guille exhibited two magnificent specimens of Polyzoa (*Eschara foliacea*) which had been dredged off the south-east coast of the island. Mr. Luff exhibited and described (a) The Winter Moth (*Chimatobia brumata*). (b) The Yellow Belle Moth (*Aspilates citraria*). The former is rare in Guernsey: the latter, though common in this island, is only locally common in England. It has been found in one place only (Powerscourt) in Ireland, and not at all in Scotland. The Herbarium, presented to the society by the late Dr. Hoskins, was examined, but though an extensive collection, it was found that the locality had not been affixed to the specimens. It was decided therefore, that the society should form a new Herbarium. Mr. F. Rose was elected a member of the society.

*Monthly Meeting held February 19th, 1889, Mr. T. Guille,
President, in the chair.*

Mr. Collenette drew attention to the interesting papers appearing in "Nature" on the supposed Annelid remains in the Metamorphic Rocks of Scotland. Mr. E. D. Marquand referred to the lists of mosses, etc., in Ansted's "Channel Islands," and remarked that they were very incomplete, and,

so far as they indicated the species indigenous to Guernsey, very misleading. Mr. Marquand stated that he had found within the last three months nearly thirty different mosses not mentioned in Ansted's list as occurring in Guernsey. These were exhibited. Of the Hepaticæ or Scale Mosses, which are not mentioned at all in Ansted, Mr. Marquand had already collected twenty-four or twenty-five species. A short paper on "Corallines" from the *Wesley Naturalist*, was then read. This finished, the members repaired to the Museum, where the rest of the evening was spent in the examination of specimens.

*Monthly Meeting held March 19th, 1889, Mr. J. Whitehead,
Vice-President, in the chair.*

Mr. John Whitehead exhibited three specimens of foreign sponges of an unusual character, also a very fine *Uraster glacialis*, dredged off St. Martin's point. In the course of a conversation on the excavations by the "Guernsey Waterworks Company," Mr. Collenette mentioned incidentally that the water from wells in a certain district of St. Martin's parish invariably contains a white sediment, which, when analysed, proves to be magnesium and calcium in the form of carbonates. Mr. Marquand exhibited specimens of two land shells recently found by him in Saints' Bay Valley, viz., *Zonites Drapanaldi*, which is very rare in the south of England, only four stations being known, and *Pupa ringens*, which is a purely northern shell, not being found south of Hereford. Mr. G. Bowie was elected member of the society.

*Special Meeting held April 15th, 1889, Mr. T. Guille, President,
in the chair.*

Mr. J. Sinel, of Jersey, who for many years past has devoted himself to the study of Marine Zoology, and who is a

most indefatigable and successful searcher among the treasures of the deep around our shores, first exhibited specimens of fish preserved by a new method suggested by Dr. Davidson, of New York, and now used by Mr. Sinel. Mr. Sinel also described a very successful mode of restoring colour to preserved specimens. Many examples of annelids and sponges were shewn, and the lecturer remarked that of the whole of the British sponges, 75 per cent. are found in the waters around the Channel Islands. In Compound Ascidiæ, the Channel Islands are richer than any place north of the Mediterranean. After describing briefly but lucidly the life history of the Ship Barnacle, and the Great Edible Crab, Mr. Sinel went on to speak of fish, and in the course of his remarks said:—"That while in the *fishes*, beyond every other class of vertebrates, we see the operations of the law of natural selection, in either the close mimicry of surroundings or armature (but principally the former) there is one genus, viz., the *Labridæ* (Wrasses) in which neither "*Natural*" nor "*Sexual*" selection seems to have had play; for instance let us glance at a few of the best known forms of our coasts, taking firstly the '*Pleuronectidæ*' (soles, plaice, etc.) here we have a close mimicry of the bottom on which they live, varying with the different grounds; so close is this imitation that it requires a sharp eye to detect even their bare outline,—this is well known to those who fish for these by spearing them in shallow waters. Then we have the surface, or mid-depth, swimmers (the mackerel for instance), here we have invariably a dark *blue* or *green* (chiefly sea-green) ground with waved lines, so that a whole shoal is hardly discernible from above amid the ripple of the surface, while to such enemies as are likely to attack them from below, they must present, through their silvery *underside*, close similarity in hue to the sky. I have consulted divers (in Guernsey) touching this, and they say they are only just visible, the shadow which they cast on the bottom, in sunny weather being the first notice of their

approach (i.e. chiefly when in shoals). Next the "Gobies," "Shannies," and the "Pipe fishes," these all closely imitate their surroundings. In the case of the latter, they would escape observation among a handful of the "Cordweed" and "Zostera" amongst which they live.

Then we have others, say the '*Triglidae*' (Gurnards) conspicuous fishes, mostly of pink, orange, or scarlet colour, but clothed in *defensive armour*.

Now let us compare with these our *Labridæ*, here we have the greatest diversity of coloration, some certainly, the Green Wrasse (*Labrus linentus*) and the Comber Wrasse (*L. comber*) bearing similarity to the *Laminaria* or *Fucus*, which clothes the rocks among which they live. But then, in the *very same localities*, so that in angling for them they come up indiscriminately, we have the *bright orange and blue* Cuckoo-fish (*L. mixtus*), the large *white spotted* "Old Wife" (*L. bergylta*), and the *dark brown* L. comber, and *bright green* L. lineatus, all haunting the self-same spots. None of the species *armed*.—true, the spinal ray fins are sharp, but they are by no means defensive spines as seen in the other bright species. Then if we turn to "*sexual*" selection to explain this problem, we find that the bright colours pertain indiscriminately to either sex.

As nearly a last resource—in order to bring them into conformity with a law that we see operate so unmistakably among all their congeners, we seek refuge in "*palatability*" (to coin a word). In the insect world, as is well known, unarmed and yet *conspicuous* forms live on and multiply with safety, through the fact that they are "palatable" to the animals that would prey upon them (e.g. the case of the Cinnabar moth), but in our "*Labridæ*" this does not operate, they are *all*, both dull coloured and bright coloured, employed with equal success by fishermen as "baits" for larger fish, and by ourselves, they are used as food, and no difference of flavour can be perceived between them.

One more attempt at the conciliation of facts with *otherwise* unfailing laws. Have they such *reproductive power* as for the race to successfully live on in spite of these difficulties? *No!* compared with most other fishes the number of eggs is *small*. The raking out of a "Wrasses' nest" (they are *nest-builders*, cramming masses of the finer fuci, etc., into rock crevices and entangling their eggs amongst them), reveals a small number of eggs (i.e. small in comparison with *Herring*, *Bream*, etc., etc., but certainly much larger than in *Cottus*, *Syngnathus*, etc.; the dissection of the ovaries of a gravid female also bears this out.

Well then where are we? Do the two great laws to which we owe the modification and adaptation to environment of all the forms around us, and which are elsewhere written in such unmistakable characters, fail to solve our problem? In answering this question I am fully aware—and sadly alive to the fact, of my lack of qualification, but I know of no scientist who has worked this problem to whom I might turn, therefore speaking from own observation solely, I must say it *looks to me as if it does fail*, or at very least, I must, pending the coming of more light, say that perhaps this genus of fishes is in a *transitional condition*, the elimination of the *least fitted* for environment not being yet completed; but by what road they have arrived at their present varied and paradoxical position is a problem far beyond my powers of even attempted solution."

*Monthly Meeting held May 1st, 1889, Mr. J. Whitehead,
Vice-President, in the chair.*

Messrs. C. E. Juleff, J. Nicolle, G. Le Masurier, and J. B. Randell were elected Members of the Society. A discussion then took place as to the best means of increasing the usefulness of the Society. Mr. Marquand presented, on behalf of the

“Penzance Natural History and Antiquarian Society” copies of their “Transactions” for the past 8 years.

Mr. Marquand then read a very interesting and suggestive paper on the genus *Isoetes*, which is printed further on.

*Monthly Meeting held May 21st, 1889, Mr. J. Whitehead,
Vice-President, in the chair.*

Mr. Frank Carey was elected Member of the Society.

Mr. Whitehead exhibited a collection of Annelida and Tunicata (some rare) found on the neighbouring shores, and which had been prepared for the Museum by Mr. J. Sinel.

(A complete list of these and other important additions to the Museum—illustrating the Marine fauna of the neighbourhood, will be found at the end of this volume.)

It was remarked that a young seal 3ft. 6in. in length had been captured in one of the little bays off Herm.

Arrangements were made for an excursion to the Island of Herm on June 15th.

*Monthly Meeting held on June 18th, 1889, Mr. J. Whitehead,
Vice-President, in the chair.*

The Secretary briefly referred to the excursion to Herm on the 15th, and Messrs. Marquand, Luff, and Randell communicated the results of their researches on that occasion. An account of the excursion, and the papers read in connection with it, together with one on the ancient chapel of Herm, read by the Rev. G. E. Lee, will be found in the following pages.

Arrangements were then made for an excursion to the island of Lihou and neighbourhood on the 15th July.

*Monthly Meeting held July 23rd, 1889, Mr. J. Whitehead,
Vice-President, in the chair.*

Rev. G. E. Lee, M.A., F.S.A., and Mr. P. L. M. Nicolle were elected Members of the Society. A copy of the “Transactions

of the Penzance Natural History and Antiquarian Society" for 1888, was received from the Society.

Mr. J. B. Randell read a short paper on the result of his researches on the shores of Lihou Island. This paper, together with an account of the recent excursion to that Island, will be found on a subsequent page.

*Monthly Meeting held August, 27th, 1889, Mr. J. Whitehead,
Vice-President, in the chair.*

Mr. Luff read a very interesting paper (which will be found further on) on "The Nocturnal Macro Lepidoptera of Guernsey, Alderney, Sark, and Herm." The paper contained the results of Mr. Luff's labours extending over many years in this branch of the science. It referred also to the work of Rev. F. E. Lowe and Mrs. Boley in the same field. Most of the rarities mentioned were exhibited. Mr. E. D. Marquand, in proposing a vote of thanks to Mr. Luff for his excellent paper, remarked that it was a good example of what such a paper should be, containing, as it did, the result of a great amount of personal observation and research expressed in an agreeable and concise form. Mr. Marquand then alluded to the death, on the 30th July, of the Rev. M. J. Berkeley, the eminent English botanist, at the advanced age of 87. Mr. Berkeley was a high authority in all sections of the Cryptogamia, and was the author of many works on the subject, but he excelled in his knowledge of the fungi, and, as a fungologist, he had no equal in England.

Monthly Meeting held September 9th, 1889, Mr. J. Whitehead, Vice-President, in the chair.

Mr. Sinel gave a most interesting lecture on the "Crustacea," illustrated by numerous preserved specimens, and

by excellent sketches on the blackboard. The substance of the lecture, which was delivered without notes, will be found in a paper supplied by Mr. Sinel, and printed in the following pages.

The Seventh Annual Meeting, held at the Guille-Allès Library on October 15th, 1889, Mr. T. Guille, President, in the chair.

The attendance of members was larger than in previous years. The proceedings opened with the reading of the following report by the Hon. Secretary (Mr. W. Sharp) :—

Mr. President, Ladies and Gentlemen,—In presenting you with the Seventh Annual Report, your Committee feel that they have an agreeable duty to perform. The year just over, as far as this society is concerned, has been marked by prosperity and progress, as is evidenced by the increased interest taken in the monthly meetings, and the large number—about a dozen—of additions to the list of members. At last the society seems to be waking to new life. Though not large when compared with similar societies in England, we must not forget that we draw our supply of members from a limited area. It behoves us therefore to make up in zeal and energy, what we lack in numerical strength. At present the society numbers 36 members. The Hon. Treasurer will be able to report favourably on its financial position. The indoor meetings of the year have been well attended, and have been of a more interesting character than those of the past two or three years. Excellent papers have been read, and lectures given. The two excursions—the first to Herm, the second to Lihou and neighbourhood—were most successful and thoroughly enjoyed by all who took part in them. The Committee gladly embrace this opportunity of recording their thanks to Mr. J. Sinel, of Jersey, for the two interesting and highly instructive lectures he has given during the year.

The publication of the *Transactions* of the Society, which

had been in contemplation for some time, is now *un fait accompli*, and copies are in the hands of members. The volume covers the work of the Society for the first six years of its existence, from 1882 to 1887. It is intended that in the future, the publication of *Transactions* shall take place annually.

In the new set of rules supplied for your consideration, and which you will be asked to confirm at this meeting, it will be noticed that an important addition has been made to the list of objects for the study and investigation of the Society; viz: The Archeology, Folk-lore, and Language of the different islands in the Bailiwick. All will admit that this opens up a vast, important, and interesting field of work, and one that may well be undertaken by an organized Society which is prepared to record and preserve all important facts gathered by its members. An accession of members, increased interest in the excursions of the Society, and a greater variety in the papers read at the monthly meetings may fairly be looked for as the result of such enlargement of the Society's aims and objects. It may be confidently asserted that no place of equal area in the United Kingdom promises a greater reward for patient and intelligent research in these subjects than Guernsey and the adjacent isles. The Committee gratefully acknowledge the kindness of Messrs. Guille and Allès in placing both a room for meetings and the valuable Reference Library at the disposal of members. The Museum—thanks mainly to the untiring zeal and liberality of Mr. Whitehead, is daily growing more valuable, and members will note among the most recent additions very complete collections of various sections of local marine fauna. It is unnecessary here to show how extremely valuable such collections, accurately named, will be to the young student of this interesting branch of Natural History, and for the study of which our seas offer such a rich field. What has been done in the past but points to the rich mines of wealth in every branch of Natural Science still unexplored, and the earnest and systematic co-operation of each member is needed

that the aim and object of the Society may be realised to its fullest extent.

Guernsey,
September 28th, 1889.

WILLIAM SHARP,
Hon. Sec.

The Hon. Treasurer then read the financial statement which showed a balance in hand of £6 10s.

This was followed by the President's address, which was listened to with much pleasure, and frequently applauded. Mr. Guille said :—

LADIES AND GENTLEMEN,—In offering a few remarks to you this evening, when the lapse of time has brought round another annual general meeting of our Society, and with it the conclusion of my term of office as president, the first thing that occurs to me is that I owe you, if not exactly an apology, at all events some expressions of regret, that I have not been able to be present at more of the periodical meetings. I know, however, that you will believe me when I say that my absences have not been caused by any want of interest in the work of the society, but rather by circumstances which I could not prevent, and which I know have deprived me of participating in some very pleasant and interesting gatherings. Although I am thankful to say that I still enjoy a very fair measure of health and strength, yet I am becoming more and more conscious that in a physical point of view at least, it is not now quite so easy as it once was for me to take an active part in investigations and discussions, for which, however, I still retain a great and undiminished taste. The conviction is even more strongly being forced upon me that I must leave to a greater extent the more onerous parts of the work to others; but yet I am glad to feel that I have in no way lost my real interest in such pursuits. If I have not been able to be with you more frequently, the loss has been my own rather than yours; and I can truly say that I have participated in your labours in mind, and heart, and sympathy, although I may have been unable to be present and preside.

Under these circumstances it is also a great satisfaction to know, and a great pleasure to me to acknowledge, the very valuable services that have been rendered by my friend, Mr. Whitehead, our esteemed vice-president. He has often taken the chair when I could not, while nothing could exceed the interest and devotion he has manifested in furthering those branches of science which the society has at heart. I suppose every member of the society is aware that Mr. Whitehead has, for years past, devoted a very large amount of valuable time to the re-arrangement and enriching of the museum—a work which will be more and more appreciated, when the Guernsey public become better acquainted with the full extent of these local Natural History treasures, which are there placed within their reach. The undertaking of a long and tedious enterprise of this kind—requiring as it does not only immense patience and perseverance, but also a very special knowledge—is exceedingly hard in itself, and would alone entitle Mr. Whitehead to our warmest gratitude and heartiest thanks. But in addition to this he has most generously presented the institution with a number of large glass cases, made specially to his order, for the preservation and display of specimens; and has besides purchased and given us a splendid collection of local crustacea, annelids, fishes, and other examples of our local marine fauna, which will prove a most welcome addition to every working naturalist. These specimens have nearly all been prepared and mounted by Mr. Sinel, of Jersey, who has preserved them in a style, of which any museum might be proud. Personally, therefore, ladies and gentlemen, on my own behalf as well as on that of the society, I beg to tender our very warmest thanks to Mr. Whitehead for his great kindness, and his very handsome and costly presents, which I am sure we all most fully appreciate and very highly value.

The museum has also recently received from Mrs. C. B. Hamilton, a very extensive and unique collection of minerals, which was formerly in the possession of her late husband Mr.

Hamilton, of Leamington Spa, and is historically as well as scientifically interesting, inasmuch as it was originally formed by the celebrated James Watt, the inventor of the steam engine, with whom Mr. Hamilton was at one time connected in scientific pursuits. This collection fills a large number of cabinets, and is now in course of examination.

I can also warmly congratulate the Society upon having had the privilege and pleasure of listening to some of Mr. Sinel's admirable and instructive lectures. The beautiful preparations by which they were illustrated, and his very graphic sketches on the blackboard, rendered it a perfect pleasure, as well as an intellectual treat to listen to them. It has been said by a certain writer that "gratitude is a lively sense of benefits to come." Perhaps it is frequently so, but be this as it may, I think we cannot be charged with any undue selfishness, if in recording our indebtedness to Mr. Sinel for his very charming descriptions and delineations, we express a hope that we shall, not unfrequently in the future, be favoured with further prelections of the same lucid and admirable character.

Another matter for mutual congratulation is the publication, this year, of the first volume of the Society's transactions, commencing with 1882. The volume contains the results of much painstaking and intelligent research, and now places these results within the reach of all, who care to avail themselves of them. The identification of various local species, and the careful revision and verification of the local lists of flowering plants, ferns, &c., published many years ago by Professor Babington and Professor Ansted, cannot but prove of great value and interest to future botanists. This work of verification has been chiefly carried out by Mr. George Derrick, who deserves our warmest thanks for his labours. Mr. Luff has also contributed a valuable paper on the moths and butterflies of the locality, besides giving, from time to time, various other interesting entomological notes. The Society is also much indebted to Mr. Adolphus Collenette, Mr. Marquand, Mr. J. B.

Randell, Mr. Sharp, the Honorary Secretary, Mr. Spencer, and others, for the sight of different interesting specimens, and the results of various local scientific research.

While, however, the Society happily possesses a few indefatigable workers, yet I cannot but regard it as a matter of regret that a greater number of people—especially of the *young* people among us—do not take a more lively and intelligent interest in these scientific pursuits. I must say that I am grieved—sincerely grieved,—when attending not only the meetings of this particular Society, but any others where mere amusement does not form the principal part of the programme, to find the very small proportion of young men in attendance. It is my sincere wish, as well as that of my friend Mr. Allés, to do all that lies in our power to stimulate and foster a spirit of scientific enquiry. The Society has also stirred itself in the same direction, by the offer of prizes and other means. But yet a very regrettable amount of apathy prevails, and how to get rid of this, and implant in its place a spirit of intelligent enquiry, is a problem which hitherto we appear not to have been able to solve. There have been so many things to do in connection with the arrangement and organization of the Library, that Mr. Allés and I have not yet been able to carry out all we intend to do in our endeavours to interest the young men and women of the island in higher and nobler intellectual pursuits than those in which some of them at least now too often spend their time. *L'appétit vient en mangeant*, is a truism which is specially applicable to the delights of science and literature; but the difficulty seems to be to persuade our young folks to take the first delicious mouthful, which shall reveal to them those intellectual tastes and pleasures unknown before, and so create in them a desire for more of this same enlightening and elevating pabulum which strengthens the soul for nobler and loftier achievements; which contains no roots of bitterness or germs of disappointment; and which never can weary, or surfeit, or cloy.

I, like yourselves, ladies and gentlemen, owe many a quiet, happy, and elevating hour to tastes and pursuits of this kind. I can truly say that I look back with unalloyed satisfaction to the happy hours devoted to the study of nature in my youthful days, when, by means of simple instruments and apparatus of my own construction, some of the wonders of creative wisdom and skill, were first revealed to my wondering vision. These studies of my youthful days, have, I am convinced, exerted a wholesome influence on all my after life ; not the least of which has been a deeper love of my fellow men, and especially a sincere concern for the moral and intellectual elevation of the youth of my native land. I may truly say that it is this deep concern for their welfare which has found practical expression in my return to my native land, and in my endeavours to provide for them in the pleasant paths of literature and science, those inexhaustible stores of pure recreation, instruction, and enjoyment, which they vainly seek through the gratification of the grosser senses.

I have spent many an anxious hour in trying to devise some method of inducing more of those around us to join in the same pure and satisfactory enjoyments. While I by no means despair of ultimate success, yet I should certainly be glad to see rather more definite signs of progress ; and if any of the members of this Society can aid in this “ consummation so devoutly to be wished,” either by any suggestions or in any other way, I, as well as my friend Mr. Allés, shall be very glad indeed to be favoured with their views on the subject.

I may just add in conclusion, that a revised code of Rules will presently be submitted for your consideration and ratification. They have been drawn up with a view of extending the scope of the Society’s labours, and of adding to its present list of subjects for investigation. such very interesting and important matters as the archæology, the folk-lore, the language, &c., of the Bailiwick. Much of our folk-lore especially, is very rapidly vanishing from our midst ; indeed I greatly fear that

many a curious old local legend is already irretrievably lost. This, however, furnishes all the more reason why what remains should be carefully gathered up and recorded; and the same may be said of many of the peculiarities and picturesque and quaint expressions of our ancient Franco-Norman dialect. The Society will certainly have before it in these directions a novel and most fertile field of scientific enquiry, and I sincerely hope that these new branches will be carefully worked and investigated.

It now only remains for me, ladies and gentlemen, to thank you once more for your kindness in having elected me to the office, my tenure of which is just expiring; and to assure you of my continued interest in all that concerns the welfare of the Society, and to wish it—which I do heartily—constant and ever increasing success.

The attention of the members was then devoted to the consideration of a new set of rules for the government of the Society, and which were finally adopted. An important addition was made to the aim and objects of the Society, viz., “The study and investigation of the archeology, folk-lore and language of the islands of the Bailiwick.” This necessitated an addition to the title of the Society, which now stands thus, “The Guernsey Society of Natural Science and Local Research.”

The election of the Council for the new year was next preceded with, and resulted in the re-election of all the old office-bearers as follows:—President: Mr. T. Guille; Vice-President: Mr. John Whitehead; Hon. Treasurer: Mr. W. A. Luff; Hon. Secretary: Mr. W. Sharp; Committee: Messrs. F. Allès, A. Collenette, C. De La Mare, G. Derrick, S. G. Hugo, and E. D. Marquand.

A copy of a pamphlet on “The Rocks of Alderney and the Casquets” by the Rev. E. Hill, F.G.S., was presented to the Society by the Author.

Hearty votes of thanks to the President, the Hon. Secretary and Hon. Treasurer, and Mr. J. Whitehead, brought a very agreeable and interesting meeting to a close.

RULES OF THE GUERNSEY SOCIETY OF NATURAL SCIENCE AND LOCAL RESEARCH.

1.—That this Society shall be called “The Guernsey Society of Natural Science and Local Research.”

2.—That the objects of the Society shall be study and investigation of the Fauna and Flora, Geology, Meteorology, Archæology, Folk-lore and Language of the islands of Guernsey, Alderney, Sark, Herm, and Jethou, (commonly called the “Bailiwick of Guernsey”), the holding of meetings for the reading and discussion of papers on the above subjects, the exhibition of specimens, and the publication from time to time of such papers and notes as may be deemed worthy of permanent record.

3.—That the annual subscription shall be five francs, payable in advance on the 1st of November. Non-payment of subscription for two consecutive years disqualifying for membership.

4.—That persons desiring to join the Society shall be proposed by two Members at one of the Ordinary meetings and balloted for at the next meeting.

5.—That the Council or governing body of the Society shall consist of a President, one or more Vice-Presidents, an Honorary Secretary, an Honorary Treasurer, and six ordinary members, all of whom (except the Vice-President) shall be elected by ballot at each Annual General meeting; and of these five shall form a quorum.

6.—That no Member shall hold the office of President for more than two years in succession; the retiring President then becoming a Vice-President.

7.—That ordinary meetings for the reading of papers, exhibition of specimens, recording of notes, &c., shall be held once every month throughout the year, notice of the same being sent to each member, and such meetings shall be free to members and friends introduced by them.

8.—That the Annual General Meeting shall be held at the Guille-Allès Library during the month of October, in each year, to receive the Report and Balance Sheet of the out-going Council, and to elect the new Council, and that notice of such meeting shall be sent to each member seven days previously.

9.—That the Council shall make such arrangements as may be required, from time to time, for Ordinary meetings, excursions, professional lectures, exhibitions, etc.; and the right is reserved to the Council under certain circumstances, of fixing a price of admission for members or for non-members.

10.—That notice of the meetings of the Council shall be issued by the Secretary at least three days before each meeting, intimating its object.

11.—That on receipt of a request in writing signed by any five members, the Secretary or acting Secretary shall convene an Extraordinary meeting within two weeks of the receipt of such request.

12.—That notice of an Extraordinary meeting of the Society shall be sent to each member not less than seven days before such meeting.

13.—That the Society shall publish Transactions annually, each Member to receive one copy free of charge.

That no addition to or alteration of these rules shall be made except by a majority of three-fourths of the members present at an Annual general meeting, or at an Extraordinary general meeting convened for the purpose, fourteen days' notice of such proposed alteration or addition being sent to each member.

Council Meeting,

September 18th, 1889.

ON THE GENUS ISOETES.

(Read before the Society by Mr. E. D. Marquand, May 1st, 1889.)

A fortnight ago Mr. Derrick most kindly sent me up fresh specimens of the Guernsey *Isoetes*, which I was much pleased to have an opportunity of examining, for it is by no means a conspicuous plant, and one might search a long while without lighting upon it. As you all know it is one of the great prizes of our island Flora, like *Ophioglossum lusitanicum*, *Lagurus ovatus*, *Orchis laxiflora*, and several other plants which are peculiar to Guernsey. As I had occasion to read up the literature of the subject in such books as I happen to have on my own book-shelves, it occurred to me that a short paper on this genus of very singular cryptogams would not be out of place this evening, and possibly would prove of interest to the members present.

There has been among botanists more or less uncertainty about the exact and proper position of this genus *Isoetes*, on account of its very extraordinary fructification, but all are agreed that it is allied to the Lycopods or Club Mosses, although very unlike them in habit. English systematists all place *Isoetes* in the Lycopodiaceæ, whilst the continental ones have formed a distinct order for its reception, *Isoetacæ*, and I am incline to think they are right.

I need not give you the generic characters of *Isoetes*, as you may find them in any text book, but I wish to call your attention to the species which are comprised in it, since it is our

good fortune to possess, and possess exclusively in this little island of Guernsey, the only British representative of the terrestrial section; and this is the more interesting as the genus is normally aquatic; in fact Berkeley in his "Cryptogamic Botany" observes in speaking of *Isoetes* "All the species are strictly aquatic, and often grow in deep water, where they are never uncovered in the driest season."

The genus *Isoetes* seems to have been unknown to Ray,—at least I find no mention of it in the 3rd Latin edition of his "Synopsis Stirpium Britannicarum" published in 1724.—Linnaeus, in his "Systema Naturæ" 13th edition, 1788, gives the generic character of *Isoetes* and describes two species, *I. lacustris* and *I. coromandeliana*, but without localities or habitats. In Hooker's British Flora, 1st edition, 1830, we find *I. lacustris* described, its habitat being "bottoms of lakes in the north, Wales and Scotland," "a very singular aquatic" the author observes "its fructification being entirely concealed at the base of the cellular subulate leaves." In the 5th edition of the same work published in 1842 the same description is used, but the following note is added:—"Mr. W. Wilson finds two varieties in Wales, the one densely tufted with slender erect leaves; the other solitary with broader leaves widely spreading." [The former is the true *lacustris*, and the latter *echinospora*.] In Mackay's "Flora Hibernica" published in 1836 is given, besides the description, a more detailed account of the two supposed modes of fructification as observed by Mr. Wilson. In Withering's "Systematic arrangement of British Plants," 6th edition, no mention is made of *Isoetes* at all, although both the Lycopods and Equisetaceæ are described in full. This intentional omission is very remarkable. Babington in his "Manual of British Botany" describes *I. lacustris* and *I. echinospora* as distinct species, whilst Hayward in his "Botanists Pocket Book" regards them as varieties of each other merely, but both these authors record *I. hystrix* as occurring at Guernsey.

In the year 1855 Messrs. Grenier and Godron published their excellent "Flora of France and Corsica," in which they described all the Isoetes found within those limits. The species are there divided into three sections:—

- 1.—*Aquaticæ*, containing our north of England species
I. palustris only.
- 2.—*Palustres*, comprising three species not found in
Britain.
- 3.—*Terrestres*, comprising *I. hystrix* and *I. Durieui*.

It seems very probable that Mr. George Wolsey, who discovered our plant on l'Anresse Common in 1860, must have seen a copy of this work and then searched specially in the likeliest places. If not, he must certainly have stumbled upon the plant by accident, for at that date a terrestrial Isoetes was as undreamt of as a terrestrial Chara. However the plant was found and submitted to Sir John Hooker who named it *Isoetes Durieui*, whilst Professor Babington who also had specimens sent to him, pronounced it to be *I. hystrix*. That it was perfectly distinct from the two aquatic species known in the British Isles, namely *I. lacustris* and *I. echinospora* was at once apparent by the root stock or corm being covered with jagged or spinous brown scales, which are never present in the water forms.

Now the distinction between the two species to which the Guernsey plant was referred seems, in the books at least, to be anything but clear. The *I. hystrix* of Durieu has the bulb surrounded by short black shining scales, terminated by two long linear subulate horns or spines, one-third of an inch in length, between which often appears a third one, very short. In *I. Durieui* of Bory, the scales were very short, black, with three teeth and no spines.

Lloyd in his "Flore de l'ouest de la France" (a book by the way which should be in the hands of every Channel Islands botanist) says the two species approach very near to each other, but in *hystrix* the macrospores are slightly granulated (Babing-

ton calls them "bluntly tubercled,") whilst in *Duriei* they are deeply pitted or honeycombed.

Mr. Baker, curator of the Kew Herbarium, after an examination of the Guernsey plant, pronounced it to be the *Isoetes hystrix*, var. *subinermis* of Durieu, adding to his note "we have the same form in Kew Herbarium from Caprera, Algeria, French Landes, Phrygia, Smyrna, Castille, etc., it is in fact more common than the typical *hystrix* with the big spines."

The species of *Isoetes* of which I have chiefly been speaking (including all the British species) may perhaps be tabulated thus:—

Aquatic, without persistent leaf bases, growing at bottom of lakes and pools in Britain :

Cæspitose, leaves erect, green *lacustris*.

Solitary, leaves spreading, pale *echinospora*.

Terrestrial, with persistent leaf bases, resembling scales, growing in exposed sandy places :

Scales with two long subulate horns, and an intermediate tooth, macrospores bluntly tubercled (West of France) *hystrix*.

Scales with three teeth, macrospores as above (Guernsey) . . *hystrix* var. *subinermis*.

Scales with teeth, macrospores pitted, much larger and more robust than the last (Algiers) *Duriei*.

A very interesting question suggests itself with respect to the propagation of *Isoetes hystrix*. How are the spores disseminated? The sporangium or sporesac is incorporated with the base of the leaf, and the rhizome or bulb from which the leaves spring is buried an inch or two in the earth. Now, if the plant grew on loose drifting sand dunes, we could readily imagine the mature sporangia becoming detached and afterwards blown about by the wind, but instead of this it grows in

a compact humus absolutely crowded with vegetation. Moreover, if the winter frosts should tend to "throw up" the detached leaves, yet the spines or teeth, which are strong and point upwards, would serve as anchors to keep it below the surface. Now in the aquatic species there are *no* spines or teeth, and here we at once see how the "wash" on the margin of a shallow lake or pool would speedily disengage any mature leaf bases, which might then by the agency of aquatic birds, or even the larger water beetles, be dispersed far and wide. But how does the dispersion take place in our terrestrial plant?

And then again, which of the two forms most approaches the original type; the *aquatic* one, *without* spines, or the *terrestrial* one, *armed with stout anchoring teeth*? In other words, is *Isoetes hystrix* the survivor of an almost extinct race of spiny-bulbed, land-growing forms, from which the aquatic species have sprung, and in the course of modification by descent, have lost the no longer needful anchoring spines? Or on the other hand, does the spinous bulbed form represent the more complex and highly specialised descendant of a simple smooth-bulbed aquatic progenitor? and lastly, of what use are the spines at all, and what end do they serve?

EXCURSION TO HERM.

July 15th was the day selected for an excursion to Herm, the spring tide offering a favourable opportunity for members interested in marine zoology to examine the extensive sand and shell beaches left bare at low water. About 30 members and friends embarked on board the *Alert*, which, crossing the Little Russel, passed between the two outer beacons, heading for the harbour; but as the tide had already fallen considerably, turned southward and ran for the Channel (the Percée) between Herm and Jethou. The strong tide in this intricate narrow passage, makes navigation dangerous, so, although the view over the adjacent islets, Jethou and Crevichon* with Guernsey in the distance, was pretty enough, we were not sorry to find ourselves safely landed on the steps at the Rosière.

After landing, it was announced that at 3.30, members would assemble at the Old Chapel, when Rev. G. Lee, Rector of St. Peter-Port, would read a paper on the history of Herm, and until then members would be free to follow the bent of their own inclinations; and that permission had been granted by Mr. McNaught, agent of the owners, to members, to visit every part of the island provided they did no mischief to the standing crops.

The shell beaches on the Eastern coast are among the most noted natural curiosities of the Channel Islands, and usually attract the majority of visitors; to them on this occasion most of the ladies repaired. The northern one is by far the largest,

*During his visits to the Channel Islands, Professor Babington landed on Crevichon; he enumerates 22 species of Flowering Plants and Ferns he noticed growing on it. Since then a granite quarry has been worked there, the blocks of stone were used in the construction of the S.W. wall of St. Peter-Port harbour at the commencement of the works.

but the small one, Belvoir Bay, has the reputation of furnishing more perfect shells. The beaches are composed to a considerable depth of broken shells, but specimens in good condition are tolerably numerous. The shells are mostly those of creatures inhabiting the adjacent seas, living specimens of which can be found on the surrounding rocks and weed or dredged from deep water. Sometimes, however, collectors have found among the debris, shells from distant parts and occasionally rare ones.

It is not easy to see why such a deposit should be *confined* to this special locality; why for instance a similar accumulation should not be formed on the east of Guernsey, a little study of the conformation of the district and of the set of the tides will give some reasons for its occurrence here.

The strong tide which rushes like a powerful river between the main island and the Godinent and other rocks on the North, and the corresponding current through the Percée* on the S. on entering the Great Russel are checked and lost in the main cross current and spread out with greatly diminished force to cover the intermediate area, east of Herm. The stilled waters drop the sand they held suspended in them, while the lighter material, the shells, are carried further and disposed in the quiet reaches along the east coast. Storms and the action of the tide then throw them up on the beach.

While the ladies were thus pleasantly employed collecting the prettiest and most beautiful shells, several of the gentlemen started across the sands spreading so extensively eastward from the pier. Here they found abundance of life interesting even to those who had not specially studied marine zoology; quantities of small crustaceans, sea hares (*Aplysia*), specimens of *Eolis*, Chitons, *Botryllus*, and various sand stars (*Ophiocoma*) and others.

*The tide through the Percée runs for nine hours to the South into the Great Russel with great strength, but only for three hours to the North and that only faintly.—(Ch. Is. Pilot 1870.)

Having with them a couple of spades they were able to dig up for the benefit of the uninitiated various Annelids, also sea anemones, e.g. *Peachia*, *Sagartia bellis* and gemmacea. Sea-urchins:—*Spatangus*, and *Amphidotus*; and razor-fish and other burrowing bivalves, &c., and to show how it was possible from the mounds on the surface to determine what animal was buried below.

Further north, a gully between the rocks was visited, which would repay a day's attention from an experienced naturalist.

This beach is considered the best shrimping ground in the bailiwick, a single individual has obtained as many as ten pints to his own net in one tide. The surface has, however, very materially altered in the last few years, pools have disappeared, apparently filled, and new ones formed; there seems to be a new and rather deep deposit over the whole area. This is probably caused by tipping ballast from barges into the Russel itself, or into waters from which the strong currents bring up the lighter material; even the quarry refuse and ballast heaps so extensive on the coasts of the Vale and St. Sampson's contribute to this new accumulation.

Meanwhile Mr. Luff had been seeking entomological treasures. The weather was not bright enough to bring out many butterflies. He secured a few specimens, one of *Pieris Rapæ* (small garden White), *Lycæna Alexis* (Common Blue) was very abundant, and had been out some time, for all those captured were much worn; of *L. Argiolus* (Azure Blue) one specimen was taken resting on a bramble; *Pyrarga Egeria* (Speckled Wood) was very common, of *Ccenonympha Pamphilus* (Small Heath) three specimens were captured in fine condition. This species is never found in Guernsey. One much battered specimen of Painted Lady (*Vanessa Cardui*) was taken.

Moths did not appear to be numerous; the only perfect insects seen were: *Camptogramma Bilineata* (Yellow Shell); *Euchlea Jacobæ* (Cinnabar); both species were abundant.

But his most important find was the larvæ of *Bombyx Neustria* (the Lackey Moth); five nearly full grown specimens all feeding upon bramble leaves. They must have been abundant, as evidenced by the numerous cast skins, and the remains of their webs on the bramble bushes in all parts of the island. This species has never been observed in Guernsey, and this is the first record of its occurrence in Herm.

The following species of Coleoptera or beetles were taken :—*Notiophilus biguttatus* :

<i>Demetrius atricapillus.</i>	<i>Rhigobius litura.</i>
<i>Calathus mollis.</i>	<i>Otiorhynchus atroapterus.</i>
<i>Amara familiaris.</i>	<i>Apion sp.</i>
<i>Cymindis axillaris.</i>	<i>Timarcha coriaria.</i>
<i>Pædarus littoralis.</i>	<i>Coccinella septempunctata,</i>

and three others undetermined.

Three species of Hemiptera and one small light coloured *Blatta* or cockroach.

Mr. E. D. Marquand was busy securing botanical specimens, and his afternoon's search more than doubled the number of plants found in the island recorded on the Society's list. The attention of nearly all the visitors was attracted by the innumerable plants of *Silene nutans* (Nottingham Catchfly) with its panicle of flowers all drooping one way. These were scattered over the elevated part of the island. A full account of Mr. Marquand's researches will be found in a subsequent page.

Some members, actively and enthusiastically employed in their own departments were perhaps sorry to find the time arrived for repairing to the ancient chapel; but they were amply repaid by the very able and interesting paper which Mr. Lee read in the chapel itself, and which will be found printed at length on another page. The structure has been overlooked by the great majority of visitors; it is among the farm buildings, and has for many years been used as a barn,

having been divided into compartments to suit the convenience of the farmers.

About an hour later, there was a general gathering at the pier, the tide having risen high enough to enable the steamer to lie alongside. A passing shower made the houses around a welcome shelter while waiting for the boat, which called on her return passage from Serk. Then a pleasant run of twenty minutes brought us once more to the White Rock from a most pleasant excursion, which, notwithstanding the most earnest endeavours, had not half exhausted the points of interest to be discovered in Herm.

THE FLORA OF HERM.

(Read before the Society by Mr. E. D. Marquand,
June 18th, 1889).

The delightful excursion to Herm of the Guernsey Natural History Society on Saturday last, proved an excellent commencement of the series projected for the present summer, and we shall await with interest the various reports of work done on that day in the matter of entomology and marine life in general; for great spoils were brought home. My own researches were purely botanical, and in the course of my solitary ramble across the sandhills I more than once cast a wistful glance at the long stretch of rocks left bare by the retreating tide, teeming with curious creatures and quaint forms of life, till I almost wished I had thrown aside my vasculum and joined the party of marine zoologists.

As I happen, however, to be actively engaged at the present time in collecting materials for a complete "Flora" of the island of Guernsey, I gladly availed myself of an opportunity of studying the plant life, or at least the phanerogamic section of it, of the little sister island of Herm,—and accordingly devoted my attention solely to that object. The five or six hours allowed on the island soon sped by, but in my hurried scamper over the place I catalogued one hundred and eighty-one flowering plants, six ferns, and one *Chara*, (a very fine growth of *C. vulgaris*).

Of course this must not be regarded as at all an exhaustive list, for there were innumerable nooks and crannies, and stretches of sand of most promising aspect, which time would not allow me even to run over; indeed something much nearer five days than five hours would be required to work the island properly.

But what struck me as very remarkable was the fact that Herm possesses a flora quite distinct in its character from Guernsey; the component parts are mostly the same, but they are arranged in a different pattern. Plants which you may search for in vain in Guernsey, or which are of extreme rarity, are, on the contrary, in Herm common flowers which you meet with at every turn; whilst on the other hand, some of the most abundant and generally distributed species appear to be, singularly enough, entirely absent from the smaller island. Now, it must always be borne in mind that it is not the rarities of a district which are alone worthy of regard; these are in many cases of accidental introduction; but what, in my view, is a point of more importance, although far less attended to, is the careful recording of any generally common species which may be wanting in a district, notwithstanding that all the apparently necessary conditions of their existence are present. A careful study of this will help to elucidate many knotty questions, and throw much light on the great Darwinian law of Natural Selection.

The only authentic Flora of Herm of which I have any knowledge, is that contained in Babington's "Primitiæ Floræ Sarnicæ," published in 1839. No new list has been made out during the half century which has elapsed. On my return home I went through that little work and ascertained that Babington has recorded one hundred and seventy-four flowering plants as indigenous to Herm. Forty-nine of these I did not find, but I discovered fifty-seven species which are not in his list, and therefore are new records. Moreover four species were brought to me during the excursion which I did not myself meet with growing, viz.: *Hyoscyamus niger*, by Mr. Randell, and *Viola tricolor*, *Myosotis arvensis* and *Bupleurum aristatum* by Mr. Derrick. The two last named are not recorded by Professor Babington. So that by combining these lists I have the pleasure of now laying before the Society a much more complete Flora of the island of Herm (so far as the flowering

plants are concerned) than has ever yet been made out, for it brings the total number of species up to 234.

The most interesting plants to be found in Herm, or rather those which are of considerable rarity in Britain, are the following :—

<i>Silene nutans</i>	<i>Polycarpon tetraphyllum</i>
<i>Erodium moschatum</i>	<i>Bupleurum aristatum</i>
<i>Trifolium glomeratum</i>	<i>Orobanche amethystea</i>
<i>Lotus angustissimus</i>	<i>Scrophularia scorodonia</i>
„ <i>hispidus</i>	<i>Bartsia viscosa</i>

Juncus acutus.

Of species which are very rare in Guernsey, but which I observed to be more or less common in Herm, may be mentioned the following :—

<i>Thlaspi arvense</i>	<i>Erodium maritimum</i>
<i>Silene nutans</i>	<i>Dipsacus sylvestris</i>
<i>Lychnis vespertina</i>	<i>Echium vulgare</i>

Veronica officinalis.

In Babington's list only one fern is recorded, and therefore I am glad to be able to testify that at this present date six species are growing wild upon the island. I rather wish to emphasize this fact, because two of them are very scantily represented, and in daily peril of being swept away by the insatiable rapacity of senseless fern-grubbers. All these ferns are common in Guernsey.

The following is a list of the phanerogams found by me at Herm, including the four species added by Messrs. Randell and Derrick. Those which are not noted for Herm in Babington's "Primitiæ Floræ Sarnicæ" have a * affixed. In order to render this list as complete as possible I have appended in a separate column all the species recorded by Babington but not seen by me. And lastly, there is the list of Ferns.

SPECIES NOTED BY ME :

<i>Ranunculus ficaria*</i>	<i>Ranunculus bulbosus*</i>
„ <i>flammula*</i>	<i>Papaver dubium*</i>
„ <i>repens</i>	„ <i>rhœas</i>

<i>Glaucium luteum</i>	<i>Cotyledon umbilicus</i>
<i>Fumaria officinalis</i>	<i>Sedum anglicum</i>
<i>Cardamine hirsuta</i> *	" <i>acre</i>
<i>Cochlearia danica</i> *	<i>Eryngium maritimum</i>
<i>Thlaspi arvense</i> *	<i>Helosciadium repens</i> *
<i>Sisymbrium thalianum</i> *	<i>Cenanthe crocata</i> *
<i>Capsella bursapastoris</i>	<i>Crithmum maritimum</i>
<i>Sinapis arvensis</i>	<i>Bupleurum aristatum</i> *
<i>Viola canina</i>	<i>Heracleum sphondylium</i>
" <i>tricolor</i>	<i>Daucus maritimus</i>
<i>Polygala vulgaris</i>	<i>Anthriscus vulgaris</i> *
<i>Silene maritima</i>	<i>Conium maculatum</i>
" <i>nutans</i>	<i>Smyrniolum olusatrum</i> *
<i>Lychnis dioica</i>	<i>Hedera helix</i>
" <i>vespertina</i> *	<i>Sambucus nigra</i>
<i>Sagina procumbens</i>	<i>Lonicera periclymenum</i>
" <i>apetala</i> *	<i>Sherardia arvensis</i> *
" <i>subulata</i> *	<i>Galium verum</i>
<i>Spergula arvensis</i>	" <i>aparine</i>
<i>Stellaria media</i>	<i>Dipsacus sylvestris</i> *
<i>Arenaria marina</i>	<i>Bellis perennis</i>
" <i>serpyllifolia</i> *	<i>Inula conyza</i> *
<i>Cerastium triviale</i>	" <i>dysenterica</i>
" <i>glomeratum</i>	<i>Achillea millefolium</i>
" <i>tetrandrum</i>	<i>Chrysanthemum leucanthemum</i>
<i>Malva sylvestris</i>	<i>Filago germanica</i>
" <i>rotundifolia</i>	<i>Senecio vulgaris</i>
<i>Hypericum humifusum</i>	" <i>jacobœa</i>
<i>Geranium molle</i>	<i>Arctium lappa</i> *
" <i>dissectum</i>	<i>Carlina vulgaris</i>
<i>Erodium cicutarium</i>	<i>Carduus nutans</i> *
" <i>moschatum</i>	" <i>palustris</i>
" <i>maritimum</i>	" <i>lanceolatus</i>
<i>Linum catharticum</i>	" <i>arvensis</i> *
<i>Ulex Europæus</i>	<i>Hypochoeris radicata</i>
<i>Ononis arvensis</i> *	<i>Thrinacia hirta</i>
<i>Medicago maculata</i>	<i>Taraxacum officinale</i>
<i>Trifolium repens</i>	<i>Sonchus oleraceus</i> *
" <i>glomeratum</i> *	" <i>asper</i> *
" <i>procumbens</i> *	<i>Jasione montana</i>
" <i>minus</i> *	<i>Erica cinerea</i>
<i>Lotus corniculatus</i>	<i>Erythrœa centaurium</i>
" <i>major</i> *	<i>Convolvulus arvensis</i>
" <i>angustissimus</i>	" <i>sepium</i> *
" <i>hispidus</i> *	" <i>soldanella</i>
<i>Ornithopus perpusillus</i>	<i>Cuscuta epithymum</i> *
<i>Vicia sativa</i> *	<i>Echium vulgare</i>
<i>Prunus spinosa</i>	<i>Lycopsis arvensis</i>
<i>Rubus, various sp.</i>	<i>Myosotis versicolor</i> *
<i>Potentilla tormentilla</i>	" <i>arvensis</i> *
" <i>reptans</i>	<i>Cynoglossum officinale</i>
<i>Rosa spinosissima</i>	<i>Solanum dulcamara</i> *
<i>Alchemilla arvensis</i> *	<i>Hyoscyamus niger</i>
<i>Poterium sanguisorba</i> *	<i>Orobanche amethystea</i> *
<i>Epilobium tetragonum</i> *	<i>Digitalis purpurea</i>
<i>Polycarpon tetraphyllum</i>	<i>Linaria vulgaris</i>

<i>Scrophularia scorodonia</i>	<i>Ulmus suberosa</i> *
<i>Bartsia viscosa</i> *	<i>Quercus robur</i> *
<i>Euphrasia officinalis</i>	<i>Iris foetidissima</i>
<i>Veronica serpyllifolia</i> *	<i>Scilla nutans</i>
„ <i>chamædryas</i> *	<i>Allium ampeloprasum</i> *
„ <i>agrestis</i> *	<i>Juncus acutus</i>
„ <i>polita</i>	„ <i>effusus</i> *
„ <i>officinalis</i> *	<i>Luzula campestris</i> *
<i>Thymus serpyllum</i>	<i>Lemna minor</i> *
<i>Calamintha officinalis</i>	<i>Carex arenaria</i>
<i>Prunella vulgaris</i>	„ <i>muricata</i> *
<i>Nepeta glechoma</i>	<i>Anthoxanthum odoratum</i> *
<i>Lamium amplexicaule</i> *	<i>Phleum arenarium</i> *
<i>Ballota nigra</i> *	„ <i>pratense</i> *
<i>Teucrium scorodonia</i>	<i>Agrostis alba</i>
<i>Anagallis arvensis</i>	<i>Ammophila arenaria</i>
<i>Primula vulgaris</i>	<i>Phragmites eommunis</i>
<i>Semolus valerandi</i>	<i>Aira caryophyllea</i>
<i>Armeria maritima</i>	<i>Holcus lanatus</i>
<i>Plantago coronopus</i>	<i>Poa annua</i>
„ <i>lanceolata</i>	„ <i>trivialis</i>
„ <i>major</i>	„ <i>pratensis</i>
<i>Chenopodium album</i>	<i>Cynosurus cristatus</i> *
<i>Atriplex patula</i>	<i>Dactylis glomeratus</i>
<i>Beta maritima</i>	<i>Festuca sciuroides</i>
<i>Rumex crispus</i>	„ <i>ovina</i>
„ <i>obtusifolius</i>	„ <i>rubra</i>
„ <i>acetosa</i>	<i>Bromus mollis</i>
„ <i>acetosella</i>	„ <i>sterilis</i>
<i>Euphorbia portlandica</i>	<i>Brachypodium sylvaticum</i>
<i>Mercurialis annua</i>	<i>Lolium perenne</i>
<i>Parietaria officinalis</i>	<i>Triticum repens</i>
<i>Urtica dioica</i>	<i>Hordeum maritimum</i>
„ <i>urens</i>	

ADDITIONAL SPECIES RECORDED BY PROFESSOR BABINGTON.

<i>Cakile maritima</i>	<i>Hieracium pilosella</i>
<i>Sinapis nigra</i>	<i>Solanum nigrum</i>
<i>Raphanus maritimum</i>	<i>Linaria elatine</i>
<i>Reseda luteola</i>	<i>Veronica arvensis</i>
<i>Silene anglica</i>	<i>Mentha aquatica</i>
<i>Mænchia erecta</i>	<i>Melissa nepeta</i>
<i>Arenaria peploides</i>	<i>Lamium purpureum</i>
<i>Hypericum tetrapterum</i>	<i>Stachys arvensis</i>
<i>Medicago lupulina</i>	<i>Salsola Kali</i>
<i>Callitriche verna</i>	<i>Chenopodium olidum</i>
<i>Scleranthus annuus</i>	<i>Atriplex erecta</i>
<i>Hydrocotyle vulgaris</i>	„ <i>rosea</i>
<i>Galium mollugo</i>	„ <i>laciniata</i>
<i>Anthemis nobilis</i>	<i>Rumex pulcher</i>
<i>Chrysanthemum segetum</i>	<i>Polygonum convolvulus</i>
<i>Matricaria chamomilla</i>	„ <i>persicaria</i>
<i>Senecio sylvaticus</i>	„ <i>maritimum</i>
<i>Carduus tenuiflorus</i>	<i>Euphorbia peplis</i>
<i>Crepis virens</i>	„ <i>helioscopia</i>

Euphorbia paralias
Trichonema columnæ
Ruscus aculeatus
Juncus acutiflorus
 „ *lamprocarpus*
 „ *bufonius*

Isolepis Savii
Aira præcox
Triodia decumbens
Sclerochloa loliacea
Triticum junceum

LIST OF THE FERNS OF HERM, OBSERVED BY ME :

Pteris aquilina
Asplenium marinum
 „ *lanceolatum*

Asplenium adiantum nigrum
Athyrium filix-fœmina
Scolosendrium vulgare

HERM.

*Paper read before the Society on June 15th, 1889, by
the Rev. G. E. Lee, M.A., F.S.A.*

The earliest document extant, which illustrates the history of Herm, informs us that Duke Robert of Normandy gave the Islet, together with one half of Guernsey, and the islands of Sark and Alderney, to the great Benedictine Abbey of Mont St. Michel. That Abbey was not long left in undisturbed possession of the island, for Duke Robert's illustrious son, William the Conqueror, made it over to the famous Augustinian Convent of Notre Dame du Voeu, near Cherbourg. In the hands of these new owners Herm remained as long as the Norman monks held any property in the English Islands. Mr. Tupper, in his History of Guernsey, quotes a statement of the Abbé Le Canu, to the effect that Sark and Herm anciently formed one parish. This is quite without foundation. There exists still at Coutances a copy of a famous work of the middle of the 13th century, called the *Livre Noir*. That work contains an account of the parishes in the Diocese of Coutances, with the names of the Churches, their patrons, and the value of their benefices. We learn therefrom that there was a church in the islands dedicated to S. Tugual, a Breton Bishop. Some writers have supposed that S. Tugual's was the Church of Alderney, but this cannot be, for we have more than one document to prove that the Alderney Church, like that of Sark and several others in the Deanery of Guernsey, was dedicated to S. Mary the Virgin.

The question where was S. Tugual's Church is answered by a parchment in the Archives at St. Lô in Normandy. This document, dated 1480, is the deed by which Geoffrey, Bishop of Coutances, on the presentation of the Abbot and Convent of Cherbourg, institutes to the priory or parish church of *S. Tugual of Herm*, a monk of Cherbourg named Jean Guyffart, on the resignation of Brother Richard de la Place, the late Rector there. What I have said is enough to prove that there was in the 13th century, and that there still existed two centuries and more later, a church in Herm bearing the name of S. Tugual. According to the *Livre Noir*, the patron was the Abbot of Cherbourg; the value of the living was the same as that of S. Sampson's Rectory, viz., 30 livres. The Bishop of Avranches owned a portion of the tithe amounting to 6 livres. Is the ancient building now existing in Herm the original parish church of S. Tugual? Of this we cannot be quite certain, though it is not improbable. In the 15th century, and perhaps earlier, there was in the island a settlement of Franciscan or Minorite Friars. When they came there I cannot tell. But in the year 1440 they were made to sign and seal a document, acknowledging that they had no proprietary rights in the island, which they confessed belong to the Abbey of Cherbourg, their own possessions being limited to the buildings which they had erected, and possibly among these was the present Church or Chapel. I am inclined however to ascribe the building to an earlier date. It is a simple construction, vaulted in stone, 29 feet long, by 12 feet 3 inches wide. On the north side is a little chantry, 12 feet 7 inches by 10 feet 6 inches, with a pointed dripstone over the arch on the southern side. The church has been mutilated to some extent and embodied with later buildings, and the windows have suffered so much alteration as to make their original form hard to trace: but the church itself could be easily restored to the purposes for which it was originally designed. Perhaps Jean Guyffart was the last rector of the island: at all events the registers at Coutances contain no record of a later appoint-

ment, and the very existence of a parish has long been forgotten. Apart from its ecclesiastical history the island is not devoid of interest. Its name, if not of Celtic origin, may possibly be connected with the Low-Latin word *herma*—uncultivated land. Mr. Tupper says, “from the same root is evidently derived the French word *ermite*, and the English hermit:” but this derivation is too ridiculous to need refutation, *hermite*, *hermit*, *eremita*, &c., terms being, as everybody knows, derived from the Greek word *eremos*—desert. The Governors of Guernsey long enjoyed the privilege of hunting and shooting in Herm, and the privilege was not formerly so barren as might now be supposed. There were plenty of pheasants, partridges, rabbits, and even larger game, such as deer and roebucks. In one of the Governor’s excursions, a sad accident occurred in 1597, when young Walter St. John, a connexion of Sir Thomas Leighton, and his tutor Mr. Isaac Daubeney, were drowned in bathing on the beach at Herm. Of the geology of the island, its granite quarries and its copper mines,—of the fauna or flora so interesting to the naturalist—I will not venture to speak in presence of so many better informed authorities.

One curious story I may add to what I have now said. Some years ago the late Bailiff, Sir Peter Stafford Carey, being on a visit to Herm, picked up an ancient gold signet ring, which Mr. MacCulloch recognized as the signet of a bailiff who lived in the middle ages. This interesting relic is now in the possession of Sir Edgar MacCulloch.

I will close what I have to say with a few notes upon the sister islet of Jethou. Duke Robert of Normandy had given the island to his Admiral Restald, and Restald, after becoming a monk of Mont St. Michel, bequeathed the island to that wealthy monastery, which by degrees obtained very large possessions in the islands. In these possessions they were confirmed by a brief of Pope Adrian IV. in the year 1155, and in this document the Pope mentions the island of Jethou (or

Ketehou or Keitehuml) *with its church*. I know of no other place where the church is spoken of. In the middle of the 13th century Sir W. de Chaeney, Seigneur of the Fief Le Comte, had the life enjoyment of Jethou, which was to return to the abbey at his death. The Abbot made some profit by the warrens and wreckage on the island, and the accounts of the Vale priory for the year 1314, give those profits at 40 sols. Like Herm, Jethou was preserved as a chase for the use of the Governor of Guernsey.

EXCURSION TO LIHOU.

On the 15th July, 1889, the excursion to Lihou, which had been decided on at the last meeting of the Natural Science Society, took place. Our secretary, who had had all the trouble and responsibility of organising it, was unfortunately unable to take part in it. At 10.30 the members and their friends who intended to join in the excursion assembled in Trinity Square, and at about eleven the start was made. The route was through St. Martin's, where we took up Mr. Guille and some ladies, which brought up the number of the party to twenty. We then drove past the Forest Church, and Les Islets Arsenal to l'Erée, where we left the carriage. Lihou, as is well known, is connected with Guernsey at this point by a causeway partly paved, which uncovers about half tide. It was now 12.30, and the passage being uncovered we lost no time in crossing over to the island. After fortifying ourselves with such refreshments as we had provided, we began the work of exploration. Lihou is about a quarter of a mile long, and of triangular shape, somewhat resembling Guernsey, and like it, terminating in a point to the west. The surface is covered with turf, and is divided into enclosures by stone walls. The rocks consist of gneiss and dark blue veins (some of considerable width) of diorite or diabase. The foliation of the gneiss is rather regular, and the rock divides in nearly vertical planes, but appears in many places to be more than usually resistant to disintegrating influences. These peculiarities have given rise to clusters of aiguilles protruding through the turf, which give the island a picturesque profile. Lihou is permanently

inhabited. The farm house and buildings are substantial, but have been rather neglected of late years. We inspected the ruins of the priory. The pilasters and arches were constructed of Caen Stone (with mouldings), only a very small part of which remains, but the far larger quantity of this material, to be found in the walls of the buildings, in rear of the farm house, shows that the ancient edifice has been utilised as a quarry for the more modern one. An iodine manufactory was up to a very recent date carried on in the building, and though now discontinued the plant is still in working order. An interesting explanation of the process (which does not appear very complicated) was given us by Mr. J. B. Nickolls. Although the island did not prove so rich a field for marine life as had been anticipated, our time was fully occupied till 4.30, when the advancing tide warned us to regain the mainland. Before leaving l'Erée we had a look at the Cromlech, known as the "Creux des fées." We started on our return journey at 5, the route being along the shore by the new road at La Perrelle, then striking inland through King's Mills and Talbot's Valley we crossed the island to St. Martin's, in order to leave Mr. Guille and other friends at their residences, and finally reached town at 7.15. The weather was very favourable throughout. The sky, generally bright, was occasionally overcast, and once a slight shower passed over us. A gentle breeze cooled the atmosphere, and I think every one who was present will admit that we had a thoroughly enjoyable day.

C. G. DE LA MARE.

On Monday, July the 15th, an excursion was organized for members of the Society and their friends, to visit the island of Lihou—the object partially being to study the marine fauna of the locality, which had been spoken of as being prolific in several kinds of animals, not frequently found in other parts of the coast. The *Aphrodita* or sea mouse, the *Aplysia punctata*

or sea hare, and the *Holothuria* or sea cucumber, with *Chitons* of large size, are some of those I expected to find, as also that pretty little Zoophyte *sagartia sphyrodeta*. To my regret we found that part of the Island which we examined singularly deficient in the more interesting of marine life—none of the above-named were found—nor were we rewarded in discovering anything of a new or unexpected nature to make up for our disappointment. One small specimen of the *Eolis* or sea sheep was found, this is somewhat of an interesting animal, and its propensities should be remembered by anyone contemplating the keeping of an aquarium. It devours small anemones, and the *Gemmacea* or pinklet appears to be a “bonne bouche.” Crustacea, echinoderms (excepting the *Ophiocoma Rosula* or brittle star, and *Asterina gibbosa*) were few and far between, as also were the Zoophytes, found abundantly in many parts. Annelids were not common. I did not come across a single specimen of the common rock bait or *Nereis*. On the mainland side of the passage leading to the Island, there were on either side, spaces of water which do not drain, and which we examined for a limited time, and from certain signs I am led to suppose, that if properly worked that locality would produce many more interesting specimens than on the Island of Lihou itself. I must not forget to say that on the Island considerable quantities of *Botryllus* were found, but not in anything like the quantity or variety of colour as can be found in *Herm*. In the pools on this side of the Island, which I have before alluded to, I noticed quantities of what one of the members spoke of as being compound ascidians, but I regret that with my imperfect knowledge, and not having had time to refer to special books on the subject (if any in the Island), I have not been able to identify them. The same remark applies to very pretty specimens of a low order of marine life. In shape the animal is like a transparent vase with longitudinal opaque stripes. I do not know to what order it belongs, and have not been able to recognise it in *Gosse's Marine Zoology*. Nor can I identify

a gasteropod, which was rather common there. It is a yellow slug, but unlike the *Doris*, it has an internal shell, which is white and of a very delicate texture. In this respect it resembles the *Aplysia punctata*, which also has an internal shell, but in other respects the animals are widely dissimilar. I have known it for some years, taken principally at Bordeaux harbour. I believe it to be a *Pleurobranchus*. I took one good specimen of *Fissurella reticulata* or keyhole limpet, also ormers, and very fine *Trochus Ziziphinus*. We found an octopus at home, who refused to be dislodged by being poked with sticks, or being coaxed out in a more gentle manner. I allowed him to fasten his suckers on to my hand, hoping to draw him out, but to this arrangement he declined to accede, and we were forced to leave him in his den, as we had not archimedean powers to remove a little stone of about a ton weight, which protected him against such invaders as ourselves. Probably a fisherman armed with a stout hook would have captured him in a short space of time. It is said that neither the octopus nor the conger is so prevalent round the coast, as it was some years ago. The octopus, pieuvre, or devil fish of Victor Hugo, being the most tempting bait for the big eel. The dearth of marine objects enabled Mr. Marquand to pay attention to the flora, about which I have no doubt he has something to say to you. Although this paper is somewhat of a negative kind, I think I may safely say that we all enjoyed the excursion to Lihou Island. Since writing the above, the animal alluded to as being like a small transparent vase, has been identified by Mr. Marquand as *Clavelina lepadiformis* (Gosse), and that gentleman must also be credited with having found the interesting echinoderm *ophiocomma neglecta*, and with having confirmed me in my opinion that the yellow mollusc, with internal shell is *Pleurobranchus*.

J. B. RANDELL.

Mr. E. D. Marquand reported the occurrence of two very interesting flowering plants on the Island of Lihou. The Seakale (*Crambe maritima*) still grew, though very sparingly on the western side of the island ; it was recorded by Professor Babbington fifty years ago for Lihou, and it was pleasant to know that it still occurred in its old habitat. The Sea Stork's Bill (*Erodium maritimum*), a plant of which no habitat seems to be at present known in Guernsey, abounds on the eastern side of Lihou in places. With a little more time at disposal, a closer examination of the more inconspicuous vegetation would have been profitable.

CRUSTACEA.

Paper read by Mr. Joseph Sinel.

The class *Crustacea*, to which division alone of the sub-kingdom *Arthropoda*, an *Economic* as well as a *Scientific* interest is attached, is remarkably well represented on the shores of these Islands. In the “*stalk-eyed*” or “*superior*” Crustaceans alone we have no less than *ninety* of the approximately one hundred species recorded as found in British waters. Both Jersey and Guernsey can separately boast of at least eighty-five of these. Several forms, among which I may cite “*Acheus*” of which Bell gives “two recorded instances,” I have taken in number in St. Clement’s bay, Jersey. “*Stenorynchus cegyptius*” one of the slender legged spider crabs is recorded for the first time as occurring in British waters, in the “*Zoologist*” for April, 1881, from specimens taken in St. Aubin’s bay, Jersey, where, by the way, it is the most common of the section to which it belongs. (In speaking of “*British Waters*” I must here remind my friends that at the time of the publication of the above records—these included the whole of the English Channel: the lines laid down at one of the recent meetings of the British Association, now place these Islands beyond the boundary).

Then we have the rare “*Alpheus* ;” a Mediterranean form occurring at Guernsey and Herm, and more sparingly at Jersey. The curious “square-faced lobster” of the fishermen, “*Scyllarus arctus*” another Mediterranean form, is not

uncommon in Guernsey. And on one occasion only, I have found the beautiful scarlet-and-white banded prawn "*Lysmata seticaudata*" (whose habitat is supposed to be the Mediterranean alone, and even there to occur rarely) at La Rocque point, Jersey.

In the "inferior" or "*Sessile-eyed*" Crustaceans, the proportion of recorded forms found here, is as great as in the above—only one or two of the Northern forms not being so far represented, while on the other hand some forms (a considerable number, I believe) found here do not appear in the monographs, in fact there is yet much to be done in the identifying and listing of this sub-class.

For a study of the subject of evolution few groups of animals present such an enticing field as does that of the Crustacea; the road whence, and the manner how, the present forms have been reached being clearly mapped in the life-history of each species.

I do not for one moment mean to say, that a clear line of descent, without a break, is observable here more than elsewhere, but that here especially, we catch glimpses of the road at points so little remote that we can more readily infer its direction.

I will roughly point out what I mean, by reference to the relative life-history and family-history (Phylogeny and ontogeny) of one or two familiar forms. I will not enter into the full details of the subject, for this would involve the entering into such abstruse points, as for instance, the merging, in some species of several developmental stages into one,—I should also have to employ those aerial bridges across the unavoidable chasms, which form the ground of objection of the anti-evolutionist. I will therefore just sketch a general outline of the subject as far as it can be illustrated by the specimens before us (in the museum cases), and as far as time will allow.

Let us take as a type of the most highly-developed species—our great edible crab. Just prior to its adoption of its

familiar adult form, it has an elongated body, with a six jointed tail, the last somite bearing fairly well-developed side appendages, this is the stage known to zoologists as the "*Megalope*" and which bears a general resemblance to the adult of a form lower in development than itself, viz., the lobster. Prior to this "megalope" stage it was of another form, known as a *Zooëa*, where it bore analogy to the adult of forms yet lower down in the scale,—*Mysis*, etc. Then, within the egg, it passed through stages analogous to the early free swimming stages of other, and still lower Crustaceans, viz., the "*Nauplius*" form.

Now, taking the lobster, we have the same changes up to the one in which we termed the great crab a "*Megalope*" but which here in the lobster, becomes the *final* form; and so forth through all the class, even forms which to the general observer would not be taken for Crustaceans at all—*e.g.*, the *Ship Barnacle* and that curious bag-like animal, devoid of power of movement, form or comeliness, the *Sacculina*, the early stages of these all bear witness to their common origin.

The *Ship Barnacle* commencing life as do most *Entomostracans*, and one or two of the prawns, (*Penæus* and *Pasiphæa*) viz., as a *Nauplius*, assumes later on the characters of another Crustacean, or rather embodies the form of two in one. It bears a bivalve shell like the *Ostracoda*, but within this, its structure is approximate to that of the *Copepoda* (as shown on diagram) finally it fastens to a piece of floating timber, and assumes its familiar form the "*Barnacle*."

In the *Isopoda*, the order to which belongs the common "*Woodlouse*" of our gardens, the ancestral history is less easy to read, but even here, in the maggot-like larvæ, we can trace the *Nauplius* outline, marred, but still recognizable, and certainly not more remote from the *Nauplian* form, than is the parasitic mite of the human skin (*Demodex follicularum*) removed from the *Acarian* type.

I am not setting this forth as the precise and complete science of the matter, but rather in a sense similar to that in

which we employ "diagrammatic drawings" in illustrations of Biology,—to give a *general idea* of the subject.

Then comes the complicated yet clearly traceable *upward*, *downward*, and again *upward* line of evolution. This is clearly manifested in some of the forms here before us, (in the Museum Cabinet) viz., in *Lithodes* and in *Galathea* and *Porcellana*.

Turning for a moment to this soft bodied and erratic looking form, the hermit crab, with its abdomen twisted to one side, and its two hindermost pairs of walking legs reduced to almost useless appendages. We see a case of *degradation*, a *down line*, in its evolution, and the answer to the "how?" in this, is not far to seek. Glancing upon this tray of smaller Macrurans, in that row representing the fossorial forms, the eye lights upon *Callianassa subterranea*, a form which burrows in the sand at the sea bottom when it can, but when the bottom is too hard, it takes shelter in the burrow already made by more powerful excavators. Here is the commencement of a life not quite self-dependent and the result is that *Callianassa* is not a hard-shelled crustacean. It may be urged "Is it not on account of its being a soft shelled one, that it seeks this shelter?" The answer to this, to be complete, would require an evening to itself, let it for the moment suffice that the causes and effects *act and re-act*. Well then, we now see *Callianassa*, when on the look out for food—the tide covering its lurking place, protruding its anterior half only, from the burrow, this practice brings about that already simply membraneous abdomen and that weak pair of hinder legs. Now let us glance back "along the files of time" as Dr. Andrew Wilson puts it, and imagine at some remote date a tribe of *Callianassæ* deprived by some means of all soft ground for burrowing, and also of ready made burrows. The next best refuge to be found will be empty univalve shells, and here in the course of generations by the action of the incontrovertible laws of adaptation and of heredity, the type we now called "*Hermit*" will be reached. This completes the "down line" I have alluded to. Then during

the ever-changing course of conditions which marks all nature, some sections of these Hermits become bereft of this last refuge. And the only alternatives offered by stern mother nature are: *Modify or Perish*.

Taking up this tail of the great Stone Crab (specimen shown), and observing here that the somites or joints of it are all whorled to one side, and that the swimming feet on its underside are in the direction of a thing that has been used to a *twist*, we see plainly that some of those ancient Hermits chose the first of these alternatives. Self-dependence and facility for motion unencumbered with a "Charity house" now bring an *upward* line in the scale of evolution. This upward line is repeated at more or less of an angle in the case of these two other genera before us, viz., the *Galatheas* and the *Porcelain Crabs*.

I may here say that in the subject of the evolution of this group I am in the very unpleasant position of variance with our Scientists who regard this group as the connecting link between the long-tailed and short-tailed Crustaceans (*Macrura* and *Brachyura*) a position which I formerly held upon the tenure of "Authority" but which investigation has forced me to abandon.

So far from regarding the *Anomoura* as transitional between the two great groups of stalked-eyed Crustaceans, I can only see in it an *off-shoot* of the *Macrura*, in a quite different direction, viz., a change through degradation, still so persistent in the Hermit crab, then again through the relinquishing of the habit of quasi-parasiticism in some of these, an assumption of forms bearing some *resemblance* to the members of the two great groups, but by no means granting them a *transitional* position.

I have explained my position upon this matter at greater length in an illustrated paper which is published in *Life Lore* for August, and to which I will refer those members who may take sufficient interest in the subject.

In opening, I alluded to the *Economic* interest attached to the

Crustacea. The fishery for home sale and export, of the edible kinds is very considerable, considering the limited area of our fisheries, and here I must point out—I will not say *what appears to me*, but boldly say *what is*, a stupid clause in our laws relative to the lobster fishery.

It is enacted by our legislators (whose forte is certainly *not zoology*), that any fisherman taking and selling a lobster of less than nine inches in length will be fined *ten shillings*—in order to protect the species; but at the same time, egg-laden females, with their burden of *thirty to thirty-two thousand (!)* little ones on the point of emergence, are allowed to be taken and sold without a question being raised. This is straining at a gnat and swallowing a camel with a vengeance.

The interesting question of protection by mimicry I cannot do more than glance at on this occasion; but this beautiful law of nature is here, in the Crustaceans very well illustrated; a look at that "*Parthenope horrida*" in the museum case, which lies beside a lump of the sea bottom whence it was dredged, illustrates this well, for it wants some practice to say at a glance which is *crab* and which is *sea-bottom*. A few hours netting in our rock pools will illustrate the matter further. The *Hippolyte* prawns, netted among the *zostera*, will be found a bright grass green; those among the *Fucus* and *Laminaria*, brown. The little species that haunt the corallines will be seen to have purple-brown lines at their sides, with transparent spaces between, resembling exactly the little branchings of coralline.

The surface-swimming "*Mysids*" are clear as bits of glass, and so all through, except where strong *armature* make concealment unnecessary. The distribution of the Crustacea in area and in time form also subjects of great interest, but time forbids even a glance at this. So I will just conclude with a word of recommendation to any of the members of this society who may be seeking a field to work upon, and say, "Take up this field of Crustaceans;" for, especially in the lower forms, I

am quite convinced that the half of the species upon our coasts has not been examined. Works that would be of service to those desirous of studying this subject would be—for the Stalk-eyed, “Bell’s British Stalk-eyed Crustacea;” for the Sessile-eyed, “Spence Bate and Westwood’s Monograph;” and for the Entomostracans, “Baird’s” (Ray. Soc.); while for the Embryology, etc., “Claus’ Zoology” and “Fritz Müller’s Facts and Arguments for Darwin,” which last treats of this matter only, would be invaluable.

A LIST OF THE NOCTURNAL MACRO-LEPIDOPTERA
INHABITING THE ISLANDS OF GUERNSEY,
ALDERNEY, SARK AND HERM, WITH NOTICES
OF THEIR OCCURRENCE.

By Mr. W. A. Luff.

In the year 1873, I contributed a list of the Macro-Lepidoptera of Guernsey and Sark, to the "Entomologist," and then had the valuable assistance of the late Mr. Edward Newman, and the late Mr. Henry Doubleday, in the determination of some of the more difficult species; since that time I have made many additions to the list, and have brought the number up to 248, (or including the Butterflies, which have already formed the subject of a separate paper) 277 species.

If the Micro-Lepidoptera were added, these figures would be very likely doubled.

This result in one small section of the class Insecta is a sufficient answer to the statement made in one of our former popular "Guernsey Guide Books," that "The Entomology of Guernsey presents little to tempt the forceps or the net of the English collectors."

Amongst the moths enumerated, are some very rare and local species. Three at least have never been known to occur in Great Britain or Ireland, whilst others are rarely seen indeed.

The three species referred to are:—*Agrotis Crassa*, *Polyphænis Sericina*, and *Eubolia Peribolata*.

The principal moths of great rarity, or local occurrence in Britain are, *Deilephila Euphorbice*, *Sphinx Convolvuli*, *Chærocampa Celerio*, *Deiopeia Pulchella*, *Callimorpha Hera*, *Leu-*

cania Albipuncta, L. L. Album, Aporophyla Australis, Agrotis Lunigera, Heliothis Peltigera, H. Armigera, and Catocala Fraxini. There are many others which are reckoned very good species.

I have been careful to note the island in which each species has been taken, by its initial letter, as some insects occur commonly in one island, and are entirely wanting in others.

For some of the notices I am indebted to Mrs. Boley, who has devoted much time and skill to the rearing of our local species. The Rev. F. E. Lowe has also kindly given me a list of those recently captured by himself in Guernsey.

Other species, no doubt, remain to be discovered, and will reward the diligent collector: and I hope that this paper, by showing what can be done in so small an area, will induce others to collect these beautiful objects, and communicate the result to this Society.

SPHINGES.

1. *Acherontia Atropos* (Death's Head Moth), G., A., and S. Common, in some seasons, rare in others. The larvæ were particularly abundant on the potato plants in 1868.

2. *Sphinx Convolvuli* (*Convolvulus Hawk Moth*), G., A., and S. Very common in some seasons, in others scarcely one to be seen. In 1868 and 1875 they were particularly abundant. A larva of this species taken in Alderney was forwarded by me to the late E. Newman who described it in the *Entomologist* for November 1874, page 272.

3. *Sphinx Ligustri* (*Privet Hawk Moth*), G. and S. Not common.

4. *Deilephila Euphorbiæ* (*Spurge Hawk*), G. and A. The splendid larvæ of this species were formerly to be found in plenty on the sea spurge growing near l'Ancrese Bay; but greedy collectors have long since exterminated them. "One solitary wing found on a common in Alderney, July 9th, 1860." Rev. F. A. Walker, in the *Entomologist*, Vol.

VII, page 151. Two undoubted Guernsey specimens are in the museum of the Guille-Allès Library.

5. *Chærocampa Celerio* (Silver striped Hawk), G. Mrs. Boley bred two specimens from larvæ found on the vine. These are now in the museum of the Guille-Allès Library.

6. *Chærocampa Porcellus*, A. Taken July 9th, 1860, by Rev. F. H. Walker, F.L.S., in Alderney, see "Entomologist" Vol. XXI, page 151.

7. *Smerinthus Ocellatus* (The eyed Hawk), G. Not common.

8. *S. Populi* (The Poplar Hawk), G. Common.

9. *Macroglossa Stellatarum* (Humming bird Hawk), G., A. and S. Common.

10. *Sesia Tipuliformis* (Currant Clear-wing), G. and S. Common in gardens.

11. *S. Ichneumoniformis* (Six Belted Clear-wing), G. Took one specimen at the top of the cliff near Doyle's Monument, on July 6th, 1874. Having noticed that it was somewhat different to the usual type as figured in Newman's British Moths, I sent it to the late Mr. H. Doubleday, with an enquiry as to whether it had been correctly named. The following was the reply:—"I do not possess a *Sesia* exactly like the one you sent. It is closely allied to *Ichneumoniformis*, but the yellow bands on the abdomen are fewer, and the caudal tuft is not exactly the same. I never saw the *Megillæformis* of Hübner; but Dr. Staudinger gives it as a variety of *Ichneumoniformis*, and says there are only three yellow bands on the abdomen."

12. *Sesia Musciformis* (Thrift Clear-wing), G. One specimen on the cliff, June 8th, 1873.

13. *Ino Statices*, G. Very local, occurring in patches a few yards square, on the southern cliffs, abundant where found.

14. *Zygæna Trifolii*, G., S. and Herm. Very abundant. The imagos usually make their appearance towards the end of June, but on visiting Herm, on July 30th, 1874, I was surprised

to find a great number of cocoons from which the moths had not emerged. The moths kept coming out for a fortnight afterwards. On August 11th, one emerged still bearing the head of the larvæ, this being a very rare form of monstrosity.

15. *Z. Filipendulæ*, S. Not common.

BOMBYCES.

16. *Nola Cucullatella*, G. Not common.

17. *Nola Confusalis* (Least Black Arches), G. One.

18. *Nudaria Mundana* (The muslin), G. The late Miss Renouf found the larvæ feeding on lichens growing on stone walls near Bordeaux Harbour.

19. *Calligenia Miniata* (Red Arches), G. and S. I have beaten it from hedges, and taken it commonly at sugar towards the end of July.

20. *Lithosia Griseola* (Dingy footman), G. One, June 26th, 1871.

21. *L. Lurideola* (Common footman), G. and S. Common.

22. *Gnophria Quadra* (Four-spotted footman), G. I have seen two larvæ taken from under some old lichen covered apple trees at Moulin Huet Bay, The lady who found them succeeded in breeding one moth.

23. *G. Rubricollis*, (Red necked footman), G. and S. The larvæ are abundant in some seasons in some four or five localities. They are found full-grown at the end of October, in every instance feeding on the lichens and mosses growing on elm trees, and on the walls near these trees. Hundreds of the perfect insects were resting on the trees, walls, etc., on June 10th, and fresh specimens were to be found on July 5th, 1874.

24. *Deiopeia Pulchella* (The crimson speckled), G. Two specimens of this great rarity have been taken at the Forest, by Mr. F. Heaume, one of which is now in the collection of Mr. E. D. Marquand. The Rev. F. E. Lowe records the capture of two specimens in the Entomologist.

25. *Euchelia Jacobæ* (The Cinnabar), G., A., S. and H. **Extremely abundant.**

26. *Callimorpha Hera* (Jersey Tiger), G. and S. This splendid moth is very abundant, especially in Sark. I have always found them more plentiful near the coast, where they are fond of settling on the sides of the cliffs, and concealing themselves under projecting pieces of rock. They fly in the morning in the sunshine, and also at dusk. They have often flown to the light of my lantern, but I have only taken them twice at sugar.

The Yellow variety (*Lutescens*) is much commoner in Sark than in Guernsey. I have never observed *Hera* on the wing before the middle of July. They are in full force during the first week or two in August, and continue to the end of the month.

The eggs are hatched in about 12 days after they are laid. I have reared them from the egg, feeding them on lettuce and groundsel. I once took several full-grown larvæ on (*Lamium album*) dead nettle; and on another occasion I found one feeding on white thorn at night. In 1875 I bred a splendid variety in which the yellow stripes on the upper wings were nearly obliterated; I sent it to the late Edward Newman, who figured and described it in the *Entomologist* for February, 1876. Another specimen in my collection from the same batch of larvæ, has the same variations, but not to so great an extent.

27. *Nemeophila Russula* (The Clouded Buff), G. Common amongst the furze and fern on the cliffs in June.

28. *Arctia Caja* (Great Tiger), G. and A. Not common.

29. *A. Villica* (Cream spot Tiger), G., A. and S. Common.

30. *Spilosoma Fuliginosa* (Ruby Tiger), G. and A. Common.

31. *S. Lubricipeda* (Buff Ermine), G., A. and S. Abundant.

32. *S. Menthastri* (White Ermine), G. and A. Common.

33. *Hepialus Humuli* (The Ghost swift), G. Taken by the Rev. F. E. Lowe.

34. *H. Sylvanus* (Wood Swift), G. Not uncommon.

35. *H. Lupulinus* (Common Swift), G. Abundant.
36. *Cossus Ligniperda* (Goat Moth), G. Very common.
37. *Porthesia Chrysorrhœa* (The Brown Tail), G. Not common.
38. *P. Similis* (Yellow Tail), G., A. and S. Very common.
39. *Dasychira Fascelina* (The Dark Tussock), G. I have found the larvæ feeding on furze flowers on the cliffs.
40. *D. Pudibunda* (Pale Tussock), G. Common.
41. *Bombyx Neustria* (The Lackey), H. I have never seen this insect in Guernsey, but on visiting Herm on Saturday June 15th, of this year (1889), I found five of the full grown larvæ feeding on the leaves of blackberry. It must be very common there, as I saw many cast skins, and old webs of the larvæ on the bushes in different parts of the island.
42. *Bombyx Quercus* (Oak egger), G. and S. Common.
43. *Bombyx Trifolii* (Grass egger), G., A. and S. The larvæ are found commonly in Guernsey and Sark all round the coast, feeding on various grasses and clover, and they are also often found eating the flowers of the furze. I received more than a hundred full-grown larvæ from Alderney, in August, 1871, and on June 30th, 1873, found more than fifty in two hours, near Fort Touraille in that island.
44. *Odonestis Potatoria* (The Drinker), G. Not common.
45. *Lasiocampa Quercifolia* (The Lappet), G. Not common.
46. *Saturnia Pavonia* (The Emperor moth), G. and S. Commoner in Sark than in Guernsey. All the larvæ I have found were feeding on bramble.
47. *Cilix Glaucata* (The Chinese character), G. and S. Common.
48. *Dicranura Vinula* (Puss Moth), G. Mrs. Boley once found the larvæ on willow.
49. *Notodonta Ziczac* (The Pebble Prominent), G. Rare. I have taken one specimen only. It has also been taken by the Rev. F. E. Lowe.

50. *Phalera Bucephala* (The buff tip), G. and S. The larvæ sometimes abundant on lime and elm trees.

NOCTUÆ.

51. *Thyatira Derasa* (The buffarches), G. Not uncommon.

52. *T. Batis* (Pearl Blossom), G. Rare. I have taken one specimen.

53. *Bryophila Muralis* (The marbled green), G. and S. Very common on old lichen covered walls, in July and August.

54. *Bryophila Perla* (The marbled beauty), G. and S. Abundant July to September.

55. *Acronycta Tridens*, G. Taken by the Rev. F. E. Lowe.

56. *Acronycta Psi* (The Gray Dagger), G. Common.

57. *A. Megacephala* (The poplar grey), G. Larvæ common on poplar in August.

58. *A. Rumicis* (The knot grass), G. and S. Common.

59. *Leucania Lithargyria* (the clay), G. and S. Abundant.

60. *L. Albipuncta* (The white point), G. One specimen taken in 1871, on ragwort.

61. *L. Putrescens* (The Devonshire wainscot), G. I have taken several specimens at sugar near the coast.

62. *L. Straminea* (The southern wainscot), G. Two specimens taken July 10th, 1871, at the Grande Mare, Vazon.

63. *L. Impura* (The smoky wainscot), G. Common.

64. *L. Pallens* (The common wainscot), G. Common in June and July, resting on stems of grass.

65. *L. L. Album*, G. I took one specimen of this great rarity near Fermain Bay, at sugar, on Sept. 6th, 1871.

66. *Nonagria Geminipuncta* (Twin spotted wainscot), G. One specimen taken flying to the light of my lantern, Grande Mare, Vazon, Sept. 1st, 1875.

67. *Calamia Lutosa* (The large wainscot), G. First noticed a specimen crawling up a reed stem, at the Grande

Mare, Vazon, whilst searching for plants, Oct. 15th, 1874, it had just emerged from the chrysalis, as its wings were yet limp. About a week later I searched the reeds at night with a lantern, and secured 8 specimens; most of them were rather worn.

68. *Gortyna Ochracea* (The frosted orange), G. The larvæ are to be found in the stems of the marsh thistle.

69. *Hydræcia Micacea* (The rosy rustic), G. One specimen, bred by Mrs. Boley.

70. *Axylia putris* (The flame), G. and S. Not uncommon.

71. *Xylophasia lithoxylea* (The light arches), G. and S. Commoner in Sark than in Guernsey.

72. *X. Monoglypha* (The Dark arches), G. and S. So abundant as to be quite a nuisance at sugar.

73. *Aporophyla Australis* (The feathered brindle), G. The larvæ common on the sandhills, near l'Ancrese, in the spring.

74. *Heliophobus Hispidus* (The beautiful gothic), G. Several specimens taken at sugar in September.

75. *Cerigo Matura* (The straw underwing), G. Not very abundant.

76. *Luperina Testacea* (The flounced rustic), G. Not uncommon.

77. *Mamestra Brassicæ* (The cabbage moth), G. and S. Abundant.

78. *M. Persicariæ* (The dot), G. Not very common.

79. *Apamea Basilinea* (The rustic shoulder knot), G. Not uncommon.

80. *A. Gemina* (The dusky brocade), G. I have taken several.

81. *A. Didmya* (The common rustic), G. and S. This is by far the commonest moth met with at sugar in Guernsey. It is very variable in the markings on the wings.

82. *Miana Strigilis* (The marbled minor), G. and S. Almost as abundant as the preceding at sugar.

83. *M. Fasciuncula* (The middle barred minor), G. Not uncommon.

84. *M. Bicoloria* (The cloaked minor), G. I have taken three or four specimens.

85. *Caradrina Morpheus* (The mottled rustic), G. I have taken one specimen; it has also been taken by Rev. F. E. Lowe.

86. *C. Quadripunctata* (The pale mottled willow), G. Not rare.

87. *Agrotis Valligera* (The Archers dart), G. Has been taken by Rev. F. E. Lowe.

88. *Agrotis Puta* (The shuttle shaped dart), G. and S. Very abundant near the coast.

89. *A. Suffusa* (The Dark Sword grass), G. and S. Very common.

90. *A. Saucia* (The pearly underwing), G. and S. This fine species is abundant in some seasons, coming to sugar near the coast. In other years scarcely one is to be seen. Time of appearance, September and October.

91. *A. Segetum* (The Turnip Moth), G. and S. This injurious insect is very abundant.

92. *A. Crassa*, G. Two specimens taken in Guernsey by me in 1874, were named by the late Mr. H. Doubleday. It has not yet been found in Great Britain or Ireland.

93. *A. Lunigera* (The crescent dart), S. Several taken in August, 1874, at sugar, in Sark, by Rev. G. H. Engleheart.

94. *A. Exclamationis* (The Heart and dart), G. Not uncommon.

95. *A. Corticea* (The Heart and club), G. and S.

96. *A. Nigricans* (The garden dart), G. Common.

97. *A. Strigula* (The true lover's knot), G. I have taken two specimens only.

98. *Noctua Glareosa* (The autumnal rustic), G. Common at ivy blossom.

99. *Noctua Augur* (The double dart), G. One specimen taken by Mrs. Boley.

100. *Noctua Plecta* (The flame shoulder), G. and S. Common.

101. *N. C-nigrum* (The setaceous hebrew character), G. Common in the autumn at sugar.

102. *N. Festiva* (The ingrailed clay), G. Common.

103. *N. Conflua* (The lesser ingrailed), G. One specimen taken in Guernsey by Mr. Dawson, was sent to the late E. Newman for identification, and returned as above.

104. *N. Rubi* (The small square spot), G. Not common.

105. *N. Xanthographa* (The square spotted rustic), G. and S. Excessively abundant.

106. *Tryphæna Ianthina* (The lesser broad border), G. Very common. The larvæ sometimes abundant on geraniums in gardens.

107. *T. Interjecta* (The least yellow underwing), G. Rare.

108. *T. Orbona* (The lesser yellow underwing), G. and S. Very common.

109. *T. Pronuba* (The large yellow underwing), G. and S. Abundant.

110. *Amphipyra Pyramidea* (The copper underwing), G. Two specimens taken at sugar, August, 1872.

111. *A. Tragopogonis* (The mouse), G. Not uncommon.

112. *Mania Typica* (The gothic), G. Taken by the Rev. F. E. Lowe.

113. *M. Maura* (The old lady), G. and S. Occasionally common.

114. *Pachnobia Rubricosa* (The red chestnut), G. One at willow blossom.

115. *Tæniocampa Gothica* (The Hebrew character), G. Common at willow blossom in April. I have found the larvæ feeding on privet.

116. *Tæniocampa Incerta* (The clouded drab), G. Common at willow blossom.

117. *T. Stabilis* (The common quaker). Common.
118. *T. Pulverulenta* (The smaller quaker), G. Not very common.
119. *Orthosia Lota* (The red line quaker), G. Not uncommon on ivy bloom in autumn.
120. *O. Macilenta* (The yellow line quaker), G. Taken by Rev. F. E. Lowe.
121. *Anchocelis Pistacina* (The beaded chestnut), G. Common at ivy bloom in the autumn.
122. *A. Lunosa* (The lunar underwing), G. Abundant at ivy bloom.
123. *Cerastis Vaccinii* (The chestnut), G. Taken by the Rev. F. E. Lowe.
124. *Scopelosoma Satellitia* (The satellite), G. I have taken several at ivy bloom.
125. *Xanthia Flavago* (The pink barred sawfly), S. One specimen taken in Sark, September, 1874, by the Rev. G. H. Engleheart.
126. *X. Circellaris* (The brick), G. Common in September.
127. *Calyminia Trapezina* (The Dunbar), G. Not common.
128. *C. Affinis* (The lesser spotted pinion), G. I have taken two specimens, it is also recorded by the Rev. F. E. Lowe.
129. *Dianthæcia Carpophaga* (The Tawny shears), G. I have taken several specimens.
130. *D. Capsincola* (The Lychnis), G. The larvæ often abundant in the seed pods of *Lychnis dioica*. I have also found one feeding in the seed head of a garden pink.
131. *Dianthæcia Nana* (The marbled coronet), G. and S. Taken by the late Miss Renouf in Guernsey ; and the late Mr. Henry Doubleday informed me that he captured specimens in Sark nearly forty years ago.

132. *Hecatera Serena* (The broad barred white), G. I have taken it several times resting on walls.

133. *Polio Flavicineta* (The large ranunculus), G. Common at ivy bloom, and flying to lighted windows.

134. *Dasypolia Templi* (The brindled Ochre), G. I have seen only one specimen taken in a conservatory, November 20th, 1873.

135. *Epunda Lichenea* (The feathered ranunculus), G. The larvæ are common in fields near Petit Bo Bay, and I have no doubt in other places near the coast.

136. *Aporophyla Nigra* (The black rustic), G. Common at ivy bloom.

137. *Miselia Oxyacanthæ* (The green brindled crescent), G. Not uncommon, also at ivy bloom.

138. *Agriopis Aprilina* (The Marveldu jour), G. Mrs. Boley has taken a specimen.

139. *Euplexia Lucipara* (The small angle shades), G. and A. Common ; the larvæ feed upon the common fern, *Pteris aquilina*.

140. *Phlogophora Meticulosa* (The angle shades), G. and A. Extremely abundant. There are two broods in a year.

141. *Polyphænis Séricina*, G. This beautiful species was first recorded from Guernsey, in the *Entomologist* for May, 1873. I captured a specimen at sugar in July, 1872, and have taken several since. I sent a specimen to the late Mr. Edward Newman, who figured it in the "*Entomologist*" for April, 1876, and wrote about it as follows:—

"This beautiful moth being now added to the list of the Lepidoptera of the British Isles, on account of its occurrence in Guernsey, I think it will be well to copy the description from Guenée," (here follows a long description of the insect). "This fine insect occurs in Central and Western France, Italy, Dalmatia and the Channel Islands, but is nowhere abundant. Owing to the peculiar habit of the caterpillar, feeding as it does on the lower leaves of the honeysuckle, and only

in the night, it is very likely to escape observation; indeed, in the larva state it would be almost impossible to find. I am indebted to Mr. W. A. Luff who is now studying the Entomology of the Channel Islands, for this beautiful species."

142. *Trigonophora Flammea* (The flame brocade), G. and S. Bred a specimen Sept. 27th, 1873. The Rev. G. H. Engleheart took several specimens in Sark in the autumn of 1874.

143. *Aplecta Nebulosa* (The gray arches), G. One specimen.

144. *Hadena Dentina* (The shears), G. Not uncommon.

145. *H. Trifolii* (The nutmeg), G. Common.

146. *H. Oleracea* (The bright brown eye), G. and S. Very abundant.

147. *H. Pisi* (The broom moth), G. and S. Not very common.

148. *Xylocampa Areola* (The early gray), G. At sallow broom in early spring.

149. *Xylina Semi-brunnea* (The tawny pinion), G. One specimen taken at ivy bloom, October 14th, 1873.

150. *Cucullia Verbasci* (The mullein), G. The larvæ abundant in some seasons, June and July.

151. *C. Asteris* (The star wort), G. Several specimens bred by Mrs. Boley.

152. *C. Umbratica* (The shark), G. and A. Common usually found on fences.

153. *Plusia Chrysitis* (The burnished brass), G. and S. Common.

154. *P. Gamma* (The silvery), G., S., A. and H. Extremely abundant everywhere.

155. *Heliothis Peltigera* (The bordered straw), G. Th late Miss Renouf frequently bred this insect; the larvæ were found feeding on marigold in her garden in Burnt Lane.

156. *H. Armiger* (The scarce boarded straw), S. One specimen taken in Sark by Rev. G. H. Engleheart, September, 1874.

157. *Catocala Fraxini* (The Clifden Nonpareil), G. A fine specimen of this handsome moth, was taken by Mrs. Boley several years ago, in her garden at St. Martin's. It is now in the Museum, Guille-Allès Library.

158. *C. Nupta* (The red underwing), G. Not common.

GEOMETRÆ.

159. *Uropteryx Sambucaria* (The swallow tail), G. Very common.

160. *Epione Apiciaria* (The bordered beauty), G. Took two specimens July 6th, 1872.

161. *Rumia Luteolata* (The brimstone moth), G., A. and S. Extremely abundant.

162. *Venilia Macularia* (The speckled yellow), G. One specimen taken by Mrs. Boley.

163. *Angerona Prunaria* (The orange moth), G. Not uncommon in June.

164. *Metrocampa Margaritaria* (The light emerald), G. I have taken several specimens.

165. *Selenia Bilunaria* (The early thorn), G. Both broods common in gardens.

166. *Odontoptera Bidentata* (The scalloped hazel), G. Not common.

167. *Crocallis Elinguaria* (The scalloped oak), G. and S. Common.

168. *Ennomos Quercinaria* (The August thorn), G. Not common.

169. *E. Aluiaria* (The canary shouldered thorn), G. I have bred one specimen.

170. *Himera Pennaria* (The feathered thorn), G. Not common, have taken two specimens, and have seen another taken by Dr. Wakefield in 1873. It has also been taken by the Rev. F. E. Lowe.

171. *Amphidasys Betularia* (The peppered moth), G. Not very common.

172. *Hemerophila Abruptaria* (The waved umber), G. Two specimens taken at light by Mrs. Boley.

173. *Cleora Lichenaria* (The Brussels lace), G. I have seen one specimen bred by Mrs. Boley, from a larva taken in Guernsey.

174. *Borania Repandata* (The mottled beauty), G. Common.

175. *B. Gemmaria* (The willow beauty), G. Not so common as the preceding species.

176. *Tephrosia Crepuscularia* (The small engrailed), G. Not common.

177. *Gnophos Obscurata* (The annulet), S. One specimen taken in Sark, August 8th, 1872, another also in Sark, August 7th, 1889.

178. *Geometra Papilionaria* (The large emerald), G. I have taken one specimen.

179. *Nemoria Viridata* (The small grass emerald), G. I have beaten it commonly out of furze bushes on the cliffs.

180. *Iodis Lactearia* (The little emerald), G. Not common.

181. *Hemithea Strigata* (The common emerald), G. S. Very abundant.

182. *Ephyra Punctaria* (The maiden's blush), G. One specimen, September, 1877.

183. *Acidalia Dimidiata* (The single dotted wave), G. Not uncommon.

184. *A. Bisetata* (The small fan footed wave). G. I have taken several near the coast.

185. *A. Trigeminata* (The treble brown spot), G. Common.

186. *A. Rusticata* (The least carpet), G. S. Common in July and August. They are very partial to the flowers of the ragwort near the coast.

187. *E. Virgularia* (The small dusty wave), G. S. Not common. Took two specimens in Sark, July 10th, 1872.

188. *A. Marginepunctata* (The mullein Wave), G. I have taken a good number of specimens. It is fond of settling on rocks or walls, covered with a gray lichen, where it is with difficulty detected.

189. *A. Subsericeata* (The satin Wave), S., A. I took one at Sark, June, 1870, several at Alderney, June 25th, 1873.

190. *A. Imitaria* (The small blood vein), G. Common during July and August.

191. *A. Aversata* (The riband wave), G. Both varieties are common.

192. *Timandra Amataria* (The blood vein), G. Rare.

193. *Cabera Pusara* (The common white wave), G. Common.

194. *C. Exanthemata* (The common wave), G. Has been taken by the Rev. F. E. Lowe.

195. *Macaria Notata* (The peacock), G. Took one specimen, near Fermain Bay, July, 1873.

196. *Strenia Clathrata* (The latticed heath), G. One specimen taken by Mrs. Boley, at light.

197. *Selidosema Ericetaria* (The bordered gray), G. This handsome species is common on our southern cliff coast.

198. *Aspilates Ochrearia* (The yellow belle), G., S., and A. Both broods common on the cliff coast. I have found the larvæ feeding on spurge.

199. *Abraxas grossulariata* (The currant moth), G., S., A. Extremely abundant in July. I have two splendid varieties, bred in Guernsey many years ago.

200. *Lomaspilis Marginata* (The clouded border), G., S. Common, very variable, scarcely two marked alike.

201. *Hybernia Leucophearia* (The spring usher), G. Not common.

202. *H. Marginaria* (The dotted border), G. Took one at sallow bloom, March 20th, 1874.

203. *H. Defoliaria* (The mottled umber), G. Taken by the Rev. F. E. Lowe.

204. *Anisopteryx Æscularia* (The March moth), G. Not uncommon.

205. *Cheimatobia Brumata* (The winter moth), G. Not common.

206. *Larentia Olivata* (The beech green carpet), G. One specimen taken July 9th, 1870.

207. *L. Viridaria* (The green carpet), G. Common.

208. *Emmelesia Albulata* (The grass rivulet), G. Taken by the Rev. F. E. Lowe.

209. *E. Decolorata* (The sandy carpet), G., A. Not very common.

210. *E. Adæquata* (The pretty pinion), G. Recorded by the Rev. F. E. Lowe.

211. *Eupithecia Linariata* (The toad flax pug), G., S. The larvæ are to be found in the flowers of the common yellow toad flax (*Linaria Vulgaris*) in August and September.

212. *E. Oblongata* (The lime speck), G., S. Common. The larvæ on ragwort flowers.

213. *E. Scabiosata* (The shaded pug), G. Not common.

214. *E. Nanata* (The narrow winged pug), G. Common.

215. *E. Subnotata* (The plain pug), G., S. Not common.

216. *E. Vulgata* (The common pug), G., S. Common.

217. *E. Pulchellata* (Foxglove pug), G. Bred from larvæ feeding in the foxglove flowers.

218. *E. Absynthiata* (The wormwood pug), G., S., The larvæ abundant on the flowers of ragwort in the Autumn.

219. *E. Exiguata* (The mottled pug), G., S. Not uncommon.

220. *E. Rectangulata* (The green pug), G. Fairly common.

221. *Lobophora Viretata* (The yellow barred brindle), G. Taken by Mr. Dawson, June 1872. Has been taken since by the Rev. F. E. Lowe.

222. *Thera Obeliscata* (The shaded broad bar), G. Taken by the Rev. F. E. Lowe.

223. *Hypsipetes Sordidata* (July highflyer), G.

224. *Melanthia Ocellata* (The purple bar), G., A. Common. I have taken it in June and August.

225. *M. Rubiginata* (The blue bordered carpet), G. Not uncommon.

226. *Melanippe Hastata* (The argent and sable), G. I have seen one specimen taken by Mrs. Boley.

227. *M. Rivata* (The wood carpet), G. Took two near Fermain Bay, July 1874.

228. *M. Sociata* (The common carpet), G. Not very common.

229. *M. Galiata* (The galium carpet), G. Common in June and August.

230. *M. Fluctuata* (The garden carpet), G. Common in gardens.

231. *Anticlea Rubidata* (The flame), G. Common near the coast.

232. *A. Badiata* (The shoulder stripe), G. Not uncommon.

233. *Coremia Designata* (The flame carpet), G. Taken by the Rev. F. E. Lowe.

234. *C. Ferrugata* (The red twin spot carpet), G. Common.

235. *Camptogramma Bilineata* (The yellow shell), G., A., S., H. The commonest geometer in all the Islands. The variety with a dark bar across the fore wings is also common.

236. *Triphosa Dubitata* (The tissue), G. I have only seen two specimens.

237. *Scotosia Rhamnata* (The dark umber), G. Taken by Mrs. Boley in her garden.

238. *Cidaria Truncata* (The common marbled carpet), G. Common in May and August.

239. *C. Immanata* (The marbled carpet), G. Not common.

240. *C. Prunata* (The phoenix), G. Very common in gardens. The larvæ feed on the leaves of currant and goose-berry bushes.

241. *C. Testata* (The chevron), G. Not uncommon.

242. *C. Fulvata* (The barred yellow), G. Not common.

243. *C. Dotata* (The barred straw), G., S. Common in Guernsey and Sark in June and July.

244. *Pelurga Comitata* (The dark spinach), A. One specimen taken in Alderney, June 24th, 1873.

245. *Eubolia Limitata* (The small mallow), G., S. Common.

246. *Eubolia Peribolata*, G.

This pretty geometer is unknown in England. It flies among furze bushes in the day time, and is common in some seasons all around our coast. It appears in the perfect state in September and the eggs are laid on the furze, the larvæ feeding on that plant. The larvæ being undescribed I sent several to the late Mr. Edward Newman, F.L.S., who described them as follows in "The Entomologist," vol. viii., page 107:—"The eggs were laid in a chip-box on the 18th September, 1874, and the larvæ left the egg-shells during the first week in October; they fed in *Ulex Europæus* (the common furze) almost exclusively on the blossoms, and after hybernation continued to feed until the end of April, when they had attained their full size; two or three have already spun up between the folds of some muslin in the breeding cage; two of the larvæ are now before me, full fed, yet exhibiting no change of colour or any disposition to spin. The larva rests in a perfectly straight position, but on being touched raises the anterior extremity, arching its back a little; its legs are then directed forwards, and closely appressed together, forming an almost continuous mass with the head. In crawling, it makes a very decided arch, bending the body nearly double. Head prone, slightly

narrower than the second segment, into which it is partially received, it is sparingly beset with short straight hairs. Body robust, more resembling that of a *Leucania*, than that of a *Geometer*, a resemblance which is rather increased by its pale colour and longitudinal striping; every part of the body, but especially the anal extremity, bears short, straight, scattered hairs; a raised lateral skin fold extends the whole length of the body, and the segmental and sectional divisions are clearly defined.

Head and body putty coloured; head with a few darker markings on each cheek, and five black ocelli on each side near the mouth; the dorsal surface of the body has three compound stripes extending its entire length; the medio-dorsal is divided longitudinally into three divisions; the middle one of which is composed of a series of wood brown markings, and these again are resolveable into mere dots; the lateral divisions are pale brown, bordered with a series of darker dots; the side stripes partake of the same triple character, and include the spiracles, which are circular and as black as jet; the ventral surface has a triple median stripe, the middle division of which is single, the external divisions double.

I am indebted to Mr. W. A. Luff, of Guernsey, for a supply of these previously unknown larvæ. They were forwarded purposely that I might describe them in the "Entomologist;" and I am much gratified to make this public acknowledgment of Mr. Luff's kindness."

247. *Anaitis Plagiata* (The treble bar), G. Common.

248. *Tanagra Atrata* (The chimney sweep), G. Taken in Guernsey by Mrs. Boley.

SUMMARY OF METEOROLOGICAL OBSERVATIONS FOR THE YEAR 1889.

Station above sea level, 250 feet; Barometer, 265; Thermometer (verified at Kew), 254 feet; Rain Gauge (1 foot off the ground), 255 feet.

1889.	BAROMETER				MEANS calculated from Two Daily Obs.		SELF-REGISTERING THERMOMETER							RAIN				
	Maximum		Minimum		Dew Point	Relative Humidity (Saturation = 100)	Absolute Maximum	Day of Month	Mean of Maxima	Absolute Minimum	Day	Mean of Minima	Mean Daily Range	Total Fall (in inches)	No. of days on which 0.01 in. or more fell			
	Absolute	corrected	Day of Month	Absolute												Minimum	Day	corrected	Day	Monthly Range	Temperature of the Air. Two daily Observations and Max. and Min. Temp.
January ..	30.206	30.688	3	29.251	12	1.437	42.6	39.4	87	51.5	31	45.7	28.8	6	39.0	6.7	1.30	12
February ..	30.029	30.580	18	29.104	10	1.476	41.5	37.0	82	51.4	1	45.1	31.8	10	37.2	7.9	3.43	25
March	30.044	30.614	15	29.072	20	1.542	42.2	38.7	85	53.8	30	46.0	31.9	16	37.1	9.0	2.01	16
April	29.773	30.321	19	29.220	8	1.101	45.9	43.0	88	56.1	19	50.0	36.3	6	40.6	9.4	1.80	24
May	29.863	30.140	20	29.645	25	0.495	52.6	49.0	86	73.9	24	58.2	40.0	27	46.4	11.8	2.41	17
June	30.015	30.419	5	29.615	9	0.804	56.9	52.9	86	73.5	7	62.3	41.0	2	50.7	11.6	1.76	9
July	29.995	30.440	1	29.636	10	0.804	58.3	53.6	86	76.6	31	64.4	49.1	19	53.2	11.2	2.39	16
August	29.976	30.331	27	29.410	19	0.921	59.3	54.9	85	78.3	30	63.6	48.2	27	53.2	10.4	2.70	18
September ..	30.078	30.402	15	29.507	24	0.895	58.2	52.6	81	77.5	12	63.8	42.6	26	52.4	11.4	0.92	10
October	29.707	30.112	25	29.157	20	0.955	51.6	46.7	81	61.2	6	55.8	41.8	21	46.4	9.4	8.75	30
November ..	30.234	30.609	7	29.694	24	0.915	48.6	44.1	85	58.9	7	52.3	35.7	29	45.4	6.9	2.39	19
December ..	30.225	30.595	25	29.334	10	1.261	43.4	39.3	85	53.4	24	47.2	31.7	3	39.5	7.7	3.47	20
Means & Sums	30.012	30.437	—	29.387	—	1.050	50.1	45.9	84	—	—	54.5	—	—	45.1	9.4	33.28	217

THE MUSEUM, GUILLE-ALLÈS LIBRARY.

MARINE ZOOLOGY.

A LIST of local species (comprising 524 specimens) presented to the museum by Mr. JOHN WHITEHEAD, the Hon. Curator, September 1889. Some of them representing the very rare local species have been obtained from other localities; and there are examples of some few species which have not yet been found here. These have * prefixed.

PORIPHORA.

Tethea schomtii
 „ lyncurium
 Halichondria panicea
 „ incrustans
 Pachymatisma Johnstonia
 (Megaspongia lævis)
 Grantia compressa
 Ophtita spongia seriata
 Isodictya palmata
 „ varians
 „ Ingalli
 Hymeniacion caruncula
 „ Bucklandii
 Leucosoleni controrta
 Microscopic preparations to illustrate
 the structure

COELENTERATA.

Tubularia indivisa
 Thuiaria thuia
 Attenularia ramosa
 Plumaria similis
 Aglaophenia piuma
 Campanularia angulata
 Obelia gelatinosa
 Coryne stauridia
 Podocoryne Ærolata (medusa stage)
 Anthea cereus
 Actinia mesembryanthemum
 Cerianthus Loydii
 Edwardsia sphaeroides
 Lucernaria auricula

ECHINODERMATA.

Comatula rosacea
 Crinoid stage of do.
 Ophiura texturata
 „ albida
 Ophiocoma neglecta
 „ punctata
 „ filiformis
 „ bellis
 * „ brachiata
 „ Ballii
 „ granulata
 „ rosula
 „ minuta
 Uraster g'acialis
 „ rubens
 Cribella oculata
 *Solaster endeca
 Palmipes membranaceus
 Asterma gibbosa
 Goniaster equestris
 Asterias aurantiaca
 Echinus sphaera
 „ miliaris
 „ Flemingii
 „ lividus
 Sphaeracomis granularis
 Echinocyamus pusillus
 Spatangus purpureus
 *Amphidotus cordatus
 Echinocardium penatifidium
 Also tests or naked shells of the
 Echinoids

HOLOTHURIDEA.

Cucumaria pentactes (sea cucumber)
 „ communis
 Synapta tenera
 „ inhærens
 Skin of do.

ANNELIDA.

Valencia splendida
Borlaisia striata
Aphrodite aculeata
Harmothoe Malingreni
Polynoe versiculosa
Sigalion arenosa
Euphrosyne foliosa
Marphysa sanguinea
Meckelia annulata
Northea tubercula
Lumbriensis tricolor
Syllis admirallis
Nereis cæcula
Heteronereis oerstedii
Nephtys Homborgii
 Young of do.
Tsamanthe punctata
Phyllodoce laminosa
Glycera dubia
Arcia Cuvèrii
Cirrhatulus Lamarkii
Arenia fragilis
Arenicola piscatorum
Chætopterus pargamentaceus
Clymene borealis
Sabella pavonina
 " *arenilega*
 " *savigni*
Balanoglossus Sarniensis
Sagitta bipunctata
 Head and Jaws of *Nereis*
 Sections for Microscope

CRUSTACEA.

Pycnogonum littorale
Phoxichilidium olivaceum
Nymphon rubrum
Argulus foliaceus
Cymbasoma Hardmanii
Caligus diaphanus
 " *centrodonte*
Pandarus bicolor
Anomalocera Patersonii
Harpacticus fulvescens
Asterope marina
Cetochilus septentrionalis
Nebalia Geoffroyii
 **Apus canceriformis*
Caprella acantifera
 " *Proto Goodsirii*
Bopyrus squillarum
Eiscladus longicandatus
 " female with ova tubes

Amathilla Sabinii
Atyllus swammerdamii
 " *gibbosus*
 " *bispinosus*
Lysianæra longicorne
Eurydice pulchra
Æga psora
Sphæroma serratum
 " *Prideauxianum*
Cymodocea truncata
Næsea bidentata
Anilocra Mediterranea
Anceus maxillarus
 " *cereus*
Lygia oceanica
Idotea pelagica
 " *linearis*
 " *tricuspidate*
Mæra grossimana
Corophium longicorne
Cryptophium Darwinii
Gammarus Edwardsii
Dexamine spinosa
 " *Vedlomensis*
 " *tenuicornis*
Acanthonotus zeii
Anonyx longicorne
Talitrus locusta
Orchestra Mediterranea
Bodotria arenosa
Squilla Desmarestii
Mysis chamælon
 " *vulgaris*
 " *Griffithsiae*
Phyllosoma commune
 Embryo from brood sac
 **Pasiphæa Sivado*
Palæmon serratus (prawn)
 " *squilla*
 " *varians*
Hippolyte varians
 " *Cranchii*
 " *viridus* (and zoëa)
 " *fascigera*
Athanas nitescens
Nika edulis
Alpheus ruber (and zoëa)
Crangon vulgaris (shrimp)
 " *fasciatus*
 " *sculptus*
 " *trispinosus*
 **Nephrops Norvegicus*
Homarus vulgaris (lobster)
 Zoëa and young of do.
Gebia deltura
Axis stirynchus

Callianassa subterranea
Palinurus quadricornis
Scyllarus arcus
Pagurus Bernhardus (Hermit Crab)
 „ in 3 stages
 „ *Prideauxii*
 „ *cuanensis*
 „ *Hyndmanni*
 * „ *Thompsonii*
Galathea squamifera
 „ in 3 early stages
 * „ *strigosa*
 „ *Andrewsii*
 „ *nexa*
Porcellana platycheles
 „ *longicornis*
Zoëa and young of do.
Dromia vulgaris
 **Lithodes Maia*
Corystes Cassivelaunus
Atelecyclus heterodon
Thia polita
Ebalia Penantii
 „ *Bryerii*
 „ *Cranchii*
Planes Linnæana
Gonoplax angulata
Pinnotheres pisum
Polybius Henslowi
Portunus puber
 „ *corrugatus*
 „ *arcuatus*
 „ *depuratur*
 „ *marmoreus*
 „ *holsatus*
 „ *pusillus*
Portumnus variegatus
 Young of „
Carcinus Mænus
Megalope of do.
Pirumela denticulata
Pilumnus hirtellus
Xantho florida
 „ *rivulosa*
Cancer pagurus
 Eggs and zoëa of do.
Eurynome aspersa
Maia squinado
 Eggs and embryos of do.
 **Hyas araneus*
 „ *coarctatus*
Pisa tetradon
 „ *Gibbsii*
Inarchus Dorsettensis
 „ *Dorynchus*
 „ *leptochirus*

Achæus Cranchii
Stenorhynchus phalangium
 „ *Ægyptus*
 „ *tenniostrotris*
 The stalk-eyed Crustacea are represented by male and female of each species.

CIRRIPEDIA.

Balanus balanoides
 Cast Skin of ditto
Lepas anatifera
 Pupal stage of Barnacle.

INSECTA.

Ærophilus Bonnaireii
Æpus fulvescens (Marine Beetle)
Marine chelefer (J. Sinel)
Geophilus sub marina (J. Sinel)

POLYZOA.

Scrupocellaria reptans
Bugula turbinata
 „ *flabellata*
Callipora ramulosa
Bowerbankii imbricata

TUNICATA.

Aplipium zostericola
Leptocodium maculosum
 „ *Lacaza*
Botryllus Schlosseri
 „ *morio*
 „ *smaragdus*
Botrylloides rubra
Perophora Listeri
Clavelina lepadiformis
Didemnum cereum
Morchillum argus
 Section of a cluster of ditto
Polymorpha glomerata
Fragarium elegans (Tadpole state)
 „ „ (separated)
Ascidia mentula
Salpa mucronata
Appendicularia flagellum

GASTROPODA.

Eolis Cuvierii
Fiona nobilis
Doris tuberculata
 „ *pilosa*
Pleurobranchus plumula
Aplysia punctata
Odontophore of Aplysia
Radula of Chiton descrepans
 „ *Nassa articulata*
 „ *Buccinum undatum*
 „ *Helix pisana*
Solecurtis candida

CEPHALOPODA.

Sepia officinalis
 Eggs of ditto
Loliga vulgaris
 Young do. just hatched
Sepioida Rondeletii
Octopus vulgaris
Radula of Sepia officinalis
 „ *Octopus vulgaris*
 Shells of each species

PISCES.

Petromyzon fluviatilis (Mud Lam-
 prey)
Lamna cornubica (Porbeagle)
Torpedo vulgaris (Cramp Fish)
Squatina angelus (angel or Monk
 Fish)
Sygnathus acus (Pipe Fish)
 „ *lumbriformis* (worm pipe
 fish)
Acestra Æquorea (needle fish)
 „ „ *incubating*
Lepidogaster cornubiensis (Sucker)
Liparis Montagu (Sea snail)
Rhombus hirtus (Müller's Top Knot)
Motella ticerrata (Rockling)
Labrus trimaculata (Wrasse)
 „ *bergylta*
 „ *mixtus*
 **Holocanthus*
Gobius aurata (Goby)
 „ *reticularis*
 „ *embryos in stages*
Callionymus dracunculus (Dragonet)
Blennius gattorugine (Blenny)
Gunellus ocellatus (Gunell)
Zeus faber (John Dory)
Cantharus griseus (Cantharus)
Pagellus centrodontus (Sea bream)
Gasterosteus spinachia (Stickleback)
Cottus bubalis (Bullhead)
 „ „ *young*
Trigla lyra (Gurnard)
 „ *lineata* (Rock Gurnard)
Trachinus vivipara (Weever)
 „ *draco* (Great Weever)
Mullus surmuletus (Mullet)
Labrax lupus (Basse)

The above specimens have been prepared and mounted by
 Mr. J. SINEL, Cleveland Road, Jersey. The larger fish have
 been preserved by Dr. Davidson's process.

