

PROCEEDINGS

OF THE

DORSET NATURAL HISTORY

AND

ANTIQUARIAN FIELD CLUB.

EDITED BY

NELSON M. RICHARDSON, B.A., F.E.S.,

Hon. Secretary.

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CONTENTS.

	PAGE
Index to Plates and Engravings	iv.
Notice to Members	v.
List of Officers and Honorary Members	vi.
List of Members	viii.
List of New Members elected since the publication of Vol. XVII.	xix.
The Proceedings of the Dorset Natural History and Antiquarian Field Club during the Season 1896-7, by Nelson M. Richardson, Esq., B.A., F.E.S. ..	xxi.
Hon. Treasurer's Statement of Receipts and Expenditure from May 4th, 1896, to May 11th, 1897	lvi.
Hon. Secretary's Accounts from May 1st, 1896, to May 1st, 1897	lvii.
Anniversary Address of the President, May 13th, 1897	lix.
—	
On the Fish of Dorset: Their Habits, Mode of Capture, &c., by Frank J. B. Beckford, Esq.	1
Newton Manor, by Sir J. C. Robinson	44
Tarrant Rushton Church, by Rev. J. Penny	55
An Account of the Albian Fossils lately discovered at Okeford Fitzpaine, Dorset, by R. Bullen Newton, F.G.S.	66
The Arms of Dorchester and Dorset, by Sir Robert Edgcumbe	100
British Arachnida observed and captured in 1896, by Rev. O. Pickard-Cambridge, M.A., F.R.S., &c.	108
The Pagan-Christian Overlap of the Wise Bird, with Dorset Illustrations, by Hy. Colley March, M.D., F.S.A.	116
Dorset Clothes-Moths and their Habits, by Nelson M. Richardson, B.A., F.E.S. ..	138
On a New Specimen of the Mesozoic Ganoid Fish, <i>Pholidophorus</i> , from the Oxford Clay of Weymouth, by Arthur Smith Woodward, F.L.S.	150
Dorset Monthly Rainfall, 1856-95, by Henry Storks Eaton, Past President Royal Met. Soc.	153
The Assistance of the Sun in Finding Traces of Destroyed Earthworks and Buildings, by H. J. Moule, M.A.	169
The Origin of the Vale of Marshwood and of the Greensand Hills of West Dorset, by A. J. Jukes Browne, B.A., F.G.S.	174
Report on Observations of the First Appearances of Birds, Insects, &c., and the First Flowering of Plants in Dorset during 1896, by Nelson M. Richardson, B.A., F.E.S.	185
Returns of Rainfall, &c., in Dorset in 1896, by Henry Storks Eaton, Past President Royal Met. Soc.	196

INDEX TO PLATES, ENGRAVINGS, &c.

	PAGE OR TO FACE PAGE
INTERIOR OF OLD BARN AT TARRANT CRAWFORD	xxxvii.
TARRANT RUSHTON CHURCH, SHEWING CHANCEL ARCH AND HAGIOSCOPES (See also Plate at p. 136, shewing Tympanum)	55
ALBIAN FOSSILS AT OKEFORD FITZPAINE, PLATES I., II., III.	98
THE ARMS OF DORCHESTER	100
BRITISH ARACHNIDA	114
PLATES ILLUSTRATING "THE PAGAN-CHRISTIAN OVERLAP OF THE WISE BIRD," PLATES I., II.	136
SPECIMEN OF <i>Pholidophorus</i> , A GANOID FISH FROM THE OXFORD CLAY, CHICKERELL	150
DORSET MONTHLY RAINFALL, 1856-95—	
Table of Comparative Rainfall, Dorset and the R. O. Greenwich, 1856-95	156
Table I., Stations and Average Rainfall in Inches, 1856-95	158
Table II., Proportionate Monthly Rainfall Corrected for Unequal No. of Days	159
Table III., Monthly and Annual Rainfall in Inches	160
Table IV., Proportionate Monthly Rainfall	161
Table V., Detailed Monthly Rainfall in Inches	162-7
Table VI., Summary of Rainfall at Stations of 20 Years' Standing ..	168
GEOLOGICAL MAP OF A PORTION OF WEST DORSET	180
SECTION THROUGH PILSDON PEN AND HARDOWN HILL ALONG THE BROKEN LINE ON THE MAP.. .. .	181
EARLIEST DORSET RECORD OF PLANTS IN FLOWER IN 1896	192-3
FIRST APPEARANCES OF BIRDS IN DORSET IN 1896	194
FIRST APPEARANCES OF INSECTS, &c., IN DORSET IN 1896	195
RAINFALL IN DORSET IN 1896—	
Table I., Monthly Depth of Rain in Inches in 1896	202-3
Table II., Rainfall in 1896	204-5
Table III., Average Monthly Rainfall	206
Table IV., Statistics of the Temperature of the Air and of the Humidity and Amount of Cloud at Winterbourne Steepleton Manor at Nine a.m. in 1896.. .. .	206



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| Searle, Allan, Esq. | Wilts and Dorset Banking Company,
Southampton |
| Shearman, John, Esq. | Peveril House, Swanage |
| Shephard, Major C. S. | Charminster, Dorchester |
| Shepherd, T., Esq. | Kingsley, Bournemouth |
| Sherren, J. A., Esq. | Weymouth |
| Simpson, Jas. Esq. | Minterne Grange, Parkstone |
| Simpson, Miss | 2, St. John's Terrace, Weymouth |
| Sivewright, Robert, Esq. | Eastbrook House, Upwey, Dorchester |
| Smart, Rev. D. C. | Milborne St. Andrew, Blandford |
| Snook, S. P., Esq., M.R.C.S.,
Engd., L.R.C.P., Lond. | 20, Trinity Road, Weymouth |
| Solly, Rev. H. S. | Bridport |
| Sowter, Rev. F. B., the Ven.
Archdeacon of Dorset | Dorchester |
| Sparks, W., Esq. | Crewkerne |
| Stephens, R. Darrell, Esq.
F.G.S., F.L.S., F.Z.S. | Treworman, Wadebridge |
| Stewart, Jas. S., Esq. | Deesa, Parkstone |
| Stilwell, Mrs. | Steepleton Manor, Dorchester |
| Stone, Walter Boswell, Esq. | 47, Wickham Road, Beckenham, Kent. |
| Stroud, Rev. J. | South Perrott, Crewkerne |
| Stuart-Gray, Colonel Hon. Jas. | Kinfauns, Perthshire |

Stuart, Hon. Morton G. (<i>Vice-President</i>)	2, Belford Park, Edinburgh
Sturdy, Leonard, Esq.	Trigon, Wareham
Sturdy, Philip, Esq.	Branksome, near Bournemouth
Suttill, J. T., Esq.	Bridport
Swift, B. R., Esq.	45, South Street, Dorchester
Sydenham, David, Esq.	Bournemouth
Sykes, Ernest R., Esq.	3, Gray's Inn Place, Gray's Inn, London, E. C.
Symes, G. P., Esq.	11, Victoria Terrace, Weymouth
Symonds, Henry, Esq.	Oakdale, Farquhar Road, Edgbaston
Tennant, Major-General	8, Belvedere, Weymouth
Thomas, Rev. S. Vosper	Moxley, Wednesbury, Staffordshire
Thompson, J. Roberts, Esq., M.D.	Monkchester, Bournemouth
Thompson, Rev. G.	Highbury, Bodorgan Road, Bourne- mouth
Thurlow, Rev. Alfred R.	Hilton Vicarage, Blandford
Todd, Mrs.	Keynsten Lodge, Blandford
Trew, Rev. C. O.	Alvediston Vicarage, Salisbury
Tucker, Mrs.	Treverbyn, Weymouth
Turner, W., Esq.	High Street, Poole
Tweed, Rev. Canon H. E.	St. John's Villa, Weymouth
Udal, the Hon. J. S.	c/o Lovell, Son, and Pitfield, 3, Gray's Inn Square, London
Usher, Rev. R., F.L.S.	East Lulworth Vicarage, Wareham
Usherwood, Rev. Canon T. E.	Rossmore, Parkstone
Walker, Dr. A. McNamnee	Tower House, Parkstone
Walker, Rev. S. A.	Spetisbury Rectory, Blandford
Ward, Rev. J. H.	Silverton Rectory, near Cullompton, Devon
Warre, Rev. F.	Bemerton, Wilts
Watson, Rev. C. O.	The Vicarage, Bothenhampton, near Bridport
Watts, Colonel	34A, South Audley Street, London
Watts, Rev. Canon R. R., R.D.	Stourpaine Rectory, Blandford
Weaver, Rev. F. W.	Milton Vicarage, Evercreech, Somerset
Webb, E. Doran, Esq.	Mitre House, Salisbury
West, Rev. G. H., D.D.	Ascham House, Bournemouth
Whitby, Joseph, Esq.	Frome St. Quentin House, Cattistock, Dorset

White, Dr. Gregory	West Knoll, Bournemouth
Willcox, B. A., Esq.	28, Portman Square, London, W.
Williams, E. W., Esq.	Herringston, Dorset
Williams, Robert, Esq., M.P.	Bridehead, Dorchester
Williams, Mrs.	Bridehead, Dorchester
Wilton, Dr. John Pleydell	Pulteney Buildings, Weymouth
Wilton, E. H., Esq.	Antwerp Villa, Dorchester Road, Weymouth
Wordsworth, Rev. Canon	St. Peter's Rectory, Marlborough
Wright, H. E., Esq.	Southend House, Wickwar, Gloucester
Wynne, Rev. G. H.	Whitechurch Vicarage, Blandford
Yeatman, Mrs.	Park Place, Blandford
Young, E. W., Esq.	Dorchester

The above list includes the New Members elected up to and including
Aug. 26th, 1897.



New Members Elected since the Publication of Vol. xvii.

The names of the Proposer and Seconder are given in brackets opposite to the name of the new Member. The addresses may be seen in the general list of Members.

FEBRUARY 17TH, 1897, DORCHESTER MEETING.

Usher, Rev. Robert, F.L.S.	{	President
		Sir T. Baker
Martin, Miss Eileen	{	General Tennant
		Mrs. Pickard-Cambridge
Anthony, Rev. Edgar Solly	{	J. H. Phillips, Esq.
		T. B. Groves, Esq.
Hopkins, Mrs.	{	Rev. Canon Hart Dyke
		Rev. H. G. Hopkins
Lys, F. D., Esq.	{	Hon. Treasurer
		G. Hibbs, Esq.
Simpson, James, Esq.	{	F. J. Beckford, Esq.
		Hon. Treasurer
Eldridge, John R., Esq.	{	C. McArthur Butler, Esq.
		Hon. Treasurer
Hudleston, W. H., Esq., F.R.S.	{	C. Hansford, Esq.
		Hon. Treasurer

MAY 13TH, 1897, DORCHESTER MEETING.

Morton, Mrs.	{	Colonel Cotton
		Colonel Russell
Robertson, Colonel	{	Rev. Canon Usherwood
		H. R. Dugmore, Esq.
Harston, Commander Frank A., late R.N.	{	Rev. Geo. Thompson
		Hon. Secretary
Berney, Algernon H., Esq.	{	Captain Carr S. Glyn
		President
Mansel, Miss Louisa	{	President
		Hon. Secretary
Day, Dr. Edward Joseph	{	H. J. Moule, Esq.
		E. Cunningham, Esq.
Moullin, Arthur D., Esq.	{	Reginald Aldridge, Esq.
		J. Eldridge, Esq.
Masters, W. J., Esq., M.D.	{	Reginald Aldridge, Esq.
		J. Eldridge, Esq.
Curtis, Wilfrid Parkinson, Esq.	{	Hon. Treasurer
		Rev. Owen Mansel

JUNE 8TH, 1897, PILSDON MEETING.

No new Members.

JULY 17TH, 1897, FLEET MEETING.

Chudleigh, Mrs.	{ Hon. Treasurer
	{ Hon. Secretary
Everett, Herbert, Esq.	{ Hon. Secretary
	{ President
Leeds, Oglander, Esq.	{ Rev. C. O. Watson
	{ J. T. Suttill, Esq.
Cornish, Vaughan, Esq., M.Sc., F.C.S., F.R.G.S.	{ Hon. Secretary
	{ President
Bell-Salter, Rev. T. M.	{ C. E. A. George, Esq.
	{ H. E. Huntley, Esq.

AUGUST 26TH, 1897, SALISBURY MEETING.

Edwards, Miss Sarah	{ Rev. Robert Usher
	{ Hon. Secretary



The Proceedings
OF THE
Dorset Natural History and Antiquarian
Field Club,
DURING THE SEASON 1896-7.

By NELSON M. RICHARDSON, B.A., F.E.S.

In speaking of *Nucula pectinata* on p. 90, lines 7 and 8 from bottom of page—

for, "truncated and angulate anteriorly, but produced and subangulate in rear,"

read, "truncated and angulate posteriorly, but produced and subangulate in front."

THE ANNUAL MEETING, held at the Museum on May 7th, 1896, was attended by about 25 members, the Rev. Sir Talbot H. B. Baker, Vice-President, being in the chair.

NEW MEMBERS.—Eight were elected.

PRESIDENT'S ADDRESS.—This was read at the meeting held November 20th, 1896, and will be found at Page lv. of Vol. XVII. of the "Proceedings." After referring to the death of Sir Joseph Prestwich, F.R.S., an hon. member of the Club, and to that of Colonel Mansel, of Smedmore, he dealt with a variety of recent scientific discoveries and investigations, including some points in the life-history of *Lipoptena cervi*, a rare fly parasitic on the roe-deer at Whatcombe, a new cycad from Portland, some new facts and theories about *Ichthyosaurus* and *Plesiosaurus*, and other geological matters, the Röntgen rays, Nansen's Polar expedition, and the Tel-el-Amarna excavations of Flinders Petrie.

A short address was given by the Chairman, in which he alluded to the regret felt by the Club at the absence of the President, the reason being his absence from England, ill-health, and the great loss he had sustained in the death of his twin-brother, the late Colonel Mansel.

JUNE 8TH, 1897, PILSDON MEETING.

No new Members.

JULY 17TH, 1897, FLEET MEETING.

Chudleigh, Mrs.	{ Hon. Treasurer { Hon. Secretary
Everett, Herbert, Esq.	{ Hon. Secretary { President
Leeds, Oglander, Esq.	{ Rev. C. O. Watson { J. T. Suttill, Esq.
Cornish, Vaughan, Esq., M.Sc., F.C.S., F.R.G.S.	{ Hon. Secretary { President
Bell-Salter, Rev. T. M.	{ C. E. A. George Esq.



The Proceedings
OF THE
Dorset Natural History and Antiquarian
Field Club,
DURING THE SEASON 1896-7.

By NELSON M. RICHARDSON, B.A., F.E.S.

The work of the Club during the season 1896-7 has comprised the annual business meeting at the County Museum, Dorchester, on Thursday, May 7th, 1896; a two days' meeting at Reading and Silchester on Tuesday and Wednesday, June 23rd and 24th; a meeting in the neighbourhood of Blandford on Thursday, August 13th; one at Corfe Castle and Swanage on Wednesday, September 9th; also two indoor meetings at the County Museum, Dorchester, on Friday, November 20th, 1896, and Wednesday, February 17th, 1897.

Volume XVII. of the "Proceedings" was issued during the winter.

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After some further remarks by the Chairman, who congratulated the Club on the satisfactory way in which the members of the two branches worked together, the increasing numbers on their list, and the success of their outdoor meetings, the Hon. Secretary explained that the President had fully intended to write an address, according to the announcement on the programme of the meeting, but was prevented by the causes mentioned by Sir Talbot Baker.

THE FINANCIAL STATEMENT was then made by the Hon. Treasurer, Rev. O. P. Cambridge, who said that this differed very little practically from that made twelve months ago. They began the financial year now just ended with a balance in hand of 18s. 8d., and they had completed it with a balance of 12s. 8d. The general statement of last year showed a balance in favour of the Club of £154 4s. 1d. ; the balance this year was £174 14s. 8d. Since December, 1894, they had elected 33 new members and had lost seven by death and 25 by resignation—total 32. The total number of members at present on the list was 324.

The accounts were handed round for inspection and passed.

REPORT ON THE ADDITIONS TO THE MUSEUM DURING THE PAST YEAR.—The following Report was read by the Curator, Mr. H. J. Moule :—

“ It is monotonous to croak year after year, as the key-note of the Report to the Field Club, of the late additions to the collections in the Dorset Museum. Let, then, these notes of what has come in since April 30th, 1895, express only this much. It cannot but be a grief to all interested in the Museum and its usefulness as a means of instruction in natural and archaeological science, that so many locally-found specimens remain in private hands. First among our acquisitions we name some gifts connected with Natural History of the present day. Several birds have been given by the President and Mr. E. R. Bankes. Among them are a wryneck, a tree-pipit, and a water-rail. A good wren's nest was given by Mr. Meader. Next may be recorded a fine slough, or cast skin, of a snake 4ft. long, presented by the Treasurer. From a very young donor, Mr. A. G. E. C. Monek Mason, we have acquired a specimen of the smooth snake, *Coronella laevis*. This snake, it will be remembered, has only of late years been recognised by naturalists as a distinct species. By Mr. Cunnington has been given an octopus from Weymouth, and by Mr. W. Tilley a whale's vertebra found in Mountain Ash-road, Dorchester. We have received from the Treasurer, the Secretary, Mr. Forsyth, and Mr. Bright a considerable number of butterflies and moths, mostly Dorset. Under the other great branch of Natural History, that relating to remote times, some valuable

gifts have come in. Among them are the following:—From the President, a good specimen of *Pholidophorus ornatus*; from the family of the late Rev. Canon Smith, several excellent Lower Lias fossils which belonged to him; from Mr. Holt, a portion of the head of a small *Ichthyosaurus* from the same formation; from Mr. Prideaux, a number of *Rhynconellæ* from the Fuller's earth. A very valuable gift, again, consists of twenty or more Inferior Oolite fossils collected in Dorset and given by Mr. Jukes Browne, F.G.S. The Rev. H. Gundry has given a specimen of *Cardiaster fossarius*, a very rare Greensand fossil. Turning to Dorset antiquities, our acquisitions unfortunately will not occupy much space in noting. But some of them are good. The most important, perhaps, is a piece of Roman pavement, from South Street, presented by Mr. Pope, and now laid down in the hall. The President gave us four Celtic urns and a stone cover of another urn, all from Bagber. One of the urns is very curious. It seems to have cracked in the making and to have been spliced by the help of two pairs of holes at the edge of the crack. The great antiquary, Dr. Greenwell, knows of only two other instances of this kind of repair. Two more, however, have occurred in Dorset, at Winterborne Stileham, near Bere Regis. (See History of Dorset, 3rd edition, I., 144, 145.) The urn-cover, too, is noteworthy, for it evidently was a corn-crusher before being used to close the urn. A very fine black ware urn, in fragments, has been given by Mr. Hunt, borough surveyor. It is $12\frac{1}{2}$ inches high, being $2\frac{1}{2}$ inches more than any other Roman urn belonging to the Museum. It has been partially mended. It is no wonder that it was broken, for its thinness is extraordinary, in places barely an eighth of an inch. It was found a few weeks ago in Albert-road, Dorchester. The President has given us a Roman pitcher from the pottery site at Bagber and a very fine basalt or greenstone celt from Bere Regis. This kind of celt has a peculiar interest, as like some other antiquities, it of itself proves the existence of foreign trade in pre-Roman times. Of course there was no wonder in this. Putting the Phœnicians out of the question, some of the Gauls were found by Julius Cæsar to be in advance of the Romans in certain things connected with sea-going. A very good flint celt was presented by Mr. Legg, a working man, who scorned the idea of any kind of payment. If we had a score or two of such friends up and down the county we should get on. Mr. N. Bond has given a Roman patera from Creech Grange, and the Rev. J. Bond has lent the lower stone of a quern from Tyneham. It is of a make uncommon, or even unknown in Dorset hitherto. It has a flange round it, keeping of course the meal from escaping throughout its girth, as was the case with common querns. There is an opening or spout through which alone

the meal poured. It is difficult to be sure of the date of this quern, but it is most likely mediæval. A pair of iron armllets has been given and a pair of bronze ones lent by Mr. Foster and Mr. Hogg respectively. Both pairs are from Dorchester. Mr. Cunnington has presented us with an incense cup and other barrow pottery, and also some worked flints, these being from a very remarkable fissure near Portesham.* Mr. Cree, too, through Mr. Cunnington, has given barrow pottery, and also has presented the brass fitting of the lower end of a dagger sheath of, perhaps, the 15th century. It is from Court House, Owermoigne. By exchange the Museum has acquired from Sir Robert Edgecumbe a valuable collection of coins, gathered together at Dorchester. There are also a few other things, especially an Agnus Dei seal. Of gifts not connected with Dorset only a few can be here recorded. Admiral Church has sent us specimens of Pholas-pierced stone and Teredo-pierced wood; Captain Pretor, a Narwhal's horn; Captain Rudyerd, an Egyptian stone ball and a fine piece of cat's-eye asbestos; the Rev. James Cross, bark and cones of *Sequoia gigantea*; and Mr. Wills, a very strange seed vessel, something like that of *Martynia*. In the library we have a few additions. Sir R. Edgecumbe has given his Family Records; Mr. M. Guest has given, what was before a loan, a curious memorandum book relating to Woodbury Hill Fair; the Rev. W. M. Barnes, his valuable transcripts of ten Civil War Tracts; Mr. Boswell Stone, "Memories," by the late Mrs. Stone, the Sale Catalogue of Merly Library, and a Weymouth Guide; Mr. Bastick, Cook's Description of Dorset and a History of Guildhall; Mr. Pearce, Pinnock's History of Dorset; Lady Meux, A Life of Alexander the Great; The Field Club, their Proceedings, Vol. XVI., the Journal of the Society of Antiquaries of Ireland, Vol. III., parts 2, 3, and 4, and the Report of the British Association for 1895; and the Trustees of the British Museum, several volumes of their books, especially of the magnificent Catalogue of Birds. The Rev. H. C. Reichardt presented a photograph of a small porcelain bottle taken by him from the bandages of a mummy. This bottle has caused great controversy. Such are the chief acquisitions since April 30th, 1895. Choice is difficult, and it is trusted that omissions may be pardoned. The notice of the year's work in the Museum must begin with a hearty word of gratitude for the untiring and quite priceless help given by the Secretary and Mrs. Richardson in arranging and naming the now considerable collection of moths and butterflies. Such work cannot be rightly done by any hands but those of an expert. The chief labour of

* See Proc. xvii, 194.

the Curator has been the moving, re-arranging, and in no small part re-mounting and re-naming fully two-thirds of the Dorset fossils. It has been a great and, of course, a burdensome task, but is now fairly finished. In it the Curator has had invaluable help from the President, and from the two distinguished professional geologists Mr. Jukes Browne, of the Government Survey, and Mr. Smith Woodward, of the British Museum (Natural History). The former has examined and in many instances named or re-named a number of Dorset Greensand fossils. He considers the Museum collection of these to be very remarkable, several species in it being hitherto supposed to be peculiar to the Cambridge Greensand. So much does he think of our collection that he induced Mr. Woods, of St. John's, Cambridge, Geological Demonstrator in that University, to come to Dorset to study the fossils in question, and to collect similar ones at Bingham's Melcombe, Armswell, &c. Mr. Smith Woodward lately visited the Museum, as he had done repeatedly before, to study the Purbeck reptiles and fishes. He gave invaluable help by naming and re-naming a good many specimens. He also told the Curator that among the fishes there are several specimens which cannot be recognised with certainty, or at all, as belonging to any known species. He pronounced the Dorset Museum collection of Purbeck reptiles and fishes to be, next to that of the British Museum, out of all comparison the best in the kingdom. Some work has been done by the Curator among the antiquities, and many months' labour awaits him in that department. In connection with some of the antiquities mentioned above it is hoped that some notes on certain points connected with recent unearthing of vestiges of the Dorchester Romans may be fittingly offered. The large urn and the bronze armlets, all noted just now, seem to be clear evidence of two Roman graves, not to mention several, we may say many others, lately struck in sewer and foundation digging in a certain locality here. And where exactly is that? It is the counterscarp, the outer slope of the western ditch of Durnovaria? Now, no one with the slightest knowledge of Roman ways and habits need be reminded that they carried out all their work with most methodical exactness according to strict rules. And this was very true of all connected with the laying-out and after-regulation of towns. With the Romans, again, everything was *fas* or *nefas*, *do-able* or *non-do-able*, in a sacred sense. And nothing was more utterly *nefas* than to bury the dead within the *pomærium*, the holy precinct of a town. And the *pomærium* usually included all the fortifications. Whence, then, these Roman graves within the *pomærium*? And, apart from its being *nefas*, how, on defensive grounds, could it be allowed that the fossa should

thus be tampered with? No confident answer to either question is here forthcoming, but a doubtful suggestion may be offered as to the second. It seems just possible that this part of Britain, Durngweis, was so thoroughly reduced to obedience by the Romans that the upholding of the fortifications was given up. The counterscarp, if so, would be disregarded as a defence. As to the first question is it just possible that when Christianity became the imperial religion the sacredness from pagan sanctification of the *pomœrium* was thought nothing of? A second note has to do with a strange ornament lent to the Museum. It was found lately in a grave in the Albert-road, and the extraordinary point is that past all doubt it was encircling the femur. It belongs to Mr. Hunt, the borough surveyor, by whose courtesy it is lent for exhibition here to-day. Thirdly, attention is drawn to a section of part of the Roman fossa accidentally made in digging a very deep trench to drain the new West Walk garden. It is at the south-west corner of the Roman ramparts. The part struck seemed to be the bottom of the fossa. There appeared to be a scarp slanting from the Bowling Alley Walk, then a ridge of undisturbed chalk, and then the counterscarp partly seen. In fact, it looked like an arrangement identical with that uncovered a few years ago in digging the foundations of South Court stables at the other end of the southern wall of Durnovaria. It is right, however, to say that Mr. Hunt, the borough surveyor, found under the Great Western-road, close to the lately uncovered section above-mentioned at Bowling Alley Walk, a depression in the chalk. This makes it doubtful whether there may not have been a second or third ditch there instead of the unbroken regular slope of the counterscarp at South Court. It is, however, very likely that the depression under the road had nothing to do with the Romans, but was a hollow lane of mediæval times. In any case it can hardly be doubted that the section at South Court revealed a contour of the fossa like the letter W, with the outer lines very long and the outer one, representing the counterscarp, slanting very gently. These discoveries have been notified to Mr. Haverfield, of Christ Church, Oxford, a great collector of information about Roman finds. He writes that to him the above contour of a fossa 'is quite new.' Here end these rough notes of a few of the very remarkable Roman discoveries lately made in Dorchester—made, too, not only near the West Walk, but also about Bell-street, where, by-the-by, an extraordinary bronze chisel was found the other day. It is a strangely moving moment to a mind with the least gleam of romance in it—the moment when those relics came to the light after a millennium and a half of darkness under six feet of black earth. Whose ashes lay

in that great delicately made urn? Who was the man with the bronze *femorilla*? Who was the lady with the pair of *armillæ*? Who indeed? Ostorius might know. Aulus Plautius might know. They, mayhap, stood by the graves and saw them filled—for Mr. Bull, foreman of the borough drainers, to uncover in the year of grace 1896. He (Mr. Bull) has lit upon more Durnovarian pottery, more Durnovarian bronzes, more Durnovarian graves, and, chiefly, more bits of Durnovarian roads, than any man alive, yes, not excepting Mr. Cunnington. Mr. Bull should be moved by the Field Club to write a book. Private persuasion has been—is—often applied.”

An interesting discussion followed the reading of the paper.

Mr. Cunnington fully endorsed what Mr. Moule had said in relation to the fortifications surrounding Dorchester, and he produced original maps which he drew some years ago with the assistance of Captain Hooper, of the Royal Engineers, and which showed the position of the wall surrounding the town. Incidentally he alluded to the large number of circumstances which had occurred in the history of Dorchester to eradicate the signs of Roman sites in it, and amongst these were the facts that in 1003 the King of Denmark besieged, took, and burned the town and pulled down its walls, that in the time of Edward the Confessor (1042) only 88 houses were left in it, and that the number of fires which had occurred was considerable.

Mr. Moule illustrated his remarks on the ancient fortifications discovered at South Court by a section drawn by himself.

Mr. Richardson, as secretary of the Museum, thanked those who had made gifts to the Museum during the year, especially Mr. A. Pope for the Roman pavement. Their thanks were also due to Mr. Jukes Browne for the great pains he had taken in connection with the Museum.

ELECTION OF OFFICERS.—The officers were all unanimously re-elected; Mr. Mansel-Pleydell as President, proposed by Sir T. Baker and seconded by Mr. J. H. Phillips; Rev. O. P. Cambridge as Hon. Treasurer and Mr. N. M. Richardson as Hon. Secretary, proposed by Sir T. Baker and seconded by Mr. E. H. Wilton.

SUMMER MEETINGS.—It was decided to hold one-day meetings at Silchester, Blandford, and Pilsdon, and a two-days meeting at Glastonbury. The latter was, however, eventually dropped, as it was found inconvenient to visit Silchester in one day on account of the distance. A two-days meeting at Salisbury was also suggested, but was postponed on account of the meeting there of the Wilts Archaeological Society, which had been already fixed. For the Pilsdon meeting an invitation to tea from the Rev. C. Drutt, of Whitechurch

Canonicorum, was accepted, whilst a similar invitation from Mr. L. B. Clarence, of Coaxden, Axminster, had to be declined on account of the distance.

The Pilsdon meeting was eventually postponed to 1897 on account of difficulties of access and train service, which could be more easily surmounted earlier in the year, and an invitation to lunch at Newton Manor, Swanage, from Sir J. C. Robinson, was accepted for September, as well as an invitation to tea on the same date from Mrs. Everett, of Peveril Tower, Swanage.

EXHIBITS AND NOTES.—

By the HON. SECRETARY :

1. Two numbers of the Transactions of the Hertfordshire Field Club, which was a society of the same age as the Dorset Field Club. The Hon. Sec. read one or two short extracts on the subject of the manufacture of worked flints from a paper by Sir John Evans contained in these Transactions. The books were presented to the Museum.

2. A specimen of Limoges enamel on copper, of the 17th century, by J. Laudin, said to represent St. Francis d'Assisi, the founder of the Franciscans. The art of enamelling on metal was carried on at Limoges in the 15th century, and reached a high state of excellence in the 16th, not dying out until about 1750. Genuine specimens of antique Limoges enamel were rare and valuable, and some by J. Laudin fetched large sums in the Hamilton Palace sale in 1882.

By Mr. H. J. MOULE :

3. Bronze ring found in a grave in Albert-road, Dorchester, in 1896. From its having been found encircling a femur and from its size and shape, this ornament seems to have been a thigh ring. It is lent for exhibition by Mr. G. J. Hunt.

4. Two small photographs of the bases of the chancel arch of St. Andrew's Church, Portland, lately discovered by Mr. J. Merrick Head, of Pennsylvania Castle.

By Dr. A. MACLEAN :

5. An old sword dug up at E. Chickerell Farm during the preparation of the golf links there. The sword is identical in shape with one in the possession of the Hon. Sec. which was found in the roof of an old house at Upwey, and it was suggested that both were perhaps hidden at the time of the Duke of Monmouth's rebellion.

By the HON. TREASURER :

6. Drawings received from Mr. G. J. Bennett, of Wareham, of a small window found near St. Martin's Church, Wareham, and probably once part of that church; also of what was considered to be most probably a

holy water stoup, found in the same situation as the window. He mentioned that a paper on Wareham was offered by Mr. Bennett for next winter.

GENERAL BUSINESS.—Mr. Moule stated that the fund collected from the members of the Club (the amount not to exceed 5s. from each member) as a donation from the Club towards the restoration of the spire of Salisbury Cathedral was now closed and amounted to the sum of £31 10s. This sum was forwarded to the Dean of Salisbury and placed to the credit of the Spire Restoration Fund. He also wished to call the attention of the Club to the proposed demolition of a very picturesque old inn—the White Horse, at Maiden Newton. A subscription had been started to prevent this, and he hoped the old inn might be preserved.

Mr. Beckford asked for any information about fish found on the Dorset coast which might be useful in the preparation of a paper on the subject for next winter.

PAPER BY MR. A. J. JUKES BROWNE, F.G.S.—The Hon. Sec. read a paper by this author “On a Collection of Fossils from the Upper Greensand in the Dorset County Museum.” This will be found at p. 96 of Proceedings, Vol. XVII.

READING AND SILCHESTER MEETING.—The first out-door meeting was held on Tuesday and Wednesday, June 23rd and 24th, 1896, and was attended by about 25 members of the Club, who were joined during the first day by numerous members of the Berks Archæological Society, who were most energetic and hospitable in their reception of their brother antiquarians and contributed very greatly to the pleasure and success of the meeting.

In the absence of the President his place was filled by the Rev. Sir Talbot Baker.

The party met at 2.45 p.m. at the Reading Museum, in which, besides a variety of other collections, are placed the whole of the remains which have been unearthed by the Society of Antiquaries from the excavations at Silchester.

Here Dr. Joseph Stevens, the Hon. Curator of the Museum, described in detail the most important objects, especially alluding to the unique Silchester collection, which was presented to Reading by the Duke of Wellington. Dr. Stevens first pointed out the chief features of the Romano-British city as planned on the large map, drew attention particularly to the various features comprehending the Forum, and mentioned to what parts of the buildings the different capitals and columns in the collection referred to. These included the

fine Corinthian capitals which helped to support the roof of the Basilica or Hall of Justice, and the smaller Doric capitals and columns of the porticos of the ambulatories, together with the capital which is believed to have occupied one side of the entrance to the Forum. The model of the western gateway of the city shows a double entrance, the heavy spine sandstone block, occupying a pedestal in the centre of the room, being pointed out by the Hon. Curator as the capital of the central column which spanned the entrances on either side. The small Christian church and its general arrangement was next touched upon, and the water source and platform for the laver, or fountain, pointed out. It was stated to be undoubtedly Christian, and might be placed in juxtaposition to certain edifices which had been explored in another part of the city, and which were considered to be pagan. The mode of roofing houses and verandahs could be seen from a specimen of roofing placed in the room, and the method of warming the winter apartments of houses, by means of hypocausts, from a model of a block of buildings from Insula II., also standing in the room. Proceeding to the relic room the contents of the window case were described, consisting of circular brooches, several of which were enamelled, and the common or bow-shaped forms, which were usually met with at Roman sites and were used by the Roman ladies to secure the *pallium*, or mantle. In bronze also were hairpins and long spoons, called *ligulæ*, for removing unguents, &c., from long-necked bottles. Iron *styli* were present in some abundance, which were employed for writing on wax tablets, the flat end being for erasing or smoothing out, as we do with india-rubber at the present day. There were buckles, finger rings, bracelets, links, lead spoons, and many other small objects, and one or two admirably preserved bronze figures—notably a bronze goat and a small enamelled stand, and close alongside of these a small statuette of Juno Lucina, the goddess who presided over child-birth, appropriately represented with two infants in her arms. Bone pins, some with figured heads, bone and ivory spoons, beads of coloured glass and vitrified paste, &c., were exhibited. They had gamblers apparently in the Romanised-British city. At all events dice had been found very like those used in the present day; and that the ladies were careful and cleanly received testimony in small bronze chatelaines, which were worn on the girdle and contained tweezers, nail picks, &c., and occasionally a small key or knife. Ancient money was next shown by Dr. Stevens, who said that chronologically they determined a period from Agrippa, B.C. 9 to A.D. 30, to Arcadius, A.D. 383 to 408, a period of something like 400 years. Two interesting discoveries of hoards of coins had been made, both probably

having been buried by some unfortunatē citizen at the moment of leaving the doomed city, with the hope perhaps of future recovery. Passing the Roman wall, which was 31ft. in depth when discovered, the party inspected the pottery and other articles in the several table cases—notably the fine red ware called “Samian,” which the learned doctor characterised as patrician pottery, made of clay of a fine texture, heavily baked, the colouring matter being peroxide of iron. The figures on it are most graceful designs in foliage and hunting scenes, and numbers of the vessels bear the names of the potters stamped on their bases, Dr. Stevens remarking that he had deciphered some 70 names. In reference to other pottery, the various cases contain a great variety in shape, colour, and ornamentation. A good deal of the pottery found at Silchester was made in the New Forest, and much of the ware was of a maroon colour and baked to an intense hardness, a common form in this material being the small drinking cup with indented sides. Two strong forms should receive mention—the very large vessels called *amphoræ*, which were receptacles for wine, some containing several gallons, and were carried by handles on each side of the neck; and the necessary appendages to the kitchen known as mortars (*mortaria*) or mortar basins. Much of the pottery would be observed to be glazed red, black, or maroon, and in some of the reddish glaze small fragments of mica could be seen. There were numerous impressions of the feet of various animals left on bricks and tiles when the clay was plastic; specimens represent a dog, cat, goat and kid, bird, moulds of shoe nails, and in one instance the impress of a child’s foot, whilst there are pieces of dried clay into which the thumb had apparently been thrust in various places, with the object, perhaps, of testing the plasticity of the material for working. The iron series is large, varied, and most instructive. Among those now cleaned and prepared for permanent exhibition are such as were in daily requisition for household purposes and used by mechanics, such as knives, keys, locks, bolts, holdfasts, latches, catches, drawer and bucket handles, nails, horseshoes, padlocks and keys, and some peculiar carpenters’ tools such as a plane (very rare), and some chisels; also a blacksmith’s anvil and pincers, shoemaker’s anvils, plough coulter, iron hammers, &c. The padlock and key of the West Gate of the city of Silchester are complete; and beside them are to be seen an iron band, also from the West Gate. The visitors had an opportunity of seeing the latest discoveries made last year at Silchester, which are now at the Museum. They include some large panels of tessellation, at the present standing in the large window till the gallery (now in course of erection) for their

reception is built. There are three tessellations, but one only at present can be exhibited. There is also a very rare object recently introduced. It is a vase of blue and white glass, the colour of which is of great beauty. There is also a bottle placed in the centre of 254 silver denarii, which were found in it. It is one of the most, if not the most remarkable, finds of a hoard of Roman coins yet found in this country. On leaving the Museum the party were conducted over the Town Hall, the church of St. Lawrence, built about A.D. 1190, the earlier church of the town having been in A.D. 1120 removed to make way for the Abbey buildings. A curious palimpsest brass is placed on the north side of the Chancel Arch. The University Extension College was next visited, part of which was originally the dormitory of the hospitium of St. John, attached to the Abbey, used as a stable by Queen Elizabeth and as a barrack during the civil war. After inspecting the massive ruins of the Abbey and Greyfriars Church, founded by the Franciscans, who settled at Reading in A.D. 1233, the party returned to dinner at the G.W. Hotel. At 8.30 p.m. a *conversazione* was held at the Abbey Gateway, the headquarters of the Berks Archæological Society, by whom the club was hospitably invited to partake of tea and light refreshments, and to hear a lecture by Mr. Theodore White, the President of the Reading Literary and Scientific Society. The lecturer dealt with the History of Silchester, and an abstract is given as follows:—Silchester appears to have been originally the *Caer Segont* of the *Segontiaci*, a Celtic tribe, which was about 300 years B.C. subdued by the *Atrebates*, a tribe of *Belgæ*, from Gaul. The town was situated on the edge of the wild track of sandy heathland, still found on the borders of Berks and Hants. It occupied high ground, falling away rapidly to the north-east and south, and was fortified by a high octagonal rampart of earth, enclosing an area of about 100 acres. The district now called Hampshire was conquered by *Vespasian*, and we may conclude that before 100 A.D. *Caer Segont* had become a Roman city, defended by lofty walls of flint and stone, which are still standing in wonderful preservation. Within this enclosure there sprang up a town with streets intersecting one another at right angles, thus forming “*insulae*,” with a large forum and a magnificent *Basilica*, and in later times at least one Christian church. Without the walls was a spacious amphitheatre, measuring 150ft. by 120ft. Roman roads ran from the town direct to London, to *Venta Belgarum* (Winchester), to *Sordiodunum* (Sarum), and to *Aquæ Solis* (Bath), *viâ Spinæ* (Speen, Newbury) and *Cunetio* (Marlborough). Silchester corresponds with the position of *Calleva*, as given in many of the old Itineraries. The etymology of the name *Calleva* has been

suggested as a Latinised form of the Celtic "Gual Vaur"—the Great Wall. The etymology of the syllable "sil" in Silchester is obscure. That Silchester during the Roman occupation of Britain was a prosperous and important place there was ample evidence. The beginning of its decay must have dated from 410 A.D., when the Romans left Britain. About 480 the Saxon Aella, on his march from Anderida to Bath, is supposed to have taken the place by storm, burnt it, and put most of the inhabitants to the sword. From that time for 1,000 years nothing was heard of the place, save for a brief notice of it in Domesday Book. Leland visited Silchester in the reign of Henry VIII., and gives in his Itinerary a quaint account of it. Camden's description of the place in his "Britannia," written in the reign of Elizabeth, is much longer and more elaborate. Stukeley visited Silchester early in the 18th century, and he was the first to publish a map of Silchester, and his pen and ink sketch, dated 1722, are to be seen in the Bodleian Library at Oxford. Excavations at Silchester before 1864 were intermittent and comparatively unimportant. In that year the Rev. J. G. Joyce, vicar of Stratfieldsaye, was authorised by the Duke of Wellington, the owner of the land, to carry out systematic excavations. These resulted in several discoveries of interest, notably the Forum, the Basilica, and many houses, large and small. Some of these, unfortunately, still remain uncovered, and have suffered sad ravages from exposure to rain and frost. The excavations were carried on by Mr. Joyce till his death in 1878, after which the Rev. T. Langshaw, of Silchester, continued the work, which was vigorously taken in hand in 1884 by Mr. Hilton Price, who obtained the Duke of Wellington's permission to employ more labour. Some important work was done in his time, but after the Duke's death his successor would sanction for the time being no further operations, so that from 1884 to 1890 the work was altogether suspended. In the latter year began the series of excavations by the Society of Antiquaries, under the direction of Mr. G. E. Fox, F.S.A., Mr. St. John Hope, M.A., Mr. Herbert Jones, Mr. Mill Stephenson, and others, which, if continued for a short time longer, will teach us almost all we can hope to learn from the remains of Silchester. Since the year 1890, amongst the more important "finds" may be mentioned the following:—In 1892, the Romano-British Church; in 1893 the elaborate system of drains in the south of the city and the Ogam stone; in 1894, remarkable hearths, probably the foundations on which coppers or boilers used in some trade were erected, and a jar containing 254 silver coins dating from Mark Antony to Severus; and in 1895 and the present year, other objects which were enumerated by Dr. Stevens in his account given at the Reading Museum. The thanks of the Club

having been expressed to Mr. White and the Berks Archæological Society for their kind and hospitable reception, the party returned to their hotel at about 10.0 p.m.

ON WEDNESDAY, JUNE 24TH, the party started at 9.50 a.m. by train for Mortimer station, whence a drive of three miles brought them to Silchester. Here they were met by Mr. Herbert Jones, F.S.A., who had kindly undertaken to act as guide over the excavations. After inspecting the church the party proceeded to the forum and basilica, excavated by Mr. Joyce in 1864-78, which had never been again covered in, as is now done by the Society of Antiquaries in their excavations made during the past six years. The contents of the small Museum at Silchester were inspected, together with the most recent finds and the trenches and parts of most interest uncovered during the present year. Trenches 2 or 3 feet deep are dug at intervals and carried along until the foundations of a wall or other obstacles are met with, which are thoroughly examined before proceeding further. Several portions of houses, a very complete hypocaust, a well, &c., were visible, and the party left at about 2.15, after thanking Mr. Jones for his kindness and for the large amount of interesting information he had given them during their visit.

Basingstoke was reached after a drive of 8 miles, in time for the 3.33 down train. The weather on both days was fortunately all that could be desired.

NEW MEMBERS.—None were elected at this meeting.

No meeting was held in the month of July owing to various causes.

BLANDFORD MEETING.—This meeting, held on Thursday, August 13th, was attended by about 70 members, the weather being favourable. The breaks started from Blandford station on the arrival of the 10.21 a.m. train for Rawston Down, where a long barrow of great size had been opened by Mr. E. Cunnington for the inspection of the Club. The work, however, of removing so large a quantity of earth had proved too great for the time allowed for it, and though a large trench had been cut, 34ft. in length, 6ft. broad, and 8½ft. deep, nothing had been found beyond 2 pieces of pottery and 3 bits of bone. Mr. Cunnington, after expressing his disappointment at the result of his excavations, read a paper on "The influences of Phœnician Colonisation, Commerce, and Enterprise on England 2,000 years ago," tracing the movements of that nation along the Mediterranean Coast and that of Spain and Portugal up to Cornwall, and suggesting a connection between the trilithons of Heshbon,

similar monuments in Malta, and the English stone circles of Stonehenge, Avebury, &c., which he said were made and cut in the same way. Nothing was definitely settled at the meeting as to any future work on the barrow, but it was eventually left in the hands of General Pitt Rivers, who proposed to investigate it in the most elaborate manner at his own cost, and the trench was some months later, by his direction, filled in, until he was able to carry out his intentions.

The party then walked across to Buzbury Camp, about half a mile distant, which is surrounded by a very slight earthwork. Pottery was present in considerable abundance and many Romano-British sherds could be found on the surface of the ground within the camp. Mr. Cunningham stated that he had made several excavations there and found plenty of Roman remains of pottery, including one piece of Samian, and other articles. He added that the entrance through the vallum at the south end was protected by a short external earthwork. He considered that Buzbury was undoubtedly simply a Roman temporary camp, of which there were plenty of similar examples in Dorset.

The church of Tarrant Rushton was next visited, on which the Rev. J. Penny, the Rector, read a paper, which will be found in full at p. 55 of the present volume. After leaving the church Mr. Penny's large and interesting Geological and Natural History Museum was inspected.

The collection consists of fossils, illustrating, in larger or smaller numbers, the Dudley, Coal, Lias, Oolite, and Chalk formations and the Tertiary beds on the Hampshire coast. It contains also numerous and choice representative minerals of all kinds, whilst there are cases and drawers filled with shells, corals, birds, butterflies, and moths. Among the more interesting objects may be mentioned a collection of cut and polished ammonites and nautili from the Oolite between Sherborne and Yeovil, which could not easily be surpassed; pear enerinites from Bradford-on-Avon; a tree fern (*Caulopteris punctata*) from the Greensand of Shaftesbury; marsupites from the Upper Chalk, and a perfect *Fholadomya decussata* from the Lower; and an excellent series of Barton Tertiary shells, collected by Mr. Keeping, Curator of the Cambridge Geological Museum. Of rarer birds the glossy ibis is represented by a beautiful pair from Christchurch; there is a specimen of the spotted crake from Childe Okeford mentioned by Mr. Mansel-Pleydell in his "Birds of Dorset," and a chough from Ludworth. The more uncommon sorts of owls, hawks, and waders are also well represented.

After leaving Mr. Penny's the party drove to Tarrant Crawford Church and Abbey Barn, which they inspected under the guidance of

the Rector, the Rev. E. Highton, who read a paper on the church and barn, from which the following are extracts. A view of the interior of the barn is given opposite :—

“ A religious house of the Cistercian order was founded here sometime in the 12th century by Ralph de Kahaines, and it is clear that a Norman church was also built about the same time, for the remains of Norman work are still to be seen in various parts of the church. There is the Norman bowl to the piscina. This piscina was found behind the plaster two or three years ago. It had been filled up with loose stones, and plastered over. The stone forming the west side of the piscina is a piece of a Norman string-course. On the opposite side of the chancel an aumbry has also come to light in the recent repairs. One side of this is also a piece of apparently the same string-course. The aumbry was filled up by a piece of cut stone which now stands on the step of the south door of the chancel. It will be noticed that the bowl of the font is also probably of the same date. In the early part of the 13th century the abbey was enlarged and the endowments increased by Bishop Richard Poore, who was born in this parish. It seems likely that the increase of wealth brought a larger population into the parish, and the church was enlarged, evidently at one period; for the small two-light windows were introduced in the nave as well as in the renovated chancel, and are evidently all of one date. The head of the south door of the chancel is, on the inside, semi-circular; on the outside, pointed in the centre. This may be accounted for by the fact, which came to light in the recent repairs, that there is a break between the outer and inner face of the wall there. The inner face of the wall contained the original Norman arch; the outer face was probably renewed and an arch of different character introduced. The small pieces of colour on the plaster were found underneath the coating of plaster which had been laid on the walls subsequently. The tower arch and the arch at the entrance of the porch are probably contemporary with the nave, and the stanchions and bars of the windows are of the same date as the windows themselves—most of them late Early English—and two, the westernmost window and the one over the pulpit, are of Perpendicular date. The upper stage of the tower contains three Perpendicular windows which are worthy of notice. Within the altar rails two coffin-slabs have been laid in the pavement. The coffins were found about 40 years ago near the barn lying side by side in a building, which had fallen into ruins—possibly the chapel of the abbey—about 150 yards from the church. In the tower is a large Purbeck marble sepulchral slab. There are signs of a shallow incised design in various parts of the stone, but not sufficiently clear to make



INTERIOR OF OLD BARN AT TARRANT CRAWFORD.

out accurately what the design was. The face has flaked off in various parts from exposure to the weather, but there are distinct indications of a double cross. In the floor of the church there will be seen various coffin slabs of Purbeck stone, whole or in fragments, one or two with parts of a cross incised on them. They may have covered the bodies of members of the religious community who were buried here. There is a small brass to the memory of John Karrant, probably a chaplain of the abbey, but the original position of it is now unknown. The inscription is—

“Hic jacet dñs Joñes Karrant cujus anime p'p'iciet' de' Amen.”

There is a curious history attached to this brass. It was for some years in the collection of antiquities belonging to the late Mr. Durden, of Blandford, and at his death it was sold, along with the rest of the collection, to the trustees of the British Museum. It was, however, kindly returned by them at the request of the incumbent of Tarrant Crawford.

THE ABBEY BARN.—The measurements of the large barn inside are :—Length, 59ft. ; width, 29ft. 6ins. ; height to wall plate, 9ft. 9ins. The wall at the north end is evidently the original wall, for a corner buttress outside shows that the building could not have been continued further in that direction. At the south end a narrower building seems to have continued, for the east wall is continuous, and the buttresses are evidently of the same date throughout. On the west side the buttresses continue only the length of the barn. The roof of half the barn is a very fine feature ; the rest was displaced when the roof at the weather end was renewed. Other barns, the remains of two of which are considerable, seem to be of the latter part of the 13th or 14th centuries, a period when the abbey largely increased in wealth. The abbey is said in Hutchins's to have been dedicated to Saint Mary and All Saints. The church is dedicated to S. Mary. Sir Robert Rous, by his will dated 1838, gave, among other bequests, money for four priests celebrating at the altar near the body of S. Richard in Tarrant. The lines of the foundations of the abbey chapel can be clearly seen when the turf is very dry. The dimensions of it were 120ft. by 25ft.”

On leaving Tarrant Crawford the party drove past Spettisbury Rings and Blandford St. Mary to the Down House, where they had been invited to tea by Sir William and Lady Marriott. Time only permitted a slight inspection of the many treasures contained in the house, books, china, &c., and of the gardens and orchids. The members left at 4.30 to catch trains at Blandford station.

NEW MEMBERS.—None were elected.

CORFE CASTLE AND SWANAGE MEETING.—This, held on Wednesday, September 9th, 1896, was probably the largest meeting in the annals of the Club, the number present at luncheon being about 170, in spite of the somewhat unsettled weather, which, however, resulted only in a slight shower at Corfe Castle. On arrival at Corfe Castle station the party proceeded to the Castle, where they were met by the Rev. Owen Mansel, who read the following paper on its history:—

“The Secretary has honoured me with a request to read a paper on Corfe Castle to the members of the Dorset Field Club on the occasion of their meeting on this historic spot. I have undertaken the duty, though with some diffidence, partly from a consciousness of inability to do justice to such a grand and impressive subject, and partly because I can say but little that has not been said by the late Thomas Bond, Esq., whose exhaustive work contains all that can be known about Corfe Castle, and to which I am largely indebted for the historic facts related in this paper. The materials available for compiling a history of Corfe Castle are unfortunately very few, and scattered over considerable periods, with long gaps of silence intervening. This may be accounted for perhaps by the fact that the Castle was used mostly as a state prison; and its remote situation may have prevented it from figuring largely in the contemporaneous events of mediæval history. The first event in connection with Corfe is recorded by William of Malmesbury in a work written by him about 1105, in which he relates that St. Aldhelm, Abbot of Shaftesbury, built a church there about 690. Owing to a want of clearness in the language of the chronicler it is not easy to fix with certainty the position of this church, but the balance of evidence seems to be in favour of the opinion arrived at by Mr. Bond that it was built on the western spur of this hill, and that a conspicuous piece of ancient masonry in the second court of the Castle is in fact the south wall of St. Aldhelm’s Church. When we reach the spot I will endeavour to explain the grounds on which Mr. Bond’s theory is based, and which will be more intelligible with the object before us. The Anglo-Saxon name of this place was Corve Gate, or the Cut Gate, or way, from the natural cleft in the chalk ridge which runs through the whole length of the peninsula, opening here away from the north into the central valley of Purbeck. It was not till after the Norman invasion, when the fortress which crowns the summit of the hill—impressive even in its ruins—was erected to establish the Conqueror’s power, that the name more familiar to our ears of Corfe Castle was given to the place and town. If this distinction had been observed by English historians a confusion of ideas

would have been avoided, which has led many persons to imagine that this castle was the scene of the murder of King Edward the Martyr, the incident which perhaps has most contributed to the notoriety of Corfe. That, of course, was impossible, as Edward was assassinated in 978—a century before the oldest part of the existing castle was built. The chroniclers relate that Edward, while hunting in the Royal Chase of Purbeck, turned aside to pay a visit of courtesy to his stepmother Elfrida, whose house was at Corvesgate. Seizing the opportunity thus unexpectedly offered of securing the throne of England for her own son Ethelred, she caused him to be treacherously murdered by her attendants. We have no means of ascertaining whether the “domus Elfridæ,” Elfrida’s house, was situated on this hill, or in some part of the town, for all traces of it have disappeared which might have aided the antiquary in his investigations. I need not dwell on the particulars of Elfrida’s crime, her real or pretended remorse, the retributive calamities which befell the country, following, if they did not fulfil, the malediction which Dunstan pronounced on Ethelred’s reign, as these are known to all students of history. A house standing by the road to Wareham, about a mile hence, called St. Edward’s Cottage, is said to mark the spot where the body of the murdered king was found, but it is more probable that it was hastily buried at once in a place near the scene of the crime, where a church was built to his memory, and which was most likely the predecessor of the present parish church, dedicated to St. Edward. The corpse was soon afterwards removed to the church of St. Mary’s at Wareham, and finally interred with royal honours in the Abbey of Shaftesbury. We meet with few incidents of an important character connected with Corfe Castle during the reigns of the first six Norman and Plantagenet kings. But it had evidently become a fortress of great strength and importance 20 years after the Conqueror’s death, as it was selected by King Henry I. as the place of imprisonment of his unfortunate elder brother, Robert Curthose, Duke of Normandy, before his removal to Cardiff, where death released him from his wearisome captivity of 28 years. In the troubled reign of Stephen, the Castle declared for the Empress Matilda, and was held for her till the accession of her son, Henry II. It occupies a rather prominent place in the time of King John, who found it a suitable place for the exercise of some of those cruel and tyrannical acts which disgraced his reign. His nephew, Arthur Duke of Brittany, rightful heir to the crown of England, and his beautiful sister Elinor, the damsel of Bretagne, having fallen into his hands after the battle of Mirabeau, he caused the former to be put to death, but Elinor was brought to England and imprisoned first in Corfe Castle, and

subsequently in Bristol Castle, where she remained for the rest of her life. She had for her companions here two other princesses—Margery and Isabel, daughters of William of Scotland—who had forfeited their liberty on account of some breach of the feudal law relating to their marriage. They do not appear to have been treated with extreme rigour while in confinement here, if we may judge from some curious and interesting details which have come down to us respecting articles supplied for their use. If the interest of any of my fair listeners should flag, while the dry facts of antiquarian research are being presented to them, I am sure they could not fail to find pleasure from the perusal of this inventory of tunics and supertunics, capes of cambric and fur of miniver, robes of bright green for use of the three waiting maids, &c., but time presses, and I must refer them for further particulars to the entertaining and instructive pages of Mr. Bond's book. Among the articles thus provided was a beautiful saddle, with scarlet ornaments and gilded reins, for the King's niece, the cost to be accounted to William de Harcourt, the King's chancellor, and to be paid for from the royal exchequer. It is pleasing to think that the weary hours of captivity, in the case of the Princess Elinor at least, were varied by occasional rides beyond the walls of her gloomy prison to enjoy the beautiful views of the surrounding country, but little changed perhaps in their general appearance with the revolution of eight centuries. If some leniency was shown to the princesses, very different was the treatment experienced by some of their fellow-captives. Of the 200 knights taken prisoners at the battle of Mirabeau and placed in different castles in Normandy and England, 24 were brought to Corfe Castle with orders to the constable to deal with them as the King should direct. Some light is thrown on the meaning of this sinister charge in a list of the prisoners given by Hugh de Neville, the constable, on his resignation of office the following year, to his successor, and which contained the names of only four of the original number. The others had, in fact, been starved to death by order of the King. Another act of John's cruelty in connection with Corfe Castle must be mentioned. Peter de Wakefield, of Pomfret, a great favourite of the populace and called by them "Peter, the Wise Man of England," ventured to predict that the King would not reign more than 14 years. The prophecy was in effect fulfilled, but not in the way which was expected, for in the 14th year of his reign John surrendered his kingdom to the See of Rome and became a vassal to the Pope. On being examined before the court, the King was so exasperated by his bold demeanour that he ordered him to be conveyed as a prisoner to Corfe Castle. Some of

my hearers may remember the scene as dramatised by Shakespeare in his "King John"—

King : Thou idle dreamer, wherefore didst thou so ?

Peter : Foreknowing that the truth would fall out so.

King : Hubert, away with him, imprison him ; and, on that day, at noon, whereon he says I shall yield up my crown, let him be hanged.'

He was, in fact, brought here, as I have said, and afterwards dragged by horses about the town of Corfe, together with his two sons, and then hanged. King John, who frequently visited Corfe Castle, spent nearly a month here in the last year of his reign. We hear little of Corfe during the reigns of Henry III. and Edward I. except as regards its architecture, of which I will speak presently when pointing out the important additions made to the Castle in these two reigns. Edward II., having been captured by the rebellious barons, was moved about as a prisoner from castle to castle, Corfe being one of the places of his detention, till at length he was murdered at Berkeley under circumstances of peculiar atrocity. The secrecy with which his places of confinement were changed led to the popular belief that the King was still alive and imprisoned in Corfe Castle. His brother, the Earl of Kent, being persuaded of the truth of the report, came here and endeavoured to gain permission to see him. This was refused, but the Constable undertook to convey a written communication to his prisoner. The Earl fell into the snare, and a compromising letter which he wrote being produced as evidence against him, he was condemned of high treason and beheaded. About 50 years later we find the inhabitants of Corfe and of the surrounding district rallying round the Constable of the Castle on the news of a threatened invasion by the French. At the present day a gallant little contingent in the town of the great army of citizen soldiers, called into existence by a similar threat across the channel a few decades ago, is a guarantee that the patriotic spirit of our ancestors still breathes in their descendants. After the end of the reign of Richard II. the Castle was given from time to time to royal favourites and relations, and as often reverted to the crown through debt or attainder. It ceased to be a royal possession in the 14th year of Queen Elizabeth, who sold it for the curious sum of £4,761 18s. 7½d. to Sir Christopher Hatton, who afterwards became Lord Chancellor, whose heirs, in 1635, sold it to Sir John Bankes, Lord Chief Justice, ancestor of W. R. Bankes, Esq., of Kingston Lacey, the present owner. The purchase, we may think, would scarcely have been made could the issue have been foreseen of the unhappy contest just then commencing between the King and Parlia-

ment. However, from this transference of ownership resulted an episode in the history of the Castle, the only one, I believe, recorded which appeals to the generous impulses of our nature. I refer, of course, to its heroic defence by Lady Bankes in 1643, which shed a halo of glory over its closing days. Time, on such an occasion as this, will not allow me to enter into the details of the memorable siege, and anything like an epitome would fail to do justice to the gallant conduct of the principal actors in it, which is fully portrayed in the story of Corfe Castle, by the late Right Hon. G. Bankes, and in an interesting book, "Brave Dame Mary." The merest outline must suffice here. During the absence of Sir John Bankes while attending on the King at York, an attempt was made by the rebels to gain admission into the Castle by stratagem, which, being discovered, the gates were shut and a regular siege commenced, led by Sir Walter Earle. Lady Bankes infused her own intrepid spirit into her little garrison, consisting only of a few soldiers, her attendants and maidservants, and with such vigour was the defence maintained that at length the assailants, after repeated unsuccessful attacks on the fortress, lasting over a period of six weeks, were compelled to withdraw on the report that a body of the King's troops were approaching to relieve the garrison. But it was only a temporary respite. In less than a year and a-half it fell into the hands of the Parliament. In the mean time Sir John Bankes had died, and Lady Bankes went to London. The Castle, now the property of their son, Sir Ralph Bankes, continued to hold out for the King, being garrisoned by the Royal forces, and after the capture of Bristol in October, 1645, was the only stronghold that remained faithful to the Royal cause. Every effort was therefore made by the Parliamentary party to reduce it, and its impregnable position might have enabled it to maintain its independence for an indefinite period had not treachery come to the aid of the besieging force sent against it. The governor, under pretence of strengthening the garrison, admitted 100 of the enemy's soldiers, and the defenders, seeing themselves betrayed, recognised the hopelessness of continuing the contest, and, after a slight show of resistance, laid down their arms. The news of the surrender of the Castle was received with unbounded joy by the Parliament, who immediately gave orders for its demolition. The decree was forthwith carried into effect. The larger masses of building were blown up with gunpowder, and the towers, being undermined and propped up by timber, which was afterwards burnt, subsided into the cavities or fell over, and nothing now remains of Corfe Castle but the picturesque ruins of what must have been one of the strongest fortresses in England. If some feelings of regret

are awakened in our minds by the scene of devastation before us, they are qualified by the reflection that, in obedience to the laws which govern alike the affairs of men and the operations of nature, out of death and destruction arise new and nobler forms of life; and, while we view here and in many a crumbling ruin in our land a type of the overthrow of that feudal system of which these vast creations of architectural skill are the exponents, we recognise the gradual growth of the noble edifice of English liberty, which may be said to have originated from the tyrannous acts of the king whose name, as we have seen, is more intimately associated with Corfe Castle than that of any other English Sovereign."

At the conclusion of the paper Mr. Mansel acted as guide over the ruins and gave many further particulars respecting them.

Some of those present availed themselves of Mr. W. A. Rixon's kind invitation to inspect the interesting features of his residence, Corfe Castle Manor House, and at 1.15 p.m. the party drove to Newton Manor, where the Club had been kindly invited to luncheon by Sir Charles and Lady Robinson. A sumptuous repast was served in the fine dining room, into which an ancient barn had been converted. The usual toasts of "The Queen" and "The Host and Hostess" having been duly honoured, the many objects of interest in the house and garden were inspected and an interesting paper describing them (which will be found in full later in the volume) was read by Sir C. Robinson.

LAKE VILLAGE AT GLASTONBURY.—At the request of the President, Professor Boyd Dawkins, F.R.S., who was present as a visitor, gave some of the results of the exploration of the lake village. He said that there was a closer connection than appeared at first sight between the Somerset lake village, discovered and explored by Mr. Arthur Bulleid, and the local interests to which the Dorset Society gave their chief attention. In the first place the beautiful designs on the pottery, and the work in wood and metal, might be appropriately mentioned after the admirable paper of Sir Charles Robinson on the art collections in his beautiful house. They consisted of designs, mostly in graceful curves and flamboyants, derived from the South of Europe in the prehistoric Iron Age, and belonging to a style older than the Greek and Roman art, many examples of which were in the house in which he was speaking. In the second place the whole group of remains in the lake village proved that the dwellers in the marshes of Somerset were in the same stage of culture and belonged to the same race as the builders of the great fortress of Maiden Castle that commanded the downs near Dorchester, and the line of strongholds which kept watch and ward over the Lower Stour and the Vale of Blackmore—Spettisbury, Hod, and Hambledon—a

group unrivalled in grandeur in Britain. The lake village consisted of a cluster of round huts built upon artificial platforms of clay and timber, surrounded by a stockade. It was made on the edge of a mere, now a tract of peat, and was then protected from attack by the sheet of water extended between it and Glastonbury, about one mile off. The huts, some 12ft. to 14ft. in diameter, were made of wattle and daub and had wooden doors between two and three feet high. Inside was a flat stone platform used as a hearth. The numerous remains in and around them proved that their possessors were advanced in an astonishing degree in the technical arts. They used iron axes, adzes, gonges, and saws in their woodwork, they reaped their wheat with iron sickles of various shapes, they were armed with iron billhooks, swords, spears, and daggers. They had iron chains. The scoriæ and the unfinished articles proved that the forges were in the village. They smelted lead ore from the Mendip Hills, and manufactured out of it spindle whorls and weights for nets. Some of the bits of glass slag made it probable that they carried on the manufacture of glass which they used for beads and rings—ruby, blue, and green—and other personal ornaments. They also were workers in bronze, and were probably the makers of the beautiful bronze bowl adorned with studs found in the village. They used bronze fibulæ, rings, pins, and mirrors, and added to their personal charms by red ochre and charcoal, the latter mixed with grease. They wore bracelets and armlets of Kimmeridge shale. They were also potters and used the lathe for the finer articles, although the coarser, for common domestic use, were made by hand. They were also spinners, and employed the loom in weaving. They excelled in the arts of carpentry, as was shown by the well-squared and holed beams, and the wooden buckets, dishes, and bowls, many with flamboyant incised patterns, and by the well-fitted wheels, ladders, and doors, and the handles of their implements and weapons. Canoes of oak gave them access to the mainland. They cultivated wheat on the adjacent land and kept horses, the small prehistoric shorthorn (*Bos longifrons*), sheep, goats, and pigs. They also hunted the red deer and roe in the forests, and trapped the beaver and otter in the marshes. Among the birds, mostly of the marshes, on which they fed, wild geese, swans, ducks, and pelicans might be noticed. The last had only been discovered in one other locality in Britain in a peat bog. In their herding and hunting they used big dogs. Their weapons were spears, arrows, slings, axes, billhooks, swords, and daggers, and they probably used the horse in warfare as well as for ordinary domestic purposes, the bits being of iron and of the snaffle type. The human remains, mostly skulls, found outside the stockade, told their

own story. Some were cut and broken, and some, including that of a woman, had been cut off the body and mounted on a spear, which had left its marks on the inside of the hole in the occiput for the admission of the spinal column into the brain. The heads had been cut off, carried on spears, and then probably mounted on the stockade in the barbarous fashion surviving in Britain till the end of the last century. A few human bones found inside the camp had been gnawed by the dogs, who probably brought them in. Two entire skeletons of infants were found buried in the huts. The next question to be considered was the race to which these people, who were at once herdsmen, tillers of the ground, skilful artificers, and hunters, belonged. They were small in stature, with well-proportioned oval heads and delicate features. They belonged to the small dark Iberic stock in the British population, whose remains occurred in the burial mounds of Dorset and Wilts, and whose remains had been discovered by General Pitt Rivers at Woodcutts. They were the representatives in the Prehistoric Iron Age of the people who inhabited the villages on the downs of Wilts and Dorset during the time of the Roman occupation, and who were now represented in the existing population by the small delicate-featured people with long straight noses and black hair, some of whom he had seen that day in Swanage."

The members then visited Swanage Church, on which the Rev. T. A. Gurney read the following paper :—

"The tower in which you stand is the oldest part of the parish church of Swanage, which was originally founded as a chapelry of Worth. A little way above Newton Manor, to the south, lies the old Press Way or Priest's Way, by which the priests of Worth Matravers used to come down to Swanage for their ministrations. It was a sort of private road which still connects Swanage with its mother parish, Worth. Exactly where the original church or chapel in Swanage was, in which the priests held their service, it is impossible to do more than conjecture now. But there can be very little doubt that it must have been close to or upon the site of the present church. The Rectory orchard has been proved by excavations to be a graveyard, and beneath the older part of the present Rectory are walls filled with windows and doors with stone arches. Possibly this was the chapel in this town. We who belong to Swanage would be very proud to claim in our present church some remains carrying us back to Saxon times, but reluctantly we are compelled by hard facts to forego the claim. There is very little doubt that a service was held in the chapel which I have mentioned from a very early period, possibly Saxon. But that building was not the building in which we stand to-day. The remains of that building are

to be found in the walls of the lowest portion of the present tower. You will notice, both within and without, certain stones which have very simple mouldings on them, which may have been either Norman or possibly even Saxon, which have evidently been taken from a previous building. They are, as you will doubtless notice, built in without plan or correspondence, and in their present position are clearly out of place. They indicate that the present tower was built with the help of materials taken either from a previous tower or a chapel. The splays of the north and south windows in the lowest part of the tower also appear to have belonged to other windows, if we may argue from the fact that they turn inwards at the edges and do not seem to fit the present lights. The height of this second building, which now forms the lowest portion of the present tower, is indicated by the set-offs just below the present ringers' floor. It communicated with the church by a segmental arch just under the present staircase. It was a short and exceedingly strong tower, like other church towers of the neighbourhood. It must have been entered by a door on the west side, and the narrow windows with their broad splays threw the light to the ground floor. The windows were rounded and segmental. The church which belonged to this short tower was probably an Early English one. Only a portion of it can be seen in the picture of this later (Perpendicular) church before you, forming the south transept. We have 'four-way' terminals of the same period over the Rectory entrance, indicating that the church was cruciform, and therefore had a transept. There are also some relics of Early English shafts with their central columns and capitals in the rectory garden. We believe that this church was built when the rectory was created about 500 years ago, and the parish separated from Worth. The windows in the north aisle of the present church were probably taken from this church, which was built not of Purbeck, but of Wiltshire stone. In the old south transept was a fine old sundial on the south side, with a gnomon of slate. A further story was added much later to the tower about 300 years ago. This later addition to the tower is half-a-foot less thick than the lowest portion. It was probably added when the Perpendicular church was built. The picture before you, drawn by the late Rev. J. M. Colson, shows a Perpendicular style. This church must have been built in place of the former Early English one at the time when the tower was added to. The only parts of it remaining are the Perpendicular window now on the south side of the nave, which used to stand at the east end of the Perpendicular church, as the picture shows, and the two windows in the south transept which used to be south chancel windows, and probably to

these we may add the oldest bell, which dates from 1594. There was a gallery on the north and west sides of the church, and the old south transept of the former Early English church was used for a vestry on the upper floor level with the old three-decker pulpit, which stood against the south wall of the church. The lower floor was a baptistry, where the old font now in St. Mark's, Herston, of Purbeck marble, stood. The church consisted then only of a nave and aisles with this old transept. The three-decker pulpit had a sound board above, on which was a dove with a holly leaf, and there were good old-fashioned pews where mind and body alike might repose during the service. No such fortune is allowed to the modern visitor to Swanage. The restoration of the church, if such a name can be properly used, took place in 1860, and was carried out by Mr. T. H. Wyatt, under the direction of the late Rector, the Rev. R. D. Travers. The interior of the tower was thoroughly restored in 1888 by the Church Lands Trustees, a local ecclesiastical charity. The present floors were put in and the old oak framework of the bells, which was very rotten, was removed, and the bells rehung by Messrs. Taylor, of Loughborough. The present framework is of iron and A shaped. At the same time four new bells were added as a gift from Mr. George Burt to the memory of his wife. The inscriptions on the old bells are: 'Thinke on God, I.W., 1594,' 'Fear God, I.W., 1612,' 'Honour the King, I.W., 1621,' 'Lester and Pack of London fecit, 1764.' It seems likely that the original approach to Swanage from Corfe was along the valley, entering the village from Church Bridge, the little bridge just north of the church. If this be so, and there are signs of such a road up the valley for some distance, then the church occupies a similar position to St. Martin's, Wareham, at the entrance to the town. This would be the junction of roads from Gollingstone, Corfe, Studland, and Goathorn. This was then the only bridge across the stream. We may, perhaps, go further and connect this fact with St. Aldhelm as its original founder, inasmuch as such a rule was largely adopted in Saxon times. In the church you will find several monuments bearing quaint inscriptions. One stone to a member of the Clavell family dates from 1470. This is an ancestor to the Clavell of whom we read in the curious old rhyme in Kimmeridge church. It had three effigies in brass, one male and two female figures. Our parish registers date from 1563. They contain some curious entries. Amongst the most noteworthy parochial entries in the parish accounts are the entries of the charges for French prisoners quartered on the parish during the great war, who, alas, never saw the dear shores of sunny France again, for the last of a long series stretching over several years are the

entries for their shroud and grave. There are also accounts of subsidies made to the stone trade in the French War, when it was unsafe to convey stone by sea. The order for the execution of the Monmouth rebels used to lie in the safe in the memory of recent inhabitants. The order directed that the parish should pay the cost of the execution. There are several stained-glass windows in the present church. Two in the south transept are put up in memory of John and Susanna Mowlem, a name which has long had an honourable connection with Swanage. Another in the same transept is raised to the memory of the children and grandchildren of George and Elizabeth Burt. The windows in the north transept are to the memory of Thomas Randell and William Moreton Pitt, the latter of whom built the Victoria Hotel. The east window in the chancel was put in by the Coventry family, formerly in possession of the Grove, Swanage, and there is a second window to the memory of Rear-Admiral Sir Eaton Travers. The window in the south side of the nave is to the memory of Elizabeth Sophia Sewell, daughter of the late Mr. George Burt. That in the north aisle was placed by Miss Colson to the memory of her father, the Rev. J. M. Colson. For the views expressed in this paper I am indebted to Mr. W. M. Hardy, who has made me his convert as to the age of the church. To remind you all of the contrast between the shortness and frailty of our own lives and the solid endurance and strength of these sacred walls, within which for a few brief minutes we stand, I will quote the curious inscription on the brass which you will see just inside the door of the church, which bears the date 1510: 'Such as I was, so be you, and as I am so shall you be and of the soule of John Harvey God have mercy, the which deceased the 17 day of March, 1510.'

Mrs. Everett, of Peveril Tower, had kindly offered tea to those present, and the party proceeded to her house, in the grounds of which stands the tower, an interesting relic of Old London.

The train left Swanage at 6.45 p.m.

NEW MEMBERS.—Nine were elected.

THE FIRST INDOOR WINTER MEETING was held on Friday, November 20th, 1896, in the Reading Room of the County Museum, Dorchester, at noon, and was attended by about 40 members, the President occupying the chair.

NEW MEMBERS.—Four were elected.

EXHIBITS.

By the PRESIDENT :

(i.) A bottle containing, in spirits, scorpions, locusts, spiders, dragon-flies, lizards, &c., all from the Soudan, collected by Captain Astell.

By Mr. HONEYWELL :

(ii.) Photograph of a stone from Lulworth Cove, containing what bore a strong resemblance to a fossil fish, but was more probably a mark in the stone of peculiar shape.

By the HON. TREASURER :

(iii.) A pear covered with a scale insect, *Mytilaspis pomorum* Bouché (= *linearis*, Geoffrey).

This scale occurs in N. Zealand, America, Teneriffe (at 7,000 to 8,000ft. on *Cytisus nubigenus*), and Guernsey. It is found on apple, elm, ling, and broom. Up to June, 1893, the male scale had not been observed in this country. It was found in Guernsey on broom on May 7th, 1893 (Entomologist's Monthly Magazine, xxvi., 226 ; xxix., 138). In Entomologist's Monthly Magazine, xxxi., 85, there is a record of four specimens (with other *Coccidæ*) found in the stomachs of the blue and long-tailed tits, and the tree creeper and marsh tit have been seen eating them. The male scale has lately been found in plenty in England.

By Miss DANSEY :

(iv.) Two gold armlets weighing about 3oz. and 1oz. respectively, which had been found on the Chesil Beach, near Portland. These excited considerable discussion, and several theories were propounded. The larger one, which is plain except for a very little lattice work ornamentation near each end, has been pronounced at the British Museum to be early British in make.

By Mr. E. CUNNINGTON :

(v.) The Humerus of a *Cimoliosaurus* from the Cornbrash at Radipole. (Presented to the Museum.)

(vi.) A leaf, measuring 2ft. × 1ft., of *Melianthus*, a Sicilian ragwort, growing 12ft. high with purple and yellow flowers.

(vii.) Flints from Agglestone.

By the HON. SECRETARY :

(viii.) Three drawers of moths from the Museum Collection.

By the Rev. O. M. RIDLEY :

(ix.) A leaflet on the Codlin moth (*Carpocapsa pomonana*), the larva of which was so destructive to apples.

By F. J. BECKFORD, Esq. :

(x.) Two square gunflints dredged up by himself from the wreck of the Royal Adelaide off Portland, which was wrecked about 80 years ago. These flints were specially interesting from the fact that a sort of skin or patina had formed on them, as on ancient flints, doubtless partly caused by the action of the sea-water, giving them thereby a much more antique appearance than properly belonged to them.

GENERAL BUSINESS.

LONG BARROW ON RAWSTON DOWN.—A discussion took place as to the best method of proceeding with regard to this barrow, which was partly excavated before the Blandford Meeting in August last. The two plans proposed were (1) that the excavation of the trench made by Mr. Cunningham shall be continued at a cost of about £2 10s. ; (2) that the barrow should be left in its present condition until someone should be found who would undertake the investigation in the manner proposed by General Pitt-Rivers, by which the whole barrow would be removed and the exact position of every potsherd and bone noted. This would, however, be expensive, and cost at least £100. It was eventually decided to leave the matter to General Pitt-Rivers, who undertook to deal with it, and the trench dug by Mr. Cunningham in August was filled in until operations could be recommenced.

ARRANGEMENT OF SUMMER MEETINGS.—It was resolved, on the proposition of Rev. H. S. Solly, seconded by Mr. J. H. Phillips, that the sites and dates of the summer meetings should in future be arranged by the officers of the club, instead of being decided on by the vote of those present at the annual meeting as hitherto.

THE TRANSACTIONS OF THE FOLLOWING SOCIETIES were received by the Club and presented to the Museum:—Reading Literary and Scientific Society, Bristol Naturalists' Society, Manchester Microscopical Society, Geological Institution of the University of Upsala, Sweden.

PAPERS.—The President's Address intended for last May was first read by him (see under account of Annual Meeting), and acknowledged by a vote of thanks proposed by Rev. Sir Talbot Baker and seconded by the Hon. Secretary. Five papers were read, of which the first four will be found at length in the present volume.

(1.) "A list of the Fishes of Dorset with a short account of their Means of Capture," by F. J. Beckford, Esq. This was illustrated by a series of nets and models, of which latter Mr. Beckford kindly presented some to the Museum.

(2.) "The Origin of the Vale of Marshwood and the Greensand Hills of West Dorset, by A. Jukes Browne, Esq., F.G.S. This paper was read by the Hon. Secretary. It had been prepared in anticipation of the visit of the Club to Pilsdon last September, which was postponed. The Pilsdon Meeting was held, and the paper again read on the top of Pilsdon Pen on June 8th, 1897.

(3.) "The Arms of Dorchester and Dorset," by Sir R. P. Edgcumbe. This was illustrated by specimens of the various designs of the arms in

use, together with a coloured drawing of the correct Arms of Dorchester, which the author kindly presented to the Museum

(4.) "Notes about the possible finding of Traces of Destroyed Earthworks and Buildings," by H. J. Moule, Esq.

(5.) "A short account of the very successful restoration of Charminster Church," by W. Albert Bankes, Esq., which is given below:—

"I feel that the parishioners of Charminster owe so much to the Field Club, and to the Rev. Sir Talbot Baker, Bart., in particular, for the interest they took and the advice they gave prior to the commencement of the restoration of Charminster Church, that the least that we can do is to acknowledge our indebtedness to the club, and to state in as few words as possible the almost miraculous change that has taken place in this church, both externally and internally, during the amazingly short period of some eight months. This time last year a hideous gallery altogether blocked out the beautiful western arch supporting the tower. The pillars, stonework, and walls were inches thick in whitewash, the roof leaked like a sieve, and the pews were of the worst and most uncomfortable loose-box style. Some £3,000 was the sum required to improve this state of things, and where was so large a sum of money to come from. But in England any project which is practical and really wanted seldom fails from lack of funds. In the case of Charminster Church the greater part of the money was raised in the parish itself, the remainder being given by outside friends or made by bazaars, concerts, and collecting cards. The work owed much to its committee, Mr. Ponting, the Diocesan Architect, Mr. Merrick, of Glastonbury, the builder, Captain Dymond, the energetic treasurer, and last, but by no means least, to the almost total absence of wet until nearly the completion of the whole work. On scraping the walls several texts were found under the whitewash. They seem to have been painted up anywhere and anyhow, and some are perfectly crooked. Over the chancel arch is a very rough fresco of our Lord carrying a pennant and holding out His hand in blessing a kneeling figure. Over the fresco were the Commandments (not the Prayer Book version), and later still, on the top of these, the Royal Arms. Four Norman slit windows, two on each side of the nave, were discovered, re-opened, and glazed, and add to the general appearance of the church, as well as making the interior of the building much lighter. A squint was re-opened on the north side of the chancel arch, as also the top and bottom doorways of the old roodloft staircase. I cannot do better than here quote from a letter I have recently received from Sir Talbot Baker: "I do not wonder," he writes, "that the work meets with universal approbation. I myself was

astonished at the way in which effects were produced in the church. I had no idea how much longer the body of the church was made to look by the lowering of the floor and the raising of the roof. The north aisle, too, is rendered a quite suitable adjunct to the church by the same process. None but an expert, perhaps, would find out that it was built, not at the date it represents—namely, the latter part of the 15th century—but in the early part of the 19th. The two wings of the tower come out very effectually, and I think are quite unusual features in a parish church. Mr. Mayo, of the Somerset and Dorset Notes and Queries, said in his experience they were unique, but above all the best has been made of the chancel difficulty. It looks to my eye quite suitable.” Such are the flattering remarks of Sir Talbot, and his concluding words as to the solution of the chancel difficulty is my main reason for writing on a subject that the Field Club might at first have thought too local for me to have troubled them with. Our difficulty was this: The old Norman arch was too low and narrow for musical purposes. With a full choir there was no room for the singing to get out, so that whilst the clergymen when doing duty in our chancel complained that their heads were nearly split in two by the chanting and hymns, there was scarcely sound enough in the body of the church to lead the singing, and I have known the organist in the west gallery being forced to give up accompanying the choristers as a bad job, and then the choir lost courage and the hymn broke down in the middle. Prior to the restoration of the church the committee had to face this difficulty. Some were for pulling down the old Norman arch and replacing it by a high Gothic arch similar to that at the west end. Others said if the Norman arch was touched they would neither subscribe a penny nor ever enter the church again. A deadlock seemed imminent, when someone suggested ‘Let us ask the opinion of the Field Club.’ The matter was laid before the club at a winter meeting some two years ago. Valuable suggestions were made by several members, and Sir Talbot Baker most kindly consented to inspect the church and give us the benefit of his opinion. The result was that the difficulty was most amicably and successfully solved by the arch being left untouched. The choir stalls were placed at the west side of the chancel arch in the nave, and the chancel now only contains the Communion table, the voices and organ now being in the body of the church. The singing is all that could be desired. Until the nave and aisles were completed in September last the intention was to re-build our chancel at its original length, but everyone visiting the church is now of opinion that we had better leave well alone. At Montacute Church, near Yeovil, in Somersetshire, the choir stalls are arranged on the west

side of the arch as now at Charminster, but they have a long chancel with pews on either side, the occupants of which look very out of place, sitting between the altar and choir, and as for hearing the sermon, that is quite out of the question for them, and they might just as well remain at home. In conclusion, then, the moral of this story and the object of this paper is to suggest the desirability of not leaving our parish churches to the mercy of local clergy, churchwardens, or parishioners, but, following our example in Charminster, advice should first be sought at the hands of some committee or body of people interested in such matters, such as our Dorset Field Club in a county like Dorset, which luckily possesses a Field Club, or where, as in benighted counties, there is no Field Club, then some committee of archæologists should be formed to preserve churches from ruin and the parishioners from unseemly squabbles."

The meeting terminated at 5.0 p.m.

THE SECOND WINTER MEETING of the Club was held in the Reading Room of the Dorset County Museum at noon on Wednesday, February 17th, 1897, about 50 being present. In the absence of the President, through ill-health, the chair was taken by Rev. Sir Talbot Baker.

NEW MEMBERS.—Eight were elected, including Mr. W. H. Hudleston, F.R.S., late President of the Geological Society. The Hon. Secretary congratulated the club on this accession to their membership, and expressed his pleasure at Mr. Hudleston having come to live in the county.

EXCAVATIONS NEAR BLANDFORD.—A letter from Rev. James Cross was read, calling attention to the proposed widening of the line from Baillie Gate to Blandford, and suggesting that the Museum should endeavour to obtain any antiquities that might be found in the course of the work.

DORSET SHELLS.—The President asked for any information on this subject, as his book would be published before long. He had records of about 384 species, including the land and freshwater and also the marine species.

THE MUSEUM ENTOMOLOGICAL COLLECTION.—The Hon. Secretary called attention to this, which was progressing very favourably and had a good number of species represented. He hoped that anyone who could do so would send donations of lepidoptera, &c., and shewed a box of moths he had just received from Mr. E. R. Banks.

ROYAL ARCHÆOLOGICAL INSTITUTE.—Sir Talbot Baker stated that the meeting of the institute would be held at Dorchester from August 3rd to 10th next, and gave particulars as to the terms of membership, &c., for members of the Dorset Field Club.

BRITISH ASSOCIATION REPORT, 1896.—This was acknowledged by the club and presented to the Dorset County Museum.

EXHIBITS.

By Dr. A. MACLEAN :

(i.) A specimen of a grass-snake preserved in a solution of one part of Formalyn in 30 parts of water. This is stated to be an excellent preservative of colour, and is much cheaper than spirit.

By Dr. BROWNING :

(ii.) Two carved elephants' tusks from West Africa, of which the following account is furnished by the exhibitor :—" The beautifully carved elephant (adult and baby) tusks are of interest, not only from the skill displayed in carving them with rude and imperfect tools, but from their evident antiquity of more than 300 years, and their curious similarity in design and mythological import to the Runic Sagas carved on walrus tusks formerly used as Norse horns. They were procured by a friend of mine, J. S. Stanton, Esq., R.N., some 40 years since when at Sierra Leone, and were part of the spoils of a former successful raid into the Gold Coast Hinterland, where and when I am unable to say. They are believed to represent the traditional myth known only by medicine men and great chiefs of the genesis of the human family, due to the direct intercession of some of the younger gods with the All Mother and All Father ; and the consequent creation of the Earth Goddess is engraved on the extremity of the large tusk, while in a similar situation on the smaller is portrayed the perennial advance of never-failing youth. The probable date of this work is about the middle of the 16th century, since the petronels and muskets of the escorting gods are fitted with wheel-locks, and one of them carries a Portuguese machete. The serpent emblem of eternity is well delineated on the small tusk. Its existence on the large one is not so definitely pronounced, but as snakes are always fetish with the negroes I believe it to be there. On the large tusk are 30 gods and goddesses, great and small, in various attitudes of supplication, escort, and protection ; on the smaller 15 children and youths passing through the course of life."

By Mr. CLEMENT REID, F.G.S. :

(iii.) A further note on worked flints from Blashenwell, which is printed as an addition to his paper at p. 67 of Vol. XVII. A well-formed celt has since been obtained from the Blashenwell deposit by Captain G. R. Elwes and presented by him to the Museum.

By Mr. A. M. WALLIS :

(iv.) Twelve Roman bronze coins from Portland.

(v.) Part of the trunk of "Quebracho negro," a tree from Paraguay, much bored by the larva of a large longicorn beetle. The wood is of a red colour, and extremely hard and heavy. It is used for tanning, and

a ship with a cargo of it having been wrecked at Portland about three years ago this piece, with others, was preserved. The wood is said to be very durable either in earth or water. Mr. F. J. Beckford stated that African blackwood, another very hard wood, was often bored by beetles.

By the HON. SECRETARY :

(vi.) A stuffed Egyptian goose, one of a flock of four which was shot on Fleet Backwater on January 13th, 1897. The specimen was presented by Mr. Richardson to the Museum.

By Rev. G. B. LEWIS :

(vii.) Two small modern copies in bronze of the famous centaurs in the Capitoline Museum at Rome, which were recovered from Adrian's Villa. The originals are in black-green marble, and are considered to be the work of a Greek sculptor in the 5th Century, B.C. The victor is represented as shaven, whilst the vanquished centaur is heavily bearded and unshorn.

By Mr. E. CUNNINGTON :

(viii.) A small bronze stud, which he believed to be used for fastening the outer metallic rim or "antyx" of the shield to the inner framework formed of wickerwork and hide. The stud was found by him on the Roman road a mile from Dorchester and presented by him to the Museum.

PAPERS.—Five were read, as follows, all of which will be found in full in the present volume.

(1.) "British Arachnida observed and captured in 1896," by the Hon. Treasurer, illustrated by drawings of the spiders described.

(2.) "On an undescribed fish of the genus *Pholidophorus* from the Oxford Clay, Chickerell," by Arthur Smith-Woodward, Esq., F.G.S.

The fish which was the subject of this paper was exhibited by the Hon. Secretary, to whom it belonged. It was found by splitting a block of the laminated clay which occurs in some parts of the Oxford Clay at Chickerell, and contains numerous fossils, generally in a rather delicate and crumbling state. This specimen was treated with a mixture of coaguline and water, which had preserved it very successfully.

(3.) "Dorset Clothes-Moths and their Habits," by the Hon. Secretary, illustrated by specimens of the moths and larvæ and coloured drawings by Mrs. N. M. Richardson.

(4.) "The Pagan-Christian Overlap of the Wise Bird, with Dorset Illustrations," by H. Colley March, Esq., M.D.

(5.) "An account of the Albian Fossils lately discovered at Okeford Fitzpaine, Dorset," by R. Bullen Newton, F.G.S., both papers being illustrated by plates and drawings.

The meeting ended at about 4.0 p.m.

Forset Natural History and Antiquarian Field Club.

RECEIPTS and EXPENDITURE from May 4th, 1896, to May 11th, 1897.

Cr.

	£	s.	d.		£	s.	d.
RECEIPTS.							
By Balance from last year		0	18	8			
" Subscriptions and Arrears		147	16	6			
" Sale of Paper on "Phalangidea"		0	5	0			
" Ditto, Vols. of "Proceedings"		8	10	0			
" Donations to "Plate Fund"		1	5	0			
					28	13	11
					1	1	0
					0	7	6
					0	2	0
					2	3	6
					101	0	0
EXPENDITURE.							
Aug. 21.—Balance due to Sims and Co.							
Engraving Plates—							
West and Sons, 1 Plate		2	18	3			
Mintern Bros., 1 ditto		3	10	0			
Meisenbach Co., 2 ditto		3	3	8			
McFarlane and Co., 1 ditto		3	0	0			
Werner and Winter, 1 ditto		16	2	0			
					28	13	11
Bright and Co.—Vols. II., III., IV., V. "Proceedings"							
S. Flander—Filling in Barrow near Blandford							
National Provincial Bank—Cheque Book							
Stamps—Treasurer							
Messrs. Sims and Co., on Account of Bill, 1896-97							
Programmes, 6 Meetings		9	0	0			
Advertising ditto		1	12	10			
Printing, &c., for Salisbury Spire Fund		1	4	6			
Ditto, Receipt Forms		2	5	0			
Ditto, Observation Schedules		6	6	6			
Ditto, Authors' Copies		5	9	2			
Postages, &c., of Vol. XVII.		100	10	0			
Printing, &c., 350 Copies Vol. XVII.							
					£127	8	0
					101	0	0
					£26	8	0
Balance							
Balance in hand							
					0	12	8
					£158	15	2

Dorset Natural History and Antiquarian Field Club.

Dr.

HON. SECRETARY'S ACCOUNT from May 1st, 1886, to May 1st, 1897.

Cr.

	£ s. d.	EXPENDITURE.	£ s. d.
RECEIPTS.			
1896.			
May 1st.—Balance from last Account	0 11 3		
By Balance on Incidental Expenses at Meetings .. .. .	.. .. .	1896 and 1897.—H. Voss for Meetings May 7th, Nov. 20th, and Feb. 17th	0 15 0
at Reading, Blandford, and Swanage	3 19 6	Hon. Sec., Postages, &c. .. .. .	.. .. .
1897.			
April 30th.—Deficit	0 0 5		
	<u>£4 11 2</u>		<u>£4 11 2</u>

Dr.

GENERAL STATEMENT, May 11th, 1897.

Cr.

	£ s. d.	EXPENDITURE.	£ s. d.
RECEIPTS.			
By Arrears of Subscriptions due :—			
From 1 Member, 7 years	10 0	By Balance due to Sime and Co. .. .. .	.. .. .
" 1 ditto 6 years	3 0 0		
" 4 ditto 5 years	10 0 0		
" 13 ditto 3 years	19 10 0		
" 16 ditto 2 years	16 0 0		
" 39 ditto 1 year	19 10 0		
—	<u>74</u>		
" 258 ditto, for Current Year	129 0 0		
By Balance in hand from this Year's Account	200 10 0		
	<u>0 12 8</u>	By Balance in favour of Club .. .. .	.. .. .
	<u>£201 2 8</u>		<u>£201 2 8</u>

SPECIAL DONATIONS OF PLATES, PRINTING, &c.,
TOWARDS VOL. XVIII.

FROM H. COLLEY MARCH, ESQ., M.D.

Plates to illustrate his paper on "The Pagan-Christian Overlap of
the Wise Bird, with Dorset Illustrations."

FROM HENRY S. EATON, ESQ.

Printing Paper on "Dorset Monthly Rainfall, 1856-95."

DONATIONS TO PLATE FUND, 1896-7.

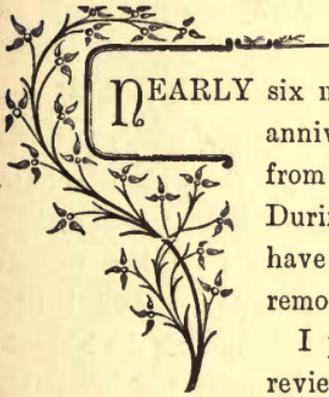
	£	s.	d.
Mrs. Forrester	0	5	0
R. S. Clarke, Esq.	0	10	0
Rev. John Bond	0	10	0
TOTAL ...	<u>£1</u>	<u>5</u>	<u>0</u>

The thanks of the Club are also due to those Artists who have given their time and skill in making the original drawings for the plates contained in the present Volume.



Anniversary Address of the President.

(Read May 13th, 1897.)



NEARLY six months have elapsed since I read my last anniversary address, which had to be deferred from the usual spring to the winter meeting. During this short interval I am glad that I have not the melancholy duty of recording the removal of a member by death.

I propose to commence my address with a review of the physical and biological phenomena of the sea, from the shore to the abyssal depths—a subject which has much interested me when preparing materials for a volume on “The Shells of Dorset,” which I hope to bring out before the end of the year, as a companion to my two other volumes, “The Birds and the Flora of Dorset” and then to continue with a few remarks upon the climates of past ages evidenced by plants. The records of the fauna of the sea, unlike those of terrestrial surfaces, show considerable changes in their forms of life, and the frequent introduction of new species which, although approaching each other, never meet. During long periods of time not marked by any sweeping change, such as when the liassic beds were being laid down, many species apparently lived unmodified from first to last. If any differences occur they may be attributable to the close proximity of currents at different temperatures, each of them characterised by special forms of life, some of which so widely differ as to present quite a different facies, showing that

sediments exhibiting great diversities may not only be strictly contemporaneous in time, but also closely approximate. Thus the law of distribution of species presents itself in a very unstable aspect, when it is seen to depend on a slight physical change, but quite enough to deflect a current. Some marine area must be chosen to attain a continuous and complete record of the history of life upon any given portion of the globe, the surface of which has been for a long period of time uninterruptedly occupied by the sea. Such areas are supposed to exist in the abyssal depth of the ocean ; if so, all the conditions for a perfect continuity of life would be present in that area.

Until the expedition of "The Challenger" and that of the "Fram" it was supposed that a uniform or approximately uniform temperature prevailed at the greatest depths in every latitude. Dr. Nansen found in the Polar basin warm water at a temperature higher, more briny, and clearly originating from the warmer current of the Gulf Stream, diving under the colder, but lighter, and less briny water of the Polar Sea, thus dissipating the hitherto entertained idea that a low uniform temperature invariably prevails at the greatest depths in every latitude, and was a part and consequence of a general system of oceanic circulation. The permanent low temperature of the bottom water of the sea at great depths would impose limits for the migration of species as equally effective as the highest ranges of mountains upon land, and such a condition of things no doubt exists in areas not affected by the Gulf Stream. The great importance of dredging was recognised about 50 years ago. Previous to that date, the little that was known of the inhabitants of the sea was not much beyond low-watermark, and seems to have been gathered almost entirely from the objects thrown up on the beach after storms, or from chance captures by fishermen or in trawls. The naturalist's dredge seems never to have been used for a systematic investigation of the fauna at the bottom of the sea. At the Birmingham meeting of the British Association in 1839 a committee was appointed "for researches with the dredge with a view to the investigation of the

marine zoology of the British Seas, the illustration of the geographical distribution of marine animals, and the more accurate determination of the Pliocene period (the geological epoch immediately preceding the present time)." The late Professor E. Forbes was the ruling spirit, and under the influence of his enthusiasm great progress was made in the knowledge of the fauna of the British seas. It was then supposed that the zero of animal life was approached at the 100-fathom line. In 1839 the Admiralty placed the "Porcupine" under the orders of a committee consisting of Dr. Carpenter, F.R.S., Dr. Gwyn Jeffreys, F.R.S., and Professor Wyville Thompson, F.R.S., to work a series of dredgings in the North Atlantic to the north and west of the British Islands, which were carried on successfully to a depth of 2,435 fathoms (upwards of two miles and a-half) in the Bay of Biscay.

The fauna of the deep water of the western coasts of Great Britain and Spain and Portugal showed a marked relation to the faunas of the early Tertiary and the later Cretaceous periods. These results revolutionised the ideas of E. Forbes, who had divided the area occupied by marine animals into eight zones of depth in which he supposed animal life gradually diminished with increase of depth until a zero was reached at about 300 fathoms.

In the winter of 1872 by far the most important expedition in which systematic dredging had ever been made a special object left Great Britain, when H.M.S. "Challenger," of 2,306 tons, was sent to investigate the "physical and biological conditions of the great ocean basins." About 70,000 nautical miles were traversed in three years and a-half, successful dredgings were carried out fifty-two times at depths exceeding 2,000 fathoms, and three times at depths exceeding 3,000 fathoms. Animal life was found to exist at all depths. Beyond the depth of 400 or 500 fathoms the faunas in all parts of the world had much the same general character. Animal life was found less abundant at the lower than at the more moderate depths, but, as well-developed members of all the invertebrate classes occur at all depths, this depended probably more upon causes

affecting the composition of sea-bottom deposits and the supply of oxygen, carbonate of lime, phosphate of lime, and other materials necessary for their development, than upon conditions immediately connected with depth. One of the results of the "Challenger" Expedition is to know that the fauna of deep water is principally confined to two belts—one at and near the surface and the other at and near the bottom, leaving an intermediate zone in which the larger animal forms, vertebrate and invertebrate, are nearly or entirely absent. Among the abyssal fauna, mollusca, crustacea, and annelida are on the whole scarce, while echinodermata and porifera greatly preponderate. Depths beyond 500 fathoms are inhabited everywhere by a fauna which presents generally the same features throughout. Deep-sea genera have usually a cosmopolitan extension. The abyssal fauna is more nearly related to the fauna of the Tertiary and Secondary periods than that of the shallower water. The peculiar adaptations to the conditions of their existence among deep-sea animals point to the struggle for existence being not less severe in the deeper regions than elsewhere. Phosphoric light plays an important rôle in the economy of the deep-sea life. Some species, in addition to large eyes, are provided with a sort of bull's-eye lantern, from which streams of light are thrown out at the will of the animal. Phosphorescent organs act also as a lure, or they may indicate the presence of prey or the passage of an enemy. In the shallower parts of the ocean the materials at the bottom are assorted and distributed by the currents in a way which produces a great variety of conditions. In some places there are siliceous and calcareous sands, in other places dead shells, and pebbles, rocks, and boulders prevail on submarine banks, fine mud and clays in depressions. On each of these bottoms there is usually a very different assemblage of animals.

With increasing depth not only the nature of the deposits, but the other physical conditions, become more and more uniform till a depth is reached along the continental shores facing the great oceans, immediately beneath which the conditions become nearly uniform, and where the fauna likewise presents a great uniformity.

In all the deeper zones the number of genera is very large relatively to the number of species. Thus the 153 undoubtedly sea-bottom-living species taken in the zone deeper than 2,500 fathoms belong to 119 genera, whereas in the zone between 100 and 500 fathoms there are 1,887 species to only 771 genera, and in the still shallower from 0 to 100 fathoms there are 4,248 species and only 1,438 zone genera. Many of the deep-sea animals, especially those found in very deep water far from land, show archaic characters and represent ancient groups, but those which flourished in very remote geological periods are not represented at the present day. The ocean had a much higher temperature than at present. Life was either absent, or represented by bacteria and other low forms, as is the case in the Black Sea, where there is an insufficient supply of oxygen to support a deep-sea fauna. It is interesting to compare the very slight development of shell and carbonate-of-lime structures in the cold waters of the polar-seas with the massive coral-reefs of Palæozoic and even later geological times, when the temperature of the sea must have been 65 or 70 degrees Fahrenheit at the Poles. The carbonate of ammonia secreted by marine animals, decomposing the sulphate of lime in sea water, produces insoluble carbonate of lime for shell making, precipitation taking place very slowly in water of low temperature, but very rapidly in water of high temperature. The Arctic Sea abounded with corals in the Carboniferous age, and it was not until Mesozoic times that a differentiation into zones of climate commenced and a cooling at the poles, where the temperature did not admit of coral reefs in the polar area. Temperature is a more important factor in determining the distribution of marine organisms, mostly cold-blooded, than in the case of terrestrial species, which are mostly warm-blooded and air-breathing animals, their distribution depending rather upon topographical features than upon climatic conditions. The Arctic and Antarctic fauna and flora resemble each other. Of these there are a large number of identical and closely-allied species, though quite unknown in the intervening tropical zone. The great majority of the deep-sea species live by eating the surface layers of

the mud, clay, or ooze, and by picking up the small organisms which fall from the surface. Usually species are most abundant in the shallow waters near land, decreasing in numbers with increasing depth; but in the polar regions there are indications of a more abundant fauna in depths of 50 or 150 fathoms than in shallower water under 50 fathoms. Foraminifera (minute animals belonging to the sub-kingdom Orotzoa), all of which live abundantly at the surface and at intermediate depths, and at death fall to the bottom, making up with coccoliths and rhabdoliths, a small proportion of the spines and tests of radiolarians and fragments of the spicules of sponges, the *globigerina-ooze*. The shells of *globigerina* make up three-fourths of the ooze, which occupies a belt of depths down to 2,000 fathoms round the shores outside the belt of shore-deposits. About 20 per cent. of the ooze consists of coccoliths and rhabdoliths, which are in all probability algæ of a peculiar form, or their sporangia. Passing on to deeper soundings, this calcareous formation is gradually replaced by an extremely fine clay at depths below 2,500 fathoms, consisting almost entirely of a silicate of red-oxide of iron and alumina. The transition is very slow, and extends over several hundred fathoms of increasing depths. Wyville Thompson, director of the civilian staff of the "Challenger" Expedition, concludes that the "red clay" is not an additional substance introduced from without, but that it is produced by the removal, by some means or other, of the carbonate of lime, which forms about 93 per cent. of the material of the *globigerina* ooze.

The most remarkable result of the "Challenger" Expedition is the final establishment of the fact that the distribution of living beings has no limit, but that animals of all the marine invertebrate classes, and probably fishes also, exist over the whole of the floor of the ocean. The distribution of life evidently depends upon the nature of the sea-bottom. Thus over the vast areas where it consists of red or grey clays animal life is scarce, and is represented by shell-less orders. The fauna at great depths is remarkably uniform. Species nearly allied to those found in shallow water of

many well-known genera are taken at the greatest depths, so that the enormous pressure, the utter darkness, and the differences in the chemical and physical conditions of the water do not influence animal life to any great extent. The geographical extension of any species appears to depend mainly upon the maintenance of a tolerably uniform temperature and an adequate supply of suitable food. No plants live at great depths in the sea; what is usually understood by vegetation is practically limited to depths less than 100 fathoms. Very few of the higher algæ live even occasionally on the surface of the sea. The exception is the gulf-weed (*Sargassum bacciferum*). Confervoids and unicellular algæ do occur occasionally, and sometimes in such profusion as to discolour the water over an area of many miles. Diatoms are found on the surface in abundance, their frustules occur in all deep water deposits. The foraminifera and radiolarians behave in a similar manner, occurring on the surface and in the intermediate water. The deep-sea deposits of the foraminifera contain over 40 per cent. of carbonate of lime, consisting principally of their dead shells. In some localities the percentage is as high as 95 per cent. The deep-sea diatom-deposits contain on an average about 25 per cent. of carbonate of lime.

In 1857 Captain Dayman sounded across the North Atlantic between Valencia and Newfoundland. The soundings were examined by the late Professor Huxley, who found them composed mainly of the dead shells of pelagic foraminifera (*globigerina*, &c.), and considered them of high scientific value on account of their depth. There can be no doubt that there is a vast sheet of rock forming at the bottom of the present ocean which closely resembles chalk, and there can be as little doubt that the Cretaceous formation, which in some parts of England has been subjected to enormous denudation, was produced in the same manner and under closely similar circumstances. In almost all of these the remains of Foraminifera are abundant, some of them apparently specifically identical with living forms. There are, however, important differences between the chalk of the Cretaceous period and the

chalk-mud of the present Atlantic. The white-chalk is very homogeneous, more so perhaps than any other sedimentary rock, and may be said to be almost pure carbonate of lime. Although the white-chalk is almost always associated with chert and flints, the chalk itself does not contain a particle of silica. The chalk-mud of the Atlantic, on the other hand, contains from 20 to 30 per cent. Although the chalk of our cliffs is of the purest form, it assumes a very different character in various parts of the world. Sir Joseph Prestwich instances a bed of white chalk from 23 to 30 feet (*Terrain Sénonien*), of Touraine, in which carbonate of lime is entirely absent. A considerable proportion of the silica of the chalk-mud consists of the spicules of sponges, of the spicules and shields of *Radiolarians*, and the frustules of *Diatoms*. The layers of flinty masses of nearly pure silica show frequently the external form of more or less regularly-shaped sponges, frequently filling up the cavities of Echini and Bivalves. We often see the flint filling up the cavities of *Galerites albogalerus* or *Ananchytes ovatus*, showing at the oral opening of the shell a projecting knob. We have no escape from the conclusion that after the death of the urchin the silica percolated into the shell in solution, or in a gelatinous condition, and must have existed in the form of organic silica distributed in the shape of sponge spicules, and other siliceous organisms in the chalk, which have been reduced or dissolved to a colloid state and accumulated in moulds formed by the shells of embedded animals.

Among the different forms of silica there are two which occur everywhere in great abundance—namely, crystallized silica as quartz, and colloid silica known as opal. The former of these is only acted upon by ordinary solvents, the latter is much more easily affected and passes into solution with comparative ease, especially in the presence of alkaline carbonates, and is capable also of passing into crystallized quartz. That the silica forming flints was originally dissolved in the waters of the sea there cannot be any doubt, and that this dissolved silica was derived from the rocks of the earth's crust. It has been calculated that the

proportion of silica is not much less than one part to from 50,000 to 100,000 parts of water. No chemical process is known by which such minute proportions of silica could be directly precipitated from a state of solution. Those animals and plants which have the power of secreting a siliceous skeleton are the only agents capable of separating even the minutest proportions of silica from solution. The organisms which now form siliceous skeletons, and on their death accumulate to form siliceous deposits, are the *Diatomaceæ*, the *Radiolaria*, and the *Silicispongia*, the first being plants the second and third animals. The silica is separated by these organisms in the colloid (opal) form, and afterwards is either re-dissolved or passes into the more stable crystalline form. It may be fairly concluded that the organisms which did the work of separating the silica from the state of solution in the Cretaceous seas were the same as are doing the same work at the present day. *Diatomaceæ* are absent in the chalk, and until recent years *Radiolarians* were supposed to be so also, and in any of the pre-Tertiary deposits. It is now known that they abound not only in the Cretaceous rocks but in all deposits from the Silurian to the present day.

The late Sir Joseph Prestwich, in his presidential address to the Geological Society in 1871, says "I think it probable that some considerable portion of the deep sea-bed of the Atlantic has continued submerged since the period of the chalk, and although adaptable forms of life have been transmitted in unbroken succession through this channel, the immigration of other and more recent faunas may have so modified the old population that the original chalk element is of no more importance than the original British element in our English people." Professor E. Forbes's name is inseparably associated with the bathymetrical distribution of marine life in Great Britain, and his clearly defined zones, the Littoral, Laminarian, Coralline, and the region of deep-sea Corals, from 50 fathoms to an undefined depth. Professor Lovén confirmed the constancy of the Laminarian zone but denied that the deep-sea zones could be compared with those in other areas, as they varied

according to latitude, the nature of the sea-bed, and other causes. There is an evident relationship of our existing marine fauna with that of the early Pliocene (Coralline Crag of Norfolk and Suffolk). Out of about 340 species of testaceous molluscs, 73 are now living in the British seas; the rest are either extinct or their most northern range is south of Britain. In the Red Crag there are 260 species of testacea, of which 60 are known to be living in the British seas, which is a larger proportion than those in the Coralline.

I will now draw your attention to the papers of Mr. Jukes-Browne, of Mr. Clement Reid, of Mr. A. Smith Woodward, and of Mr. Bullen Newton, which were read at our last winter meetings, all of which relate to the county of Dorset. We shall have another of Mr. Jukes-Browne's papers at our Pillesden meeting next month, in which he clearly shows that the Cretaceous beds were spread over the whole district from Bridport to Bere Head in Devonshire. The exposed Jurassic beds have an easterly tilt, and are broken by many faults which occurred before they were overlaid by the Greensand. During the later Tertiary times the beds were lifted dome-like, occasioning a dip outwards in all directions. The centre of this uplift was probably at the intersection of two lines, the one from Lambert's Castle and Drakenorth Hill, the other from Lewesdon and Eype Down. The author thinks that the watershed of this part of Dorsetshire has considerably changed, and that the streams cut for themselves channels through the Chalk and Greensand, reaching the sea far southwards, when the English Channel was dry land, and, like the other local streams, were tributaries of a large river, traces of which are apparent in the Isle of Purbeck. The rivers which now drain the district are the Char and the Simene, which pass to the sea through the southern hills.

One of the most important contributions to the history of the Blashenwell deposit is the discovery of implements by Mr. Clement Reid. Among the many flint-flakes scattered throughout the tufa no implement of any kind showing the slightest sign of secondary

chipping had been met with until Mr. Clement Reid found four. One was worked across and another very finely serrated. This minute "rat-tooth" working has been found elsewhere in Britain and in India, and may help to give some clue to the identity of these early occupants of the district. The tufa, which is about eight feet thick, must have taken a long time to form, and shows traces of the same race throughout. In addition to flint-flakes and charcoal there are bones of ox, deer, and pig, but no remains of cultivated plants. The marine shells are those which are now found between high and low watermarks on rocky shores, such as Chapman's Pool. The coast in those days probably extended farther south, and had an estuary at its lowest extremity. The absence of cockles makes it improbable that they were brought from Poole Harbour, which probably did not exist during the deposition of the bed. Mr. A. Smith Woodward's paper on the fish found by the Secretary in the Oxford Clay at Chickerell shows the persistency of the genus *Pholidophorus* through several geological epochs—from its first appearance in the Trias to its last in the Purbecks. There are four species from Lyme Regis in the British Museum, one from the Oxford Clay of Wiltshire, and one from the Purbeck Beds of Swanage. The Chickerell fossil is too imperfect to identify it with the Wiltshire specimen. Some of its elements are so similar to *P. macrocephalus*, from the Lithographic Stone (Kimmeridge Clay) of Bavaria, that Mr. Smith Woodward thinks it might be identical. A head of this genus has been found in the Kimmeridge Clay, of Kimmeridge, in this county. The sub-orders *Ganoidei* and *Teleostei* are no longer regarded as scientifically defined groups, but they sufficed until palæontologists became better acquainted with the extinct forms. The *Ganoidei*, which had enamelled scales and the skeletons for the most part cartilaginous, overlap the Teleosteans, whose skeletons are ossified in the family *Isospondyli*, in which both are represented, some having enamelled scales and cartilaginous skeletons and others more ossified skeletons, as *Pholidophorus*. The Perch is perhaps the most highly specialised of this section.

Mr. F. Bullen Newton's paper on the Gault fossils of Okeford Fitzpaine is a valuable addition to the geological literature of the county, and our gratitude is due to Miss Barbara Forbes and to Miss Lowndes for their careful attention and supervision over the diggings while these interesting beds were being exposed. The fossils give no evidence of the presence of the Lower Greensand, as was at first supposed, all being typical of the Gault; the Ammonite, *Acanthoceras mammillatus*, being the characteristic fossil of the Lower and *Hoplites interruptus* of the Upper. The *Acanthoceras* bed is sandy, micaceous, and oolitic; the *Hoplites* bed consists of sandy clay, with phosphatic nodules. There is an underlying bed of pure sand, which may possibly belong to the Lower Greensand. *Hoplites Benettianus* occurs in the *Acanthoceras mammillatus* section, and is interesting, as the late Miss Ethel Benett was the first to find it in the Wiltshire Cretaceous beds. Some few Gault species, such as *Nautilus clementinus* and *Exogyra caniliculata*, survive upward to the Upper Greensand. *Pholadomya Favrina* represents a genus which had a marvellous development during the Jurassic age, but has dwindled down to only one species at the present day. It played an important part in the fauna of that period, and was represented by 48 species. Ten species only have been found in the strata of the Cretaceous, of which *P. Favrina* is one, five in the Eocene, and one in the Pliocene, of which the Australian species may be a survival. The genus *Trigonia* had also a similar large development, and was represented by 88 species in the Jurassic age, 22 in the Cretaceous age, and five at the present day, all restricted to the Australian seas. The Okeford Fitzpaine *Trigoniae* are *T. aliformis*, *T. Archisiana*, and *T. Fittoni*.

Since my last anniversary address Mr. A. C. Seward, F.R.S., has written an interesting monograph on the fossil cycadean tree from the Purbeck beds of Portland, which he considers to be one of the most remarkable specimens in the fossil-plant gallery of the British Museum. Like most species of recent cycads, the persistent bases of the spirally-arranged leaf-stalks cover the surface of the stem, as

is well illustrated in the living *Zamia Skinneri*. At the summit of the tree there is a conical bud covered by several bud-scales. The author compares this terminal bud with *Encephalartos Altenstini*, both bearing a striking resemblance to each other in this respect. There is no appearance of a lateral inflorescence, and it is probable that the flowers, as in the recent species, were produced at the apex. Mr. Seward names it *Cycadeoidea gigantea*. A piece of coniferous wood slightly charged with pyrites is the only representative of plant-life in the Okeford Fitzpaine bed, but the only elements of it which can be traced are the medullary rays and the annulations of growth. Perfect certainty in the determination of Coniferæ can only be obtained when they are found in conjunction with the cones. Fragments of wood having the structure of living conifers are found throughout the entire series of the geological formations, from the Middle Devonian, and began to be common everywhere as early as the Coal Measures. It is difficult to distinguish the genus of a conifer by the structure of the wood, the annular rings and pits. Goppert, who was the first to take up this branch of research, found that it is only in the rarest cases this can be obtained. He groups most of the Abietinæ in the family Pinites; Araucarias and Dammaras with Araucarites; Cupressinæ and Podocarpæ with Cupressinoxylon; and Taxineæ with Taxites. Krauss, after a careful examination, found that the breadth of the annual rings, the number of the row of pits, and the height of the medullary rays cannot be accepted as distinctive characters. He showed, too, that in the case of a connected stem and branch from a bed of lignite, if the two had been found separate they would have supplied two good species. The Abietinæ probably first appeared in the Rhætic beds, and continued to be abundant in the Cretaceous and the Tertiary. *Pinea* appears for the first time in the Upper Greensand. The annual rings are absent or undefined in the Palæozoic coniferous woods, but better defined in the Liassic and increasingly so in the Oolitic and the Tertiary conifers. In tropical countries the rings are not so well marked as in the woods of trees whose period of vegetation is interrupted by seasons of

cold and wet, but where there is a recurring period of suspension in the activity of growth, the annual rings are more clearly defined. Sachs says "In tropical woody plants, when they are several years old, the additions to the wood formed in each successive year are not distinguishable on a transverse or longitudinal section. The entire wood is homogeneous." During each season of growth there is a marked separation between wood formed in the spring, and wood added in the autumn. The part formed in the early part of the year is called spring-wood, that in the latter, autumn-wood. The explanation of the formation of annual rings is not quite so simple and easy as is often supposed. for we have not as yet sufficient data with regard to the rings of growth in trees of different latitudes to allow us to speak with any certainty upon questions of past climates. Many tropical plants flower all the year round, and there is no interruption to the thickening of their stems ; others pass through a resting period brought on by a long continuous period of drought.

I conclude by quoting Sachs's remarks on the question of dormant periods:—"This periodic alternation of vegetative activity and rest is in general so regulated that, for a given species of plant, both occur at definite times of the year, leading to the inference that the periodicity only depends upon the alternations of the seasons, and therefore chiefly upon that of temperature and moisture. Without wishing to deny the co-operation of these factors, a closer consideration shows that this matter depends chiefly upon changes which take place in the resting plant, independently of external influences, or only indirectly affected by them." Our knowledge of the structure of the tissues of fossil plants, especially those of the Carboniferous Age, has in recent years made considerable progress. Botanists recognise more and more the importance of Palæobotany, and fossil plants have ceased to be regarded simply as aids, and of no great value to the stratigraphical geologist. We may hope that a closer study of the ancient floras of which the strata afford such numerous, though fragmentary relics may make us better acquainted

with the conditions of those forests. The Carboniferous flora was uniform in character, and gives no indication of zonal differences in temperature; this is the case with the flora of the Jurassic and the Lower Cretaceous periods. Sir Joseph Hooker, whilst admitting the possibility of drawing legitimate conclusions from their distribution in the past, points out how wide is their geographical range at the present day. The preponderance of ferns in the Carboniferous period is adduced in proof of the temperate, equable, and humid nature of the coal measure climate. There was possibly a difference of habitat of some of the plants of that period. The vegetation may be divided into upland and lowland types. That of low level surfaces must have been composed of dense growths of such plants as could maintain themselves, like the peat vegetation of the present day, for indefinite periods on the same spots. Peat is the present-day example of an accumulation of vegetable matter, corresponding, in all probability, to the conditions under which the *débris* of Carboniferous forests gave rise to coal.

“It is not,” says Neumayer, “in the towering primæval forests of India and Brazil, nor the mangrove swamps of tropical coasts, but in the moors of the subarctic zone, that plant-remains are now being stored up in a form that, in the course of geological ages, may become converted into beds of coal.” The geographical extent of the Upper Carboniferous flora was exceedingly great; it is traced from the shores of the Atlantic through the northern half of the world to China, and it is greatly developed in the eastern half of the United States. Similar deposits, with nearly the same vegetation, occur far north in the American archipelago, in Spitzbergen and Nova Zembla. We know nothing of extinct plants, such as *calamites*, *lepidodendra*, and *sigillareæ*, and there is no reason for concluding that they could only have lived in tropical forests. Conifers grow now in very severe climates, and only the tree-ferns really indicate warm climatic conditions. At the present day their chief development is in the tropics, where they do not require great heat, only the absence of frost. Differentiation of temperature

is first seen in the floras of the Upper Cretaceous strata, showing a dependence upon geographical position that is still more clearly seen in the Miocene Period. In the more recent plant-bearing strata there are not a few instances where plants characteristic of different latitudes are preserved in the same rock. Such a commingling, Mr. Starkie Gardner thinks, is due to repeated cyclical changes in temperature and the resulting migration of plants to warmer or colder climates. In the case of the Eocene plant-beds of Hampshire, Mr. Serles Wood suggests that the river whose delta-deposits contain the plant-remains flowed through a district where a tropical climate prevailed on the low-ground and was fed by tributaries which flowed from a mountain region, thus accounting for a mixture of tropical northern forms in delta sediments. Although the evidence afforded by fossil plants in the earlier geological periods is generally considered to point to temperatures in past eras higher than those of the same latitudes to-day, among the Pliocene and post-Pliocene floras, Palæobotany supplies us with facts suggestive, in some cases, of colder conditions than those of the present day. Among the Tertiary floras of Australia and New Zealand there is a large number of plant-types congregated together such as now characterise widely separated latitudes, which is difficult to understand from the point of view of climate or other physical conditions of environment, but it may be explained by regarding it as a composite type of flora not yet differentiated into its various branches.

RUSHMORE.

The further the examination of the Rushmore earthworks and ditches is proceeded with, the more they confirm General Pitt Rivers's theory that their age can, within certain limits, be ascertained by a rigid attention to the character and position of the pottery, as accurately as the comparative age of a series of geological beds—the oldest invariably underlying the newer. In like manner the earliest pottery of an earthwork invariably lies at the bottom of the ditch, and if, during the process of silting up,

the earthwork happened to be occupied by another race or more, their occupation will be indicated in the silting by the pottery in chronological order. Charts are exhibited on the walls of Farnham Museum delineating these strata. Occasionally the lower impinges upon the upper, owing to the leniency of the conqueror, and the non-extirpation of the conquered, leading to a gradual amalgamation. The pottery of the Roman period in Dorsetshire is chiefly Romano-British. Next summer I hope to read the history of the Bagber-barrow more clearly, when I shall adopt General Pitt-Rivers' plan of excavating by parallel sections instead of perpendicular.

FRESH RECORDS OF PLANTS.

Atropa (L.). *A. Belladonna* (L.)—G. St. Alban's Head, under cliff, Mr. Eustace Bankes. Recorded in Pulteney's List of 1813 for Purbeck without a locality; found only once since, by the Rev. W. Heath, in the shrubbery of Morden Rectory, probably introduced. *Empetrum* (L.)—*E. nigrum* (L.)—F. Parkstone, Clarke. *Crepis* (L.)—*C. taraxicifolia* (Thuill) F.—*Lepidium* (L.)—*L. draba* (L.)—F. both found at the ballast quay, Goatarne, Poole Harbour, by Miss Ella Smith.

CONCHOLOGY.

Helix.—*H. cantiana* (L.)—Spetisbury, Mr. Clement Reid. The only other record of this shell is in Spetisbury also, by Pulteney in 1799. Mr. Clement Reid has since found it on the hedgebanks between Stickland and Normandy Farm.

ORNITHOLOGY.

The supposition that migratory birds return from their winter quarters to their breeding-grounds of the previous year is supported by the appearance of two pairs of nightingales in a grove at Whatcombe, where a pair had nested and brought up their brood the previous year—the last place one would expect for so retiring and shy a bird to select, for the grove is only a very narrow strip of land between a highway and a private road, and very much used.

In spite of this hindrance another pair was safely brought up and took away a brood last year. Since April 17th the male has been pouring its love song from the same branch of the tree it frequented last year. The Dipper, or Water Ouzel, has been gradually distributing itself eastward. A pair nested and brought up their brood between East Stoke and Bindon Abbey. Mr. Freeman saw one at Affpuddle, and the Rev. Mr. Walker saw another on the Stour at Spetisbury last summer.





On the Fish of Dorset :
Their Habits, Mode of Capture, &c.

By FRANK J. B. BECKFORD.

(Read Nov. 20th, 1856.)



OUR Treasurer having one day asked me if I could not write you a paper on the fish of Dorset, I thought the matter over and came to the conclusion that, as the fish of our County were included in the fish of Great Britain, and as they had been done so well by Yarrell, Couch, Day, &c, the best thing I could do was first of all to make a list of all the species that I had either taken myself, or could find out from authentic sources had been taken in our waters, giving with each the name of my authority, a reference to the works of Drs. Day and Couch, and a few remarks I thought might be of interest. And I find there are about 135, of which 12 are freshwater and three migratory. Of these three two—the salmon and sea trout—migrate from the sea to the fresh waters to shed their spawn, while the eel, on the contrary, comes down from the rivers to the deep sea for the same purpose, and does not even show signs of reproduction till it reaches the salt water. This has been the great puzzle to naturalists which has now (November,

1896) been solved by Professor Grassi, who found breeding eels thrown up by the currents in the Straits of Messina.

Secondly, to say a few words as to their general habits, means of capture, boats employed, &c. And now let me thank all those who have so kindly lent me their aid, among whom I may mention Mr. T. Groves, who got me a sight of the notes of the late Mr. W. Thompson, of Weymouth; Mr. Eustace Bankes, who kindly let me examine his copy of the Purbeck Society's papers; and our worthy Secretary, who got me interviews with sundry fishermen, and has helped me in various ways. Now, though all fish are more or less migratory, the different species keep to different sorts of ground, so that, by taking note of the nature of the sea bottom and the surrounding coast, one can pretty well tell what fish one may expect to catch in any particular locality. Thus one does not expect to find soles on a bed of rocks, nor rock-frequenting fish on smooth sand or mud.

One sometimes catches other things besides fish on one's hook. I have here a stone and two old gun flints, which were attached to the base of an ascidian which came up on my hook one day in 1887 while fishing over the wreck of the *Abergavenny* off Weymouth. She was lost in 1806, so that they had been a long time under water.

Now, if we take a map, or, better still, a chart of the Dorset coast, we shall see how very varied the nature of it is. Our eastern boundary line comes down to the sea in Bournemouth Bay, where the bottom is mostly clean sand and the water shallow, under ten fathoms, with one or two small patches of rock, and is, therefore, good trawling ground. Here we may expect to get all sorts of flat fish, with a few whiting, gurnard, and pout near the rocks. Then we come to Poole Harbour, which is no doubt a great nursery for small fish, where in the main channels we have sandy and stony bottoms, where soles, plaice, dabs, and pout, and at times small whiting, are got, whereas in the latches between the mud flats, flounders, eels, bass, and grey mullet are found, with salmon and sea trout in the mouths of the rivers Frome and

Puddle. In Studland Bay, near the chalk cliffs, there are beds of sea-grass (*Zostera marina*) beloved of red mullet, and at Standfast Point, or Old Harry, begins the succession of rocks and rocky ground that extends as far as White-nose and Ringstead. With the exception of one or two such open beaches as Warbarrow Bay, where seines can be used, the only other nets in use are trammels or set nets, and the fish taken are pollock, pout, wrass, bream, and other rock-loving fish, and these are mostly used as bait for crab-pots, the crab and lobster fishing forming the staple industry of this part of the coast. We now come to Weymouth Bay, where the sandy, oozy bottom enables trawling to be carried on, and the shallow water near the shore the use of team or tuck seines.

At times large numbers of mackerel are taken in the large seines used from a boat in the Bay and not brought to shore, and when, in August and September, the schools break up, are also taken with hook and lines between the end of the Breakwater at Portland and White-nose. Then in Weymouth Harbour and Backwater there are bass, grey mullet, eels, flounders, and any number of atherine or sand smelts, and the same in the Fleet. At Portland, with its Breakwaters, we come again to rough and rocky ground covered more or less with seaweed, where great numbers of small pout and pollock, with an occasional conger, are to be got, and afford good sport to some of the summer visitors to Weymouth. We then come to the Chesil Beach, along the whole length of which the large seines are worked, and where at times enormous quantities of mackerel are taken besides all sorts of other fish, and so on to our western boundary. Most of the larger and rarer fish are caught in these nets, for Portland seems rather to act as a stop to fish going further east. And now I may say that we have no large fishery on our coast with its attendant fleet of large boats, such as you find at Brixham to the west, and on the coast of Sussex on the east. All our fishing takes place within the three-mile limit, and, according to the Board of Trade returns, there is only one first-class fishing boat (i.e., over 15 tons) on the whole coast, and that is at Lyme Regis.

As their locality changes so does their food. Most are cannibals, the larger living on the smaller, even of their own species, whilst all are carnivorous (I am speaking particularly of sea fish)—that is, eating the flesh of some living thing, whether it be that of fish, crustacea, worms, molluses, echinoderms, and the hundred and one forms of life found at the bottom of the sea, provided it be fresh. Some live entirely on other fish, like most of the mackerel and shark tribe ; others, like most of the flat fishes, live on worms and small crustacea ; others, again, on shell-fish and crabs, like the ray and the cat-fish ; while others, like the wrasses, get their living off such forms of life as are found among and adhering to rocks.

The spawn of others forms the food of some species, and it is a wonderful provision of nature that the ovum of most of our best food fishes, when once impregnated, becomes so transparent that when floating in mid-water it is almost invisible, and is thus protected.

The form of the teeth and mouth generally gives one a very good notion of what their principal food consists of. Their digestion is very rapid, as is also their growth, but this latter depends a great deal on the supply of food. They seem to arrive at maturity in the second or third year. There is only one sea fish that I know of that will eat vegetable food, and that is the grey mullet, that at times eats the green silk-weed off the bottoms of boats ; even that may be for the sake of any small shells or creatures in it.

Their spawn and places of deposit vary immensely. In the sharks the young are mostly brought forth alive, as also in the monk fish. I once took a large monk fish in a trammel which produced 24 young of about 8 or 9 inches long after it was captured. The dog-fish mostly produce their eggs in oblong sacks of a texture like horn, with long tendrils at each corner, by which they attach them to sea weed, while in the rays these sacks are nearly square and have only long points at each corner. In the foregoing fish the production of eggs or young is not very great, being only from two to about four dozen in a season, and they are

deposited at the bottom of the sea, whereas in the cod and whiting tribe the eggs are almost innumerable. Buckland counted 6,867,000 in the roe of one cod. The spawn of most of our food fish is shed in mid-water, floats not far from the surface, and is quite transparent, while in the herrings it falls to the bottom and adheres to anything it may touch. In some fish, as the pipe-fish, it is transferred to the male and carried about until it hatches. In the perch and pike the spawn is shed in long ribbons and adheres to the reeds and water plants that grow under water at the sides of streams, while the stickleback makes a little nest with an opening at each end in which to deposit its eggs and keeps guard over them. The salmon and trout deposit their spawn at the bottom of the river and cover it over with a heap of gravel, out of which the young find their way when they are hatched.

From Poole we have 34 second-class boats engaged in trawling, and about 20 of these in the winter months use drift nets for herrings and sprats. They are mostly half-decked cutters of from 18 to 25 feet in length, and their trawl beams are from 10 to 15 feet in proportion to the boat. There are 70 third-class, or open boats, propelled with oars only, the largest of which use seine nets, and the others small stop nets for flounders, lines, and shrimp nets, and are also used for eel picking.

At Swanage there are 8 third-class.

At Bottom 7 third-class.

At Warbarrow 7 third class.

At Lulworth 5 second and 27 third.

At Weymouth 46 third. You will be surprised at there being only third-class boats at Weymouth, but it seems that the Weymouth people are so un-enterprising that they allow boats from Portsmouth to come and do their trawling for them.

At Portland there are 29 third-class.

At Hill 16 third-class.

At Wyke 10 third-class.

At Abbotsbury and Swyre 24 third-class.

At Burton 12 third-class.

And at Lyme Cobb 1 first, 16 second, and 30 third-class.*

The trawling boats generally carry a man and a boy, or two men, and the third-class from 1 to 6 or 12, according to the work they are doing, as of course the large seines take many more men to work them than the small ones or hooking. The reason we have no deep-sea fishing is that the sea bottom in the offing from Portland to East of the Isle of Wight is rough and unsuitable for trawling, being mainly composed of broken shells, stones, and a sort of coral (*Eschara foliacea*), which fish don't seem to like, and so much is this the case that an Eastbourne fisherman once told me that the Sussex fishing luggers never thought it worth their while to put a hook line over board when becalmed anywhere between these points. Still there are spots where a trawl could be used, but only under steam, and this is now prohibited by the Southern Fisheries Board.

The nets in general use along our coast are the trawl, seines of various sizes, drift nets, stop or plouch nets, and trammel nets.

The trawl is a conical bag, the mouth of which is kept open by a wooden beam supported at each end on a hoop of iron, and dragged along the bottom, where it sweeps up everything it comes across. I have taken lumps of coal, a new galvanised bucket, and a navy coal sack with two lobsters in it.

The hoops, or heads, as they are called, are not quite round, the under side being flat and called the shoe. On the front side is a ring, to which the bridle or span is attached, and on the top is another larger ring, into which the end of the beam fits. In one head this ring is square, while in the other it is made round, and the object of this is to enable the heads always to sit square on the ground, even if the beam should get twisted. The beam

* In all, 1 first, 55 second, and 286 third-class boats, the third-class including all sorts of rowing boats from the large seine boats which, though larger than some of the second-class, are open boats and only used with oars, down to canoes and gunning punts. The large seine boats are from 18 to 21 feet long by about 7 to 8 feet 6 inches beam, row 6 oars, and cost £25.

is usually made of ash or oak, or other heavy, tough wood. The net consists of an upper and under leaf, and a cod, or small bag, into which most of the fish go, and is closed at the end with a cod line, which before now I have known to have been left undone and all the fish lost. The front end of the upper leaf is square, and is stopped with yarns along the beam, while the under leaf is much shorter and formed into a semi-circle by two short pieces of net called wings. Along this semi-circle is fastened the ground rope, the two ends of which are made fast to the after part of the two heads. The ground rope is usually made of a piece of four-stranded rope, one strand of which is removed to make it soft and pliable, while round it is twisted or wholed another rope, making the whole about 3 or 4 inches or more thick, so as to prevent it from cutting into soft ground. Sometimes a small chain is used for the centre of the ground rope, in which case it is cut in two in the middle, the ends being stopped together with a few yarns, so that if the ground rope fouls a rock or other obstruction the yarns break, and though the net may be torn the whole gear is not lost, which might otherwise be the case. The trawl is, if possible, always towed with the tide, the reason being that fish always lie with their heads up stream, and, on being touched by the ground-rope, dart upward and forward, and so into the net, and not out of it, as would be the case if their tails were touched first. In one or two places along each side of the net the upper and under leaf are sewn together so as to form pockets, whose mouths open inwards. These are to catch the soles, which are more cunning than other fish, and will soon work their way out of the net along the sides if not stopped by the pockets. There is another sort of trawl called an otter trawl, but it is only used by yachts and steam trawlers, though it has the advantage of being more easily worked, and a very much larger net in proportion to the boat being used than with the beam trawl. A line of corks, the same length as the ground rope, takes the place of the wooden beam, and the heads are wooden boards shod with iron, so attached to the bridle that they act like kites and so keep the net open.

The seine net is probably the oldest fishing net known, and by its means by far the greater number of fish on our coast are taken. They vary in size and cost, according to the nature of the fishing in which they are employed and the means of the owners, from the large mackerel seines of 150 to 200 fathoms, and costing £10 to £60, to the small team seines or tuck nets of 30 or 40 fathoms, used in harbours or mouths of rivers. The cost of seines has been much reduced of late years, as the greater part, if not the whole, can be made by machinery, while a trawl cannot. The seine consists of three parts, that is, two wings and the middle or bunt. The wings are made of straight net roped top and bottom, the top having corks and the bottom leads. The outer ends of the wings are generally of larger mesh, and the size of the mesh is reduced several times before the bunt is reached. The bunt is formed by the net being not only much wider, but also by being gathered closer together along the ropes, so that it forms a bag, and sometimes a cod like that of a trawl is added. Seines are used in two ways, the most general being that a long rope is made fast to one end of the net, and the free end of the rope being left on the shore, the boat is rowed out to sea, the rope being paid out on the way. When all the rope is out the net is shot in a semi-circle and the corresponding rope at the other end taken on shore, when both ropes are hauled on and gradually brought together and the net dragged on shore with anything it may have caught in it. In the other way the ropes are dispensed with, the net being shot round a shoal of fish seen, and in the form of a horse shoe, the circle being completed by a smaller net called a stop seine being shot across the ends. The whole is gradually brought together, with the fish enclosed, into the boat. Great quantities of mackerel, herrings, pilchards, and sprats are taken in this way, besides other fish. Drift nets are long rows of plain net supported by a corked line but with no leads. They hang perpendicular in the water like a wall, and the fish are caught by getting their heads only through the meshes, their gills preventing their getting out, the size of the mesh being proportionate to the sort of fish expected, whether they

be mackerel, herrings, pilchards, or sprats. I have here some samples of the different sizes of mesh used for the above-named fish. The boat having shot its nets (which vary in number with the size of the boat) rides to them till it is time to haul them. Stop nets are plain nets corked and leaded, which are placed across narrow creeks and latches on a falling tide, and the fish are either driven into them by plouching, *i.e.*, beating the water with poles or oars, or waiting till the tide has left them dry, and are mostly used for flounders. The trammel net, a model of which Messrs. Hounsell, of Bridport, have sent me, is a more elaborate concern, and, as its name implies, being a corruption of the French *trois maile* (three meshes), is composed of three nets. The two outer ones are of equal size, and are made of stout twine with a mesh of nine or ten inches from knot to knot, and are so fastened to the cork and lead lines, or rawlins, as they are called, that the meshes shall stand quite open and square, and the length and depth of these walls regulate the size of the whole net. Between these two walls is placed another net of very much finer twine, thread or even silk being used, and of only $1\frac{1}{4}$ to $1\frac{1}{2}$ inch mesh, but at least double the length and depth of the walls. The leads should sink the corks, so that when set with an anchor or big stone at each end the net should stand up from the bottom like a wall. A fish on striking the net passes through the wall nearest to him, and, striking the inner net, or linnen or lint, as it is called, forces it through the other wall, thus making a purse or bag for himself, and is thus caught. The best places to set trammels are on smooth patches, among rocks, or on the edges of grass beds (*Zostera marina*), and the fish taken are red mullets, pollock, wrass pout, and sometimes soles, dabs, and plaice. My friend Colonel Willan once took a sole at Portland $21\frac{1}{2}$ inches long, and Captain H. Powell 55 red mullets, besides other fish. The best time to set the net is about $1\frac{1}{2}$ hours before sunset, and to haul it when it is dark enough to see three stars, and should it be high water slack about this time so much the better. It is just about dusk that fish seem to be mostly on the move and to change their quarters. Hook and line fishing is not so much

practised professionally as on most other coasts, and except railing for mackerel when the shoals break up nearly all the hooking is done by amateurs. The lines for mackerel are usually about 12 or 15 fathoms of fairly fine water-cord, to the end of which is attached a lead weight of about one or two pounds. A little above the lead is a small stick or piece of wire with a hole at one end through which the line is passed, and to the other end of which is attached a fine piece of snood about three yards long with a foot or two of strong gut at the end, to which the hook is fastened. The best bait is a piece off a mackerel's tail cut to resemble a small fish, or, failing this, a bright tin or copper-plated spinner. These are towed behind a boat under sail, and if care be taken to regulate the length of the line and snood to the weight of the leads, five or even seven lines can be used at one time. Hand lines vary in size and strength according to the fish expected, from stout conger line to fine lines for pout, the best rig being a conical lead of square section, having a hole at the top through which passes a strap of leather about four inches long, having a hole at each end to which the line is made fast. Round the leather by a couple of turns a piece of brass wire is twisted, leaving the ends about ten inches from the leather, and to these ends the hooks on gut are fastened. Pollock lines are best made of horse-hair twisted up the thickness required and knotted together, each link being laid up alternately right and left handed, which gives great elasticity to the whole line and prevents a good deal the chance of breakage from the hook fouling a rock, which is constantly happening while pollock fishing. The best baits are sand-eels, rag worm, shrimps, and prawns, used alive, either stationary or moving slowly along near the rocks and seaweed where the pollock love to lurk. Long lines or trots consist of a back of stout line of any length you like with a hook on about a yard or so of snood every two fathoms. The hooks are baited and the line shot on likely ground, where the fish hook themselves. By this means often large cod, skate, and conger are taken on ground not suited for trawling. All fish except, perhaps, one or two, are cannibals, therefore, the best baits are fish of some sort, the fresher

the better, those of an oily nature like mackerel, herrings, pilchards, and sprats, preferred. Also sea worms such as the annelids, lug, and rag, and such molluscs as cockles, mussels, and whelks are excellent. About two years ago the fisheries on our coast were placed under the Southern Fisheries Board for regulation, but beyond framing and posting up a certain number of by-laws with penalties attached for non-observance the Board seems to be doing little or nothing at present. Some of the by-laws if strictly enforced are, no doubt, most useful, while others are questionable or capable of great improvement, and others might be added with advantage. Perhaps something may be done if we wait long enough. What is so much wanted is protection for the immature fish while too small to be of any use as food. I saw the other day in Poole exposed for sale under the very nose of one of the said Board a lot of soles not six inches long, and not worth the fat to fry them in, which could easily have been returned to the water, as soles will live longer and are not so easily killed as most other fish. I have purposely omitted the crab and lobster fisheries, as perhaps another time, if you have not been too much bored by this one, I might be able to collect sufficient information on the subject to write a separate paper on them.

CARTILAGINOUS FISH.

SCYLLIUM CANICULA.

ROUGH HOUND, NURSE, HUSS, OR LESSER SPOTTED DOG-FISH.

Common. Often taken with a hook when fishing for pout, whiting, or dabs, and in all kinds of nets. Will take almost any kind of fish-bait or worms. The skin is very rough and is sometimes used as sandpaper. Care should be taken in unhooking this fish, as by a twisting motion it will rasp the skin off the hands, causing a nasty wound. The flesh is coarse, though some people like it. The female lays curious horn-like eggs like sacs with long tendrils at each corner, which it twists among the seaweed. It is among the few fishes that can close its eyes. Couch I., p. 14, Pl. II. Day II, p. 309, Pl. CLIX., fig. 1.

SCYLLIUM CATULUS.

GREATER SPOTTED DOG, NURSE HOUND.

In most respects like the last, only larger, with fewer but larger spots and darker colour. Frequents deeper water, and is not so often taken with a hook. Couch I., p. 11, Pl. I. Day II., p. 312, Pl. CLIX., fig. 2.

LAMNA CORNUBICA.

PORBEAGLE OR BEAUMARIS SHARK.

Not common on our coast, the only specimen I know of being a stuffed one in the possession of our Secretary, Nelson M. Richardson, Esq., which was taken in the West Bay some years ago and measured 5ft. 3in. in length; also W. Thompson, 7th October, 1872. Seems to feed on other fish, and is mostly taken on lines. Couch I., p. 41, Pl. VIII. Day II., p. 297, Pl. CLVI.

GALEUS VULGARIS.

COMMON TOPE OR TOPER.

Off Swanage; Rev. Lester Lester. Couch I., p. 45, Pl. IX. Day II., p. 292, Pl. CLIII.

MUSTELUS VULGARIS.

SMOOTH HOUND.

Caught off Poole and at Weymouth. Couch I., p. 47, Pl. X. Day II., p. 295, Pl. CLV.

ACANTHIAS VULGARIS.

PICKED DOG, SPUR DOG, OR PECK HOUND.

Very common and a great trouble to fishermen, as they go in immense shoals, and when about little else can be caught. I once took 168 and nothing else in a short time. They take any sort of fish bait and destroy immense quantities of fish. Great care has to be used in taking them off the hook, as the two spines on the back in front of the dorsal fins are very sharp and make a nasty wound. The best plan is to place the foot on the middle of the

back of the fish, and holding him by the nose with the left hand, remove the hook with the right. They are eaten by the fishermen both fresh and dried, but the flesh is strong and rather sweet to taste. Their teeth are sharp, and will cut the line and do great damage to nets. Couch I., p. 49, Pl. XI. Day II., p. 315, Pl. CLX., fig. 2.

ALOPIAS VULPES.

THRASHER SHARK.

Mr. W. Thompson reports one weighing 98 lbs. taken off Portland 6th August, 1877, and another on 13th September, 1870, in West Bay, 10 feet 3 inches. Also one taken in a mackerel seine off Poole 30th June, 1882. Couch I., p. 37, Pl. VII. Day II., p. 300, Pl. CLVII.

CARCHARIAS GLAUCUS.

BLUE SHARK.

W. Thompson records one taken on Preston Beach 19th July, 1873. Also near Swanage, Rev. Lester Lester. Couch I., p. 28, Pl. VI. Day II., p. 289, Pl. CLII.

RHINA SQUATINA.

MONK FISH, ANGEL, FIDDLER, OR FIDDLE FISH.

This fish is common, and seems to be the connecting link between the sharks and rays. It is seldom eaten, being coarse and rank, and is used mostly to bait crab-pots. It is usually caught in trawls and trammel nets, but not often on hooks. In August, 1879, I took one, in a trammel net, nearly 5 feet long, which, on being hauled into the boat, produced 24 young ones about a foot long each. Its skin is rough like a file and is sometimes used as sandpaper. Couch I., p. 73, Pl. XVII. Day II., p. 326, Pl. CLXIII.

RAIA OXYRHYNCHUS.

LONG OR SHARP-NOSED SKATE.

One taken near Swanage, 6th December, 1857, Rev. Lester Lester. Couch I., p. 93, Pl. XIX. Day II., p. 341, Pl. CLXIX.

RAIA BATIS.

SKATE, TRUE SKATE, ROKER, OR MAID.

Common at certain seasons, such as when the sprats come in. It is taken on long lines and in trawl nets. The best baits are herring, sprats, or whiting. The smaller ones are good eating and are best in the latter part of the winter, and are called Maids. The large ones are coarse, and are much used as bait for lobster pots. They sometimes grow to a large size, one being taken off Swanage in December, 1885, weighing 119lbs. The flesh of these fish, and, in fact, all the rays, contains a good deal of ammonia, the smell of which is plainly perceptible after a few days' keeping, and which has been extracted by one of our members, Mr. T. B. Groves. Couch I., p. 87, Pl. XVIII. Day II., p. 336, Pl. CLXVI.

RAIA CLAVATA.

THORNBACK OR THORNY.

This is the commonest of all the rays, and hardly a trawl is hauled without some of these fish in it. It does not attain to so large a size as the skate, but I have seen them about three feet long. It frequents shallower water than the skate, and will take most kinds of fresh bait. It is very good eating when not too large, and is better for keeping a day or two; in fact, it will keep good a deal longer than most fish. It derives its name from the back being covered with sharp, strong spines, especially along the tail. Couch I., p. 99, Pl. XXII. Day II., p. 343, Pl. CLXXI.

RAIA MARGINATA.

BORDERED RAY.

W. Thompson records one taken off Lyme Regis 21st July, 1871, and sent to Dr. J. Couch, who figures it Vol. I., p. 110, Pl. XXVI.

RAIA MACULATA.

SPOTTED RAY, HOMELYN, OR SANDY RAY.

This is quite as common as the thornback, but rather better eating. It frequents much the same ground, but is not, I think, so

often taken with a hook. It derives its name from the back being covered with dark spots. It has no spines except along the centre of the back and on the tail. Like the thornback it requires keeping, otherwise it is apt to be tough. Couch I., p. 104, Pl. XXIV. Day II., p. 345, Pl. CLXXII.

RAIA MICROCELLATA.

PAINTED RAY.

This is not a common fish. In shape it is like the thornback, but has only spines along the back and tail; and is much lighter in colour, with pretty cloudy markings of grey, white, and yellow along the back and fins. I took one in a trawl at Weymouth on September 16th, 1891. Couch I., p. 107, Pl. XXV. Day II., p. 346, Pl. CLXXIIA.

MYLIOBATIS AQUILA.

EAGLE OR WHIP RAY.

One taken by B. Wills in August, 1891, about 10lbs. Couch I., p. 135, Pl. XXXII. Day II., p. 352, Pl. CLXXVI.

TRYGON PASTINACA.

STING RAY, FIRE FLARE.

This fish is not very common and is seldom caught with the hook, but mostly in trawls, and is not used as food. It is distinguished from the other rays by the sharp spine on its tail, with which it can cause very nasty wounds, as the edges are serrated with the points turned backwards, so that it is difficult to withdraw when once it has penetrated the flesh. The fishermen usually chop off the tail as soon as they can to prevent being struck by the spine. One in August, 1895, B. Wills. Couch I., p. 130, Pl. XXXI. Day II., p. 350, Pl. CLXXV.

TORPEDO NOBILIANA.

TORPEDO OR NUMBFISH, ELECTRIC RAY.

W. Thompson records one taken at Weymouth. One about 5 feet long was taken in October, 1894, by J. Oats, off Poole. Couch I., p. 119, Pl. XXX. Day II., p. 331, Pl. CLXIV.

ACIPENSER STURIO.

COMMON STURGEON.

Caught now and then in the West Bay. It used to be considered a royal fish. The flesh is very firm, in fact more like meat than fish. It is caught only in nets. Thompson notes one taken off Chesil Beach, 5 feet long, weighing 112lbs., 5th May, 1874. Couch I, p. 157, Pl. XXXV. Day II., p. 280, Pl. CL. A large one was taken at Studland in September, 1857, by White, of Poole (Rev. Lester Lester).

BONY FISH.

GASTEROSTEUS ACULEATUS.

THE THREE-SPINED STICKLEBACK.

This pugnacious little fish is found in most of our ponds and rivers, and seems equally at home in both fresh, brackish, and salt water. Gosse found them at Weymouth, and the Rev. J. M. Colson in Swanage and Durlstone Bays, and Corfe Mill-dam and Luckford Lakes. I have found them in the Fleet near Chickerell. Couch I., p. 167, Pl. XXXVII. Day I., p. 238, Pl. LXVIII., fig. 1, 2, 3.

GASTEROSTEUS SPINACHIA.

FIFTEEN-SPINED STICKLEBACK.

This is strictly a salt-water fish, and P. Gosse says it is abundant at Weymouth, where the writer has also noticed it swimming near the Quay wall among the sea-weed. Couch I., p. 180, Pl. XXXVIII. Day, I., p. 246, Pl. LXVIII.

HIPPOGLOSSUS VULGARIS.

HOLIBUT.

This fish is seldom found so far south as our shores, but is common in the north, where it attains a large size and takes the place of turbot. It is the largest of the flat fishes, often weighing over 2cwt. It is only of late years that it has been much sold in the South of England, and was mostly bought up by the Jews, especially the

head parts. It is inferior to turbot or even brill for table. One of about 5lbs. was caught by B. Wills in November, 1892, off Studland Bay. The eggs of all the British flat fishes are of the buoyant and separate kind. Couch III., p. 149, Pl. CLIX. Day II., p. 6, Pl. XCIV.

RHOMBUS MAXIMUS.

TURBOT.

This is one of the largest and most highly-valued of flat fish, but on our Dorset coast it is not so common, nor does it seem to attain to so large a size, as in the North Sea. It is mostly taken by the beam trawl and sometimes on long lines, when the bait must be very fresh. The flesh is firm and white, and it is one of the few fish that are not spoilt by boiling. Like all the Pleuronectidæ, it begins life swimming on edge with an eye on each side, but by degrees the right eye passes over to the left side of the head and the under or right side becomes white, while the upper or left side is dark, and, in the turbot, studded with bony tubercles. W. Thompson mentions one with both sides dark and covered with tubercles, 9½ins. long, 25th May, 1872. Couch III., p. 155, Pl. CLXI. Day II., p. 2., Pl. XCVI.

RHOMBUS LÆVIS.

BRILL.

This is a much commoner fish on our coast than the turbot, and is neither so large nor so highly valued, as the flesh is neither so firm nor is it so thick. The larger ones may be boiled, but the smaller ones should be fried either whole or in fillets. It is nearly always taken in the trawl or in tuck-nets, and is found on a sandy bottom. It seldom takes the hook. Couch III., p. 161, Pl. CLXII. Day II., p. 14, Pl. XCVII.

ZEUGOPTERUS PUNCTATUS.

MULLER'S TOPKNOT, OR BLOCH'S TOPKNOT.

This small fish seldom exceeds 6 or 7 inches, and seems to frequent softer ground than the brill. I have taken them in

Portland Roads and Weymouth Bay when trawling in the autumn. The flesh, when fried, is good. Couch III., p. 170, Pl. CLXV. Day II., p. 18, Pl. C.

ARNOGLOSSUS LATERNA.

MEGRIM OR SCALD-FISH.

This is the smallest of the flat fishes taken on our coast, and seldom exceeds four to five inches in length. Its scales and even skin come off with the slightest touch, so that it looks like having been put in boiling water; hence its name scald fish. It was very abundant in Weymouth Bay in 1876. No use except for bait. Couch III., p. 177, Pl. CLXVIII. Day II., p. 22, Pl. XCIX., fig 2.

ARNOGLOSSUS MEGASTOMA.

SAIL FLUKE OR CARTER.

Taken in Studland Bay November, 1895, by G. B. Wills. Couch III., pp. 163, 167, Pls. CLXIII. and CLXIV. Day II., p. 21, Pl. XCVIII.

PLEURONECTES PLATESSA.

PLAICE.

This is about the most abundant of our flat fishes, and is easily recognised by its dark green back being covered with bright orange-red spots. It is found wherever the ground is fairly smooth. It is mostly taken by trawling, but also takes a bait freely, the best bait being lugworm. They vary very much in quality according to the ground they frequent, being more often than not soft and watery; but now and then a good thick plaice filleted and fried is not to be despised. Couch III., p. 181, Pl. CLXIX. Day II., p. 25, Pl. CI.

PLEURONECTES LIMANDA.

DAB.

This is also a common fish on our coast, and with plaice form the greater part of the contents of our trawl nets. They mostly frequent sandy ground, and are easily distinguished from plaice by

their light brown colour and rough backs, which are sometimes very faintly spotted with pale yellow spots. The under side has a more transparent look about it than in plaice. They seldom exceed a foot in length. They are far better eating than plaice. I may class them as one of our sporting fishes, as they readily take a bait, the best being lug or rag worms, and form one of the principal items in a day's hooking in Poole Harbour. At Portland, outside the Breakwater, I once took 70 in an hour. They are fried either whole or in fillets. Couch III., p. 185, Pl. CLXX. Day II., p. 31, Pl. CIV.

PLEURONECTES MICROCEPHALUS.

SMEAR DAB.

Caught in Studland Bay, B. Wills. Couch III., p. 187, Pl. CLXXI. Day II., p. 28, Pl. CII.

PLEURONECTES FLEUSUS.

FLOUNDER.

This is both a salt and freshwater fish, being found mostly in harbours and the tidal part of rivers, while at times they ascend far into the fresh water. I have seen them as far up the Aberdeenshire Dee as the Commonty Water, some 30 miles from the sea or tide. Few fish vary so much in taste with the ground they frequent. In Poole Harbour, for instance, the lakes and latches in the mud are full of them, but they are so strong of mud as to be quite unfit to eat, whereas if caught outside the sandbanks they are nearly as good as dabs. They are mostly taken with nets, but will often take a ragworm, or even garden worm, in fresh or slightly brackish water. Couch III., p. 195, Pl. CLXXV. Day II., p. 33, Pl. CV.

SOLEA VULGARIS.

SOLE.

This is the best and most esteemed of all our flat fish. It is mostly caught in trawls, but will now and then take a hook baited

with lugworm at night. The largest I know to have been taken on our coast measured $21\frac{1}{2}$ inches by 9, and weighed $3\frac{1}{2}$ lbs., and was caught by Colonel Frank Willan in a trammel at Portland 21st August, 1880. Mr. W. Thompson (1851) says:—"The colour of the sole depends upon and varies according to the quality and depth of the feeding ground. At Weymouth there are four prevailing varieties—1, a dark sole; 2, a shrub sole from the marks on the back; 3, a lemon sole; 4, a spotted sole. No. 1 is, I believe, caught in the shallowest water, No. 2 next, and 3 and 4 in the deepest water." The male is not nearly so plentiful as the female, and for a long time was not known, as the milt is very small and easily overlooked. Soles have been taken this summer (1895) in good numbers, both inside and outside of Poole Harbour. Couch III., p. 200, Pl. CLXXVI. Day II., p. 39, Pl. CVI.

SOLEA LASCARIS.

LEMON SOLE.

Gosse mentions two taken at Weymouth, 1854. Couch III., p. 205, Pl. CLXXVIII. Day II., p. 42, Pl. CVII.

SOLEA VARIEGATA.

VARIED SOLE.

W. Thompson considers this only a variety of the common sole, and they were called at Weymouth "bastard soles," or thickbacks. Couch III., p. 203, Pl. CLXXVII. Day II., p. 43, Pl. CVIII.

SOLEA LUTEA.

LITTLE SOLE.

P. Gosse says they are common at Weymouth. Couch III., p. 207, Pl. CLXXIX. Day II., p. 44, Pl. CVIII.

PERCA FLUVIATILIS.

PERCH.

This is the best of the non-migratory fresh water fishes for the table, and being a bold and free biter is generally the first fish

caught by the young angler. They are found in ponds and in such rivers as the Stour. Worms and minnows are the best baits. Couch I., p. 185, Pl. XXXIX. Day I., p. 2, Pl. I.

LABRAX LUPUS.

BASS.

This is the perch of the sea and, like the former, a voracious feeder. They are found all along our coast, and I have taken numbers of small ones in Poole Harbour, and have seen many large ones about Portland and at Passage Bridge, Weymouth. They take almost any sort of fish bait, such as skate's liver and small fish, and at times rise well to a large salmon fly. Couch I., p. 189, Pl. XL. Day I., p. 8, Pl. II.

POLYPRION CERNIUM.

STONE BASS.

J. Hunt, of Chickerell, includes this fish in his list of those caught in the West Bay, but says it is not common. Couch I., p. 200, Pl. XLIV. Day I., p. 17, Pl. VI.

MULLUS SURMULETUS.

SURMULLET, OR STRIPED RED MULLET.

This is one of the best fish we have, and is at times very abundant on our coast. I have taken as many as 35 at one haul of a 25fm. trammel at Portland, and my friend, the late Captain T. H. Powell, took 55 in the same place 18th September, 1879. They remain in deep water during the winter, and only come in shore towards the end of July and in August and September. When first caught, and before the scales are stripped off, as one sees them in the shops, they are a creamy white with yellow stripes, and with most beautiful opalescent hues on the gill covers. They are caught only in nets, and I have only heard of one instance of one being caught on a hook, and that was off Studland. Couch I., p. 208, Pl. XLVII. Day I., p. 22, Pl. VIII.

CANTHARUS LINEATUS.

BLACK BREAM.

This fish is often taken when using small hooks while pout or dab fishing, but, having a very small mouth, often robs the hook of its bait without being caught. I have taken them at Portland Breakwater, Weymouth, and St. Alban's Head. Couch calls them "old wife." Couch I., p. 222, Pl. XLIX. Day I., p. 26, Pl. IX.

BOX VULGARIS.

BOGUE.

W. Thompson notes one as having been caught at Weymouth 27th December, 1872. Couch I., p. 225, Pl. L. Day I., p. 28, Pl. X.

PAGRUS.

BECKER, OR BRAISE.

B. Wills tells me he has taken this fish off Studland. Couch I., p. 228, Pl. LI. Day I., p. 30, Pl. XI. (uncertain).

PAGELLUS CENTRODONTUS.

COMMON, OR RED SEA BREAM.

Common along the coast in summer, when those under $\frac{1}{2}$ lb. are called chads, but the large ones up to 3 or 4 lbs. keep to water of from 20 to 30 fathoms. They bite freely, taking almost any fish-bait, and are good eating when large. Couch I., p. 237, Pl. LV. Day I., p. 36, Pl. XIII.

COTTUS GOBIO.

MILLER'S THUMB, OR BULL HEAD.

Is found in most of our streams, where it hides among stones. Couch II., p. 6, Pl. LIX. Day I., p. 46, Pl. XIX.

COTTUS SCORPIUS.

FATHER LASHER, OR GOGGIE.

The first fish I ever caught at Weymouth in 1848, and I have caught many since in various ways. Couch II., p. 8, Pl. LX. Day II., p. 49, Pl. XX.

COTTUS BUBALIS.

BUBALIS.

Often confounded with *Cottus Scorpius*. W. Thompson had one 18th July, 1877. Couch II., p. 11, Pl. LXI. Day I., p. 51, Pl. XX., fig. 2.

COTTUS QUADRICORNIS.

FOUR-HORNED COTTUS.

W. Thompson had one alive 7th February, 1834. Couch II., p. 15, Pl. LXIII. Day I., p. 53, Pl. XXI.

TRIGLA CUCULUS.

ELLECK OR COMMON RED GURNARD.

Is often taken on our coast both in nets and by hook. The flesh is firm and good. Couch II., p. 19, Pl. LXIV. Day I., p. 58, Pl. XXIII.

TRIGLA GURNARDUS.

GREY GURNARD.

This is also common on our coast. It takes a bait freely. I took five at Portland, 23rd April, 1881, trawling. Couch II., p. 27, Pl. LXVIII. Day I., p. 62, Pl. XXV.

AGONUS CATAPHRACTUS.

POGGE, OR ARMED BULL HEAD.

I found several about $3\frac{3}{4}$ inches long among some sprats on 30th January, 1896, caught in a stow-net off Poole Harbour. Some contained roe just ready to be shed, and the males were in the same condition. Couch II., p. 41, Pl. LXXII. Day I., p. 67, Pl. XXVIII., fig. 1.

TRIGLA LYRA.

PIPER.

Not uncommon at times. Taken in Swanage Bay. Couch II., p. 23, Pl. LXVI. Day I., p. 64, Pl. XXVI.

TRACHINUS DRACO.

GREATER WEEVER.

Is sometimes taken in trawls and on mackerel lines. It has a very sharp spike on each gill cover, and also on the back, with which it can inflict a nasty wound. Couch II., p. 43, Pl. LXXIII.

TRACHINUS VIPERA.

VIPER WEEVER.

This little fish seldom exceeds 4 or 5 inches, and, like the greater weever, has very sharp spikes, both on the gill covers and back, with which it inflicts nasty wounds on the feet of bathers, as it buries itself in the sand in shallow water, where it is often caught in shrimp nets. Couch II., p. 48, Pl. LXXIV. Day I., p. 81, Pl. XXXI.

SCIÆNA AQUILA.

SCIÆNA.

W. Thompson notes that one of these splendid fish was taken near Weymouth about the year 1849. They run to a large size, being often 5 to 6 feet long, and weigh up to 100lb. Couch II., p. 54, Pl. LXXVI. Day I., p. 150, Pl. L.

LEPIDOPUS CAUDATUS.

SCABBARD FISH.

B. Wills, fisherman, of Poole, tells me he has taken this fish in Studland Bay. Thompson also mentions it, but seems to have confused it with Banks' oar-fish. Couch II., p. 59, Pl. LXXVII. Day I., p. 156, Pl. LI., fig. 2.

TRICHIURUS LEPTURUS.

HAIR TAIL.

W. Thompson records one of these fish, 3ft. 6in. long by 3in. deep and 1in. thick, as being taken by the smack Liberty at Weymouth on 17th January, 1877. Day also says that one was taken at Swanage about 2½ feet long on 10th December, 1872. Couch II., p. 61, Pl. LXXVIII. Day I., p. 144, Pl. LI., fig 1.

SCOMBER SCOMBER.

MACKEREL.

This beautiful fish is often very abundant on our coast, more especially in the West Bay, along the Chesil Beach, where about 46 boats are always kept ready for launching, each containing a large seine net some 150 fathoms long by 58 feet deep, which cost about £100 each. Many thousands are at times taken at one haul, and it constitutes the largest fishery on the Dorset coast. Mackerel seem to spawn in deep water, though the ova float near the surface. I have had small mackerel about one inch long brought to me from mid-Atlantic, having been dipped up alongside the ship in a bucket. *S. punctatus* and *scriptus* are only colour varieties of *S. scomber*. They feed mostly on small fish, especially on the mackerel midge or young of the rockling. Couch II., p. 67, Pl. LXXIX. Var., Pl. LXXXI. Day I., p. 83, Pl. XXXII. and XXXIII.

SCOMBER COLIAS.

SPANISH MACKEREL.

Hardly to be distinguished from the common mackerel except by the size of its eye, which is larger. It has also an air bladder, which is absent in the common species. Couch II., p. 78, Pl. LXXX. Day I., p. 91, Pl. XXXIV.

ORCYNUS THYNNUS.

TUNNY.

The largest of the mackerel tribe is now and then taken in the mackerel and herring nets. W. Thompson mentions one taken near Weymouth 8th April, 1877, 9 feet long, and John Hunt, of Chickerell, one of nearly a ton weight. Very likely the same fish. Couch II., p. 86, Pl. LXXXII. Day I., p. 93, Pl. XXXV.

ORCYNUS GERMO.

GERMON OR ALBACORE.

W. Thompson records one 33 inches long taken at Portland in March, 1861, and sent to the British Museum, and another 18 inches

long off the Chesil Beach, 9th July, 1877. Couch II., p. 100, Pl. LXXXIV. Day I., P. 97, Pl. XXXVI.

PELAMYS SARDA.

PELAMID OR BELTED BONITO.

One was taken 4th December, 1860, at Swanage, and was 14 inches long, and is the one figured in Couch II., p. 102, Pl. LXXXV. Day I., p. 102, Pl. XXXVIII.

NAUCRATES DUCTOR.

PILOT-FISH.

W. Thompson says that one of these fish was taken in the Fleet at Ferry Bridge, 12th November, 1876. Couch II., p. 107, Pl. LXXXVII. Day I., p. 127, Pl. XLV.

ZEUS FABER.

DOREE OR JOHN DORY.

This highly prized fish is not uncommon on our coast at times, and I have taken as many as 14 or 12 at one haul of a trawl net in Weymouth Bay, August, 1875. One of the greatest luxuries in the West of England is supposed to be a John Dory, stuffed with the livers of red mullets. Couch II., p. 118, Pl. LXXXIX. Day I., p. 138, Pl. XLVIII.

CARANX TRACHURUS.

SCAD, HORSE MACKEREL OR SCOWSPRIGG.

This is a common fish, and is often taken with mackerel, but it is worthless, and full of bones. I see in my notes that I took one at Portland 27th August, 1881. Couch II., p. 136, Pl. XCIV. Day I., p. 124, Pl. XLIV.

CAPROS APER.

BOARFISH.

This curious little fish occurs now and then on our coast in great numbers, and then perhaps none may be seen for years. I have a note that it was first taken at Poole in May, 1879, and I myself found several dead on the beach at the Sand Banks in the

autumn of 1895. As to its occurrence on the Chesil Beach, see ante, Proc. X., p. 167. It has a disagreeable smell, and is valueless as food. Couch II., p. 142, Pl. XCVI. Day I., p. 134, Pl. XLVII.

XIPHIAS GLADIUS.

SWORDFISH.

John Hunt says this fish is sometimes caught in the West Bay early in the season. Couch II., p. 145, Pl. XCVII. Day I., p. 146, Pl. XLIX.

GOBIUS NIGER.

ROCK GOBY OR BLACK GOBY.

This little fish is common among the rocks on our coasts and is the largest of the Gobies. I took one on a hook at Weymouth 31st July, 1884. Couch II., p. 153, Pl. XCVIII. Day I., p. 164, Pl. LII.

GOBIUS PAGANELLUS.

This is also common, and the late Professor Rolleston collected several at Weymouth, one of which was a much lighter colour than the others. Couch II., p. 157, Pl. XCIX. Day I., p. 162, Pl. LII.

GOBIUS MINUTUS.

YELLOW GOBY OR SPECKLED GOBY.

Is often taken in great numbers in shrimp nets, and is found in the lakes and latches of Poole Harbour. Couch II., p. 159, 167, Pl. C. and CI. Day I., p. 165, Pl. LII., fig. 4.

GOBIUS RUTHENSPARRI.

TWO SPOTTED GOBY.

Noticed at Swanage by the Rev. Lester Lester. Couch II., p. 162, Pl. C., fig 3. Day I., p. 160, Pl. LII., fig 1.

CALLIONYMUS LYRA.

YELLOW SCULPIN OR DRAGONET.

Frequents soft and sandy ground. I have caught great numbers both in Studland and Portland Bays in the trawl 1880-81. The

Dusky Sculpin is the female. Couch II., p. 173, 178, Pl. CIII. and CIV. Day I., p. 174, Pl. LIV.

CYCLOPTERUS LUMPUS.

LUMPFISH, LUMPSUCKER.

Several of these curious fish have been taken off Poole lately. One was taken in a drift net in Studland Bay 22ins. long and 13ins. deep, 3rd February, 1896 ; also one $1\frac{3}{4}$ inches long adhering by its sucker to one of the mooring buoys in Whitley Lake, 9th January, 1896. Couch II., p. 183, Pl. CV. Day I., p. 179, Pl. LV.

LIPARIS MONTAGUI.

MONTAGU'S SUCKER OR NETWORK SUCKER.

The Rev. Lester Lester mentions three of these fish as having been taken at Swanage, 1856. Couch II., pp. 193, 195, Pl. CVII., fig. 1, 2, 3. Day I., p. 186, Pl. LVI., fig 2.

LIPARIS VULGARIS.

SEA SNAIL OR UNCTUOUS SUCKER.

Couch and Day both mention this fish as having been taken at Weymouth. Couch II., p. 190, Pl. CVI. Day I., p. 184, Pl. LVI.

LEPADOGASTER BIMACULATUS.

DOUBLY SPOTTED SUCKER.

Day says that the Duchess of Portland first recorded this fish at Weymouth, and Gosse says it is frequently dredged there. Couch II., p. 198, Pl. CVIII. Day I., p. 192, Pl. LVII.

BLENNIUS GATTORUGINE.

GATTORUGINE.

I have taken two or three of these fish when fishing for Pout at Portland Breakwater. One on the 28th August, 1884. W. Thompson and P. Gosse both record it as having been taken at Weymouth. Couch II., p. 219, Pl. CXI. Day I., p. 198, Pl. LIX.

BLENNIUS OCELLARIS.

BUTTERFLY BLENNY.

W. Thompson records this fish at Weymouth, 22nd February, 1857, and Yarrell at Portland. Couch II., p. 224, Pl. CXII. Day I., p. 201, Pl. LIX., fig. 2.

BLENNIUS GALERITA.

MONTAGU'S BLENNY.

P. Gosse took an example of this fish by dredging, 1854. Couch II., p. 231, Pl. CXIII., fig. 3. Day I., p. 200, Pl. LX., fig. I.

BLENNIUS PHOLIS.

SHANNY.

P. Gosse says it is abundant at Weymouth, and I caught two by Old Harry, 10th September, 1896. Couch II., p. 226, Pl. CXIII., fig. 2. Day I., p. 203, Pl. LX., fig. 2.

CARELOPHUS ASCANII.

YARRELL'S BLENNY.

P. Gosse notes one taken at Weymouth, 1854, and W. Thompson one at Portland, February 27th, 1850, and one in Chesil Bay, 7th April, 1850, Rev. Lester Lester, 1st April, 1856. Couch II., p. 233, Pl. CXIV. Day I., p. 206, Pl. LX., fig. 3.

CENTRONOTUS GUNNELLUS.

BUTTER FISH OR GUNNEL.

This fish is found under stones at low water mark, and is so slippery as to be very difficult to hold, hence the name of butter fish. It is a good bait for Pollack. Rev. Lester Lester, September, 1855. Couch II., p. 236, Pl. CXV. Day I., p. 208, Pl. LXI., fig. I.

LOPHIUS PISCATORIUS.

ANGLER OR FISHING FROG.

So called from two long spines on the top of the head with loose filaments on the top, which are supposed to act as fishing

rods with a bait at the end to attract small fish, which are engulfed in its enormous mouth. They are taken occasionally in Studland Bay. One was caught off Poole about 1895. Couch II., p. 204, Pl. CX. Day I., p. 73, Pl. XXIX.

ATHERINA PRESBYTER.

ATHERINE OR SAND SMELT.

These bright little fish are found in great numbers in all our harbours and sandy bays. They take a bait readily, the best being a small piece of rag worm. They make good bait for other fish, but are poor eating, and not to be compared with the true smelt, being full of bones, and the scales are difficult to remove. They seldom exceed six inches in length. Couch III., p. I., Pl. CXXI. Day I., p. 225, Pl. LXV., fig. I.

MUGIL CAPITO.

GREY MULLET.

These fish frequent our harbours and backwaters at times in great numbers and sometimes run to as much as 10lbs. in weight. I have seen them quite as large in Weymouth Harbour feeding on the green silk weed on the bottoms of boats. They are very shy and difficult to catch, especially the large ones, but will sometimes take rag worm, boiled cabbage, or even macaroni (*vide* Badminton Library on sea fishing, p. 327). They will now and then take a fly in brackish water when feeding on the surface. When surrounded by a net they will hunt the whole length for a hole, which, if found, they will all pass through. A friend of mine had a net made on purpose with pieces cut out here and there and filled in again with fine green silk and was very successful in taking grey mullet. They will also jump the cork line, and if one does so the rest follow like sheep. They are good eating when about 1 to 2lbs. Couch III., p. 6, Pl. CXXII. Day I., p. 230, Pl. XLVI.

MUGIL CHELO.

LESSER GREY MULLET.

The same remarks apply to this as to *Mugil capito*, only they do not run so large, but go in much greater shoals, and, if anything, are not quite so shy. A great number bred in Poole Harbour last year (1895), and I took several about $2\frac{1}{2}$ inches long in a small hand net off Whitley Pier in February, 1896. Yarrell took a small fish in Poole Harbour which he called the short grey mullet, but which most likely is only a deformed specimen of *Mugil chelo*. (See Couch III., p. 17.) Couch III., p. 15, Pl. CXXIII. Day I., p. 232, Pl. LXVII.

LABRUS MACULATUS.

BALLAN WRASS, ROCK FISH, OR CONNER.

These fish are common all along our coast wherever there are rocks and seaweed. They vary very much in colour, so much so as to be taken to be different species. Sometimes they are a brilliant green, at others brown or spotted. They take freely a hook baited with any of the usual baits, but are not worth eating, the flesh being soft and tasteless. They are much used for bait for crab pots. Couch III., p. 24, Pl. CXXV. Day I., p. 252, Pl. LXX. and LXXI. The Comber Wrass and Green Wrass are only varieties of the above.

LABRUS MIXTUS.

COOK, STRIPED WRASS (MALE), 3-SPOTTED WRASS (FEMALE).

This very handsome wrass is not often caught on our coast, but W. Thompson mentions a female caught at Weymouth 21st July, 1873. Couch III., p. 34 and 36, Pl. CXXVII. and CXXVIII. Day I., p. 256, 7, Pl. LXXII., fig 1, 2.

CRENILABRUS MELOPS.

BAILLON'S WRASS, VAR., CORKWING, GOLDSINNY, &c.

The Rev. Lester Lester mentions all these fish as having been caught at Swanage, and I have myself taken them at Weymouth, as have also P. Gosse and Thompson. Couch III., p. 45, 47, Pl. CXXXII. and CXXXIII. Day I., p. 260, Pl. LXXIII.

GADUS MORRHUA.

Cod.

Cod are often taken in the winter off our coast, but usually of small size and not very good quality. The young, or codlings as they are called, are often abundant at Weymouth in the autumn, and I have taken many when whiffing for Pollack. Couch III., p. 53, Pl. CXXXV. Day I., p. 275, Pl. LXXVIII.

GADUS LUSCUS.

WHITING POUT, POUT, BIB OR BLIN.

These fish are more sought after by the amateur fisherman than the professional, owing to their being so delicate that they will only keep a very short time after being taken. In the day time they congregate in great numbers round old wrecks, or in holes, or round patches of rock, but roam about after dark. They keep so close to one spot that a boat's length will make all the difference in your taking fish or not. They bite freely at all kinds of bait, the best being lugworm, squid, or mackerel cut up, and will even take a piece of one of themselves. They should be cleaned as soon as possible after being caught, and the best way to do this is to cut them right across from the back of the head to the vent, and if intended to be kept till the next day they should be hung up, each separate, and a little salt sprinkled over them. I have taken great numbers along the breakwater at Portland, just where the stones end and the mud begins. A friend and I having found an old wreck about two miles from Ballard Head caught over 100 in an hour. Couch III., p. 70, Pl. CXXXVIII. Day I., p. 286, Pl. LXXX.

GADUS MERLANGUS.

WHITING OR SILVER WHITING.

Are not so numerous on the coast of Dorset as they are either to the eastward or westward, still a good many are taken both by hooking and trawling. I once in May, 1851, took 200, hooking in Poole Harbour with a friend. They take any of the usual fish baits and bite freely. They keep longer than pout, and can be

salted and dried. Couch III., p. 74, Pl. CXL. Day I., p. 290, Pl. LXXXII.

GADUS MINUTUS.

POWER OR POOR COD.

Is the smallest of the whiting or cod tribe, seldom exceeding 6 or 7 inches in length. Among a lot of pout one usually takes 5 or 6 power, so that by some they were thought to be the male of the pout, but they are now considered a separate fish. Couch III., p. 72, Pl. CXXXIX. Day I., p. 288, Pl. LXXXI.

GADUS POLLACHIUS.

POLLACK.

This sporting fish is plentiful along the rocky parts of our coast, especially about St. Albans' Head, Lulworth, and Portland, where they harbour among the long oar weed in the latter part of the summer and autumn. They afford great sport with either rod or hand line as they will take a spinning bait, fly, indiarubber band, shrimp, rag worm, or, best of all, a live sand eel. They are very strong, and attain to as much as 10 or 12lbs., but the average is from 1 to 3lbs. They are not nearly so good to eat as whiting, and soon deteriorate. They are best slightly salted and broiled. Couch III., p. 80, Pl. CXLII. Day I., p. 296, Pl. LXXXIII.

GADUS VIRENS.

COALFISH, SAITHE, &c.

The young are called Billet, Cuddies, Podlie, and many other local names. They are not so common on our coast as in the north, where large numbers are taken both in nets and by rods, using a white fly for bait. I myself have only taken two off the Dorset coast, one off St. Albans' Head on a mackerel line and one in Poole Harbour when pout fishing. A few were taken this spring (1896) in Poole Harbour in a tuck net and were sold as pollack. They afford good sport as they take a fly or spinning bait freely, but are of little use for the table, the flesh being soft and woolly. They are sometimes called green pollack, but are easily

distinguished from that fish. Couch III., p. 87, Pl. CXLIV. Day I., p. 293, Pl. LXXXIV.

MOLVA VULGARIS.

LING.

Not often taken on our coast, but John Hunt includes it in his list of fish taken off the Chesil Beach. Couch III., p. 89, Pl. CXLV. Day I., p. 305, Pl. LXXXVI.

MERLUCIUS VULGARIS.

HAKE.

This fish also is not often taken on our coasts, though very plentiful farther west. One was taken of about 12lbs. by B. Wills in Studland Bay in August, 1892. They are most voracious feeders and consume great quantities of herrings, sprats, and pilchards, even taking them out of the nets when caught. They feed mostly at night. Couch III., p. 99, Pl. CXLVIII. Day I., p. 300, Pl. LXXXV.

MOTELLA TRICIRRATA.

THREE-BEARDED ROCKLING.

This handsome fish is often taken in crab pots and trammel nets as it frequents rough and rocky ground, where it feeds on crustaceans and small fish. It varies somewhat in colour from pale brick dust to crimson with black spots. I took one at Portland, and another was taken off Poole, April, 1896. P. Gosse says it is not rare at Weymouth. Couch III., p. 105, Pl. CXLIX. Day I., p. 317, Pl. LXXXVIII, fig. 1. The young of the above are figured in Couch as Thompson's Midge and Silvery Gade. Couch III., p. 118, Pl. CLI., fig. 3, 4 and IV., p. 427. Day I., p. 317, Pl. 89.

MOTELLA MUSTELA.

FIVE-BEARDED ROCKLING.

W. Thompson records one taken at Weymouth 10½ in. long, 24th May, 1878, also Gosse. It is found in pools among rocks at low

water. Not uncommon in Purbeck (Rev. Lester Lester). Couch III., p. 108, Pl. CL., fig. 1. Day I., p. 314, Pl. LXXXVIII., fig. 2. (Mackerel Midge (young of above). Couch III., p. 113; Pl. CLI., fig. 1 and 2.

RANICEPS RANINUS.

LESSER FORKBEARD.

Uncommon. W. Thompson notes two taken at Weymouth. One 9½ in. long on 8th October, 1853, and another 11th September, 1878, 12½ in. long. Couch III., p. 122, Pl. CLII. Day I., p. 320, Pl. XC., fig. 1.

AMMODYTES TOBIANUS.

LESSER LAUNCE.

This is the common sand eel which is found sometimes in great quantities in our harbours and along our coasts. It forms the principal food of many fish, and is by far the best bait for bass and pollack. It buries itself in the sand, and may be dug out with a fork at low water. W. Thompson mentions one 14½ in. long, having been taken on the Chesil Beach, 28th May, 1873, but I think this must have been *Ammodytes lanceolatus*, as a *tobianus* seldom exceeds 7 in. Couch III., p. 137, Pl. CLVII., fig. 1. Day I., p. 331, Pl. XCII., fig. 2.

AMMODYTES LANCEOLATUS.

GREATER LAUNCE.

Yarrell mentions the Dorset coast as the habitat of this fish. Couch III., p. 140, Pl. CLVII., fig. 2. Day I., p. 329, Pl. XCII., fig. 1.

CLUPEA HARENGUS.

HERRING.

Herrings are often caught in great quantities in seines off the Chesil Beach. They are also taken in drift nets at the back of the Hook Sand near Poole harbour in the winter, but have not been very plentiful of late years. The young form the greater part of what is called whitebait. Couch IV., p. 95, Pl. CCII. Day II., p. 208, Pl. CXXXVIII., fig. 2.

CLUPEA PILCHARDUS.

PILCHARD.

This fish is at times caught in great numbers off the Chesil Beach, but earlier in the season than the herrings, but they have not been plentiful of late years. A few are sometimes taken with the herrings in the drift nets. They are much more oily than herrings, and are first rate bait for most fish. The sardines of the French and Mediterranean coasts are only small pilchards. Couch IV., p. 79, Pl. CCI. Day II., p. 224, Pl. CXXXIX., fig. 1.

CLUPEA SPRATTUS.

SPRAT.

Great numbers of sprats are often taken on our coast in the winter months mostly by stow nets, which are like long taper bags with square mouths, and are secured to the anchor of the smack, and into which the fish are driven with the tide. The fish are taken out by hauling up the cod end of the net into the smack. They are also taken in seines and drift nets. They are good bait, and when very plentiful are used for manure. The young also form whitebait. The best way to cook sprats is to fry them without any grease, but only sprinkling them with salt which makes them crisp and brown. Couch IV., p. 109, Pl. CCIII. Day II., p. 231, Pl. CXXXIX., fig. 2.

ENGRAULIS ENCRASICHOLUS.

ANCHOVY.

Thompson mentions one as having been taken at Weymouth, 7th May, 1873. Couch IV., p. 125, Pl. CCVI., fig. 2. Day II., p. 206, Pl. CXXXVIII., fig. 1.

CLUPEA ALOSA.

ALLIS SHAD.

These fish are often taken in the tuck nets, off Poole harbour, also off the Chesil Beach in the large seines. They are not bad eating, but have a great many bones. Couch IV., p. 117, Pl. CCIV. Day II., p. 234, Pl. CXL.

CLUPEA FINTA.

TWAIT SHAD.

Arrive in Swanage bay before the herrings (Rev. Lester Lester).
Couch IV., p. 122, Pl. CCV. Day II., p. 236, Pl. CXLI.

BELONE VULGARIS.

SNIPE EEL, GAR FISH, GREEN BONE, GORE BILL, LONG NOSE.

These fish are sometimes taken in great numbers both off the Chesil Beach and inside Portland in seine nets, they also often take the bait when mackerel fishing. They are excellent eating cut in pieces and fried, and also make good bait for other fish. Some people, though, will not eat them on account of their bones being a bright green colour. In the young the upper jaw is quite short. Hence the name half-beak. Couch IV., p. 146, Pl. CCIX. Day II., p. 147, Pl. CXXVII., fig. 1.

ANGUILLA VULGARIS.

THE COMMON EEL.

Until lately there were supposed to be at least three different sorts of the common or freshwater eel, and they were distinguished as the broadnosed, sharpnosed, and snig eel. Couch also figures one as the Dublin eel, but it is now considered that they are all one species, that the broadnosed and snig are the males which do not go very far into fresh water but remain more or less in the brackish water of estuaries and mouths of rivers. They do not grow to a large size, and are of a dark olive colour on the back and a greenish yellow or golden underneath. The females, or sharpnosed eel, on the other hand ascend to the very sources of rivers, and go up ditches into ponds and lakes, and will even work their way over land where the grass is wet. Their life history is far from having been satisfactorily worked out, but it is known that the spawn is deposited in the brackish water of estuaries, that the young, called elvers, ascend the rivers in vast multitudes when about three inches long and about the thickness of a knitting

needle, in the Spring of the year, and that they will overcome every obstacle in their path I can bear witness, for I have seen them crawl up the perpendicular face of a wooden hatch some four feet high wherever the surface was damp, to get at the higher water above, and so continue their course up stream. How long they remain in fresh water is not known, but towards Autumn, when the rivers flood, large quantities of adult eels come down into the estuaries to spawn and never return, and what becomes of them is not known. An eel with mature spawn is so rarely found that a full-sized drawing of one which had been sent to the College of Surgeons, appeared in the *Field* of 21st December, 1895. Since the above was written Professor Grassi seems to have discovered that the adult eels only attain maturity in the depths of the ocean, where in due time they breed, and from the eggs are hatched the young *Leptocephali* which, after a certain time, assume the form of the elver, and ascend the rivers. Eels hibernate in mud and in bogs, and in banks of rivers and ponds, during which time they do not seem to feed, but when warm weather sets in feed greedily (mostly at night) on small fish, worms, and insects. Couch IV., p. 306, Pl. CCXXXIV., CCXXXV., and CCXXXVI. Day II., p. 241, Pl. CXLII.

CONGER VULGARIS.

CONGER.

This is essentially the salt water eel, and is never found in perfectly fresh water, though it is often taken in harbours and estuaries where the water is not wholly salt. It differs in many respects from the common eel, both in colour, size of the eyes and head, and consistency of the flesh, which is very white and firm. The colour varies from black to white, according to the ground it frequents, the darkest being found among dark rock and seaweed, and the lightest on light sandy bottoms. They run to a large size, having been taken over 100lbs. weight. They feed best at night when they come out of their holes among the rocks, and cruise about on the smoother ground in search of food, which consists

mostly of fresh fish. In fishing for conger the bait should be perfectly fresh, and the best are pieces of squid, mackerel, bream, or half a freshly caught pout. On first being hooked it pulls hard, but after a time begins to spin round and round, then is the time to haul it into the boat, when a sharp blow with a small club called "the priest," or conger bat, should be given across the vent, just as it comes over the gunwale. This will disable it and prevent it from mixing up everything in the bottom of the boat. The snood for some six inches or so from the hook should be served round with fine copper wire or made of several strands of soft plaited green hemp such as is used by saddlers for sewing. Couch IV., p. 340, Pl. CCXXXVIII. Day II., p. 250, Pl. CLII., fig. 2.

SIPHONASTOMA TYPHLE.

BROAD-NOSED PIPE FISH.

This curious fish is common at Weymouth, where it is found in the *Zostera* beds (T. Gosse). I have also taken it there myself. Also at Studland and Swanage (Rev. Lester Lester). In common with the rest of the pipe-fishes the eggs are transferred from the female to the male, who carries them in a sort of fold of the skin of the abdomen till they hatch. The tail in this species is not prehensile. Couch IV., p. 355, Pl. CCXXXIX., fig. 2. Day II., p. 257, Pl. CXLIV., fig. 3.

SYNGNATHUS ACUS.

THE GREAT PIPE FISH.

Taken at Studland (Rev. Lester Lester). Couch IV., p. 351, Pl. CCXXXIX., fig. 1. Day II., p. 259, Pl. CXLV., fig. 1 and 2.

NEROPHIS ÆQUOREUS.

OCEAN OR SNAKE PIPE FISH.

Swanage, October 1856 (Rev. Lester Lester). Weymouth (Gosse). Tail prehensile. Couch IV., pp. 356, 359, Pls. CCXL. and CCXLI. Day II., p. 261, Pl. CXLIV., fig. 4.

NEROPHIS OPHIDION.

STRAIGHT-NOSED PIPE FISH.

Studland (Rev. Lester Lester). Couch IV., p. 363., Pl. CCXLI., fig. 3. Day II., p. 262, Pl. CXLIV., fig 5.

NEROPHIS LUMBRICIFORMIS.

WORM PIPE FISH.

Common (F. J. B. B.) Studland Bay (Rev. Lester Lester). Weymouth (Gosse). Couch IV., p. 361, Pl. CCXLI., fig. 2. Day II., p. 263, Pl. CXLIV., fig. 6.

HIPPOCAMPUS ANTIQUORUM.

SEA HORSE.

The sea horse is so called from the shape of its head. The only authority I have for including this fish in our fauna is that Day mentions that "Dilwyn says the specimen he gave Yarrell came from Dorsetshire, not Swansea." Couch IV., p. 364, Pl. CCXLI., fig. 4. Day II., p. 265, Pl. CXLIV., fig. 7.

BALISTES CAPRISCUS.

FILE FISH.

One was taken on a pout line baited with lugworm at Portland Breakwater 14th August, 1873, by Master T. G. Wood, of Bath (W. Thompson). Couch IV., p. 369, Pl. CCXLIII. Day II., p. 268, Pl. CXLVI.

TETRODON LAGOCEPHALUS.

GLOBE FISH.

Day says that one $17\frac{1}{2}$ inches long was taken at Charmouth, and is in the British Museum. Couch IV., p. 373, Pl. CCXLIV. Day II., p. 270, Pl. CXLVII.

ORTHAGORISCUS MOLA.

SHORT SUN FISH.

I saw one that was taken off the Chesil Beach in August, 1884. Day mentions one from the same place June, 1846, which was

6 feet 3 inches long, and also one in August of the same year from Swanage 6 feet 10 inches by 4 feet 5 inches high. One at Lulworth weighing 6cwt. (W. Thompson) was taken by B. Wills, of Poole, 29th June, 1893. 1st July, 1875, two at Swanage (Rev. J. M. Colson), and one at Warbarrow 1853 or 1854 (Rev. N. Bond). Couch IV., p. 377, Pl. CCXLV. Day II., p. 272, Pl. CXLVIII.

PETROMYZON MARINUS.

SEA LAMPREY.

One of 10½ ins. long was taken 22nd May, 1873, off the Chesil Beach (W. Thompson). Also one was caught by B. Wills 10th January, 1896, in Studland Bay. Couch IV., p. 385, Pl. CCXLVII., fig. 1. Day II., p. 356, Pl. CLXXVIII.

SALMO SALAR.

SALMON.

Is found in the rivers Frome and Puddle and their estuaries. It is also caught sometimes in the seine nets off the Chesil Beach and in Poole Harbour. Couch IV., p. 163, Pl. CCXI. Day II., p. 66, Pl. CX.

SALMO TRUTTA.

SEA TROUT.

Are often caught in the seines off the Chesil Beach in the West Bay ; also in Poole Harbour and off the Preston stream in Weymouth Bay and Swanage (W. Thompson), but are seldom taken in the Frome, though some, no doubt, ascend that river. Couch IV., pp. 214-221, Pl. CCXVI. Day II., p. 84, Pl. CXI., fig. 1, and CXII., fig. 1 and 2.

SALMO LEVENENSIS.

LOCH LEVEN TROUT.

This variety has been introduced into the Frome at Dorchester and into some of the streams and ponds near Shaftesbury to

improve the breed of *Salmo fario* with more or less success. They are not unlike the sea trout in colour, but are not migratory. The flesh is pink like sea trout. Couch IV., p. 243, Pl. CCXX. Day II., p. 92, Pl. CXVI., fig. 2 and 2a.

SALMO FARIO.

COMMON TROUT.

Is found in nearly all our Dorset rivers. They vary very much both in shape and colour, and also in the colour and goodness of their flesh in the same stream and within a few yards of each other. I believe it all depends on the particular food each individual fish prefers. Nothing comes much amiss to them when hungry. Couch IV., p. 225, Pl. CCXVIII. Day II., p. 95, Pl.'s CIX., CXIII., CXIV., and CXVI.

CYPRINUS CARPIO.

CARP.

Is found in some of our lakes and ponds, such as those in Morden Park. Couch IV., p. 4, Pl. CLXXX. Day II., p. 153, Pl. CXXIX., fig. 2.

GOBIO FLUVIATILIS.

GUDGEON.

Is found in some of our smaller streams such as the Allen, near Wimborne. Couch IV., p. 20, Pl. CLXXXII. Day II., p. 172, Pl. CXXXI., fig. 2.

LEUCISCUS CEPHALUS.

CHUB.

Are found in the Stour. Couch IV., p. 44, Pl. CXC. Day II., p. 178, Pl. CXXXII., fig. 1.

LEUCISCUS RUTILUS.

ROACH.

Are found in the Frome and Stour. Couch IV., p. 47, Pl. CXCI. Day II., p. 175, Pl. CXXXII., fig 2.

LEUCISCUS VULGARIS.

DACE.

Is found in most of our streams and in some lakes through which a constant supply of water flows. Couch IV., pp. 51, 54, and 59, Pl. CXCIII., CXCIV., and CXCVI.

LEUCISCUS PHOXINUS.

MINNOW.

Is found in all our streams, where they form food for trout, perch, &c. Couch IV., p. 64, Pl. CXCIX., fig. 1. Day II., p. 185, Pl. CXXXIV., fig. 1.

NEMACHICHUS BARBATULA.

LOACH.

Is found in some of our smaller streams such as the Allen, and is a good bait for trout and perch. Couch IV., p. 69, Pl. CXCIX., fig. 2. Day II., p. 203, Pl. CXXXVII., fig. 2.

ESOX LUCIUS.

PIKE.

This voracious fish exists in the Frome, the Stour, the Puddle, and many of our private lakes and ponds. They grow to a large size. I have myself taken them up to 11lbs. in the Frome and I have heard of them up to 30lbs. from the Stour. Couch IV., p. 150, Pl. CCX. Day II., p. 139, Pl. CXXVI.

TINCA VULGARIS.

TENCH.

Is found mostly in ponds or lakes such as those in Morden Park. Couch IV., p. 22, Pl. CLXXXIII. Day II., p. 188, Pl. CXXXIV., fig. 2.



Newton Manor.

By Sir J. C. ROBINSON.

(Read Sept. 9th, 1896.)



OUR excellent Honorary Secretary has told me that I am expected to give some account of this house and its contents. I am afraid there is very little to be said of sufficient interest to warrant my taking up the time of our Society. However, I will do my best.

As to the place itself, Newton is an ancient property lying, like most of the farms and small manors in Swanage, within nearly the same boundaries, the old grey stone walls, by which it was first enclosed. It is a hamlet in the parish of Swanage, the New"ton," or town, occupying the first rising ground known as Newton "Knap," on the main Purbeck road to Corfe Castle and Wareham. Two or three hundred yards further on comes Herston, a somewhat similar hamlet now grown into a village, and doubtless in its origin the "ton," or holding, of some Anglo-Saxon settler in Purbeck.

The estate runs up to the sea on the south and is bounded by rugged Purbeck stone cliffs, the hill side being in part honey-

combed with quarry workings of many centuries. On the north, now separated by the railway, are water meadows, extending towards Swanage town, through which meanders the little Swanage river, and there are some closes of arable land, called the North Fields, stretching towards the chalk down. Here, my sons tell me, they get more partridges than anywhere else. There are snipe about the brook at the right time of the year, and occasionally a heron is to be seen, one of which, an especially handsome bird, has found an abiding shrine in a glazed case in the corridor. As an illustration of the little reliance to be placed on the permanence of field names, I may mention that there is an upland arable field on the north, which goes by the name of "*Wetwhistle*." Being quite unable to understand why a hill-side field, usually as dry as a bone, should have got such a name, I asked, many years ago, an ancient labourer if he could throw any light on the matter. "I can tell 'ee, you see," he said, "that field were, forty or fifty years ago, old pasture, and I mind the time when old farmer Beaton he broke it up into arable. It were in the month of July, and powerful hot, and the men drank so much of the old farmer's cider that he said 'Well, my lads, you have wet your whistles this time. I shall call this field *Wetwhistle* in future,'" and *Wetwhistle* it is to this day.

Newton was for centuries the headquarters of an old Purbeck family, the Cockrams of Newton, Whitecliffe, and Bucknowle, which three estates remained in their possession till about 1830, when the last of the family, Captain John Cockram, died, and the property was sold. The Cockrams were a race of Purbeck gentry, bearing coat armour, the coat a canting one, the charge a cock on a ram's back, and they seem to have furnished quite a succession of parsons to the parish. They lived in this house, and doubtless built at different times all there was of it till I came into possession. It will be gathered, then, that Newton is an old house, but I am afraid mainly in the same sense as was the schoolboy's penknife, which was an old knife, but had a new blade and a new haft. Captain John Cockram built or refaced the

front part of the house, and he has left us his autograph, written with a diamond on one of the window panes—

“John Cockram, April, 1799.

Very cold easterly wind.”

The Captain also in his younger days probably planted many of the elm trees in front, which have ever since been the chosen home of a flourishing colony of rooks. Sundry old men in former years have given me various scraps of information about Captain Cockram : he was a captain in the Militia and evidently proud of his title, a somewhat bulky man and very much addicted to smoking a long clay pipe in the winter evenings “down at the Anchor” in Swanage. He seems to have remained a bachelor till rather late in life, when at last he was smitten by the charms of one Mary Cole, who was his cousin. It is said that he had previously made his will, leaving her all his property, and that when he married the lady he never thought of altering it, the result being that when he died there was no Mary Cole to inherit, and the poor lady was summarily dispossessed by distant relatives, who left her but her bare legal rights. I think the Cockrams must have been a jovial race, for in digging the foundations of the new drawing-room we came upon some scores of old squat Dutch gin bottles, doubtless once filled with good liquor, very comforting when the cold easterly winds blew at Swanage, and which probably had not contributed much to the king’s revenue. Only one small plot had in former times been taken out of the Newton property. It is the pretty little old stone house and garden on the other side of the road known as Newton Cottage. I have never been able to ascertain the exact reason why the Cockrams parted with this house, but I have an old deed dated 1760 conveying it to one Esther Mowlem, but who and what Esther Mowlem was nobody seems to know ; probably she may have been a widow, once a Miss Cockram, and this her dower house. I mention this because this alienation makes me rather envious, and for a particular reason ; it is that my house has not got a ghost, whilst Newton Cottage rejoices in the possession of a first-rate one. The legend and

particulars of this visitant, by no means an alarming one, are, however, so well known in these parts that I need not retail them here.

A little further down the road past Newton Cottage, and in a field adjoining, belonging to the next property, once took place perhaps the most dreadful and pitiful proceeding which was ever enacted at Swanage. There three poor men were hanged, drawn, and quartered in 1685 by order of the infamous Judge Jefferys for participation in Monmouth's rebellion. A flagstone in the pavement, which may be recognised by having a square mortice hole cut in the centre, marks the place, and it is said that this stone held the post on which the quarters of the poor victims were hung up. By a grim irony, in Judge Jefferys' usual style, the parish was made to pay the expenses of the execution, and the hangman's bill for the same was preserved in the church chest until some 30 or 40 years ago, when it disappeared, nobody knows how.

I came to Newton about twenty-three years ago ; the house had been unoccupied as a residence for some years, and was in the keeping of the farm tenant. At the back of the house were the farm buildings, all now cleared away and rebuilt elsewhere, excepting the old barn, now converted into this dining hall ; in front was the farm yard^d, and the present bay window occupies the place of the barn door. When first I entered this room the farmer and a wool merchant were bargaining for and weighing out the wool from a recently shorn flock, and the drawing-room was filled with cider casks. I may here say that I afterwards built on to it the present back drawing-room, whereby a fair-sized apartment was formed. Bats, rats, and mice occupied the bedrooms, a colony of owls was established in one of the old stone chimneys, and a swarm of bees was installed in the corresponding chimney at the other end of the roof. The bees and the owls have maintained their holding to this day, a family of four young owlets having made their appearance this year. For the information of our entomological friends, moreover, I may say that we think we possess a private breed of spiders, fine, big, long-legged creatures, as active as race horses. They are

established in the louvre turret in the centre of the hall. They make their appearance every year to a day or two at the beginning of September, and one of their amiable customs is to drop down on the shoulders of our lady guests at dinner time.

Now as to my doings and the sundry "bric-à-brac" got together in the house. It has been a great amusement from year to year to alter and build a little, plant a good deal, and generally improve the house and its surroundings. I found that I could connect the barn, a substantial old stone-built and stone-tiled structure, with the rest of the house by means of a corridor, and convert it into a dining-hall. The other inner works of the house have had no end of choppings about, changes, and additions, all of which have provided most pleasant diversions after the more serious occupations and fatigues of London residence. In short the place has been entirely transformed within a comparatively short time. Now as to the objects of interest, if there are any worthy of special notice. The chimney-piece, always the focus and centre of every habitable room, is probably the most notable object in the dining-hall. This is really a fine example of an ancient Italian-hooded mantelpiece, carved in the Tuscan black stone called "Pietra serena." It is a massive structure of considerable size : it dates about 1480, and was brought from one of the palaces or villas in the neighbourhood of Florence. An interesting peculiarity will be noticed in the two niches, one on each side within the jambs, covered with shell-shaped canopies ; these were the ingle nooks where the master of the house and his wife could sit and warm themselves at the fire in the cold winter evenings. In the frieze will be noticed the coat of arms of the family for whom the work was constructed, an inscription in finely-cut letters and carved festoons of leaves and flowers pendant from vases with dolphin handles. The inscription is in Latin much abbreviated ; it reads as follows:—*Ipsa dies quandoque parens quandoque noverca est*, which may be freely rendered "the day is sometimes a mother and sometimes an unkind step-mother." It is paraphrased from the Greek of the "Works and Days" of Hesiod, and was in all probability furnished

to the original owner of the chimney piece by one of the notable humanists of the quattro-centro revival of letters. At the back of the fireplace is a back plate or reredos of old Sussex cast iron ; it bears the Tudor arms of Henry VII. or Henry VIII., and it was originally at Hever Castle, in Kent, the birthplace of Anne Boleyn. At first we used to burn turf in the old style, mainly because the Newton property has attached to it an ancient right of turbary on Coringdon Heath, about three miles away on the other side of the chalk down. Unfortunately, however, though there was an ancient and not unpleasant smell from the burning turf, there was also a great deal of pungent smoke, but very little heat. In short, turf burning was found to be an antique custom on the whole pleasanter in the breach than in the observance. It ended in the setting up of the hideous iron stove now to be seen, which, although ugly and incongruous enough, gives out a very comfortable amount of warmth.

The entrance folding doors from the corridor into the dining-hall are of old Spanish work of about the year 1600 ; they came from a convent near Madrid, and the carved panels, which are in the semi-Moresque or "Mudejar" style, contain various emblems and devices illustrative of a Litany to the Virgin. The other glazed folding doors in the corridor, I am sorry to say, were originally, together with another similar pair, which I have utilised in another part of the house, in Wareham Church. They are to my mind charmingly quaint specimens of the age of Queen Anne, yet they were ruthlessly turned out, some 20 or 30 years ago, on the occasion of one of the numerous so-called "restorations" which the old church has undergone. I found them abandoned in a corner of the builder's yard "who did the job." A series of three carved doors in the entrance hall and corridor are of Italian work of the end of the 16th century ; they came from a convent at Padua. The carved cabinets in the corridor are of French and Italian 16th century origin, and a series of marble busts and other sculptures will be noticed ; these are all of antique Greek and Roman work, and most of them came from the Stowe collection. Perhaps I ought to say a

word or two about the series of seven pictures which hang in the corridor. These are Italian 17th century productions, and I obtained them at Brescia. As works of art they have very little merit, but the strange incomprehensible subjects, all apparently weird witchcraft scenes, have a sort of curious attractiveness. Pictures of this kind were in the 16th century termed "capricci," or "Bambocciate;" it is rather difficult to make out the meaning of the present series, if indeed they had any definite meaning. They furnish in any case matter for amusing comment and speculation. Perhaps, I ought next to notice the tapestry in the hall. Nearly all ancient tapestry was made in Flanders, mostly at Arras and Brussels; it was usually made in sets to order, and very often from drawings and cartoons sent from other countries. This is the case with two of the three pieces on these walls. Two of these hangings are in excellent preservation, but the other and most important piece of the three is, I am sorry to say, in a very fragile and tattered condition. All three pieces are nearly of the same period, ranging from 1500 to 1520. The large piece which covers the end of the hall, and is the worst preserved, was obtained in Spain, and although doubtless woven in Flanders was done from a cartoon or drawing of the same size by a Spanish artist. The subject is, I believe, quite unique; it represents a sort of triumphant march, the figures being of the size of life, headed by a Moorish King or Emir walking in amity with a Christian knight, their ladies and children, soldiers, musicians, and servants following. The principal feature is a procession of five huge giraffes, caparisoned with richly embroidered trappings; each of these animals carries a pair of panniers, in which are Moorish and Christian children with their nurses and attendants. A crowd of soldiers with halberds and musicians with kettledrums and trumpets form a splendid medley, whilst in the upper part of the tapestry are seen several Moorish cavaliers with javelins and kite-shaped "adarga" shields, riding jennets in the Moorish fashion with shoe stirrups, and at each end of the tapestry are carob trees with the great pendant beans hanging down. This piece, doubtless one of a series, must have been woven

in the earliest years of the 16th century, not long after the conquest of Granada by Ferdinand and Isabella. Unfortunately, it had served for a century or two before I acquired it as a carpet in front of the altar of a Spanish church, and its condition has not improved since it has been here. I should think this piece of tapestry contains the earliest known representation of the giraffe. The beasts are fairly well drawn, and may possibly have been taken from actual animals kept in the gardens of the Alhambra. The piece at the other end of the hall is also an unusual specimen. The design is a fine decorative treatment of conventional acanthus scroll work ; it is taken from a very rare Italian engraving at the end of the 15th century. The other piece is purely Flemish, both in design and execution ; it represents a musical party in the grounds of a Flemish chateau. The date of both pieces is about 1520.

Of the three suits of armour the one at the end of the hall is a tilting suit with its helmet and other pieces of about 1560.

The standing suit in the bay window is complete in almost every detail. It is of English work of the time of James I. ; it is an interesting suit, but I don't think it was ever worn. It was originally obtained from a church in Warwickshire, where it had been hung over a tomb to a member of the family of Chadwick of that county. When it came here it was packed in a coffin-shaped case, and my old gardener who unpacked it was quite taken aback when he saw the contents ; evidently he thought that there was either a skeleton or a mummy inside. All he could say was, in awe-stricken tones, "Is it Blucher, sir?" The poor old man's historical souvenirs went back, at all events, as far as Waterloo!

The other suit in the corner is a pikeman's demi suit of Elizabeth's or James I.'s period, also English ; a good many helmets, bills, swords, &c., are scattered about other parts of the house, and several rather curious and very ancient Japanese helmets.

The drawing room comes next. Here the principal thing is the old carved oak chimney piece in the front room ; this is, I think, a capital and quite complete specimen of Elizabethan work. I obtained it about 20 years ago, through the agency of the late Mr. Pouncy, from

a house in Dorchester, which was being modernised in the usual way ; fortunately, it fitted its new situation as though it had been made for the spot. The carved oak brackets betwixt the two rooms are authentic specimens of the work of the celebrated artist Grinling Gibbons. They are portions of the old altar piece of Hammersmith Church, near London, which Gibbons is known to have executed. This altar piece, as usual, was condemned and broken up and sold for an old song when the present big and ugly " Gothic " structure was built. Fortunately, I was able to secure the most beautiful details. I recollect that when last I had the honour of receiving the members of this Society at Newton, an unlucky reporter who wrote an account for a local newspaper, and who had evidently never heard of the famous old wood-carver, stated that these carvings were by " Grindling Gibbons and Co., of London."

There are several old mirrors in these two rooms in elaborate carved frames ; two of them are of English work of the period of Charles II. One hanging on the pier betwixt the two rooms is Italian of about 1550, and the one over the fireplace in the back room is of pure Flemish work of about 1650. This is, I think, a masterpiece of carving in its way, and of the style which Grinling Gibbons afterwards developed in London. In a corner of this room will be found a very curious old English picture of about 1560. It is a sort of Pilgrim's Progress allegory, the subject being the Christian man assailed by the vices and protected by the shield of Faith. Another curious English picture of the same date, which may possibly have been painted in this county, hangs in the corridor. This is a " memento mori ;" it is inscribed with a number of very curious and quaint verses and texts. As to the furniture in general in different parts of the house, there is a series of old high-backed chairs covered with incised and embossed leather ; these are of Portuguese work of the second half of the 17th century, and, together with an inlaid cabinet in the drawing room, were obtained at Evora, in Portugal. There is rather a fine Flemish carved oak cabinet in the hall, dating about 1620, and a number of old English carved oak chairs, &c. Lastly, the staircase

leading from the entrance hall may be noticed ; the balustrade of this is an elaborate specimen of Flemish carved oak of about 1650. It came, I think, from a house at Antwerp ; fortunately, it fitted its new situation with very little alteration, and it goes to the top of the house.

There are a good many specimens of ancient sculpture placed about the garden, many of them authentic "stones of Venice." In front of the house the old well, which still serves, has a "pozzo," or well head, above it. This came from one of the old palaces in Venice ; it is in Istrian stone, finely carved, and it bears the coat of arms of the family to whom it originally belonged ; it is of about 1490. Another, also in front of the house, is a more interesting piece. This is the capital of an antique Roman Corinthian column in white marble, which, in the Middle Ages, was hollowed out and made to serve as a well head ; it came from a village on the site of the Roman City of Aquileia, near Venice, and it was probably from a portico of one of the temples, or the basilica of the city. One side is well preserved ; this evidently went against a wall, but the other side is much defaced and worn, evidently from centuries of abrasion from buckets and pails. Near the vineyard will be found an antique Roman marble altar with a finely cut inscription. This also was brought from Aquileia. The purport of the inscription is to record the dedication of some monument or other, probably a roadside shrine, to the local god Belenus by an "Evocatus," or pensioned legionary soldier, by permission of the authorities of Aquileia.

It is interesting to note that this altar, which was obtained by the late Mr. Cavendish Bentinck in Venice, must have been preserved in some one of the palaces of that city ever since the early part of the 16th century, inasmuch as the inscription was published and known to scholars in the year 1548. A number of sculptured capitals of columns, mostly from Venice, are about the grounds ; these form a series dating from the 8th or 9th down to the end of the 16th century. There remains now only one other object to be noticed—this is an old Italian marble life-sized statue

of Silvanus, placed at the end of the terrace behind the house and near the high road. This statue, part of which can be seen above the garden wall, is a great object of curiosity with the trippers from Bournemouth, who are driven to Corfe Castle by the Swanage coachmen. It was formerly in the grounds at Branksea Island, and was brought there by the notorious Colonel Waugh during his brief reign. When it was first put up at Newton there was much discussion among the Swanage quidnuncs as to whom it represented. The general opinion at first was that it was the devil, inasmuch as it had horns on its head and shaggy hair on other parts. Finally, however, public opinion christened it "Esau." For a long time I could not understand why, but at last I was gravely informed it was because Esau was a hairy man. Latterly, however, Esau has been supplanted, and Silvanus, the god of woods and gardens, has become a most terrific personage. One of the drivers was heard a short time ago to explain to a tripper, in reply to the question as to whom the statue represented, that it was "Ajax defying his mother-in-law!" As this astonishing attribution seems to have quite satisfied the average excursionist, I suppose we must now accept it as the orthodox explanation.





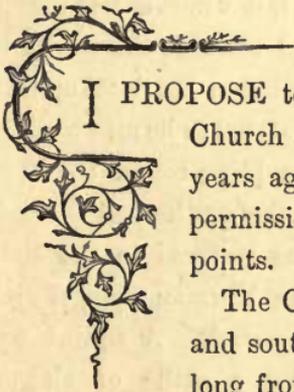
TARRANT RUSHTON CHURCH, SHEWING CHANCEL ARCH AND HAGIOSCOPES.



Tarrant Rushton Church.

By Rev. J. PENNY.

(Read August 13th, 1856.)



I PROPOSE to take as the basis of my paper on this Church a portion of the return which I made some years ago to the Rural Dean, and then with your permission to add some remarks on one or two points.

The Church consists of chancel, nave, and north and south transepts, forming a Greek-cross, 50 feet long from east to west, and 45 from north to south.

The *chancel arch* is *Norman* or *Romanesque*, very plain and massive. The mouldings at the springing of the arch appear to have been removed. It is considered by competent judges to have been built before the Conquest, certainly not later than 1150. In the east face of the wall, just above the head of the arch and equi-distant from the centre, are two so-called "acoustic vases," about which I shall speak later on. There can be no doubt that they were inserted when the wall was built. The *north transept* belongs to the *Early English* period, and may probably be dated from 1220 to 1270. In the west wall there is a lancet window, reaching so near to the ground as to suggest the thought that it may have been intended for the same purpose as

the ordinary leper windows, especially as there was a leper hospital—St. Leonard's—a few yards beyond it, and the door by its side has within the memory of some been called "The Leper's Gate." The north window is Early English.

The rest of the Church belongs to the *Decorated* Period, its probable date being about 1370. The heads of the three principal windows, E., S., and W., are of the reticulated pattern, the top of that in the south transept being boldly cut off, as the window was placed so high that there was not quite room enough for the whole.

In the chancel on the south side is the ordinary leper window of one light or lychnoscope, as it is sometimes called. There are two similar windows, each of two lights, facing one another, one on the north, the other on the south side, and a three-light window in the east, all belonging to the same order. The last window was placed a little way from the middle of the wall and towards the south to make room for a beautiful niche, which is figured in Barr's "Anglican Church Architecture" (J. H. Parker), and is stated to be an excellent model of the Decorated character. The moulding round the head ends in the characteristic ball-flower. In the south wall there is an elegant piscina. When the Church was restored in the time of the Decorated Period, the jambs of the Norman chancel arch were pierced and traceried hagioscopes inserted. A squint was also made from the north transept, having a grille of elegant design. There are traces in the middle of the archway—above the springing of the arch—of a rod, around which was probably rolled "the blacke cloth" used "at the sacring of the mass," such as that mentioned in the History of the Church of St. Lawrence, Reading. There is a square hole about the middle of the wall, opening eastward, in connection with this rod. In the east wall of each of the transepts there is a square-headed three-light window, which may belong to the Perpendicular Period. The mullions are hollowed, those of all the other windows being simply chamfered or bevelled. Above these two windows on the outside there are labels, that on the north ending in grotesque animal heads, that on the south in a mitred and a crowned head.

Over the south door is a very old rudely-sculptured slab. The centre figure is a lamb bearing a cross, with something of a serpentine form proceeding from the mouth. On the right is the figure of a man with uplifted right hand,* as though teaching or blessing, and an open book in the left hand. On the left is another human figure with a bird in the right hand and a closed book under the left arm. Both these figures are seated.

The stoup is at the right hand side on entering the door, on the outside, under the porch. On the south side of the west face of the chancel arch above the pulpit is a perfect corbel, and in the corresponding place on the north the sunk portion of another corbel. On these there probably rested a beam for the support of the rood. There is also a corbel or stone bracket in the south transept, on which the image of the patron saint, St. Mary, may have been placed. The windows, arches, and three hagioscopes are originals, with the exception of the east chancel window, the two-light south chancel window and that in the east wall of the south transept. These have been restored, but only in those parts which absolutely required to be renewed, and there has been no departure from the original patterns. In cleaning the porch a corbel was brought to light and two openings in the wall, apparently for joists, from which I should infer that there was once a bell chamber over the porch, as at Rawston. There is one bell to the church, with the inscription "William Barnes, Richard Arner, Churchwardens, 1675, R.F." (The initials R.F. are those of R. Flower, or Flowry, bell founder, of Salisbury.) The walls at the west end appear to have been raised after the completion of the nave to form a belfry. They were not strong enough to bear the swinging of a bell, not having been originally intended for anything of the kind, and as a consequence the west wall even recently exhibited several serious cracks. In 1874 a considerable

* Not necessarily the attitude of one blessing. Apuleius thus describes the action of a speaker:—"Porrigit dextram et ad instar oratorum conformat articulum, duobusque infimis conclusis digitis ceteros eminentes porrigit.

sum was expended on the roof and other parts of the church. A gallery at the west end was removed, and as the eastern face of the bell chamber had been formed by timber only, resting on a beam, this was replaced by a wall built on an arch, which, whilst it adds to the stability of the building, may be considered by some to be not altogether in keeping with the architectural character of the church generally. When I became Rector in 1877 the church was almost entirely covered with plaster, probably several hundred years old, which had been again and again whitewashed or coloured in one uniform tint. Portions of the walls were in a ruinous state as well as the whitewashed semi-circular ceiling of the nave and transepts. The plaster has now been removed, and the walls of green sandstone, ironstone and flint pointed. The roof of the north transept has been restored to its old appearance, the principals, purlins, and circular braces having, on examination, proved to be perfectly sound; whilst in the nave and south transept there is an independent ceiling of wood. The leper-door in the north transept had been blocked up. This has been opened and now forms the inner entrance to a vestry, which has been built on the outside in a style suited to the church. The work was spread over nine years and was completed shortly before the celebration of Her Majesty's Jubilee. In consequence of the dampness of the chancel before the earth was removed from the foundations on the outside, and especially as the two-light south window was entirely, and the leper window partly, blocked up, a former Rector raised the level of the floor. This has had the effect of dwarfing the chancel arch. For many years there were two slabs of Purbeck marble forming the pavement at the south entrance outside the porch. One of these having an incised cross—given roughly in Hutchins' History of Dorset—had originally been the cover of a tomb. The pattern of the cross exactly resembles one in relief placed over one of the last Abbots in Tewkesbury Abbey. This is now in the churchyard wall opposite to the south door. The other slab either belonged to an altar-tomb or, as some think, was the stone altar of the church, ordered to be removed at the

Reformation. Whatever may have been its original use, it has some interesting points which have exercised the ingenuity of antiquaries. It is now placed against the wall in the vestry. In removing the plaster, the capital of the old Norman piscina was found under the existing piscina, forming a basin to it. This is at present on one of the window sills in the chancel. On the opposite sill is a piece of Purbeck marble with a portion of a cross in relief in good condition. The slab of which it formed part evidently belonged to a tomb, and was probably broken in pieces for building purposes. It was found imbedded in the wall under the west window, and I am inclined to think that there may be other portions in different parts of the west end. On the outside there are two stones marked for sun-dials—one under the south transept window, the other forming a part of the south door jamb. There is a small coffin cover under the south window of the bell chamber, and to the right, a little below, a rude cross built into the wall.

So much for the description of the church. There are some points in it which demand more than a passing notice.

I spoke of the two earthenware vessels in the eastern face of the chancel arch wall as acoustic vases. It is well known to archæologists that there has been many a battle fought over this subject. When they were first exposed to view my first thought was that they might contain relics or a portion of the remains of some distinguished persons, but having read all on the subject on which I could lay my hands I have long since abandoned the idea. One thing is certain—that in various parts of Europe, certainly in France, Italy, Sweden, Denmark, Ireland, and especially England, earthen jars, many of them of a domestic character, are found imbedded in the walls or placed under the floor of churches.

At Fountain's Abbey, in 1854, they were found at the base of the choir screen. At St. Peter's, Mancroft, Norwich, in 1850, under the part occupied by the choir stalls were found two rows of red earthen jars, 26 in number, opening towards one another into the space between them. Ten years later a similar discovery was made at St. Peter's, Mountergate. At St. Peter's, Upton, in the

County of Lincoln, in 1863, there were found in the chancel walls of the Decorated Period three on each side, at intervals of about 6ft. and 7ft. or 8ft. above the floor; whilst at St. Nicholas, Ipswich, in 1848, vessels were met with under the roof, and at East Harling, in 1873, in the alternate spaces between the short timber uprights. In every case they were lying on their sides, with their mouths towards the interior.

There have been all kinds of conjectures as to their purpose—some as ridiculous as they could well be—but I am more than disposed to acquiesce in the opinion of one of the best writers on the subject, the Rev. G. W. Minns, that they were supposed to enrich the voice. Whether they did so or not is quite another matter. There is a passage in a manuscript of the 15th century containing the Chronicles of the Celestins of Metz, on which reliance is especially placed for the opinion. It is as follows:—“In the month of August, 1432, on the vigil of the Assumption, after Brother Odo le Roy, the Prior, had returned from a general chapter, it was ordered that pots should be put into the choir of the Church of Ceans, he stating that he had seen such in another church, and that he thought they made the singing better and resound more strongly.” It is only right to add that the Chronicler goes on to ridicule the Prior with some pleasantry for what he had done, and a later hand wrote on the margin “*Ecce risu digna.*” Dr. Codrington, who worked with Bishop Selwyn in Melanesia, visited Rushton Church in October, 1891, with our Rural Dean, and being interested in what he had seen wrote to a well-known antiquary, Sir Henry Dryden, on the subject, who agreed with the writer of the marginal note and said, briefly but expressively, “The idea is all nonsense.” I turn, however, to Liddell and Scott’s *Lexicon*, and there under the word *ἠχέιον* (you will recognise in it the familiar word “Echo”) after its common meaning, viz., a kind of loud drum or gong, it is stated that vessels of like kind were let into the walls of theatres to strengthen the sound or to imitate the noise of thunder. And this was done in both Greece and Italy.

But to come nearer home. In the Churchwardens' Accounts of Wimborne Minster for 1541, as given in Hutchins, is the following entry :—" Payd for 2 potts of cley for wyndfylling of the Chyrch, 8d."

The so-called leper window. The object of this is also a matter of dispute. Barr says of the small low window frequently found on the south side of the chancel, at about the height for a man to look through, that it is supposed to have been for watching the light in the Easter sepulchre. This may have been one of its uses; but was it the only one? Others regard it as the place where doles were given or where at the burial of the dead the service was begun, or as an external confessional. In this Church we have not only the low window in its usual place, but also in the north transept a lancet window, unusually low, and as the Hospital of St. Leonard was only a few yards off it gives some colour to the opinion that lepers were not admitted within a church, and that it was at such a window that they took part in the service.* I am inclined to think that the north transept was the chantry of the hospital. Certainly it has its separate entrance, which immediately faced the hospital, and it was formerly from one to two feet below the level of the nave.

It may not be without interest to some to hear of a bequest to Rushton Church by George Lovelly, probably Lovell, who died in 1639. These are the words of his will—" I give unto the Church of Rushton 20s., which I desire my successors to bestow in a silver plate to put the bread in at the Communion table, that the clerk, *i.e.*, the clergyman, may not carry it about in his bare hand after

* In Vol. xiv., p. 37, of the Club's Proceedings Mr. Fletcher points out that where such windows existed they had been at some time invariably closed up, probably to do away with the possibility of their being used for the purpose for which they had been originally constructed. It is some confirmation of this statement that the low window on the south side of the Rushton chancel was half blocked up, and the fact that the lancet window in the north transept was entirely walled in seems to favour the opinion that it had been used for the same purpose.

the consecration." I am sorry that we no longer possess that paten—our present one bears date 1756. The date on the Rawston Church plate is 1639. It was given by Katherine, widow of Arthur Radford (a younger son of the Radfords, of Mount Radford, near Exeter), and daughter of Thomas Uvedale, of Horton. May not George Lovell's bequest, and especially the reason assigned for it, have suggested a similar gift to the neighbouring Church ?

But for interest, perhaps, there is nothing in the Church to be compared with the slab, or lintel, over the south door. It is probably the oldest thing in the Church, and it has been considered that the 10th century is not too early a date to assign to it. As a piece of sculpture, it is as rude as it could well be, and yet the work is as sharp to-day as when it came from the craftsman's hand. There are three figures, the central one of which is the Lamb bearing the Cross, or the Agnus Dei. For some years I was asked again and again, but all in vain, for the meaning of the scroll-like form issuing from the Lamb's mouth. Was it by a confusion of metaphor a serpent ? Or was it a sort of label, such as one sometimes sees in old prints, in which are enclosed the words that are supposed to be uttered ? Or what ? Fortunately, I had lent to me, not, however, with reference to this point, a paper of Dr. Baron's on Stockton Church. It opens with an account of the restoration, of what, for want of a better name, has been called "a horizontal vesica piscis" over the middle and tallest of the three lancet lights of the east window in that Church. He says of it—"This is, alas ! only a shadow of the past, for the window was restored in 1840 ; but we have a trustworthy record that the new window was intended to be a careful reproduction of the old one. The very peculiarity of this feature nearly caused its destruction at the beginning of the recent restoration of the Church. Who ever heard of such a thing as 'a horizontal vesica piscis' ? It could not be original. I pointed out, in the Benedictional of St. Ethelwold, a 'vesica piscis' leaning to the right, although usually represented vertical in the same tenth

century MS., and pleaded that if the oval pointed figure, called by Albert Dürer 'vesica piscis,' has any relation to the early Christian symbol *ἰχθῦς*, a fish, it was only natural that this rude outline of a fish, as some assert it to be, should occasionally be shown in a horizontal—the usual swimming—position. All this might have been in vain if I had not been enabled, by the suggestion of a kind and valued friend, the Rev. C. F. Saxby, to refer to a passage in *Archæologia Cantiana*, where a 'horizontal vesica piscis,' in combination with round arches, is figured and described as unique. This settled the question as to a 'horizontal vesica piscis' being a genuine feature of Early English architecture, but I should be much interested by hearing of other examples."*

On reading this, I at once thought of what had puzzled me and others so long, and hastening to look in the light which Dr. Baron had thrown on it, there I saw the "horizontal fish," and there could be no doubt about it. The Lamb is uttering His own Great Name—'ΙΧΘΥΣ—'Ἰησοῦς Χριστὸς Θεοῦ Υἱὸς Σωτὴρ : Jesus Christ—Son of God—Saviour.

But what about the other two figures? It is wonderful when the reins are given to the imagination what a variety of directions it may take, especially in different persons, and with what curious results. May I illustrate this in the case of our lintel? For myself, as I knew that in Norman Churches the tympanum over the door commonly refers to some incident in the life of our Lord, or to something in the history of the patron saint, I was disposed to regard the figure towards the east as representing Our Lord in the act of teaching or blessing; and as the Lamb and the Dove are two great emblems in the Gospel, the third figure is again probably Our Lord, the Giver of the First-fruits of the Spirit.

But now for other views. Hutchins considered the three figures to represent the three Persons of the Blessed Trinity—an opinion to which I am entirely opposed—and the last editors of Hutchins reject it. It is, however, still held by some. Mr. C. E. Keyser,

* Dr. Baron had passed away before his paper came into my hands.

F.S.A., who read a valuable paper to the Society of Antiquaries in 1881 on the subject of the Agnus Dei, in which he instances the example on our lintel, after visiting the Church, wrote to me as follows :—

“ The sculpture on the tympanum, or rather the mutilated lintel, of a former Norman doorway at Rushton Church is very curious, and, as far as I am aware, unique in its treatment. In the centre is the Agnus Dei with the Cross supported on the right forefoot, and a scroll coming from His mouth enclosing a portion of an oval object, perhaps intended for a vesica. On the east side is a figure seated full-faced in the act of Benediction and holding an open book in the left hand, while on the west side is another figure, seated sideways and facing the Agnus Dei, with a closed book in the left hand and holding a dove in the right. I think we have here portrayed the three Persons of the Blessed Trinity, a subject which cannot to my knowledge be positively identified elsewhere in England during the Norman period.”

Another suggests that whilst the great central object represents the crucified Saviour, each of the human figures may be intended for an ecclesiastic (the book in each case implying a teacher), the hand of the one lifted up in the act of benediction, denoting the blessing, and the dove on the hand of the other the peace which will be bestowed on those who pay homage to the Redeemer. Whilst another says, “ I think it possible that the third figure may be the personification of ‘ Sapientia,’ which occurs in very ancient sculptures in conjunction with the well-known representation of Our Saviour in the act of blessing.” And still another. A scholar who has seen much of the world and has read and thought much comes and suggests that the east figure may represent the Saviour pronouncing His benediction on those whose names are in the open book—the Lamb’s Book of Life—whilst the west figure represents Him as Judge, the bird, looking in the face, representing a soul undergoing judgment or giving an account of the past ; the closed book implying that the time is past for any name to be written there. And so one might go on *ad infinitum*.

But to me this, at any rate, seems clear—that long before the Reformation we have the open Bible held up to the people, and

the same people pointed to the Lamb and the Cross and the Name of Him who is Jesus Christ, Son of God, and Saviour, and very possibly to the Heavenly Dove, the Holy Spirit.

May I hazard the conjecture—a mere conjecture—as to the word Tarrant, which gives a name to every village in the valley. In the last edition of Hutchins it is suggested that it may be a corruption of the word torrent. But, whatever our stream may be, it is certainly never a torrent. I should as soon accept this derivation by a Latin scholar as I should one of the synonyms for Rushton—viz., Russeauton—given probably by French ecclesiastics when they walked down the valley from Launceston, which was connected with the Abbey of Caen, to Keyneston, which belonged to the Bishop of Lisieux or to the far-famed Abbey of Tarent—*i.e.*, Crawford.

To me Tarent, as it is almost always spelt in old documents, seems to be the same as Trent, or Derwent, the d and t being interchangeable, and derived from dwr = water—a word which is found in Durweston, Dorchester, and Dorset.

Then what about the ending? If it is more than an ending I should connect it with the word Wynne, which we find in Wyn Green, Wyngate, Vindogladia, and which in the Latin form is found in Venta, as Venta Silurum, now Caerwent, meaning bright, clear.

The poor stream is sadly failing now, in consequence of the long drought, but Charles Kingsley, when for a short time he had charge of the neighbouring parish of Pimperne, wrote of it, among others, almost enthusiastically, and said he could preach for an hour on the chalk streams of Dorset because of their *clearness*.





An Account of the Albian Fossils lately discovered at Okeford Fitzpaine, Dorset.

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BRITISH MUSEUM, SOUTH KENSINGTON, LONDON.

(Read February 17th, 1897.)



THROUGH the enterprise of two lady collectors, Miss Forbes and Miss Lowndes, I was enabled, some few months since, to announce the presence of the *Acanthoceras mammillatum* and the *Hoplites interruptus* Zones at Okeford Fitzpaine, in the County of Dorset, (1) these well-known Cretaceous beds representing the lowest portion of the Albian or Gault deposits of this country and the continent, the first-named being the older of the two.

With the exception of Mr. Jukes-Browne's (2) contribution of 1891 very little has been published on the geology of this locality or its immediate neighbourhood. At the date mentioned this author reported some sands lying beneath the Gault between Twyford and Childe Okeford which he regarded as of "Vectian" or Lower Greensand age. Lithologically, this so-called "Vectian" deposit corresponded very closely with what I described as

(1) On the Identification of the *Acanthoceras mammillatum* and *Hoplites interruptus* Zones at Okeford Fitzpaine, Dorsetshire. *Geological Magazine*, 1896, p. 198.

(2) Note on an Undescribed Area of Lower Greensand or Vectian in Dorset. *Geological Magazine*, 1891, p. 456.

occurring at Okeford Fitzpaine and the fortunate discovery at the latter place of so characteristic an Ammonite as *Acanthoceras mammillatum* would appear to determine at once the accurate zonal value of both sets of beds. Mr. Mansel-Pleydell (3), in 1895, speaking of the distribution of the Gault in this part of Dorset, states that—"The Gault is exposed in a brickyard at Sutton Waldon, West of Iwerne Minster, at Okeford Fitzpaine, and at Ansty, north of Bingham's Melcombe, but it seldom contains fossils. It can be traced westward as far as Batcombe and Woolcombe near Evershot Station; but there it is very thin, and no trace of it has been met with in the extreme west of the county."

Before submitting detailed particulars of the fossils, it may be as well to recapitulate some of the facts connected with the arrangement and constitution of the beds at the locality in question which formed the subject of my previous paper.

SECTION AT OKEFORD FITZPAINE.

In descending order the formations observed in a brick pit were thus tabulated :—

				Feet.	
Subsoil				1	
Yellow clay with chert				3	
Brown clay without chert				5	
Albian	{	<i>Hoplites interruptus</i> ZONE.	{	Dark-grey coloured, micaceous, and sandy clay with phosphatic nodules; fossiliferous in the lower 4 feet	15
				Brown sandy rock, with fossils in the upper part	4
				Argillaceous sandy beds, micaceous, and of a brown, grey, or yellowish colour; ferruginous and oolitic; siliceous pebbles interspersed; fossiliferous	5
? APTIAN	...	...	Pure sand	3
KIMERIDGIAN	...	...	Stiff blue clay	8 or 10
? CORALLIAN	...	...	Sandy rock.	

(3) "The Flora of Dorsetshire" with a sketch of the Topography, River System, and Geology of the County, 1895, ed. 2, p. xxix.

REMARKS.—The matrix surrounding the shells from the *Acanthoceras mammillatum* zone “is mostly of an argillaceous sandy character, slightly micaceous, and of a brown, grey, or yellowish colour. That associated more particularly with the specimens of *Ostrea* and *Exogyra* exhibits an oolitic structure, the grains of which are heavily charged with hydrated oxide of iron. This fossiliferous bed, containing also some small siliceous pebbles, has a thickness of five feet, and lies about twenty-eight feet from the surface; beneath is a deposit of pure sand, having a depth of three feet, which reposes on a stiff blue clay of, probably, Kinmeridge age; at the base of this occurs a sandy rock-formation which possibly belongs to the Corallian period. Immediately above the *A. mammillatum* zone is a seam of brown sandy rock, four feet in depth, succeeded by fifteen feet of a grey-coloured sandy clay (of a bluish tint when damp), with phosphatic nodules interspersed (a section of one showing veins of calcite); both these bear a Lower Gault fauna, characterized by *Hoplites interruptus*, &c. Then follow two unfossiliferous bands—one of brown clay, five feet thick, the other of yellow clay with angular fragments of chert, three feet thick; a foot of subsoil occurring above this completes the section.”

DESCRIPTIONS OF THE FOSSILS.

(A) THE ACANTHOCERAS MAMMILLATUM ZONE.

- Acanthoceras mammillatum*, Schlotheim sp.
Hoplites Benettianus, J. de C. Sowerby, sp.
Pleuromya plicata, J. de C. Sowerby, sp.
Cucullæa carinata, J. Sowerby, sp.
Ostrea Leymeriei (Deshayes MS), Leymerie.
Exogyra sinuata, J. Sowerby.

MOLLUSCA—Cephalopoda.

ACANTHOCERAS MAMMILLATUM, Schlotheim.

Plate 1, fig. 1-2.

Ammoniten, Walch: Der Naturforscher 1774, Vol. I., Pl. 2, fig. 3, p. 196.

Ammonites mammillatus, Schlotheim : Leonhard's, Taschenbuch Mineralogie, 1813, Vol. 7, p. 111.

Ammonites monile, J. Sowerby : Mineral Conchology, 1816, Vol. 2, pl. 117, p. 35.

Ammonites clavatus, (De Luc, ms.) Brongniart : Cuvier's Ossemens Fossiles 1822, new edition, Vol. 2, part 2, Pl. 6, fig. 14, p.p. 335, 609.

Ammonites tuberculifera, Lamarck : Hist. Nat. Anim. sans Vert., 1822, Vol. 7, p. 639.

Ammonites mammillaris, Orbigny : Paléontologie Française, Terrains Crétacés, Céphalopodes, 1840, Pls. 72-73, p. 249.

Acanthoceras mammillatum, Neumayr : Zeitsch. deutsch. geol. Ges., 1875, Vol. 27, p. 249.

Only three fragments of this Cephalopod were found at Okeford Fitzpaine, but as they possess the typical ornamentation of the species there is no doubt as to their accurate determination. Age and probably sexual conditions have produced certain varieties of sculpturing in the shell, so that young specimens are covered with a close moniliform ribbing, whereas older examples have the costæ composed of robust tubercles arranged at distant intervals on the test; and in the aged state of the shell the tubercles become quite obsolete. Two of the specimens in question illustrate the intermediate condition, having widely distant tubercles forming wedge-shaped, tall, and conical protuberances, being divided on the peripheral or ventral area by a median groove encircling the whorls. The wide space between successive tubercles is occupied by two prominent lines, representing the position of tubercles at a younger period of growth. Every tubercle is marked by five or six equi-distant, transverse, and semi-circular ridges, having a smooth concave surface between each. As they extend down the sides of the whorls the tubercles diminish to a point or node, from which a short rib proceeds to the umbilical margin. In the third or more aged specimen the tubercles and peripheral groove are obsolete, the ribs being closer together and extending across without interruption; only a few obscure nodes are seen on the sides of the whorls.

The present specimens agree in every detail with d'Orbigny's illustration on Pl. 73 of his work quoted in synonymy, and with an excellently preserved example in the British Museum from Escragnolles, France.

RANGE OF SPECIES.—Restricted to the basal zone of the Albian.

LOCALITIES.—Sandgate, Folkestone, Crookerton, &c. ; and from several places in France, Switzerland, &c.

HOPLITES BENETTIANUS, J. de C. Sowerby.

Pl. ii., fig. 1.

Ammonites Benettianus, J. de C. Sowerby : Mineral Conchology, 1829, Vol. 6, Pl. 539, p. 77.

Ammonites interruptus, Orbigny : Paléontologie Française, Terrains Crétacés, Céphalopodes, 1840, Pl. 31, p. 218.

Hoplites Benettianus, Neumayr : Sitzb. K. Ak. Wiss. Wien, 1875, Vol. 71, part i., p. 684

Two portions of this Ammonite are in the collection, that selected for figuring being a cast belonging to as large an example as is shown on d'Orbigny's Plate 31 (reduced one half), which has a diameter of about 180 millimètres. In section it may be described as semi-globose, or with sides rather compressed. The peripheral region exhibits the characteristic alternation of the ribs divided by a centrally smooth area, whilst the lateral aspect shows long primary ribs, which are sometimes interrupted by an obtuse tubercle before reaching the umbilical margin. From near this tubercle proceeds a secondary rib, which, though free, curves so closely to the others at its end as to give the appearance of bifurcation. The ribs are robust, elevated, hook shaped at the periphery, and somewhat curved on the lateral surface, where they form boundaries to deeply sculptured grooves or channels.

Many authors regard this species as a synonym of *Hoplites interruptus*, but there is good reason for keeping it distinct. In *H. Benettianus* we have an altogether coarser shell, more inflated and much larger, besides being limited in its horizon to this particular zone.

RANGE OF SPECIES.—Basal zone of the Albian formation.

LOCALITIES.—Maidstone, Crockerton, Warminster, Devizes, Folkestone, Dorking, &c., and from France, Switzerland, &c.

MOLLUSCA, *Lamellibranchiata*.

PLEUROMYA PLICATA, J. de C. Sowerby.

Pl. ii., figs. 4-5.

Mya plicata, J. de C. Sowerby: Mineral Conchology, 1823, Vol. 5, pl. 419, fig. 3, p. 20.

Panopæa plicata, J. de C. Sowerby: Mineral Conchology, 1840, Vol. 7. Alphabetical Index, p. 6. Orbigny: Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1843. Pl. 357, fig. 4-5, p. 337.

Myopsis plicata, Agassiz: Études Critiques Mollusques Fossiles, 1840, p. 253.

This species, of which there are two examples, refers to an oblong and ventricose shell with valves gaping at both extremities, though mostly so posteriorly; the beaks are anterior and incurved, beneath them being a deep concavity; shell structure thin and ornamented in places with obscure, minute, granular striations; the larger ornamentation consists of regular, thick concentric plicæ obtusely angulated posteriorly, where they incline upwards to the dorsal line and form a more or less truncated end.

Some discussion has arisen as to the merits of Agassiz's two genera, *Pleuromya* and *Myopsis*, both of which present the same general features. Terquem* made a special study of them in 1853, and came to the conclusion that *Pleuromya* should be adopted and that *Myopsis* should be included in its synonymy, a plan which has been followed by most palæontologists, and which is recognised on the present occasion.

<i>Dimensions</i> —	Height = 44	}	Millimètres.
	Length = 70		
Depth, both valves attached = 40			

* *Bull. Soc. Geol. France*, 1853, Ser. 2, Vol. 10, Pl. 10, p. 534.

RANGE OF SPECIES.—Upper Barremian to Cenomanian.

LOCALITIES.—Atherfield, Hythe, Sevenoaks, Folkestone, Black Ven, Devizes, Warminster, &c. ; Wissant, d'Ervy, St. Croix, Perte du Rhone, Escragnolles, and other localities of France and Switzerland.

CUCULLÆA CARINATA, J. Sowerby.

Pl. ii., fig. 6.

Arca carinata, J. Sowerby : Mineral Conchology, 1813, Vol. 1, Pl. 44, lower figures, p. 96.

Cucullæa costellata, J. de C. Sowerby : Mineral Conchology, 1824, Vol. 5, Pl. 447, fig. 2, p. 67.

Arca carinata, Orbigny : Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1843, Pl. 313, figs. 1-3, p. 214. Pictet and Roux : Desc. Moll. Foss. Grès Verts Genève, 1853, Pl. 37, fig. 1, p. 462. Pictet and Campiche : Desc. Foss. Terrain Crétacé St. Croix, 1866, p. 462.

Cucullæa carinata, De Rance : Geological Magazine, 1874, p. 252.

A familiar species represented by an impression of a left valve contained in one of the fragments of *Hoplites Benettianus*. It is of medium size, and well ornamented with the characteristic radiating costæ, crossed by rather indistinct rugose lines of growth, which are chiefly prominent near the ventral border ; the carina is well defined, together with the oblique posterior area, which bears a series of curved costæ ; the summit or beak is strongly incurved and anterior ; ligamental details not seen. This is quite a separate form from J. Sowerby's *Cucullæa carinata* of a later date, which has been united with the *Cucullæa glabra*, of Parkinson.

Dimensions—Height = 15 }
Length = 23 } Millimètres.

RANGE OF SPECIES.—Albian to Cenomanian.

LOCALITIES.—Folkestone, Black Ven, Blackdown, Warminster, Devizes, Isle of Wight, &c. ; Wissant, d'Ervy, Argile du Gaty-Gerosdot, Ardennes, Meuse, Aube and Yonne districts of France, St. Croix, &c.

OSTREA LEYMERIEI (Deshayes MS.) Leymerie.

Pl. i., fig. 3.

Ostrea Leymeriei, Leymerie: Mém. Soc. Géol. France, 1842, Vol. 5, part 1, Pl. 13, fig. 4, p. 11. Forbes: Quart. Journ. Geol. Soc., 1845, Vol. 1, p. 250. Orbigny: Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1846, Pl. 469, p. 704. Coquand: Monographie *Ostrea*, Terrain Crétacé, 1869, Pl. 70, fig. 14-17; Pl. 71, figs. 6-7, p. 179.

This is an oyster of variable shape, as it may be oval, oblong, or subtrigonal; the two latter varieties having been obtained at Okeford Fitzpaine. The largest specimen, selected for figuring and description, has both the valves in contact, though some of the shell has been removed from the right or upper valve to show the extent of the ligamental area. It is oblong and depressed; right valve smooth and bearing concentric lamellæ of growth; left valve is thicker, more lamellose and irregular than the other, besides bearing the fluted costæ; ligamental region very wide, with a more excavated central depression in the lower valve, and having a pointed dorsal termination which curves anteriorly; muscular impression (not seen in specimen under description, but well marked in others from the same locality) of large size, squarish outline, deeply cut, and near to posterior side.

This specimen is of great size, measuring 221·5 by 180 millimètres.

The species is characteristic of the "Argiles Ostréenes," a deposit forming the base of the Barremian system of France, and so named by Cornuel * in 1840 because of the profusion of this oyster.

RANGE OF SPECIES.—Barremian to Albian.

LOCALITIES.—Atherfield, Sandgate, and in the Haute-Marne and Aube districts of France.

* *Bull. Soc. Géol. France*, 1840, Vol. 11, p. 126. *Mém. Soc. Géol. France*, 1840, Vol. 4, p. 335 (footnote).

EXOZYRA SINUATA, J. Sowerby.

Pl. ii., figs. 2-3.

Gryphæa sinuata, J. Sowerby : Mineral Conchology, 1822, Vol. 4, Pl. 336, p. 43.

Exogyra aquila, Goldfuss : Petrefacta Germaniæ, 1833, Vol. 2, Pl. 87, fig. 3, p. 36.

Exogyra sinuata, Leymerie : Bull. Soc. Géol. France, 1840, Vol. 11, p. 124.

Ostrea aquila, Orbigny : Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1846, Pl. 470, p. 706. Coquand : Monographie *Ostrea*, Terrain Crétacé, 1869, Pl. 61, figs. 4-9, p. 158.

A well-known shell belonging to one of the most ponderous forms of the Ostreidæ. It possesses a very convex lower valve, which is subcarinated in young specimens but rounder and more massive in the adult stage, and bearing external sculpturing of coarse lamellose lines of growth; the right or upper valve is depressed, operculiform, and much smoother than the other; the beaks of both valves are postero-laterally incurved and more or less spiral, this latter feature being characteristic of Say's genus *Exogyra*.

E. Couloni, a closely related species, differs from *E. sinuata* in possessing a lateral expansion when young, which, at a later stage, disappears, the shell then becoming singularly narrow in the adult stage; the lower valve is more strongly carinated and sometimes plicate; it also characterizes a lower horizon, viz., the Hauterivian division of the Neocomian system.

Continental authors have endeavoured to suppress the familiar specific name attached to this shell on account of Lamarck's usage of *Ostrea sinuata* for a recent specimen in 1819, but as Sowerby applied the generic title of *Gryphæa*, and not *Ostrea*, to his shell it is obvious that no change in specific nomenclature is needed.

Dimensions.—120 by 120 millimètres
(= specimen figured).

RANGE OF SPECIES.—Barremian to Albian.

LOCALITIES.—Atherfield, Sandgate, Speeton Cliff, &c. ; Aube and Haute Marne provinces of France ; Perte du Rhone, &c.

(B) THE HOPLITES INTERRUPTUS ZONE.

PISCES.

Lamma appendiculata, Agassiz, sp.

Synechodus, sp.

CEPHALOPODA.

Hamites, sp.

Hoplites interruptus, Bruguière, sp.

Hoplites splendens, J. Sowerby, sp.

Nautilus Clementinus, Orbigny.

GASTEROPODA.

Actæonina formosa, J. de C. Sowerby.

Anchura carinata, Mantell, sp.

Natica Gaultina, Orbigny.

Ringinella inflata, J. de C. Sowerby.

Scala Dupiniana, Orbigny.

Solarium subornatum, Orbigny.

LAMELLIBRANCHIATA.

Cucullæa carinata, J. Sowerby, sp.

Exogyra canaliculata, J. Sowerby, sp.

Gervillia Forbesiana, Orbigny.

Inoceramus concentricus, Parkinson.

Lima parallela, J. Sowerby, sp.

Mytilus subsimplex, Orbigny.

Nucula pectinata, J. Sowerby.

Pecten Galliennei, Orbigny.

Pholadomya Favrina ? Agassiz.

Pleuromya plicata, J. de C. Sowerby.

Solen Dupinianus, Orbigny.

Syncyclonema orbicularis, J. Sowerby, sp.

Teredo, sp.

Thracia, n. sp.

Trigonia alæformis, Parkinson.

Trigonia Archiaciana, Orbigny.

Trigonia Fittoni (Deshayes), Leymerie.

PLANTE.

Coniferous wood.

PISCES—*Elasmobranchii*.

LAMMA APPENDICULATA, Agassiz.

Pl. iii., fig. 1.

Otodus appendiculatus, Agassiz : Poissons Fossiles, 1843, Vol. 3, Pl. 32, figs. 1-25, p. 270.

Lamma appendiculata, A. S. Woodward : Cat. Fossil Fishes, British Museum, 1889, Pt. 1., p. 393.

The tooth referred to this species appears to be of normal character. It exhibits the plano-convex coronal eminence with its smooth cutting edges, flanked by a pair of broadly acuminate denticles ; the base or root is arched and tumid, and its inner surface very convex.

Dimensions—Height = 28 }
Width = 21 } Millimètres.

RANGE OF SPECIES.—Albian to Senonian.

LOCALITIES.—Folkestone, Warminster, Devizes, Cambridge, Hunstanton, Dover, &c. ; Ardennes, Meuse, Aube and Yonne districts of France, &c. ; New Jersey and North Queensland.

SYNECHODUS, sp.

Pl. iii., fig. 2.

Only one detached tooth of this genus is in the present collection, and until more material is available it is not desirable to place it under a definite specific name. Mr. A. S. Woodward, the author of the genus (Proc. Geologists Assoc., 1888, Vol. 10, p. 288), has seen the specimen and confirms the above determination. The

tooth, embedded in matrix, has a slenderly conical and elevated coronal cusp, with four small denticles on each side; base with a width about twice the height of the crown, slightly arched in the centre, and having a finely striated margin. With the exception of these striæ the tooth generally appears to be perfectly smooth.

The specimen was obtained from the sandy rock occurring at the base of the *Hoplites interruptus* Zone, and was found associated with a small *Nucula*, probably the young form of *N. pectinata*.

Dimensions—Height = 5 }
Width = 10 } Millimètres.

RANGE OF SPECIES.—Aptian to Semonian.

LOCALITIES.—Maidstone, Dover, Folkestone, Margate, Norwich, &c., and from Russia, Belgium, and the Amuri Bluff of New Zealand.

MOLLUSCA—*Cephalopoda*.

HAMITES, sp.

Under this name I have included two badly-preserved specimens which I am quite unable to specifically identify. One may belong to Sowerby's *H. attenuatus*, as the shell appears to decrease in diameter at the curvature of the axis, besides being ornamented with transversely oblique, regular, and elevated, costæ. No tubercles are present, and no septal characters are seen.

HOPLITES INTERRUPTUS, Bruguière.

Pl. iii., fig. 3.

Langius : *Historia Lapidum Figuratorum Helvetiæ*, &c., 1708, Pl. 25, fig. 5, p. 98.

Ammonites interrupta, Bruguière : *Encyclopédie Méthodique* (Vers), 1789, Vol. 1, p. 41, No. 18.

Ammonites serratus, Parkinson : *Trans. Geol. Soc. (London)*, 1819, Vol. 5, p. 57. *non* J. Sowerby, 1813.

Ammonites dentatus, J. Sowerby : *Mineral Conchology*, 1821, Vol. 4, Pl. 308, p. 3.

Ammonites interruptus, Orbigny : *Paléontologie Française, Terrains Crétacés, Céphalopodes*, 1840, Pl. 32, p. 211.

Hoplites interruptus, Neumayr : Sitzb. K. Ak. Wiss. Wien, 1875, Vol. 71, part i., p. 685.

This species is closely related to *H. Benettianus* in the character of its costæ and the details of the periphery, but differs in its more discoid or compressed form, its smaller diameter, and its generally smoother facies. Four specimens are in the collection :—(1) a fragment of a large example approaching *H. Benettianus*, but less tumid and not so coarse ; (2) a small, rather inflated, and much distorted form, showing tubercles ; (3 and 4) two compressed varieties representing a more normal condition of the species, the smaller one being figured on the present occasion.

Dimensions—45 by 40 Millimètres.

RANGE OF SPECIES.—Albian.

LOCALITIES.—Folkestone, Warminster, Norfolk, Shalford, Cambridge, Hunstanton, and Lincolnshire (red chalk), Blackdown, &c. ; Perte du Rhone, Saxonet, Forstberg, Schulberg, d'Ervy, Yonne, &c.

HOPLITES SPLENDENS, J. Sowerby.

Ammonites splendens, J. Sowerby : Mineral Conchology, 1815, Vol. 2, Pl. 103, figs. 1-3, p. 1.

Ammonites subplanus, Parkinson : Trans. Geol. Soc. (London), 1819, Vol. 5, Pt. 1, p. 57.

Ammonites planus.

Ammonites splendens, Mantell : Geology of Sussex, 1822, Pl. 21, figs. 3, 13, 17, p. 89.

Ammonites splendens, Orbigny : Paléontologie Française, Terrains Crétacés, Céphalopodes, 1840, Pl. 63, p. 222.

Hoplites splendens, Neumayr : Sitzb. K. Ak. Wiss. Wien, 1875, Vol. 71, part i., p. 686.

Two very young imperfect examples and a fragmentary whorl belonging to an adult shell (width = 47 millimètres) were collected at Okeford Fitzpaine. This species is compressed and involute ; when perfect it shows subcostate lateral surfaces, a small umbilicus, and a crenulated periphery with a smooth median space ; the aperture is oblong and cordate, deeply cut for the reception of the spire.

RANGE OF SPECIES.—Albian.

LOCALITIES.—Folkestone, Black Ven, Cambridge, Warminster, Blackdown, Hunstanton, &c. ; Wissant, St. Croix, Cheville, &c.

NAUTILUS CLEMENTINUS, Orbigny.

Nautilus clementinus, Orbigny : Paléontologie Française, Terrains Crétacés, Céphalopodes, 1840, Pl. 13 bis., p. 77. Pictet and Campiche : Desc. Foss. Crétacé Sainte-Croix, 1859, Ser. 2, pt. 1, Pl. 19, figs. 1-5, p. 144. Foord : Cat. Foss. Cephalopoda, British Museum, 1891, Pt. 2 (Nautiloidea), p. 285.

A globose species, though laterally compressed ; umbilicus small ; siphuncle slightly below the centre (obscure in specimen) ; septal margins arcuate near umbilicus and becoming straighter near the periphery ; aperture higher than wide ; indentation of previous whorl deep and about one-half the height of entire aperture.

There are two fragmentary specimens of this shell in the collection, probably belonging to the same individual, denuded of test, and therefore showing very well the septal margins. They agree with Pictet and Campiche's illustrations (figs. 1 and 2) better than any I have seen.

RANGE OF SPECIES.—Albian to Cenomanian.

LOCALITIES.—Folkestone, near Ringmer, Devizes, Cambridge, &c. ; Escragnoles, Perte du Rhone, Wissant, St. Croix, &c.

MOLLUSCA—*Gasteropoda*.

ACTEONINA FORMOSA, J. de C. Sowerby.

Pl. iii., figs. 4 and 4a.

Phasianella formosa, J. de C. Sowerby : Trans. Geol. Soc. London, 1836, Ser. 2, Vol. 4, Pl. 18, fig. 14, p. 343.

(?) *Ovacteonina formosa*, Cossmann : Essais Paléoconchologie Comparée, 1895, Pt. 1, p. 61.

In my former paper I listed this specimen as allied to *Actæon Dupiniana*, Orbigny, but I have since come to the conclusion that it represents Sowerby's *Phasianella formosa* from the Blackdown Beds of Devonshire. The original description of the species is as

follows :—“elliptical, elongated, rather blunt ; smooth, except a few striæ at the base ; aperture more than half the length of the shell.” In addition it may be stated that the spire is of gradient construction, or in other words ramped at the suture ; the summit, well-preserved in our specimen, shows the protoconch beautifully curved inwards and slightly embedded in the spire. The species, though related to *Actæon Dupiniana*, differs from it in being rather more convex, in having a shorter aperture, and in the absence of striæ on the suture. Both forms, however, belong to the genus *Actæonina*, though, probably on account of the basal striations, M. Cossmann has referred them doubtfully to his sectional name of *Ovactæonina* (type = *Actæon sparsisulcata*, Orb.). Several examples of this species were obtained at Okeford Fitzpaine.

Dimensions—Length = 7 }
Breadth = 4 } Millimètres.

RANGE OF SPECIES.—Albian.

LOCALITY.—Blackdown.

ANCHURA CARINATA, Mantell.

Rostellaria carinata, Mantell : Geology of Sussex, 1822, Pl. 19, figs. 10-14, p. 86. Orbigny : Paléontologie Française, Terrains Crétacés, Gasteropoda, 1842, Pl. 207, fig. 2, p. 284.

Anchura carinata, Conrad : American Journ. Conchology, 1866, Vol. 2, p. 102.

Aporrhais carinata, J. S. Gardner : Geological Magazine, 1875, Pl. 5, fig. 1, p. 125.

The specimen referred to this species is very imperfect, and a mere cast with only minute patches of the test remaining. About four whorls of the spire are seen, the last exhibiting its bicarinate character and the commencement of the prolongation of the labrum, which, in well-preserved examples, terminates with two ensiform projections running in opposite directions more or less parallel with the axis of the shell. The long anterior canal is absent in our specimen, and the central elongate tubercles

ornamenting the surface are only obscurely seen on one of the earlier whorls.

Conrad has included this species in his genus *Anchura*, which he characterises as having "a prolonged straight labrum, biangulated, abrupt, and broad on the outer margin." Conrad's work appears to have been overlooked by Mr. J. S. Gardner during his study of the Gault Aporrhaidæ, as no reference is made to it in his interesting monograph on this subject.

RANGE OF SPECIES.—Albian.

LOCALITIES.—Ringmer, Ridge, Folkestone, Bletchingley, Laugh-ton, Norlington, Cambridge, &c. ; Wissant, d'Ervy, Ardennes, St. Croix, &c.

RINGINELLA INFLATA, J. de C. Sowerby.

Pl. iii., fig. 5.

Auricula inflata, J. de C. Sowerby : Trans. Geol. Soc., London, 1836, Ser. 2, Vol. 4, Pl. 11, fig. 11, p. 336.

Ringinella inflata, Orbigny : Paléontologie Française, Terrains Crétacés, Gasteropoda, 1842, Pl. 168, figs. 1-4, p. 128.

Avellana inflata, Morris : Cat. British Fossils, 1854, Ed. 2, p. 235.

Ringinella inflata, Cossmann : Essais Paléoconchologie Comparée, 1895, Part I, p. 119.

Sowerby's species, to which this shell is referred, has a somewhat elongate, pointed spire, and is of oval contour ; the columella bears two lamellar plications, the lower one of which is frequently divided or bifid ; labrum thick, rounded, and internally smooth ; surface ornamented with spiral grooves containing closely-set punctations. This form is related to *Avellana pulchella* of Price. (Quart. Journ. Geol. Soc., 1874, Vol. 30, Pl. 25, figs. 4-5, p. 356) and chiefly differs from it in possessing no dentations on the internal margin of the outer lip. M. Cossmann uses d'Orbigny's genus *Ringinella* as a sub-genus of *Avellana*, but I prefer to regard it in the generic sense as originally proposed by its author in 1842. The specimen figured has an imperfect spire ; otherwise it is fairly well preserved and exhibits the main characters of the species.

RANGE OF SPECIES.—Albian.

LOCALITIES.—Folkestone, Ridge (S.E. of Chilmark) ; Wissant, d'Ervy, Machéromenil, Varennes, &c.

NATICA GAULTINA, Orbigny.

Pl. iii., fig. 6.

Ampullaria canaliculata, Mantell: Geology of Sussex, 1822, Pl. 19, fig. 13, p. 87. *non* Lamarck, 1804.

Natica canaliculata, J. de C. Sowerby: Trans. Geol. Soc., London, 1836, Ser. 2, Vol. 4, Pl. 11, fig. 12, and Pl. 18, fig. 6, p. 336. *non* Deshayes, 1832.

Natica Gaultina, Orbigny: Paléontologie Française, Terrains Crétacés, Gasteropoda, 1842, Pl. 173, figs. 3-4, p. 156.

Helix Woodwardi, Alfred Bell: Geological Magazine, 1875, p. 240.

Two specimens of this species were found at Okeford Fitzpaine, and, although somewhat crushed, they retain their characteristic features. The shell is of greater width than height, very inflated, and marked by prominent lines of growth; the spire is composed of convex whorls divided by a canaliculated suture; the aperture is oval; umbilicus large, circular, gradually expanding into the base, and without a callosity.

Dimensions—Length = 20 }
Breadth = 25 } Millimètres.

Thinking that he had discovered a terrestrial mollusc in the Folkestone Gault, Mr. Alfred Bell named and described a specimen as *Helix Woodwardi*; but the most cursory examination of this type, now in the British Museum, clearly proves the determination was erroneous, the shell undoubtedly representing a rather depressed form of *Natica Gaultina*. D'Orbigny first pointed out that Mantell's original name for this shell had already been occupied by Lamarck for another form; therefore a change in nomenclature was needed, and *N. Gaultina* was adopted. This author, however, did not allude to the fact that *N. canaliculata* of Sowerby, 1836, would have been available had it not been that Deshayes monopolised it for an Eocene shell in 1832.

RANGE OF SPECIES.—Albian to Cenomanian.

LOCALITIES.—Folkestone, Black Ven, Cambridge, Chardstock, Blackdown, Bletchingley; Wissant, d'Ervy, Ardennes, St. Croix, Cheville, &c.

SCALA DUPINIANA, Orbigny.

Scalaria Dupiniana, Orbigny: Paléontologie Française, Terrains Crétacés, Gasteropoda, 1842, Pl. 154, figs. 10-13, p. 54. Pictet and Roux: Desc. Moll. Foss. Grès. Verts. Genève, 1849, Pl. 16, fig. 2, p. 168. Pictet and Campiche: Desc. Foss. Terr. Crétacé St. Croix, 1862, p. 332.

This form consists of a fragmentary cast, which was determined, after careful comparison with specimens in the British Museum. It has the two last whorls, the basal one being without perforation and showing a subrotund aperture; the whorls are convex and separated by a deep suture, the last showing an obscure carination at the base.

RANGE OF SPECIES.—Albian.

LOCALITIES.—Folkestone, Black Ven, Blackdown; Wissant, d'Ervy, Gaty-Gerosodot, Perte du Rhone, St. Croix, &c.

SOLARIUM SUBORNATUM, Orbigny.

Solarium ornatum, J. de C. Sowerby: Trans. Geol. Soc., London, 1836, Vol. 4, Ser. 2, Pl. 11, fig. 13, p. 336; *non* Lea, 1833. Orbigny: Paléontologie Française, Terrains Crétacés, Gasteropoda, 1842, Pl. 180, figs. 1-4, p. 199. Pictet and Roux: Desc. Moll. Foss. Grès. Verts. Genève, 1849, Pl. 20, fig. 3, p. 210.

Solarium subornatum, Orbigny: Prodrome Paléontologie, 1850, Vol. 2, p. 130.

This species is very depressed, discoid, and orbicular; spire with an acute elevated apex composed of angulated whorls with bicarinated margins; surface ornamented with quincuncially-arranged granulations and a series of radial costæ; aperture rhomboidal; periphery sharply keeled; base with a wide umbilicus. Two specimens only were found at Okeford Fitzpaine, and, although not well preserved, retain sufficient characters for determination.

D'Orbigny, very properly, altered the original name of this shell on account of Lea's pre-occupation of the same for a recent molluse in 1833.

RANGE OF SPECIES.—Albian to Cenomanian.

LOCALITIES.—Folkestone, Cambridge, Chardstock, Devizes ; Wissant, Ardennes, Meuse, Larrivour, St. Croix, &c.

MOLLUSCA—*Lamellibranchiata*.

CUCULLÆA CARINATA, J. Sowerby.

[For synonymy see p. 72.]

This species is represented by two fairly well-preserved examples. The valves, attached in both cases, show a highly-ornamented test, with the characteristic keeled and oblique posterior area.

The geographical distribution has been before alluded to.

SYNCYCLONEMA ORBICULARIS, J. Sowerby.

Pl. iii., fig. 9.

Pecten orbicularis, J. Sowerby : Mineral Conchology, 1817, Vol. 2, Pl. 186, p. 193.

Pecten laminosa, Mantell : Geology of Sussex, 1822, Pl. 26, figs. 8 and 22, p. 128.

Pecten membranaceus,

Pecten orbicularis, Nilsson : Petrificata Suecana, 1827, Pl. 9, fig. 16 ; Pl. 10, fig. 12, p. 23. Orbigny : Xavier Hommaire de Hell's "Les Steppes de la Mer Caspienne," Paléontologie, 1844, Pl. 6, fig. 6, p. 439 ; and Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1846, Pl. 433, figs. 14-16, p. 597.

Pecten (Syncyclonema) orbicularis, Stoliczka : Mem. Geol. Surv. India, Pelecypoda, 1871, pp. 426-428.

Three specimens were obtained of this species at Okeford Fitzpaine. The smallest (selected for figuring) is a lower valve in which the chief details of the shell are fairly well expressed. It is suborbicular, compressed, lenticular, and ornamented with parallel, concentric, imbricating laminæ ; the ears are small, narrow, of nearly equal size, vertically striated, with their

summits obtusely angulated and raised slightly above the general periphery of the shell; there is no indication of a distinct byssal sinus beneath either of the anterior ears; height greater than length; test fragile.

Dimensions—Height = 14 }
Length = 12·5 } Millimètres.

Another valve, rather larger, has a smooth shining surface, through which can be seen a series of obscure, closely-set, fine concentric lines; this represents an upper or left valve. The largest specimen in the collection has a height and length respectively of 55 and 50 millimètres; it shows the transverse ridges for articulation purposes in the auricles, and the central ligamental fossette is also obscurely seen.

Interiors of this species observed in specimens from other localities show a comparatively smooth surface with no elevated radial ribs.

It is difficult to recognise this and similarly-formed pectinoid shells under the name of *Pecten* if we would restrict that genus in its meaning to such types as *Pecten maximus* or *P. Islandicus*. I, therefore, follow Stoliczka in adopting Meek's *Syncyclonema* * of 1864 to include those shells which exhibit such characters as are here indicated. This genus, founded by its author for the reception of a small Cretaceous species known as *Pecten rigida* (Hall and Meek), was described as follows:—"Shell small, compressed, nearly equivalve, vertically ovate, the height being greater than the transverse diameter; hinge line very short; ears very small, the anterior being larger than the other; margins closed all round; no defined byssal sinus in either valve; surface only showing concentric striæ, and sometimes stronger, regularly-defined concentric ridges on the right valve." Some authors have regarded *Syncyclonema* as synonymous with *Pseudamussium*, but this latter genus, as generally understood, appears to include a

* Smithsonian Check-List, North American Cretaceous Fossils, 1864, p. 7; Rept. Invert. Cret. and Tert. Fossils, Upper Missouri, United States Geol. Surv. Terr., 1876, p. 26.

number of smooth and ribbed forms which are very distinctly sinuated beneath the anterior ear, and consequently its use would be more adapted for Tertiary and Recent species. Another of Meek's shells called *Entolium*,* founded on *Pecten demissus* of Phillips, a Jurassic species, resembles in so striking a manner the features of our Cretaceous specimen, *P. orbicularis*, that, restricted to the type mentioned, it might well be amalgamated with the *Syncyclonema* of an earlier date.

Quenstedt's *P. cornutum* is sometimes quoted as the type of *Entolium*, a species, I believe, never referred to by Meek, and therefore not acceptable. Besides, *P. cornutum* is internally ornamented with radiating costæ, and consequently more nearly related to *Amussium*; there are no internal rays to *Pecten demissus*. With this explanation I must withdraw *Entolium*, under which I listed *orbicularis* in my former paper, and substitute *Syncyclonema*.

RANGE OF SPECIES.—Albian to Turonian.

LOCALITIES.—Folkestone, Black Ven, Devizes, Warminster, Blackdown, Cambridge, near Dover, Bingham's Melcombe, Norfolk, Lincolnshire, &c.; Ardennes, Meuse, Savoy, Seine-Inferieure, Basses-Alpes, Yonne, Sweden, Germany, &c.

PECTEN GALLIENNEI, Orbigny.

Pl. iii., fig. 10-10a.

Pecten Galliennei, Orbigny: Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1846. Barrois: Bull. Soc. Géol. France, 1875, Ser. 3, Vol. 3, p. 227.

The only specimen obtained consists of an impression in the clay of a right valve, which, after a careful squeeze in wax, has disclosed an elegantly-formed shell exhibiting the unmistakable sculpture of this species.

It is slightly convex and very unequally auricled; surface ornamented with from thirty to forty smooth, elevated, flattened, radial costæ variable in size and crossed by numerous obscure,

* Geological Survey, California, Geology, Vol. i., 1865, Appendix B., p. 478, Pl. i., figs. 6, 6a.

minute, concentric lines of growth; the lateral costæ, more especially, have their intermediate grooves filled with a regular series of closely-set oblique striations; anterior ear obliquely ribbed and faintly tubercled.

The species differs from *P. Robinaldinus* in possessing fewer and smoother costæ; from *P. interstriatus* it is distinguished by bearing more numerous ribs, a more oblique ornamentation on the anterior auricle, and having a more orbicular contour; from *P. Rothomagensis* it is defined by its elevated and fewer costæ and by a less pronounced excavation beneath the anterior expansion.

The Okeford Fitzpaine example is much smaller than D'Orbigny's type, but corresponds exactly with the dimensions of a specimen from Folkestone in the British Museum.

Dimensions—Height = 25 }
Length = 20 } Millimètres.

RANGE OF SPECIES.—Albian to Cenomanian.

LOCALITIES.—Isle of Wight (Ventnor), Folkestone, Devon, Warminster; in the N.W. of France, such as Coudrecieux (Sarthe), Villers (Calvados), St. Jouin and La Hève; and in the Ardennes, Meuse, and Aube districts of France.

GERVILLIA FORBESIANA, Orbigny.

Gervillia solenoides, J. de C. Sowerby: Mineral Conchology, 1826, Vol. 6, Pl. 510, figs. 1-4, p. 14 *non* DeFrance.

Gervillia Forbesiana, Orbigny: Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1843, Pl. 396, figs. 5-6, p. 486.

This is a very elongate, compressed, arched, narrow and thin, tested species. The hinge line is short and furnished with small aliform expansions, anterior one diminutive; ornamentation consisting of lines of growth. One of the two specimens belonging to this species is in fairly good condition, though without any ornamentation; its valves, embedded in matrix, are united at the hinge, but separated posteriorly.

Dimensions—Height = 7 }
Length = 34 } Millimètres.

RANGE OF SPECIES.—Barremian to Albian.

LOCALITIES.—Atherfield, Sandown, Folkestone, Cambridge, Blackdown, &c.

INOCERAMUS CONCENTRICUS, Parkinson.

Pl. iii., fig. 12.

Inoceramus concentricus, Parkinson : Trans. Geol. Soc., London, 1820, Vol. 5, Pl. 1, fig. 4, p. 58. J. Sowerby : Mineral Conchology, 1821, Vol. 3, Pl. 305, p. 183. Mantell : Geology of Sussex, 1822, Pl. 19, figs. 15, 19, 20, p. 95.

Inoceramus gryphæoides, J. de C. Sowerby : Mineral Conchology, 1828, Vol. 6, Pl. 584, fig. 1, p. 161.

Inoceramus propinquus, Goldfuss : Petrefacta Germaniæ, 1836, Vol. 2, pl. 109, fig. 9, p. 112.

Inoceramus concentricus, Orbigny : Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1846, Pl. 404, p. 506.

Two examples of this shell are in the collection, the largest measuring 130 by 95 millimètres, the other, which is now figured, being about half that size. The shell varies slightly according to age ; when young it is short and very convex, in the older state it spreads out and becomes somewhat compressed. The specimen figured has both valves in contact, the smaller one showing an oblique hinge line and some obscure growth lines, whilst the larger valve is ornamented with the characteristic concentric ridges and grooves, placed at regular intervals from each other.

Dimensions—Height = 67
Length = 38 } Millimètres.

RANGE OF SPECIES.—Albian.

LOCALITIES.—Folkestone, Golden Cap, Norfolk, Hunstanton (?), Black Ven, Cambridge, Blackdown ; Wissant, d'Ervy, Gaty-Gerosdot, Cheville, &c.

LIMA PARALLELA, J. Sowerby.

Pl. iii., fig. 11.

Modiola parallela, J. Sowerby : Mineral Conchology, 1812, Vol. 1, pl. 9, fig. 1, p. 31.

Plagiostoma, Mantell : Geology of Sussex, 1822, Pl. 19, fig. 1, p. 129.

Plagiostoma elongata, J. de C. Sowerby : Mineral Conchology, 1827, Vol. 6, Pl. 559, fig. 2.

Lima parallela, Orbigny : Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1846, Pl. 416, figs. 11-14, p. 539.

The anterior and posterior sides of this species are nearly parallel to each other. The shell is of oval contour, compressed and ornamented with about 18 elevated radial costæ, which, when well preserved, are crossed by fine longitudinal striæ. The hinge line is short, straight, and oblique; no intermediate ribs as in some allied forms. Several fragmentary examples were obtained at Okeford Fitzpaine, that selected for figuring being a cast, found in the sandy-rock division of the *H. interruptus* zone, which, however, shows very well the general form of the shell.

Dimensions—Height = 39 }
Length = 25 } Millimètres.

RANGE OF SPECIES.—Albian to Senonian.

LOCALITIES.—Folkestone, Black Ven, Cambridge, Maidstone, Hamsey, Gravesend, Drumochose (Ireland), &c. ; Wissant, Ardennes, Meuse, St. Croix, &c.

MYTILUS SUBSIMPLEX, Orbigny.

Pl. iii., fig. 13.

Modiola simplex (Deshayes Ms.), Leymerie : Mém. Soc. Géol., France, 1842, Vol. 5, Pl. 7, fig. 8, p. 8.

Mytilus simplex, Orbigny : Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1844, Pl. 338, figs. 1-4, p. 269, *non* Defrance 1824.

Mytilus (Modiolus) simplex, Forbes : Quart. Journ. Geol. Soc., 1845, Vol. 1, p. 248.

Mytilus subsimplex, Orbigny : Prodrôme Paléontologie, 1850, Vol. 2, p. 81.

Mytilus gurgitis, Pictet and Roux : Desc. Moll. Grès Verts Genève, 1852, pl. 40, fig. 2, p. 481.

Mytilus subsimplex, Pictet and Renevier : Desc. Foss. Aptien Perte du Rhone et St. Croix, 1858, Pl. 16, fig. 3, p. 114.

In my first paper I determined this shell as being allied to *M. subsimplex*, but a further study of the specimen inclines me now to regard it as a true form of Leymerie's species, as emended by d'Orbigny, who made it to include the arched variety, as well as those of straighter contour. The Okeford Fitzpaine example shows an external aspect, with the valves open. It is strongly curved or arched, narrow, elongate, and smooth; the valves are attached by a long, linear hinge; anterior extremities are obtusely pointed, posterior ends being broad and rounded. Some indistinct traces of concentric growth lines are observable in places. This is a very graceful and elegant shell, and appears to differ from all other species, not only in these details, but also in its elongate form and generally smooth appearance.

Dimensions—Length = 57 }
Width (max.) = 17 } Millimètres.

RANGE OF SPECIES—Neocomian to Albian.

LOCALITIES.—Atherfield, Black Ven, Perte du Rhone, Savoy, Geneva (environs), Haute-Marne, Yonne, &c.

NUCULA PECTINATA, J. Sowerby.

Nucula pectinata, J. Sowerby : Mineral Conchology, 1818, Vol. 2, Plate 192, figs. 6-7, p. 209. Mantell : Geology of Sussex, 1822, Plate 19, figs. 5-6-9, p. 94. Orbigny : Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1843, Plate 303, figs. 8-14, p. 177.

This is one of the most characteristic of the Gault shells. It is transversely elliptical, elongate, and convex; truncated and angulate anteriorly, but produced and subangulate in rear; lunule cordate and much excavated; surface ornamented with radiating ribs, crossed by fine, closely-set concentric striæ; inner edges crenulated. The wide cordate lunule and the details of the ornamentation distinguish this from all other species of *Nucula*.

There are two fairly good specimens in the collection showing most of the above characters, besides some obscure remains of a

smaller nukuloid shell which may represent the young form of this species. These latter occur in the sandy-rock base of the *H. interruptus* zone.

RANGE OF SPECIES.—Albian.

LOCALITIES.—Folkestone, Black Ven, Maidstone, Devizes, Norfolk, Cambridge, &c. ; Wissant, d'Ervy, &c.

EXOGYRA CANALICULATA, J. Sowerby.

Plate iii., figs. 7-8.

Chama canaliculata, J. Sowerby : Mineral Conchology, 1813, Vol. 1, Pl. 26, fig. 1, p. 68.

Gryphæa canaliculata, J. de C. Sowerby : Mineral Conchology, 1829, Vol. 6, p. 218.

Ostrea lateralis, Nilsson : Petrificata Suecana Cretacæ, 1827, Plate 7, figs. 7-10, p. 29. Goldfuss : Petrefacta Germaniæ, 1833, Vol. 2, Pl. 82, fig. 1, p. 24.

Exogyra parvula, Leymerie : Mém. Soc. Géol. France, 1842, Vol. 5, Pl. 12, figs. 8-9, p. 16.

Ostrea canaliculata, Orbigny : Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1846, Pl. 471, figs. 4-9, p. 709.

Gryphæa canaliculata, Brown : Illustrations Fossil Conchology, 1849, Pl. 61, fig. 18, p. 149.

Ostrea canaliculata, Pictet and Roux : Mollusques Grés Verts, Perte du Rhone, 1853, Pl. 50, fig. 2, p. 522. Coquand : Monographie genre *Ostrea*, 1869, Pl. 45, figs. 13-14 ; 47, figs. 7-10 ; 52, fig. 13 ; 60, figs. 13-15, p. 128.

Ostrea lateralis, Coquand : *ibid*, Pl. 18, fig. 12, p. 96 ; and Pl. 30, figs. 10-14.

This shell shows the typically spiral umbones of *Exogyra*, under which genus it is now placed instead of *Ostrea*, as in my former paper. It is a small form, with a deep lower valve, the other being flat and operculiform. Both valves are ornamented with regular concentric plications, the convex one having a postero-lateral expansion in the adult state, which is also feebly expressed in the flat valve. The specimen figured is a detached and well-preserved

upper valve showing an external surface, bending slightly upwards at the ventral margin, where it is obtusely acute; muscular scar is elongate and close to posterior border.

Goldfuss was the first authority to indicate that Nilsson's *O. lateralis* from the Swedish Cretaceous was synonymous with Sowerby's *Chama canaliculata*, a fact generally recognised by paleontologists, though Coquand saw some slight differences in these shells, sufficient, as he thought, for separation purposes, but which, I consider, after studying the figures and descriptions referred to in the above synonymy, are not tenable. The species appears to have been very gregarious, as a number of them are crowded together on one piece of matrix.

<i>Dimensions</i> of figured	}	Height = 26	}	Millimètres.
example—		Length = 20		

RANGE OF SPECIES.—Albian to Cenomanian.

LOCALITIES.—Folkestone, Cambridge, Blackdown, Devizes, Stoke, &c.; Gaty-Gerosodot, Ardennes, Meuse, St. Croix, &c.

PHOLADOMYA FAVRINA? Agassiz.

Pholadomya Favrina, Agassiz : *Etudes Critiques Mollusques Fossiles* (Myes), 1842, Pl. 2, figs. 1-2, p. 59.

Pholadomya Fabrina, Orbigny : *Paléontologie Française, Terrains Crétacés, Lamellibranchia*, 1844, Pl. 363, figs. 6-7, p. 354.

Pholadomya Favrina, Pictet and Roux : *Desc. Moll. Foss. Grés Verts Genève*, 1853, Pl. 29, fig. 1, p. 403.

Pholadomya Fabrina, de Rance : *Geological Magazine*, 1874, p. 252.

Two specimens, much crushed and imperfect, have been doubtfully referred to this species. The most complete one has both valves in contact, but the umbonal and anterior parts are missing. It is highly ornamented with numerous straight, radial costæ, extending obliquely from the beaks, crossed by frequent concentric growth lines, which at the points of junction set up a tubercled or granular appearance. This sculpturing agrees better with d'Orbigny's figures than with the originals of Agassiz, these latter

appearing to represent a much coarser shell without the tubercled surface, and having radial costæ, which are curved and fewer in number. The great breadth of the valves, however, agrees very well with our specimen.

Such differences as are here alluded to led Pictet and Roux to question d'Orbigny's determination, and it is more than likely that if the types could be consulted they might be separated with advantage. It is worthy of mention that the Barremian and Aptian species, *P. Martini* of Forbes (Quart. Journ. Geol. Soc., 1845, Vol. 1, Pl. 2, fig. 3, p. 238) appears to be so closely related to *P. Fabrina* of Orbigny that both forms may subsequently require to be merged under the former name. The specimens from Black Ven, referred to this species, are in the same condition of preservation.

Dimensions of specimen with both valves attached—	}	Height = 27	} Millimètres.
		Length = 57	
		Breadth = 39	

RANGE OF SPECIES.—Albian.

LOCALITIES.—Black Ven and Folkestone; d'Ervy and Perte du Rhone on the Continent.

PLEUROMYA PLICATA, J. de C. Sowerby.

[For synonymy see p. 71.]

Two specimens of this form are attached to the same slab of clay, showing extended valves with the regular curved plicæ, the incurved umbonal area and posterior truncation being well represented.

SOLENI DUPINIANUS, Orbigny.

Solen Dupinianus, Orbigny: Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1843, Pl. 350, figs. 3-4, p. 320. De Rance: Geological Magazine, 1874, p. 252.

A single left valve is all that was obtained of this extremely rare species at Okeford Fitzpaine. A small part of the posterior end is absent, otherwise the specimen is in fairly good condition.

It is elongate, compressed, slightly narrower anteriorly, and vertically truncated in rear. The dorsal and ventral margins are

parallel ; the umbo is a short distance from the anterior extremity, obscure and not elevated above the dorsal border ; surface bearing fine lines of growth which are obtusely angulated posteriorly ; test fragile.

D'Orbigny established this specific name for an imperfect shell obtained from the Albian deposits at d'Ervy in the Aube Department of France. His specimen consisted of what he termed the anterior part of the shell, but which from the truncated character of the growth lines seen in his illustration would more correctly be described as belonging to the posterior region. Except that d'Orbigny mentions its general resemblance to *Solen Vagina*, Linnæus, no further attempt at the characterisation of this shell is made in the text, having therefore nothing but the figure to guide us.

I believe its occurrence in this country was unknown until Mr. de Rance recorded it from Black Ven, near Lyme Regis.

Dimensions—Height = 10 }
Length = 22 } Millimètres.

RANGE OF SPECIES.—Albian.

LOCALITIES.—d'Ervy, Black Ven, &c.

THRACIA, n. sp.

Thracia simplex, R. B. Newton : Geological Magazine, 1896, p. 200, non d'Orbigny, 1843.

The following characters are drawn up from a very imperfect form of *Thracia*, which I had erroneously determined in my previous paper as *T. simplex*, Orbigny. The ventral and part of the anterior details are not seen, otherwise I should have been able to submit a more complete description. Shell with valves in contact, much compressed though slightly convex in the umbonal region ; beaks obtusely acute, 25 millimètres from the posterior margin, and a little raised above the nearly-horizontal postero-dorsal line ; posterior end truncated, vertical, area obliquely angled and flattened ; the antero-dorsal line slopes abruptly from the beaks ; test nacreous, obscurely granulated and showing some indistinct lines of growth.

This appears to differ from d'Orbigny's species (*T. simplex*) by being more compressed, having a greater height, and in its less oblique postero-dorsal margin. It corresponds very well with an undescribed form from Black Ven, near Lyme Regis, specimens of which are in British Museum.

No accurate dimensions of this shell can be given on account of its being so much buried in the matrix.

TRIGONIA ALIFORMIS, Parkinson.

Pl. iii., fig. 14.

Trigonia aliformis, Parkinson : Organic Remains, 1811, Vol. 3, Pl. 12, fig. 9, p. 176. J. Sowerby : Mineral Conchology, 1818, Vol 3, pl. 215, p. 27. Lycett : Mon. Palæontographical Soc., 1875, pl. 25, figs. 3-6, p. 116.

A very imperfect example of this species is in the collection associated with a specimen of *Syncyclonema orbicularis*. It is a left valve with a much inflated anterior area ; posteriorly depressed and attenuated. The umbo is elevated, incurved, and recurved ; the posterior area has a plain and curved inner border, the outer border being ornamented with transverse costellæ (the intermediate transverse striations of the area are absent in our specimen) ; the pallial costæ originating at the areal border are rounded, closely arranged posteriorly, and in well-preserved examples should have crenulated edges. The species is mainly characterised by its posterior depression and attenuation, and by the narrow, inflated condition of the anterior half of the shell.

Dimensions—Height = 15 }
Length = 25 } Millimètres.

According to Mr. Lycett's investigations no true form of this species had been collected in foreign localities, notwithstanding the researches of Orbigny, Goldfuss, Pictet and Roux, &c., and Lycett states "that the few figures given by foreign authors which are correctly attributed to that species (*T. aliformis*) are delineations of British specimens."

RANGE OF SPECIES.—Albian.

LOCALITIES.—Blackdown and Haldon.

TRIGONIA ARCHIACIANA, Orbigny.

Pl. iii., fig. 16.

Trigonia Archiaciana, Orbigny : Paléontologie Française, Crétacés Terrains, Lamellibranchia, 1843, Pl. 290, figs. 6-10, p. 142. Pictet and Roux : Desc. Moll. Foss. Grès Verts Genève, 1853, Pl. 35, fig. 4, p. 453. Pictet and Renevier : (Pal. Suisse) Desc. Foss. Aptien, Perte du Rhone, and St. Croix, 1857, Pl. 12, fig. 3, p. 95.

A single right valve of this shell is represented in the collection. It is of oblong shape, feebly keeled and truncated posteriorly ; ornamented with obtuse and transverse pallial ribs, which curve obliquely and downwards, then meet at an angle on the carinal margin, a corresponding series of arched costæ covering the posterior area ; between the ribs are closely arranged perpendicular plications, though only obscurely seen in our specimen on account of bad preservation.

Dimensions—Height = 21 }
Length = 25 } Millimètres.

Lycett's *T. Vicaryana* is closely allied to this species, but appears to differ in its greater number of pallial costæ.

RANGE OF SPECIES.—Aptian to Albian.

LOCALITIES.—Lac de Joux, Perte du Rhone, Meuse, Ardennes, Aube, and Yonne.

TRIGONIA FITTONI (Deshayes), Leymerie.

Pl. iii., fig. 15.

Trigonia Fittoni, Leymerie : Mém. Soc. Géol., France, 1842, Vol. 5, Pl. 9, fig. 6, p. 7. Orbigny : Paléontologie Française, Terrains Crétacés, Lamellibranchia, 1894, Pl. 290, figs. 1-5, p. 140. Lycett : Monograph Paleontographical Society, 1874, Pl. 23, figs. 4-5, p. 132.

This species is represented by two small valves, which, although somewhat fragmentary, exhibit the typical sculpturing. The shell is ovately oblong, anterior side short with an elliptically curved margin ; posterior end truncated ; surface with rather

distant curved costæ, having papillated edges ; costæ attenuated at both extremities, the area between each being finely striated ; the area is moderately wide and covered with numerous delicate papillated costæ, which descend in a slight curve from the keel.

Dimensions—Height = 12 }
Length = 13 } Millimètres.

The species is mainly distinguished by the beaded structure on the summits of the ribs.

RANGE OF SPECIES.—Albian.

LOCALITIES.—Folkestone ; Aube, Yonne, and other districts of France.

TEREDO, sp.

The specimen referred to this genus consists of a lengthened tube, slightly curved, showing a nearly uniform diameter in its central region, and afterwards becoming attenuated at one extremity. The other end is short and narrow, bending outwards or contrary to the general curvature of the shell. No test characters can be traced as the surface is much perished. In my first paper I regarded this fossil as an Annelid tube under the name of *Serpula antiquata*, but I have since considered it may more correctly be assigned to the genus *Teredo*, though its bad preservation renders this even a doubtful identification.

Dimensions—Length = 110 }
Max. diameter = 7 } Millimètres.

PLANTÆ.

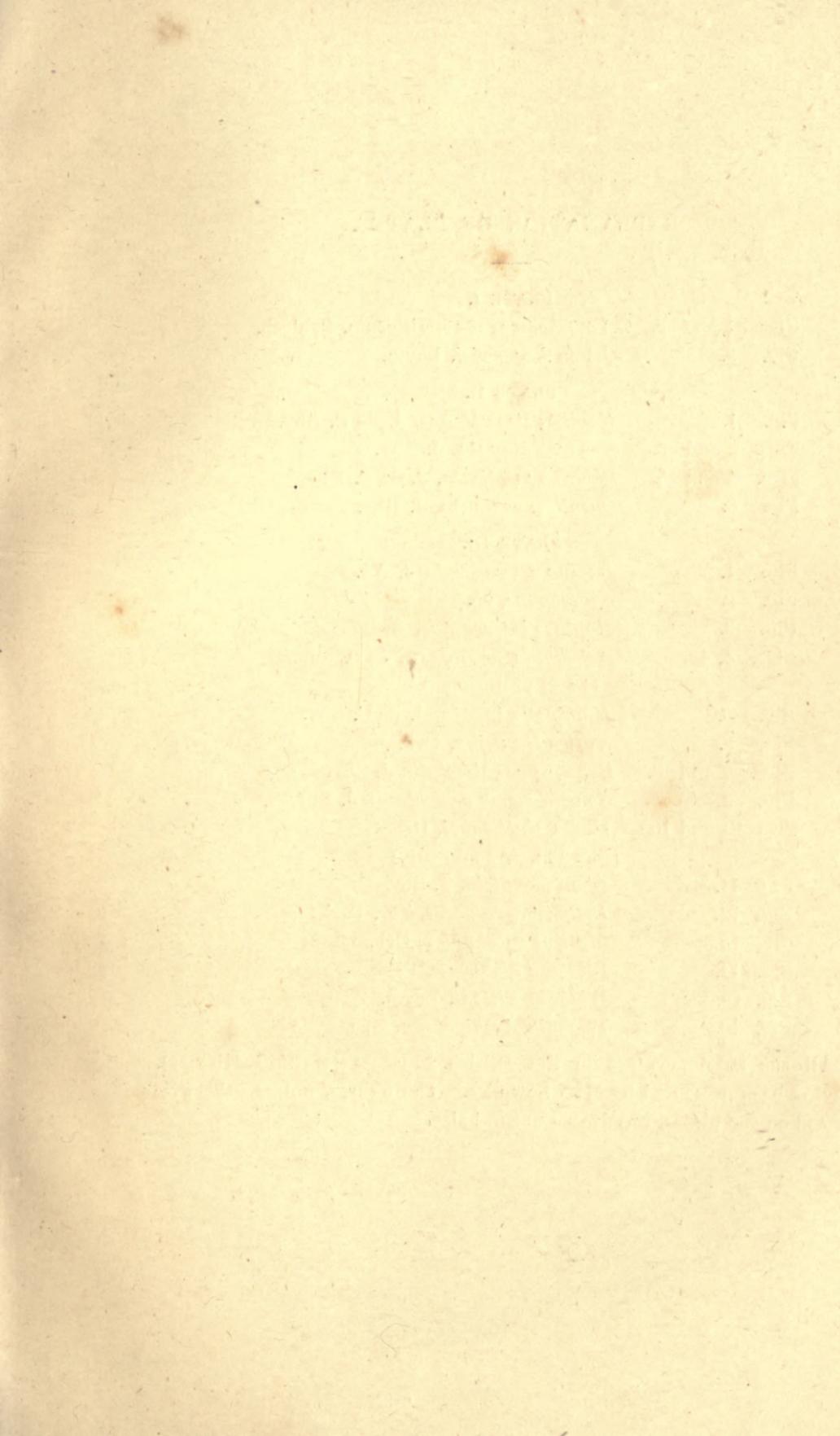
The specimen of "Coniferous Wood," alluded to in my former list, represents a somewhat rolled fragment of wood heavily charged with pyrites, and so black and dense that all attempts have failed to secure a satisfactory microscopic section. With an ordinary platyscopic lens, and when viewed transversely, a fine radial structure can be detected, together with the annulations of growth. Coniferous remains are common to most of the formations, and date back to Palæozoic times.

TABLE EXHIBITING THE GEOGRAPHICAL DISTRIBUTION, in some of the chief Albian areas of England, of the twenty-four named species of Mollusca obtained from the *Hoplites interruptus* Zone at Okeford Fitzpaine.

	Folkestone.	Black Ven.	Cambridge.	Blackdown.	Hunstanton. (Red Chalk).
<i>Hoplites interruptus</i> ...	x	...	x	x	x
<i>Hoplites splendens</i> ...	x	x	x	x	x
<i>Nautilus Clementinus</i> ...	x	...	x	...	...
<i>Actæonina formosa</i> ...	...	...	...	x	...
<i>Anchura carinata</i> ...	x	...	x	...	...
<i>Ringinella inflata</i> ...	x	...	...	...	...
<i>Natica Gaultina</i> ...	x	x	x	x	...
<i>Scala Dupiniana</i> ...	x	x	...	x	...
<i>Solarium subornatum</i> ...	x	...	x	...	...
<i>Cucullæa carinata</i> ...	x	x	...	x	...
<i>Syncyclonema orbicularis</i>	x	x	x	x	...
<i>Gervillia Forbesiana</i> ...	x	...	x	x	...
<i>Inoceramus concentricus</i>	x	x	x	x	?
<i>Lima parallela</i> ...	x	x	x	...	...
<i>Mytilus subsimplex</i> ...	...	x	...	...	...
<i>Nucula pectinata</i> ..	x	x	x	...	...
<i>Ezogyra canaliculata</i> ..	x	...	x	x	...
<i>Pecten Galliennei</i> ...	x	...	...	...	...
<i>Pleuromya plicata</i> ...	x	x	...	...	...
<i>Pholadomya Favrina</i> ?	x	x	...	...	...
<i>Solen Dupinianus</i> ...	...	x	...	...	...
<i>Trigonia aliformis</i> ...	...	..	...	x	..
<i>Trigonia Archiaciana</i> ...	...	...	...	...	...
<i>Trigonia Fittoni</i> ...	x	...	...	...	...
	19	12	12	11	3

For purposes of correlation this table is interesting as showing that 19 of the species occur at Folkestone, 12 at Black Ven near Lyme Regis, 12 in the Cambridge "Greensand" deposits, 11 in the Blackdown beds of Somersetshire, and 3 in the Red Rock of Hunstanton.* Lithologically the Gault at Okeford Fitzpaine more closely resembles the Black Ven beds than the bluer and more clayey deposits of Folkestone.

* The occurrence of *Hoplites interruptus* in the Red Chalk of Hunstanton is given on the authority of Messrs. Jukes-Browne and W. Hill. *Quart. Journ. Geol. Soc.*, 1887. Vol. 43, p. 571.



EXPLANATION OF PLATES.

PLATE I.

- Figs. 1 and 2. *Acanthoceras mammillatum*, Schloth.
Fig. 3. *Ostrea Leymeriei*, Leym.

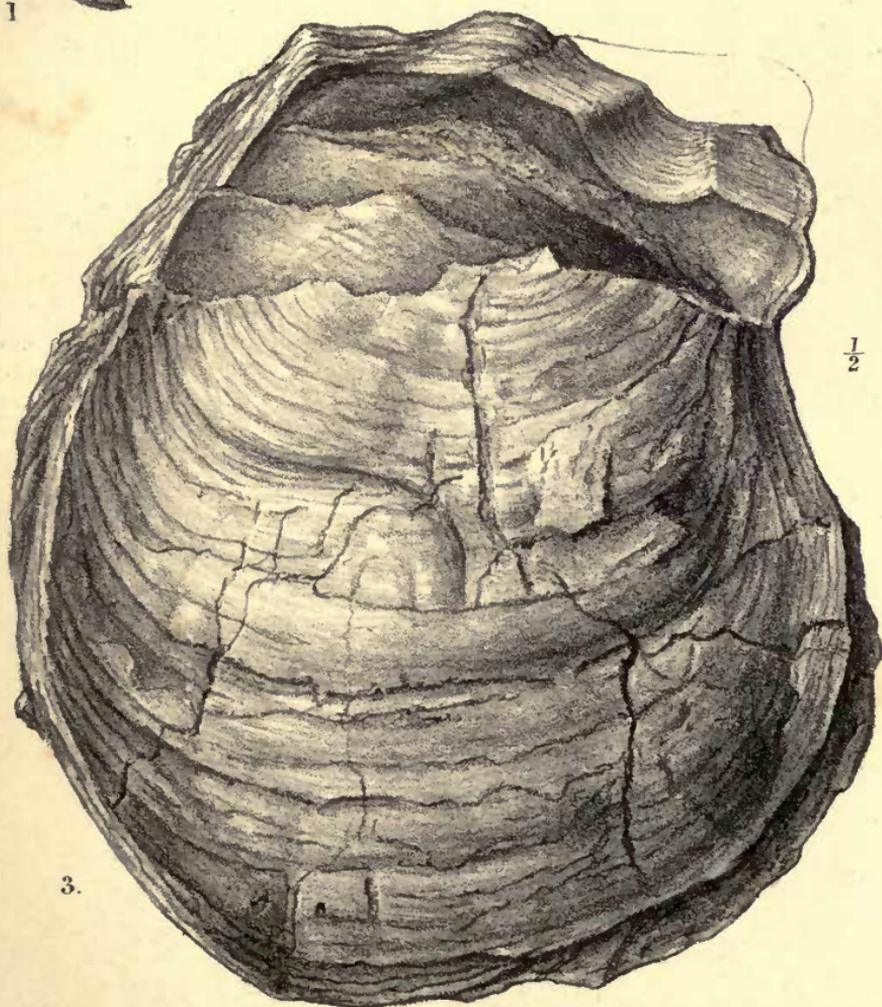
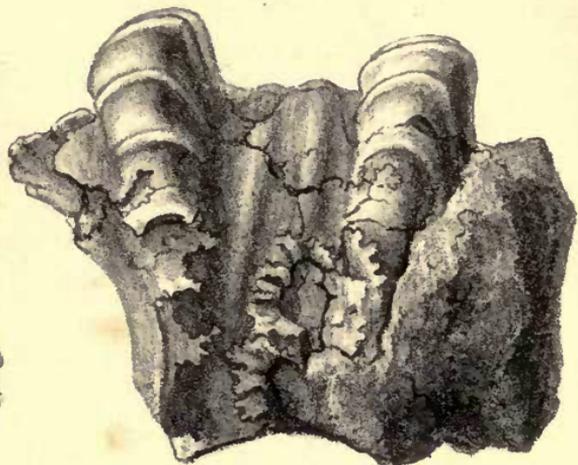
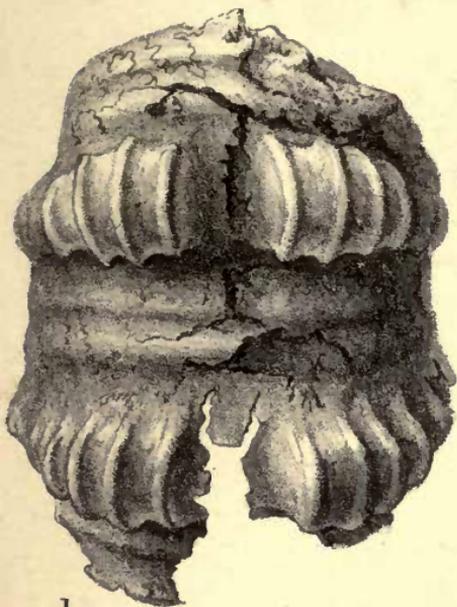
PLATE II.

- Fig. 1. *Hoplites Benettianus*, J. de C. Sby.
Figs. 2 and 3. *Exogyra sinuata*, J. Sby.
Figs. 4 and 5. *Pleuromya plicata*, J. de C. Sby.
Fig. 6. *Cucullæa carinata*, J. Sby.

PLATE III.

- Fig. 1. *Lamna appendiculata*, Ag.
Fig. 2. *Synechodus*, sp.
Fig. 3. *Hoplites interruptus*, Brüg.
Figs. 4, 4a. *Actæonina formosa*, J. de C. Sby.
(4a = protoconch).
Fig. 5. *Ringinella inflata*, J. de C. Sby.
Fig. 6. *Natica Gaultina*, Orb.
Figs. 7 and 8. *Exogyra canaliculata*, J. Sby.
Fig. 9. *Syncyclonema orbicularis*, J. Sby.
Figs. 10 and 10a. *Pecten Galliennei*, Orb.
(Fig. 10a. = sculpture.)
Fig. 11. *Lima parallela*, J. Sby.
Fig. 12. *Inoceramus concentricus*, Park.
Fig. 13. *Mytilus subsimplex*, Orb.
Fig. 14. *Trigonia aliformis*, Park.
Fig. 15. *Trigonia Fittoni*, Leym.
Fig. 16. *Trigonia Archiaciana*, Orb.

All the specimens are in the British Museum (Natural History), having been presented by Miss Lowndes. The figures, unless otherwise stated on the plates, are drawn natural size.

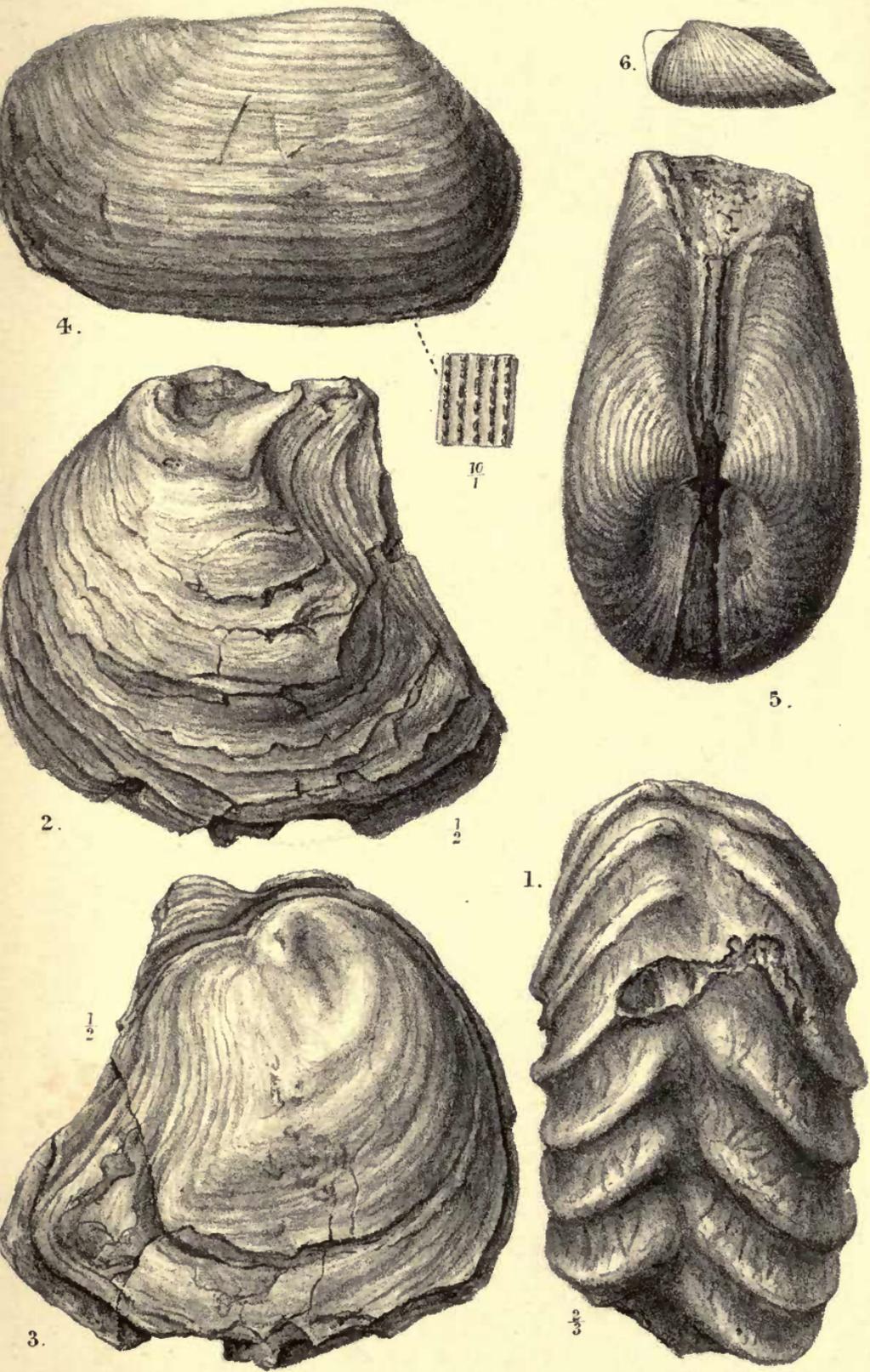


Percy Highley del. et lith.

Mintern Bros. imp.

Fauna from the *Acanthoceras mammillatum*

Zone at Okeford Fitzpaine, Dorset.

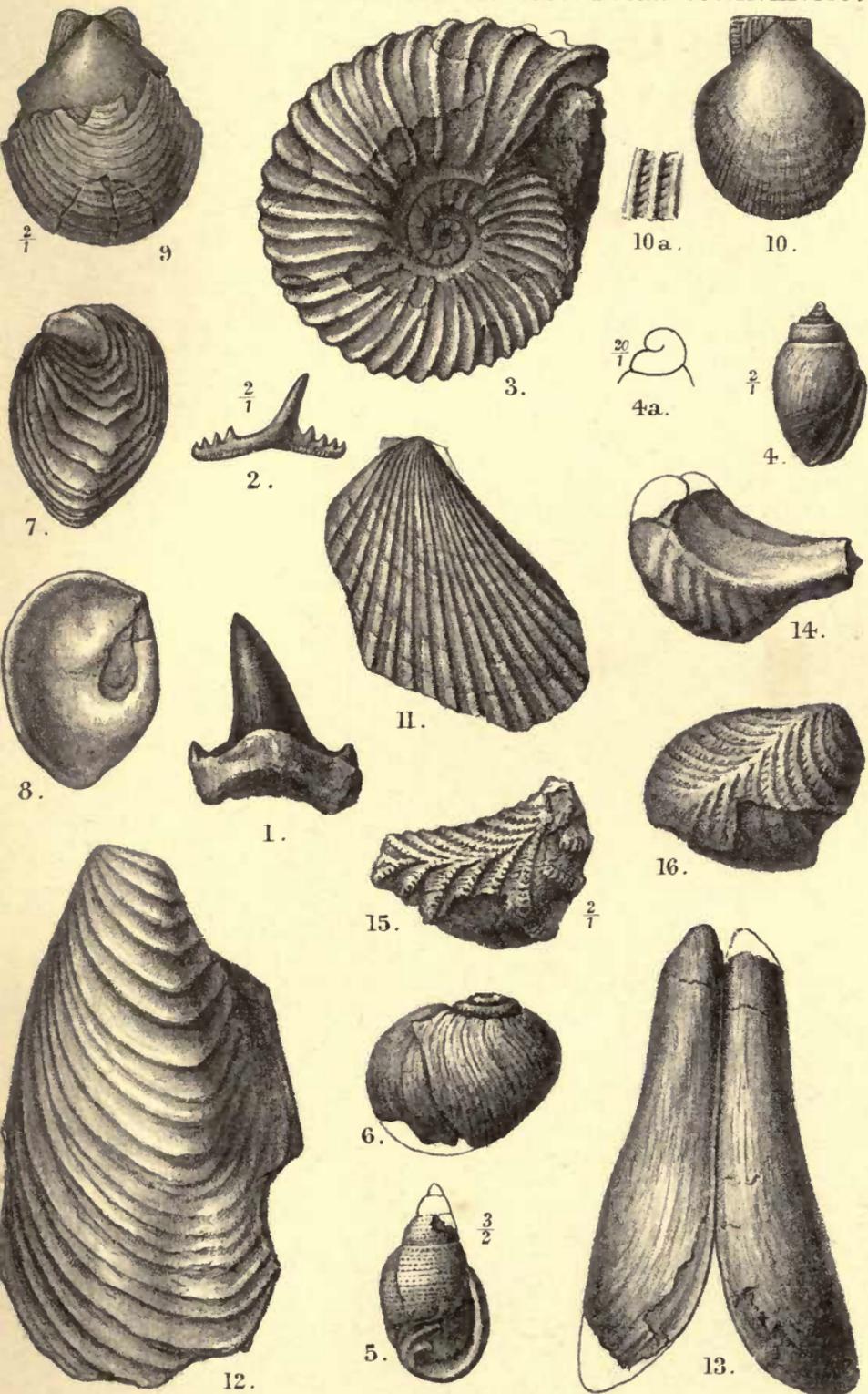


Percy Highley del. et lith.

Mintern Bros. imp.

Fauna from the *Acanthoceras mammillatum*
Zone at Okeford Fitzpaine, Dorset.





ercy Highley del. et lith.

Mintern Bros. imp.

Fauna from the *Hoplites interruptus* Zone
at Okeford Fitzpaine, Dorset.



In describing the fossils from this part of Dorset I wish to observe that only the leading synonymy is given of each species. Similarly when treating of their geographical distribution only a few of the principal localities are referred to.

When quoting the time range for each species I have adopted continental terms, these being more comprehensive than our local English equivalents. To better explain this system of nomenclature I have appended an abridged schedule setting forth in sequential order the main divisions of the Cretaceous rocks, the French names being those employed by Prof. A. de Lapparent in the last edition of his "Traité de Géologie," 1893.

TABLE OF THE CRETACEOUS FORMATIONS.

CONTINENTAL TERMS.	[ABRIDGED.]	BRITISH EQUIVALENTS.
<i>Danian</i>		[Not represented.]
<i>Senonian</i>		Norwich and S. of England Chalk (with flints).
<i>Turonian</i>		Chalk Rock and Chalk without flints.
<i>Cenomanian</i>		Chalk Marl, Chloritic Marl, and Upper Greensand.
<i>Albian</i>	{	Blackdown Beds, Cambridge "Greensand," Red Rock of Hunstanton, Gault Clay, <i>Acanthoceras mammillatum</i> Zone.
<i>Aptian</i>		Lower Greensand, Folkestone, Sandgate, Hythe, Farringdon, &c.
<i>Barremian</i>		Punfield and Atherfield beds.
<i>Neocomian</i>	{	<i>Exogyra Couloni</i> (= <i>E. subsinuata</i> , Leymerie) beds of Speeton Cliff, &c., Weald Clay and Hastings Sand (Sussex).

In bringing this paper to a close I must draw attention to the fact, alluded to in my former notice on this subject, that the measurements of the beds at Okeford Fitzpaine were most carefully obtained by Miss Forbes and Miss Lowndes, to whom I am also indebted for the organic remains forming this collection and which are now deposited in the British Museum. Lastly, my thanks are due to Mr. G. C. Crick, F.G.S., for valuable aid when drawing up my descriptions of the Cephalopods dealt with in the paper.



The Arms of Dorchester and Dorset.

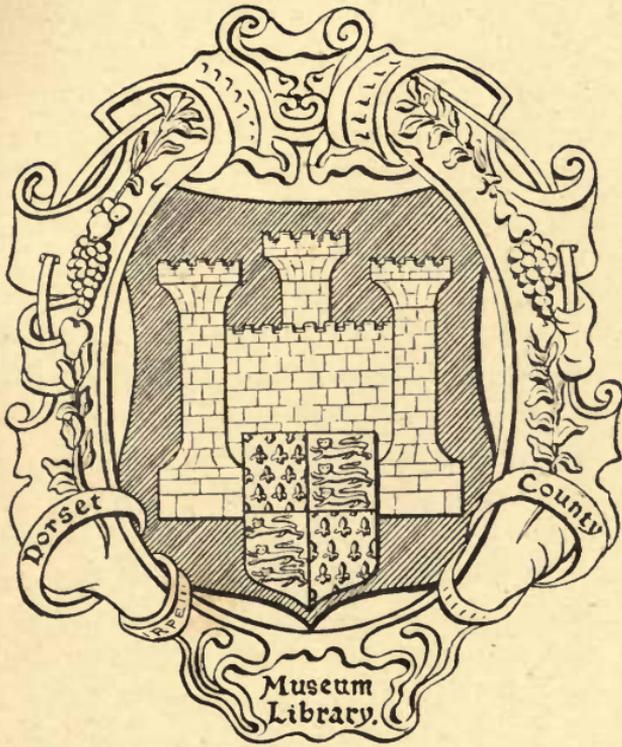
By Sir ROBERT EDGCUMBE.

(Read Nov. 20th, 1896.)

I.—THE ARMS OF DORCHESTER.



THE Arms of the Borough of Dorchester are:—
Purpure, a castle embattled triple crowned
ar. masoned sa. surmounted projecting in base
by an escutcheon of France Ancient quarterly
(1 and 4) with the Arms of England, certified
and confirmed for the borough seal by William
Hervey, Clarencieux King-of-Arms, September
22nd, 1565. The document in vellum con-
firming this blazon is in the possession of the
Corporation, and is filed as No. 7, Class B.; and above the
written confirmation the Arms, as above described, are drawn, or,
to use the heraldic term, tricked. The only point in which this
exemplification by William Hervey is defective is in not indicating
the tincture of the field. A letter from Mr. Bellasis, Lancaster
Herald, states that, according to the records of the Heraldic
College, the field is purpure, and as no user of any variation of the
Arms can be sustained, as against the authority of the qualified



BOOKPLATE OF
THE DORSET COUNTY MUSEUM LIBRARY
SHEWING
THE ARMS OF DORCHESTER.

officials of the Heralds' College, we may accept the blazon of the Arms I have given as final. Let us suppose that we are strangers to the town of Dorchester and know nothing of its history. What do the Arms of the borough tell us about the borough? Firstly, they indicate to us, from the purple tincture of the field, that the town of Dorchester has, or has had, some connection with Royalty. We dive into the history of the borough and we find that this indication is correct, for the borough for many centuries was a Royal manor. In the Stuart days, when the Sovereign was in want of funds, an offer was made to the burgesses to purchase of the Crown the manorial rights. The Corporation, acting for the town, purchased these rights, and to-day the Corporation of Dorchester are lords of the manor of Dorchester in succession to the Crown. The effect of this, amongst other things, is that the Corporation of Dorchester actually owns the soil underneath the streets of Dorchester. In other towns the local authorities have only a surface right of use over the roads, and the soil underneath and the air above are, in law, the property of the adjacent property-owners, whose rights extend to the middle of the highway from either side. But in Dorchester this is not so. In this town these rights belong to the municipality as lords of the manor. When we look, then, upon the purple field of the shield we see a history woven into it of ancient Royal rights now transferred to the municipality. Secondly, we note the castle. This is an indication that the town is, or was, in some way protected from attack, either by a fortified castle or embattled walls. Although but a slight vestige remains we know that down to the middle of the last century the old Roman walls stood round the town "four square to all the winds that blew." Lastly, the escutcheon at the base of the castle is of quite extraordinary interest, as it takes us back to a brief period of 65 years, to the days of Edward III., Richard II., and Henry IV., to a time limited on the one hand by the year 1340, when Edward III. made claim to the crown of France and adopted the lilies of France on the shields of the English sovereigns, to a time limited on the other hand by the year 1405, when

Henry IV. altered the French Arms from lilies *semée* (strewn), known as the Arms of France Ancient, to three lilies only, known as the Arms of France Modern. This change in the Arms of France to three lilies, as borne by the kings of England after 1405, came about in this way. After Edward III. laid claim to the throne of France and adopted the Ancient French Royal Arms of the lilies *semée*, Charles V. of France, in order to avoid bearing exactly the same Arms as the English kings had adopted, reduced the number of the fleurs-de-lys on his shield to three only. But Henry IV., in 1406, imitated the change introduced by Charles V., and after that year the English sovereigns bore the three lilies of France, known as the Coat of France Modern. The fact that the borough bears the Arms of France *semées* carries back the insignia of the borough fully five hundred years. But this is not all, for, so far as I can discover, it is an older form of the Arms of England than any other Corporation possesses. All the other Corporations which have Royal Arms emblazoned on an escutcheon bear the Arms of France Modern, and not one, save Dorchester alone, bears the Arms of France Ancient. Even the Royal Borough of Windsor, whose Arms somewhat resemble those of Dorchester, bears the Arms of France Modern and not the Arms of France Ancient. This brief examination of the Arms of the borough epitomises for us the life and history of the borough—its Roman ramparts, its Royal manor, and its extremely ancient corporate life. Let us now enquire what Arms are at present in use. The Arms displayed throughout the borough differ from the authentic blazon in no less than five important particulars. First, as to the field, instead of its being purpure (purple) it is now blazoned as gules (red). Secondly, the castle is variously depicted as standing either upon rocks or upon a green sward, either of which are complete departures from the true blazon. Thirdly, the castle is portrayed windowed and loopholed, which is incorrect. Fourthly, as to the escutcheon of Arms it now invariably gives the Arms of France as the three fleur-de-lys—that is, as France Modern—and sometimes the French Arms are

placed in the 2nd and 3rd quarters instead of in the 1st and 4th quarters. Fifthly, the escutcheon is made to incorporate the Arms of Scotland and Ireland. Thus all indication of great antiquity is gone, and the Arms, as they are now used, might be the Arms of a Corporation incorporated in the last century instead of being the Arms of a Corporation which should indicate unmistakeably that they have been borne for a period of at least 500 years. How the change in the Arms has come about, so that the true blazon has been almost lost sight of, is perhaps difficult to fathom. It is clear, however, that Hutchins is largely responsible for the error, for, in the edition of Hutchins' Dorset, published in the last century, the Arms are described as:—"Gules, a castle embattled triple-towered arg. on the front a royal shield, quarterly France, England, Scotland, and Ireland." Hutchins evidently had never seen the drawings of the Arms as tricked by William Hervey amongst the Corporation records, otherwise he would not so have described the Royal Shield. In the modern edition of Hutchins the editors have reprinted Hutchins's description of the Arms, and next following his description they have printed the confirmation of William Hervey, but they have omitted either to reproduce his drawing of the Arms or to describe them as drawn by him. Accordingly they have perpetuated the erroneous description of the Borough Arms, though at the same time, by drawing attention to the confirmation of them by William Hervey, they have provided a clue to the real Arms as exemplified by him. In the Heralds College, as I have said, we have it on record that the colour of the field is purple. Mr. Fox-Davies, in his recently-published *Book of Public Arms*, 1894, gives the Arms of Dorchester from a seal engraved in 1836, with all the stock modern errors:—First, the Arms of Modern France; secondly, the Arms of Scotland and Ireland; thirdly, the castle standing on a nicely-cropped green lawn; fourthly, the castle is neatly windowed and loopholed; and, lastly, the tincture of the shield described in the letterpress as gules instead of purpure. Mr. Fox-Davies prides himself on his accuracy, but he has only transcribed the errors of

Burke's Armorial, and the erroneous description of the Borough Arms in Burke's Armorial was evidently taken from the faulty description of them in the old edition of Hutchins. Had Mr. Fox-Davies turned up the modern edition of Hutchins he would have been put upon the true scent, for this would have made him acquainted with the confirmation of William Hervey, Clarencieux King-of-Arms—a confirmation of which he is evidently ignorant. In Dorchester itself inaccurate representations of the Borough Arms are rampant. The Council have had the Arms blazoned on the blank wall of the Corn Exchange in a painting of magnificent proportions, but, sad to say, with all the five errors I have pointed out. The Mayor issues his invitations adorned with these adulterated Arms. The Town Clerk heads his correspondence with these spurious Arms. On the doorway to the Corn Exchange in the High Street the same mistakes are carved. On the topmost gable of the County Museum these spurious Arms appear. On the bookplate of the Museum these inaccuracies are so perpetrated. On the Arms stamped on the books presented to the prize winners of the Grammar School the same mistakes appear. Last, but perhaps not least, on the pretty china ornaments now sold at Mr. Godwin's shop, which many buy as mementoes of Dorchester, the same Arms with all their imperfections are blazoned in colours. I sincerely trust that the Town Council will lose no time in directing that their true Arms are blazoned afresh on the wall of the Corn Exchange. The true Arms of the town are so full of interest and of such exceptional antiquity that it is a real pity that the misleading and spurious Arms, which, as I have said, might be the Arms of a municipality incorporated in the last century, should be allowed for a moment to supplant the actual blazon of the Arms of the Borough of Dorchester.

[Since the above paper was read the Heralds have further considered the tincture of the field, and are of opinion that the lines in the drawing in the Heralds' College, which were taken by Mr. Bellasis to represent "purpure," signify no colour, being merely hatched in by way of improving the look of the drawing. The

effect of this view is, that Dorchester must be held to have a "Badge" rather than a Coat of Arms proper—an extremely handsome Badge and one of very early date.]

II.—ARMS OF DORSET.

When we come to the Arms of the County the record is simple, for Dorset has no Arms. In the Natural History of Ireland under the head of "Snakes" it is recorded that Ireland has no snakes. Of Dorset under the head of "Arms" we may enter up a parallel record. It is true that wherever the County Council of Dorset makes its presence known, whether it be in advertisements in the newspapers, on documentary records, on certificates for proficiency in mental or manual education, on notices in public places in town or in village or in hamlet, there it marks its ubiquitous influence with the ensign of three emaciated heraldic lions passant. How is this, and can the use of these three lions be justified? Counties in England had no right to Arms until the passing of the County Council Act in 1888. Before that time counties as having no corporate existence could have no right to Arms. Two counties were in an exceptional position in this respect—namely, Lancashire and Cornwall. These enjoyed Arms by courtesy—the first as the Duchy of the Sovereign, the second as the Duchy of the Prince. The white horse of Kent was regarded by heralds at best as a badge, and not as the Arms of the County. The establishment of County Councils entitled counties, by calling them into corporate existence (Local Government Act, 1888, sec. 79), to Arms, and the same sec. directs that they shall have a seal. There is nothing in the Act which prescribes that such a seal should bear a device of Arms; that is a matter for each county to determine as it pleases. Such a seal may be quite plain and merely be inscribed "The seal of the Administrative County of Dorset." It may, on the other hand, be adorned with Arms, but in this case there is one way, and one legitimate way only, of obtaining Arms, and that is by due application through the Heralds' College to the Earl Marshal. I cannot do better than quote what Mr. Fox-Davies says as to this :—

“ There is no law and no custom which requires a Corporation to obtain a grant of Arms ; consequently there is no excuse for the display of a bogus escutcheon invented or borrowed. The seal of the Corporation may not look so well without them, but it will render a document every whit as valid.” He further says :—“ I cannot urge it too strongly as the proper thing for a body of persons when erected into a Corporation to petition for Arms. It is better to start fair at once than to start with bogus Arms, and then when matters have been put right have to alter everything or let it stand as a reminder of the ignorance or folly of a former-day Corporation.” When the Dorset Council was about to enter upon its corporate existence it appointed a small committee to consider and report upon a design for a county seal. The committee had to act somewhat hurriedly, as a seal was one of the first requirements of the Council. It is clear that this committee should have reported to the Council that it was open to them to use a plain seal without any heraldic device, or, in the alternative, if they required their seal to be adorned with Arms, that the proper course was to make application for a grant of Arms. Unfortunately, this committee did not so report, but took a different course, and recommended the adoption of the Arms of England, stating that the three lions passant were upon “ the most ancient seal of the Borough of Dorchester—one used under the charter of Edward I., a copy of which was hung on the wall.” If we assume for the moment that this statement was correct it would still fail to justify in any way the appropriation by the county of a seal belonging to the county town. But the statement itself is misleading, for this seal was in no true sense a seal of the Borough of Dorchester. At that time—Edward I.—boroughs in default of Arms of their own were in the habit of using the Arms of England. If this committee had opened Mr. Moule’s admirable “ Records of Weymouth and Melcombe Regis ” they would have seen on the first page a precisely similar seal with the three lions passant used in very early times by the Borough of Weymouth. If they had pursued their enquiries further they would have found that other

boroughs used the same Arms, and that Corporations long years ago were estopped by the Heralds from using the National Arms and required to adopt Arms of their own. England and the Channel Islands, the latter as part of the old Duchy of Normandy, are alone entitled to the blazon of the three lions passant. Lancashire, as the Duchy of the Sovereign, by courtesy, uses the National Arms of England, but with a distinctive "label of three points" to distinguish the Duchy Arms from the National Arms. The only right course for Dorset to adopt is to apply in the usual manner for a grant of Arms. If the expense is too great—the cost is £76 10s.—for the county to bear, then, at any rate, we had better expunge the three lions passant from the county seal and adopt a plain one. The exhibition of bogus Arms by a county is bad enough. But the exhibition of the National Arms, to which it has no shadow of title, only makes it a butt for the ridicule of those who have the most elementary knowledge of these matters.



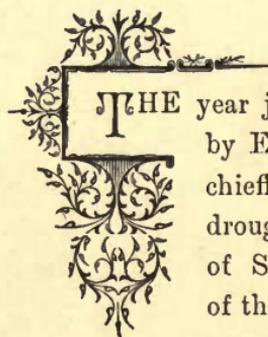


British Arachnida
Observed and Captured in 1896.

By Rev. O. PICKARD-CAMBRIDGE, M.A., F.R.S., &c.

(Read February 17th, 1897, at a Meeting of the Dorset
N.H. and A.F. Club.)

[WITH PLATE.]



THE year just ended (1896) will be long remembered by Entomologists as a remarkable one. This is chiefly owing to the almost unchecked period of drought from the end of March until the beginning of September. With some exceptions the effect of this was to upset the usual times of appearance, as well as the size of specimens and abundance of many insects; indeed, of the most ordinary diurnal Lepidoptera the numbers were in my own district few, and some scarcely appeared at all. The general report was disappointment; and the same may be said also of the spider tribes. Among these we have to record a similar lack both of species and individuals; still there have been met with some few of both interest and rarity, among the *Araneidea* or true spiders, and especially one of the *Phalangidea* (or Harvestmen) hitherto unrecorded as British, and, in fact, when first received it was undescribed. This Phalangid was sent to me from Scotland through Mr. G. H. Carpenter (of the

Science and Art Museum, Dublin) in June last as *Oligolophus ephippiger*, Simon. A very slight inspection convinced me of the incorrectness of this determination, in which Professor Kraepelin (who had also received examples of it from Mr. Carpenter) agreed with me. It appeared to me to be nearly allied to *Oligolophus tridens*, C. L. Koch, as well as to our very abundant British species, *Oligolophus agrestis*, Meade, but quite distinct from both. Professor Kraepelin, who meets with the species pretty abundantly near Hamburg, has since described it as a new species, under the name *Oligolophus Hansenii*. The Professor has also very kindly sent me the specimens he received from Mr. Carpenter as well as some of those found near Hamburg, with which last the Scotch examples quite agree. More recently Mr. Wm. Evans (of Edinburgh), by whom Mr. Carpenter's specimens were found, has sent me several others, well marked and in good condition, from the neighbourhood of Edinburgh. The addition of this species to our British list is of considerable interest and importance, as the group is, in its extent, very limited everywhere, and in Britain only numbers hitherto 24 species; the number of those as yet recorded in "Europe" being not much more than 50.

Of the true spiders met with by myself or received in the past year I may particularly mention *Lithyphantes corollatus* Linn., of which immature examples were recorded in our last year's Proceedings (Vol. XVII., p. 56, and p. 58) from Bloxworth Heath. Adults of both sexes of this handsome spider were found pretty abundantly by myself and my nephew, F. O. P. Cambridge, from the 2nd of April to the 4th of May, 1896, in the same locality as that in which the immature examples had before occurred.

Two adults of our largest Lycosid (or, popularly, *wolf* spiders), *Trochosa robusta*, Sim. were kindly sent to me by our Secretary, Mr. Richardson, by whom they were found under stones below high-water mark on the shore of the "Fleet," at the "Herbary," Langton Herring, on the 7th of May. This is only the third

record of its occurrence in Great Britain. In June, 1896, and again in August, I received from Mr. Linnæus Greening, of Warrington, adults of both sexes of a fine salticid spider which I am pretty sure is *Attus floricola*, C. L. Koch. It was found in tolerable abundance by sweeping among rank herbage, and also by beating stunted birch bushes, in a swampy spot, at Hartford, near Warrington. This is its first record as an English species. From Ireland it has been previously recorded (see Proc. Dors. N.H. and A.F. Club, Vol. XVII., p. 62, 1896). Early in July, 1896, I had several days' spider-hunting near Worthing, in Sussex, where my special object was to try and turn up again a pretty *salticid* which I had found close to Shoreham in some abundance in 1871, and thought then to be *Attus floricola*, C. L. Koch. The weather was unfortunately dark, gloomy, cold, and wet each day, so that, although I did meet with the species I was in search of, the examples—only three—were immature or not well marked. The spot on which I had found them in 1871 was no longer ascertainable; the whole locality had been cut up into roadways, and rows of houses had been built upon it, so that the place was quite irrecongnisable. There is little doubt, however, but that this spider occurs at intervals all along the coast from Shoreham to Worthing. The spot where I found the three examples mentioned was nearer to the latter place, but a genial sunny day is needed to bring them out of their hiding-places. Several other rare spiders were found here, the most remarkable being *Agroeca littoralis*, F. O. P. Cambr., of which examples had only before occurred at Swanage. *Euophrys aequipes* Cambr., *Gnaphosa lugubris* C. L. Koch, *Drassus macer* Thor., *Steatoda sticta* Cambr., and *Erigone promiscua* Cambr., all rare and local spiders, were also found on the coast near Worthing. I received also from Mr. Gulliver (by whom they were found in the New Forest, near Brockenhurst) an adult female of the fine and rare *Pistius truncatus* Pall, as well as one of *Hyptiotes paradoxus* C. L. Koch (see Proc. Dors. N.H. and A.F. Club, XVII., p. 61) and an adult of each sex of *Epeira angulata* Clerck, and *Epeira scalaris* Walck.

SYSTEMATIC LIST OF SPIDERS NOTED IN 1896.

ORDER ARANEIDEA.

FAM. DRASSIDÆ.

DRASSUS MACER.

Drassus macer, Thor. Proc. Dors. N.H. and A.F. Club, xvi., p. 100.

An adult male among shingle near Shoreham. It seems hardly yet certain whether this form is a true species or only a variety of *Drassus lapidicolens* Walck. The chief distinction at present seems to be in the less developed palps and differently dentated fangs of *D. macer*.

GNAPHOSA LUGUBRIS.

Gnaphosa lugubris, C. L. Koch. Spid. Dors., p. 419.

Among stones and shingle near Worthing, but none adult.

AGROECA LITTORALIS.

Agroeca littoralis, F. O. P. Cambr. Proc. Dors. N.H. and A.F. Club, xvi., p. 101.

An adult female among stones on the coast between Worthing and Shoreham. Only previously found at Swanage.

FAM. THERIDIIDÆ.

STEATODA STICTA.

Theridion stictum, Cambr. Spid. Dors., p. 97.

An adult female of the black variety found near Worthing.

LITHYPHANTES COROLLATUS.

Lithyphantes corollatus, Linn. Proc. Dors. N.H. and A.F. Club, xvii., pp. 56, 58.

Adults of both sexes tolerably abundant beneath small, flat, finely-woven webs, spun among very short heather and dwarf-stunted furze close to the ground, and over small depressions in the surface. The earliest adult was taken on April 21, the latest on May 4th. Its chief food appears to be a beetle, which is rather

common on the heath, the wing cases and other remains being found in most of the snares.

ERIGONE PROMISCUA.

Neriene promiscua, Cambr. Proc. Dors. N.H. and A.F. Club, vi., p. 4, 1884.

An adult male, under a stone near Worthing.

FAM. EPEIRIDÆ.

EPEIRA ANGULATA.

Epeira angulata, Clerck. Proc. Dors. N.H. and A.F. Club, xvi., p. 116, 1895.

An adult example of both sexes as well as many immature ones were sent to me from Brockenhurst by Mr. Gulliver at the end of the past summer.

EPEIRA SCALARIS.

Epeira scalaris, Walck. Spid, Dors. p. 268.

Adult females were sent to me from near Brockenhurst by Mr. Gulliver.

FAM. ULOBORIDÆ.

HYPTIOTES PARADOXUS.

Hyptiotes paradoxus, C. L. Koch. Proc. Dors. N.H. and A.F. Club, xvi., pp. 116, 125, and xvii, pp. 51, 61.

An adult female, sent to me from near Brockenhurst by Mr. Gulliver.

FAM. THOMISIDÆ.

PISTIUS TRUNCATUS.

Pistius truncatus, Pall. Proc. Dors. N.H. and A.F. Club, Vol. xvii., p. 61.

A fine and well-marked adult female of this rare spider, sent to me by Mr. Gulliver, from Brockenhurst.

FAM. LYCOSIDÆ.

TROCHOSA ROBUSTA.

Trochosa robusta, Sim. Proc. Dors. N.H. and A.F. Club, xvi., pp. 93, 119.

Two adult females were found under stones below high water mark at the Herbarry, Langton Herring, by Mr. N. M. Richardson, in May, 1896. I had in the previous year found one near Chickerell under dried seaweed.

FAM. SALTICIDÆ.

EUOPHRYS ÆQUIPES.

Euophrys æquipes, Cambr. Proc. Dors. N.H. and A.F. Club, x., p. 28, 1889.

Adult females among stones and on bare spots on the coast near Worthing.

ATTUS FLORICOLA.

Attus floricola, C. L. Koch. Proc. Dors. N.H. and A.F. Club, xvii., pp. 56, 62, 1896.

Both sexes rather abundant and in the adult state in June, July, and August, 1896, received from Mr. Linnæus Greening, by whom they were found in a swampy locality at Hartford, near Warrington, by sweeping and beating among rank herbage and low stunted birch bushes.

ATTUS MANCUS.

? *Attus mancus*, Thor. Proc. Dors. N.H. and A.F. Club, xvii., pp. 56, 62.

Three adult and immature females between Worthing and Shoreham, July 2, 1896.

After a long and careful comparison of an adult male (found between Brighton and Shoreham in 1871) with the Hartford spiders (*A. floricola*, see *supra*) received from Mr. L. Greening, I think that the two are decidedly distinct from each other, though very nearly allied. The Brighton species is smaller (though of course absolute size alone is not to be relied upon), the legs of the 1st pair in the adult male are shorter, the radial joint of the palpus has the apophysis rather longer, less robust, and more uniformly tapering to its point, the digital joint is altogether smaller and narrower, and the palpal organs are less prominent, and differ, though slightly, in structure. From its habitat (among stones and

short herbage on the seashore) I fancied that the Brighton spider might be *Attus rupicola*, C. L. Koch, but it differs from that species also in the same respects and quite as distinctly as from the Hartford species, and from types of both *A. floricola*, C. L. Koch, and *A. rupicola*, *ibid.*, received from Dr. L. Koch himself. It appears to agree well with *A. mancus*, Thor, and I am inclined to consider it a good species, though M. Simon thinks that *A. mancus*, Thor., is only a variety of *A. floricola*, C. L. Koch. In the females of the Hartford species, the Brighton one and *Attus rupicola*, C. L. K. (German type), the epigyne differs slightly in form.

ORDER PHALANGIDEA.

FAM. PHALANGIIDÆ.

OLIGOLOPHUS, Sim.

OLIGOLOPHUS HANSENI.

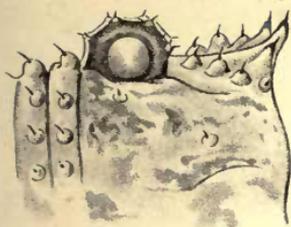
Acantholophus Hansenii, Kraepelin. Mittheil: dem Naturhistorischen Museum, xiii. (Beiheft zum Jahrbuch der Hamburgischen Wissenschaftlichen Anstalten, xiii.), p. 232 (Hamburg 1896).

Acantholophus ephippiger, Hansen. Naturh. Tidskr. (3), xiv., p. 511, 1884.

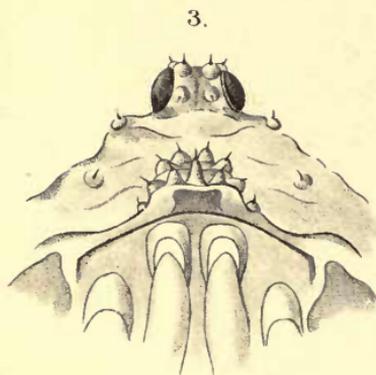
This species is very nearly allied to *Oligolophus tridens*, C. L. Koch, but may be at once distinguished by a difference in the three prominent spines at the fore-margin of the caput. These in *O. Hansenii* are placed close together, their bases contiguous, and are stouter. The spinous tubercles on the palpi also differ, and the hinder part of the abdomen is shorter and rounder. The general colouring is darker, and the spines on the eye-eminence are stronger. On the abdomen the dark, central dorsal band (which is truncate at its posterior extremity) has (in fine specimens) its margins marked with a broken white line or spots. The femora of the legs are cylindrical, whereas in *O. tridens* they are angular. *O. Hansenii* is also very nearly allied to *O. agrestis*, Meade (*O. ephippiger*), Sim., but may easily be distinguished, not only by difference of colouring, but by the genital plate in *O. agrestis* being distinctly emarginate

EXPLANATION OF PLATE A.

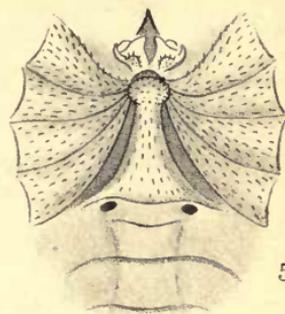
- Fig. 1. *Oligolophus Hansenii*, Kraep., much enlarged.
2. Ditto, in profile, without legs or palpi.
 3. Ditto, caput from in front.
 4. Ditto, caput in profile.
 5. Ditto, underside of thorax.
 8. Ditto, spines on fore part of caput, from behind.
 9. *Oligolophus tridens*, C. L. Koch.
Spines on fore part of caput, from behind.
 6. *Ero tuberculata*, De Geer (Spid. Dors., p. 235).
Egg cocoon, found, near Bloxworth, June, 1892. (*Vide*
"L. industrie des Araneina," Par., W. Wagner,
St. Petersburg, 1894, p. 146, pl. iv., fig. 210.)
 7. Egg cocoon of spider unknown, probably of the Genus
Agroeca; found near Bournemouth on heather.



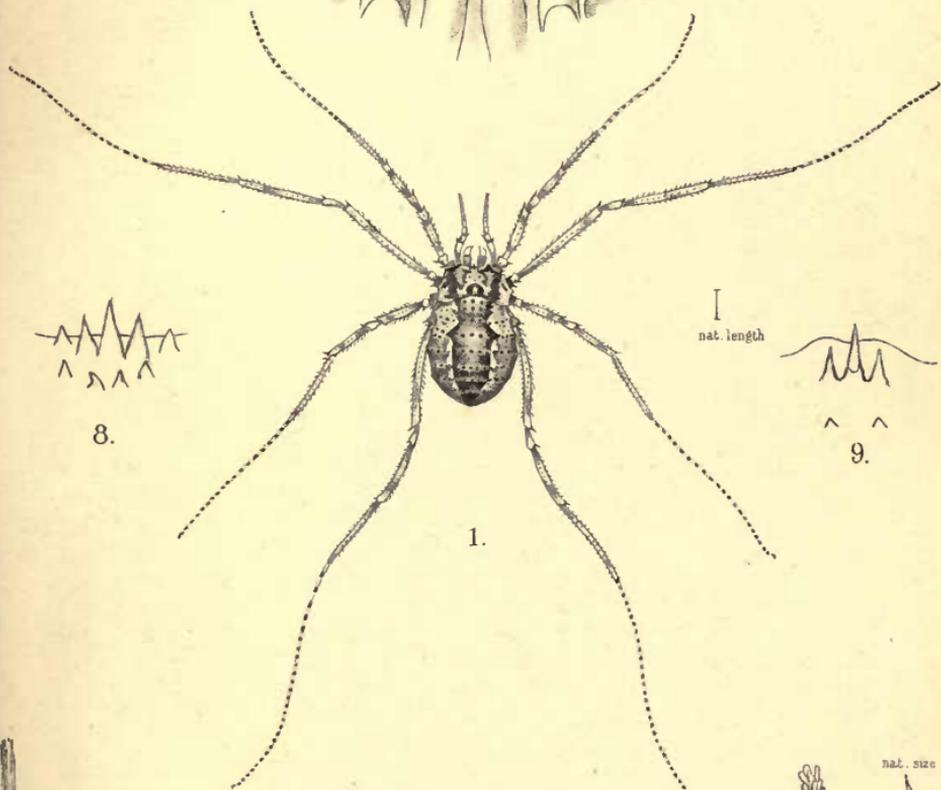
4.



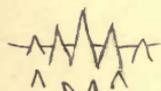
3.



5.

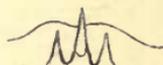


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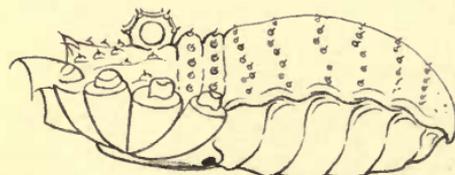
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nat. length



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7.

at its fore-extremity, where a small semi-circular piece appears as if bitten out ; the femora of *O. agrestis* are similarly cylindrical.

An example of this species (new to me) was sent to me in June, 1896, by Mr. J. H. Carpenter, of Dublin, as *O. ephippiger*, Sim., on the determination of Professor Kraepelin, of Hamburg. This example, with several others, Mr. Carpenter had received from Mr. W. Evans, from Edinburgh. On my calling attention to the distinguishing characters of *O. ephippiger*, Sim., Professor Kraepelin agreed with me as to its distinctness, and has since described it as new under the name *Acantholophus Hansenii*. I have recently received several examples in fine condition from Mr. Evans, who obtained them from the neighbourhood of Edinburgh last autumn.





The Pagan-Christian Overlay of the Wise Bird, with Dorset Illustrations.

By HY. COLLEY MARCH, M.D., F.S.A.

(Read February 17th, 1897.)



AS one creed or cult superseded another, it would be difficult, in the long history of religious beliefs, to find a single example of a change that was discontinuous or abrupt. The new was a modification of the old ; the old underlay and interpenetrated the new. Continuity is as inevitable in psychical processes, or in spiritual things, as it is in physical facts.

The extraordinary multiplicity of the Egyptian gods, the henotheism * that marked their individual worship, the extreme variety and complexity of their ritual, all indicate the repeated overlapping of one religious conception by another. There was no displacement but only superposition. The pantheon of the Nile Valley was unrestricted ; its deities were limited neither in number nor in nature. And any inconsistency that might strike a modern mind was ignored, or perhaps would have been denied, by the intellectual subtlety of the inhabitants of ancient Egypt.

* A word suggested by Max Müller to denote a system of polytheism in which the particular divinity who happened to be selected for adoration is regarded as supreme.

Elsewhere the overlapping of creeds did not always end in their mutual preservation. Either one system by degrees absorbed the others, or a resultant was formed that differed from any component. The goddess Dione, for example, was adored at Dodona, until, by command of an oracle, Zeus was introduced, when, for a time, both divinities were worshipped conjointly, and both their effigies appeared on the coins of the Melossian kings. But at last Dione was forgotten.

We are apt to overlook the degree to which Christianity, especially in the Middle Ages, was tinged and changed by the religions that preceded and environed it ; though a recognition of the fact is necessary if we are to succeed in the difficult task of interpreting mediæval Christian sculptures. Let us not forget that the very days of the week constantly bring upon our lips the names of Woden, Thor, Frey, and Tew, the chief gods of our heathen ancestors. The happy time of spring was the festival of the solar goddess Eástre, worshipped by the pagan Saxons, who called April Eástre-monath. The boar, that was sacred to Frigga, Woden's divine spouse, was sacrificed to her at Yule-tide ; and " the boar's head " still appears at many a Christmas feast.

The 25th of December, or VIII. KAL. JAN. as the Romans wrote it, was the birthday of Mithras the Invincible, and was celebrated by games in the Circus Maximus. The Fathers of our Faith confessed their ignorance of the precise time of the Holy Advent, and Chrysostom writing A.D. 400 says (Hom. 31) in reference to the pagan festival of the Sun-god : " On this day also the birthday of Christ was *lately* fixed at Rome in order that while the heathen were busy with their profane ceremonies the Christians might perform their sacred rites undisturbed. They call this the Birthday of the Invincible One ; but who so invincible as the Lord ? They call it the Birthday of the Solar Disc ; but Christ is the Sun of Righteousness, &c., &c."

In Christian ritual, too, many overlaps exist ; but of these one instance must suffice. Among pagans the *Aqua lustralis* was a

species of holy-water, since it was that in which a sacrificial torch had been extinguished. It occupied a vase, or aspersorium, at the entrance of the temples, and into this everyone who entered or passed out of the edifice dipped his fingers. Moreover, light brooms, or aspergilla, were immersed in it by the officiating priest, who scattered the fluid over those present.

Any particular overlap depends, of course, on points of resemblance between any two religious systems that happen to grow in contiguity. In Italy Christianity confronted the creeds of ancient Rome, and the catacombs show us reminiscences of the great god Pan ; for while Christ, as the Good Shepherd, bears a lamb on His shoulders, He carries a syrinx in His hand ; and recollections of Orpheus, for we see Christ striking a lyre. Even in the churches themselves, at that early period, Orpheus, Psyche, Deucalion, Hermes, and Ulysses are represented side by side with Christian effigies and symbols.

In the north of Europe the first contact of Christianity with paganism took place many centuries after the birth of Christ, and extensive overlapping of the creeds of our forefathers by the new faith occurred not only in Scandinavia but in England. Yggdrasil, the Holy Ash, the Teutonic Tree of Life, on which hung Woden for nine whole nights that he might win for mankind the secrets of wisdom, grew by Weird's Brook. An eagle sat on its branches, a hawk, too, and a raven ; and its roots were gnawed by the serpent Nithhögg. The eagle knew many things, and its words were carried by a squirrel and told to the serpent below. Here then were all the materials that made an overlap likely to occur, and ample evidence of one can be found. The conception Yggdrasil, the Holy Ash, lingered beneath that of the instrument of crucifixion, the Holy Rood. Some of the earliest representations of the Christian cross in this country give it a distinctly arboreal appearance ; leaves and boughs surround it (fig. 1). At S. Pierre, Monmouthshire, is a foliated cross of the 13th century. The eagle, hawk, and raven are perched upon it, a squirrel is running up its stem, and a dragon is biting its roots.

At a later period the Holy Rood bears the foliage and tendrils of a vine (fig. 1.) ; and in some cases, as at Moccas, in Herefordshire, a lamb is in the midst thereof, and even appears to be browsing upon its leaves, although, as we shall presently perceive, the sculpture has another meaning. Meanwhile we turn to the overlap that especially concerns us, that of the Wise Bird.

Literature is full of allusions to the wisdom of birds. "We bear our civil swords and native fire," says Prince John (II. Hen. IV. v. 5), "as far as France; I heard a bird so sing." "Curse not the king," says the Preacher, "for a bird of the air shall carry the matter" (Eccl. x., 20).

For a belief in such wisdom it is not difficult to find reasons. The usual aspect of birds is one of alertness and intelligence. To great keenness of sense-organs they unite a rapid nerve-response so that they are quickly aware of coming change or danger. Able to extend their horizon by mounting far up in the air, and having a telescopic vision, their knowledge of the world is proportionately enlarged. Secret indeed must be that "path which no fowl knoweth, which the eye of the vulture hath not seen" (Job xxviii., 7). They fly swiftly whither they will, and all countries are free to them. They follow the climate they love. They go away and return after many days, year after year, companions of the spring. "The stork knoweth her appointed times, the crane and the swallow observe the time of their coming" (Jer. viii., 7). By clearing the land of vermin and dead organisms they perform important offices that were early recognised and highly valued by mankind. They exhibit obvious sagacity in choosing a site for nests, which they construct with admirable skill. Some of them are acquisitive and some have a taste for decoration. Many of them sing melodiously and a few can actually imitate articulate language.

It was natural that in different countries men should have been attracted by different orders of birds. The gallatores, or waders, whilst they were esteemed throughout the Old World, were chiefly venerated in Egypt; and the same may be said of the accipitres,

such as eagles, hawks, and vultures. The columbæ were most admired in the East; and, of the passerines, the suborder conirostres found most favour in Europe.

The ancient Egyptians, in their evolution of a doctrine of immortality, made gallatores the symbols of their creed. Such birds are generally of migratory habit, active, running rapidly, and possessing great powers of flight. They are often monogamous and are careful of their young. Associated with the raptorial hawk and vulture, they "were the scavengers of the Nile Valley, and man's existence depended on them" (Perrot and Chipiez).

The bennu, *Ardea bulbulcus*, a sort of heron, was sacred to Osiris, the god of agriculture. It was the emblem of resurrection, and symbolised the rising again of the sun, the return of Osiris to the light. It was sacred also to the planet Venus, whose appearance, sometimes in the evening and anon as a morning star, was a sign of the renewal of life.

In a hymn of the 12th Dynasty we read "I am the Great Bennu who am in Annu (Heliopolis). I am the creator of all things." And we are reminded of the Gigantic Crane that waded on the primæval ooze, in the cosmogonic legends of other lands.

The Egyptians, who bestowed so much care and cost upon their sepulchres, nevertheless believed that the two most important parts of a man did not remain in the tomb, namely the *ba* and the *khu*; and these they always represented in the form of gallatorial birds. Their conception of the *ba* closely corresponded, Wiedemann thinks, to our "soul," for it was a being which, on the death of the man in whose body it had dwelt, left it in order to fly to the gods, to whom it was akin, and with whom it abode when not united to the man. But it was neither immaterial nor able to dispense with food and drink. Sometimes the *ba* bore, in funerary paintings, a human head; and sometimes, too, it was furnished with human hands. It was often depicted as flying down from heaven with the *ankh*, the symbol of life, in its hand, and approaching the burial place to visit the mummy; or as flying down into the vault, with the offerings it had found at the door of

the tomb, carrying bread in one hand and a jar of water in the other, food and drink for the body that once invested it (Wiedemann).

It can be shown that the *ba*, as painted by the Egyptians, has a specific resemblance to certain African birds, such as the Argala or Gigantic Crane, which have a pouch projecting from the neck. These birds are very voracious, and some of them feed their young by disgorging into the chick's mouth some of the half-digested food from their own stomach.

The other important portion of a dead man that did not reside with him in the tomb was the *khu*, represented by a highly-conventionalised crested ibis. The hieroglyph occurs with the meanings, α brilliant, excellent, useful ; and β the glorified spirit of a man after death. It has also been translated "the luminous, or shining one," "the intelligence," "the soul." The pyramid texts reveal that the *khus* of the gods lived in heaven, whither went the *khu* of a man after death. We read, "He standeth among the *khu* s." "Give him his sceptre among the *khu* s." "Horus hath given thee his eye to strengthen thee withal, that thou mayest prevail among the *khu* s." And we are reminded that, of all our faculties, vision is the sense of intelligence. Woden gave one of his eyes to buy for man a draught of knowledge from the Brook of Wisdom.

In the Book of the Dead is a formula to enable the *khu* to pass from the tomb to the habitations of Ra and Hathor. We read : "I am a *khu* provided, I am furnished with what I need."

The ibis itself is migratory, taking long journeys every year, but always returning to the place it left. It is strictly monogamous, and most affectionate towards its mate and its young. It is fond of pure, fresh water ; and, accompanying, it seems to herald, the annual overflow of the Nile.

Is it possible for us to distinguish between two such conceptions of the *ba* and the *khu* ? Is Pierret right in translating them, "Mon âme et mon intelligence" ? Do the French words imply a sufficient diversity of meaning ? Ought we not rather to follow

the difference between the ravenous argala and the dainty ibis? The *ba* and the *lhu* would have been designated by Aristotle the *ψυχή* and the *πνεῦμα*, the Nutritive Soul and the Rational Soul; and St. Paul might have called the *ba*-bird the *σῶμα ψυχικόν* and the *lhu*-bird *σῶμα πνευματικόν*. In the nutritive soul arose organic cravings, whilst the rational soul was the seat of intellectual processes. The *ba*-crane busied itself in carrying food and drink to the mummy; the *lhu*-ibis provided itself with mystical information and protective formularies for its long and perilous journey to the abode of the gods.

A similar distinction may be perceived between the two wise Ravens of Woden, that were called Huginn and Muninn. The name Huginn is from the noun *hugr*, "the intellect," and the verb *huga* is "to mind, attend to, think out;" whereas Muninn is "the mind" in the sense of "longing, love, delight." "Woden's two ravens," says *Grimm's Mal*, "fly every day over the mighty earth. I fear for Huginn lest he never come back, yet for Muninn I am more fearful still." In other words, "The thoughts of Woden range far indeed, yet not so far as the wandering of his desire." "There flew two ravens," says the *Völuspá*, "from Woden's shoulders; Huginn to the gallows, Muninn to the carrion." And here carrion represents carnal appetite, devouring slaughtered foes; whilst the mystic gallows, of which Woden was Lord, is the symbol of justice and self-sacrifice.

A belief that human souls are as birds can be found in Christian writings. In the Book of Lismore we are told of "the preaching which Elijah is wont to make to the souls of the righteous under the Tree of Life in Paradise. Now when Elijah opens the book for the preaching, then come the souls of the righteous in shapes of bright white birds to him from every point. Then he first declares to them the rewards of the righteous and the delights of heaven, and thereupon they are exceedingly rejoiced. Then he declares to them the pains and punishments of hell, and the birds then make a great wailing and beat their wings against their bodies till streams of blood came out of them for dread of Doomsday."

The wisdom of birds has been utilised for path-finding. Even as Hiisi, an ancient god of the Finns, was represented on horseback preceded by a bird, so the mounted Woden follows the flight of a raven. Aristophanes makes two men come upon the stage who, in search of a habitation, are guided, the one by a crow the other by a daw.

In the *Landnamabók* we read about one "Flóki, son of Vilgerth, who was a mighty viking. He made ready to search for Snjóland [in Iceland], setting forth from Rogaland [in the district of Stavanger]. He provided a great sacrifice and hallowed three ravens to show him the way. In the ship with Flóki was one Faxi, a Hebrides man. Then Flóki sailed to the Faroes, where he gave in marriage one of his daughters. And thence he sailed out to sea with the three ravens that he had hallowed in Norway. And the first which he let loose returned to the prow. Another, having flown up into the air, also came back to the ship. But the third flew away in that direction where presently they found land. And they sailed along the southern coast, and as they drew west to Reykja-nes the firth opened out so that they saw Snæfells-nes. Then said Faxi, 'This is a great country that we have found, and here, too, is a big waterfall.' And this was afterwards called Faxa-ôss."

We cannot doubt that the birds were liberated in succession, after considerable intervals of time, the ship still holding a northerly course; and that when the last raven rose up in the air, and the horizon receded from its view, then all at once the bright gleam of the snow-clad mountain caught its eye, and it flew straight to the shore.

It is noteworthy that the great Diluvial legend, however it originated, contains many realistic details, such as the use of bitumen for caulking the ship. The Mosaic account is, perhaps, a little less intelligible than that of the Chaldæans, but both heroes adopted the same method of ascertaining the proximity of land. They both employed a dove and a raven; but Izdubar also a swallow. A raven will fly towards the first land it sees, and a

dove or a swallow will make for the home it knows. The raven of Noah went forth, to and fro, until the waters were dried up from off the earth, and the dove did not, at last, return (Gen. viii., 7). Whereas Izdubar's dove came back, whilst his raven went forth and saw the decrease of waters and wandered away and returned not (George Smith, *Chald. Acc. Gen.*, p. 270).

The wisdom of the conirostres was recognised of old in all countries. Ravens assemble from enormous distances round any supply of food, led, it is believed, rather by their powerful sight than by their sense of smell. Birds of the crow family will, even in a state of nature, mimic the voice of other animals, such as the lamb, the kite, the owl, the cat; and in confinement they will imitate the barking of a dog or the human voice, of which they can be taught to repeat a few words (Dallas, *Nat. Hist.*, p. 524). They have much curiosity and love of mischief, and will steal and secrete glittering objects. They have been known to bring food for days together to a wounded dog. They have a keen perception of the approach of danger and give warning of it to their friends. Thus, the Buphaginæ or Oxpeckers of Africa, who extract the larvæ of bot-flies from the backs of horned cattle, to the great delight and relief of the latter, have such an understanding with their four-footed companions that though with a domestic animal they allow man to come very near without any alarm, yet for a wild animal they give a signal of danger at man's distant approach (J. G. Millais, F.Z.S., *A Breath from the Veldt*).

We cannot be surprised, then, that Pallas Athene, at Corone, in Messenia, bore a crow in her hand; or that this bird was an attribute of Apollo, and rested on his lyre; or that ravens brought bread and flesh to a prophet of the Jews.

The columbæ remain to be considered. They have a reputation for conjugal fidelity. During the breeding season the sexes exhibit a most tender affection; and they produce two broods in the year. Their wisdom is chiefly shown by the faculty that some species possess of finding their way home from distant places. According to Darwin, the modern homing pigeon is descended

from the Persian messenger-dove, first brought to Europe by Dutch sailors. It has been said that at the moderate elevation of 430 feet a bird can see 25 miles a-head. This estimate is much too low. When the atmosphere possesses what meteorologists call "visibility" the unaided human eye at an altitude of 300 feet can easily detect coastlines across the sea at a distance of 70 miles.

It must be observed that the words *dove*, *culver*, *columba*, and *κόλυμβος*, all mean a diver or swimmer; and it is said that these names were bestowed on pigeons because of their "peculiar mode of flight." This is imaginary. Their mode of flight does not in any way suggest the action of swimming or diving so forcibly as to single them out for a name from hawks, larks, sea-gulls, and all the fowls of heaven.

They have, however, one distinguishing habit so peculiar as to warrant a generic designation. In their mode of drinking they differ remarkably from all other birds (Dallas, *Op. Cit.*, 494), for instead of taking up a small quantity of water in the mouth and then swallowing it by raising the head, *they immerse the bill in the water* and drink without stopping till they are satisfied.

In re-considering the etymology we find that *κόλυμβάω* may be used with the modified meaning "to dip," since Thucydides and Plato employ the stronger form *κατακόλυμβάω* for "diving," and that the English *dove*, the A. S. *dufa*, and the Gothic *dubo* have "dip" as well as "dive" for their congener. The A. S. verbs *dippan*, *dopettan*, mean "to dip," "to plunge," "to immerse." The A. S. *dop-fugel* is the moorhen, which is a true diver, as are the dipper, or water-ousel, and the dab-chick, or little grebe, called in Dorset die-dapper. But the A. S. *dob-enid*, or dipping-duck, is the gannet, which is quite incapable of true diving (Dallas, *Op. Cit.*, p. 437), and takes its fish by flying over the sea and suddenly dropping upon any that comes in sight. "Dip" and "dive" are therefore etymologically convertible, and doves are fowls that are named from the fact that they dip the beak in drinking.

By the Greeks doves were ranked as wise birds. Dionysius of Halicarnassus, who wrote in the first years of our era, states that

oracles were obtained at Dodona through pigeons which, sitting on oak trees, revealed the will of Zeus. Sophocles, B.C. 400, speaks of two oracular doves, and Herodotus, who wrote a little before this, was told by the priestesses at Dodona that a black pigeon flew there from Thebes, in Egypt, and, sitting on an ilex, proclaimed in a human voice that an oracle must be erected for Zeus. Varro, the Roman, who wrote on Agriculture about 50 years before Christ, distinguished three kinds of pigeons—wild, tame, and mixed. The *miscellæ*, or mixed, show us that already there was a tendency to the variation that is now so marked. The *agrestes*, or wild pigeons, were of a blue colour, and so were called by Herodotus, Homer, and others, *πέλειαι*, in relation to the adjective *πέλος*, dusky or blue, the hue of our rock-pigeons. And the *cellares*, or tame pigeons, were doubtless those which the Greeks designated by the term *περστεραί*, used by Sophocles and Xenophon and exclusively by the Septuagint, and in the New Testament. The dove-cote of Plato was *δ περιστερέων*.

The amatory disposition and fecundity of the dove made it a suitable associate for a goddess of love and maternity. In the East the favourite sacrifice to Istar, Astoret, or Astarte, was this bird. And it is a highly significant fact that young pigeons and turtle-doves were sacrificed to Jahveh, under the Levitical law, as an atonement for the impurity of childbirth, whilst similar offerings were brought by the Virgin to the Temple at Jerusalem after the birth of Christ.

According to Hyginus, chief of the Palatine Library, a collector of mythological legends, and one of Ovid's friends, the Greeks thought that an egg dropped from the sky into the Euphrates; fishes carried it to the bank, where a dove sat upon it and hatched out Aphrodite.

Diodorus the Sicilian, a contemporary of Hyginus relates that "at Ascalon, in Syria, is a temple dedicated to the famous goddess Derceto. She, having given birth to a daughter, thereupon, in a paroxysm of remorse, killed its father, abandoned the child, and destroyed herself. The infant was, however,

preserved and nourished by a great flock of pigeons, who not only nestled upon her and kept her warm, but constantly fed her with milk, which they brought in their beaks from the shepherds' huts. When she was a year old they began to feed her with cheese. But the shepherds, finding their cheeses pecked out, followed the birds and discovered a very beautiful child, whom they brought to the king's herdmaster, and he adopted her and called her Semiramis, a name derived from pigeons, which the Syrians ever after adored. In the end she surrendered her throne to her son and disappeared, metamorphosed into a dove, as if she had been translated to the gods, according to the words of the oracle of the Temple of Ammon."

On coins found in Cyprus appears the Temple of Paphos, on which rest the holy doves of Aphrodite. Elsewhere, on sculptured monuments, they hover round goddesses; Astarte presses them to her bosom; priests and sacerdotal women carry them. They were encouraged to breed in sacred precincts. A terra-cotta model of a temple, found at Dali, has in its upper storey a multitude of pigeon holes. A dove that was believed to be the messenger of Mohammed used to perch upon his shoulder. And to-day, in the courtyard of the great mosque at Mecca, are more than two thousand of these birds; and to feed them is the duty of all worshippers.

Here, then, we have a vast mass of popular belief and practice of great antiquity that confronted Christianity from its birth onwards all through the Middle Ages. And we may confidently expect, on *à priori* grounds, that a careful investigation will discover many examples of a religious overlap on points of resemblance; that the myth of wise birds has influenced, if not Christian creed, at any rate Christian iconography.

When we enter the catacombs of Rome we find that the dove, symbolically used, had several meanings. Usually it was the emblem of peace, for it often bears the legend PAX; and it often carries an olive-branch in its beak, reminding us of the promise to Noah, though it also recalls the diluvian hero's wise bird. The injunction "Be ye harmless as doves" made them the sign of innocence; and the Virgin with the inscription *Maria* is placed in

an attitude of prayer between two pigeons, not perhaps without a reminiscence of Semiramis. They appear to stand also for pious Christians, or for the souls of departed saints, since a dove is depicted as resting on each arm of the cross; and Tertullian, A.D. 198, calls the sanctuary *columbæ domus*.

Neither had the significance of the dove in relation to maternity altogether vanished from later times. The Immaculate Conception was often symbolised by a pencil of light that, streaming from a dove, as the Holy Ghost, fell upon the Virgin. And we read in the Blickling Homilies, A.D. 979, that "the Holy Ghost abode in the holy womb nine months, and then the queen of all maidens gave birth to the true Creator and Consoler of mankind, when the gold-flower came into this world and received a human body from S. Mary, the spotless virgin."

During mediæval times, in both Eastern and Western churches, a vessel shaped like a dove and called a peristerion, was suspended before the High Altar by a chain from the roof of the edifice. It opened on the back, and in the body of it the Blessed Sacrament was reserved. In the year 370 S. Basil the Great reserved the Host in a dove made of gold; and in the year 474 Perpetuus, Bishop of Tours, left by will a silver dove to Amalarius, a priest. In England this receptacle was called a culver. One, made of "latyn," a sort of brass, is mentioned in the churchwardens' accounts of S. Dunstan's, Canterbury, in 1500; and in 1596 a culver was repaired of the church of Kirton, in Lindsey.

In mediæval Bestiaries a white dove denotes the Holy Ghost, but one of a purple colour is declared to signify Jesus, the son of Mary; and the dragon is affirmed to be afraid of the doves upon the "Arbor pereclixon," the Tree of Life that grew amidst water-streams (*περικλύζω*).

The etymological association of its name gives the dove a special significance as a symbol of baptism, and may have been one of many reasons for its sculptured presence on dipstones or fonts.

But the dove claims recognition also in its character of a wise bird. It is recorded that every Good Friday a white dove

descended from heaven bearing a wafer, which it laid before the Sangrael; and thereupon the holy vessel gave oracles, expressed in writing on the surface of the bowl, which appeared for a moment and then faded away.

Moreover, the dove was chosen to signify inspiration; and particularly to be the symbol of the Holy Ghost, whose seven gifts, which are all intellectual, are Wisdom, Understanding, Counsel, Fortitude, Knowledge, Piety, and Veneration. It should be noticed that neither Comfort nor Purity is one of them. Indeed, the word Paraclete, always rendered "Comforter," has an exclusively intellectual origination. The Greek word *Παράκλητος* arose in courts of justice, and meant "an advocate." Accordingly, the Paraclete was "to teach all things," *ὁμᾶς διδάξει πάντα*, and bring things to remembrance. He was to convince the world of error and of righteousness, *ἐλέγξει τὸν κόσμον περὶ ἁμαρτίας, καὶ περὶ κρίσεως*; and *ἐλέγχω* is a word used of arguments and proof, whilst *κρίσις* means trial as well as judgment.

We are, therefore, prepared to find that in the 4th century a shining white dove was seen to alight upon the shoulder of S. Basil the Great and inspire his writings; that in the 10th century, in an illuminated Benedictional of S. Æthelwold, bishop of Winchester, the tongues of fire that fall upon the heads of the twelve Apostles on the day of Pentecost issue from the beak of a dove; that a statue of the 13th century in the Cathedral of Chartres shows a dove with cruciform nimbus resting on the shoulder of Pope Gregory and whispering into his ear; and that in the 13th and 14th centuries Christ is represented as receiving inspiration from seven doves.

At this point we ought to remember, first, that S. Augustine, the Apostle of the English, did not come to this country till the very close of the 6th century; and that S. Ansgar, the Apostle of the North, a German monk, who attempted to evangelise the Danes, was only born A.D. 801. And then we ought to recall some features of the pagan religion that was encountered.

Worsaae, in his work on "The Industrial Arts of Denmark," says, "The idea of a divine trinity must have been extensively diffused throughout the north during the Bronze Age." This conception, too, was henotheistic. The sign of Woden was the triskele, the three-legged symbol; Thor was often represented with three heads, as indicative of triunity; whilst Frey's token was that of supremacy, the solar cross. Carved upon a runic stone in Gotland may be seen this triad grouped together; on one side Woden with his spear, in the middle Thor, Woden's divine son, begotten of Fjörgyn, or Mother Earth, and on the other side Frey with a large bird that bends its head over him.

It was inevitable that Christian art should be influenced by such an environment. Pagans of the North, as they tardily, through the long centuries, embraced a new religion, saw nothing strange in symbolising knowledge by a wise bird—by an eagle or a dove. S. John was represented, as in S. Æthelwold's Benedictional of the 10th century, not in the form of an eagle, but in the company of one, who taught him what to write (fig. 2). In the *Byzantine Guide to Painting*, a work that had much vogue between the 12th and 15th centuries, the artist is directed, in dealing with the "tetramorph," to turn the eagle's gaze towards S. John, since the semblance of an eagle indicates [not the evangelist, but] the inspiration of the Holy Ghost. On the runic cross of Bewcastle, in Scotland, of the 7th century, an eagle on the wrist of S. John is apparently holding converse with him (fig. 3); whilst on the runic cross of Ruthwell, of the same country and century, an eagle climbs the evangelist's thigh to whisper its tidings (fig. 4).

It would appear, too, that our Saxon forefathers, led by their preconceptions in favour of a wise bird to a ready adoption of the dove as a symbol of the Holy Ghost, naturally supposed that the λόγος, or verbum, or Word, in the opening sentence of S. John's Gospel was the Third Person, and not the Second Person, of the Trinity. They were further confused as to the proper relationship of the Dove by a discovery that the sum of the numerical letters

in the term *περιστέρα* was 801, and so possessed a value identical with that of the letters ΑΩ, Alpha and Omega, which Christ had assumed as his own title.

The Anglo-Saxon gospels were translated from a Latin text, in which, literally following the Greek, the Johannine sentence runs: "In principio erat Verbum, et Verbum erat apud Deum." One of the earliest translations was made by Aldhelm, Bishop of Sherborne, who died in 709. He rendered the text with absolute exactness: "In the beginning was the Word and that Word was with God." But those converts who had recently believed that Wisdom, in the form of a Raven, was Woden's constant companion, and who were now taught to represent the Divine Intelligence in the shape of a bird, naturally supposed that the Word which abode with the Father from the beginning was to be symbolised by the dove, and was therefore the Holy Ghost.

To correct any error of this kind a subsequent version of the gospel, made about 950, and called the Lindisfarne, does not simply translate this passage, but gives it a highly explanatory gloss, as follows:—"In the beginning was the Word, and the Word, which is God's Son, was with the Father."

That the myth of the Wise Bird has affected the position of the Dove in representations of the Christian Trinity many examples prove, and some of them may be found in Dorset. But in order that this remarkable influence may be recognised the normal configuration of the Three Divine Persons must be briefly reviewed.

The crucifixion is absent from Roman art during the first four centuries. The cross was, in fact, a heathen symbol, and does not appear in the catacombs. Christ was originally depicted in the Sacred Group as a Lamb—the Agnus Dei—which bore on Its forehead the *chi-rho* monogram. Next, when the *chi-rho* had been transformed into a cross, this, too, was borne at first on the forehead, but afterwards was carried on the right shoulder. And, lastly, the Lamb was enclosed in a circular nimbus which filled the crucial axis. The substitution of the human figure of Christ

for that of a Lamb was effected by the Quinisext Council held at Constantinople A.D. 683, which decreed : " We pronounce that the form of Him who taketh away the sin of the world be set up in human shape or images henceforth, instead of the Lamb formerly used." The lamb, indeed, when undistinguished by the addition of some token of divinity, had been used in early times to denote separately Abraham, Moses, S. John Baptist, S. Peter, and the Church. For a century after this the Crucified One was represented as clad in a tunic, with legs straight, and subsequently as wrapped in a loin cloth, with legs crossed.

The Father was originally depicted only by a right hand, usually in the attitude of the Latin Benediction. In this position the first three digits are extended, and the last two are bent upon the palm. The thumb, stout and strong, denotes the Chief Person of the Godhead ; the third finger, taller than the others, denotes Christ, the most important Person in man's salvation ; and the second finger, as between the others, denotes the Holy Ghost, proceeding from the Father and the Son. The two digits bent upon the palm denote respectively the divine and the human nature of Jesus. The Latin Benediction is, therefore, a sign of trinity in unity.

The attitude of the hand in the Greek Benediction is quite different and has another meaning. The second digit (or forefinger) is extended to form the Greek letter *iota*, the third is slightly flexed for *sigma*, the fourth is bent down and crossed by the first (or thumb) to make *chi*, and the fifth digit (or little finger) is curved for a second *sigma*. Thus the letters $\text{I}\Sigma\text{X}\Sigma$ stand for *'Iησοῦς Χριστός* and constitute the benedictional symbol, not of the Trinity, but of the Saviour.

The Holy Ghost was originally depicted as a dove. Full personal effigies of all Three Persons in a group began to be made about the 11th century. Their divinity was generally, but not always, indicated by a nimbus. This adjunct, which had its origin in pagan times, was at first merely a circle round the head ; then the solar cross appeared in it and it was called *nimbus*

cruciger, the cruciform, or, more properly, the cruciferous nimbus. Gradually this became consolidated and contracted until, after the 15th century, it assumed altogether the shape of a head-dress.

That form of nimbus which encloses the whole body has been termed an *auréole*, or glory, in France ; a *mandola*, or almond, in Italy ; and in this country a *vesica piscis*, or fish's bladder. It is generally constituted by the opposed segments of two equal circles. It has been used to enclose the body of Christ, as in Ely Cathedral ; of the Virgin, of the Madonna and Child, of the Father, of the Supreme Judge, and of S. Martin. Sometimes one side of it is made by a rainbow. It is the customary frame of monastic seals, as in the case of Wimborne Monastery, founded by Cuthburga in the 8th century. The term *vesica piscis* seems to have arisen in modern times and to have had no connection with the very early use of a Fish as a symbol of Christ, or as a sign of baptism.

Another indication of divinity in representations of the Three Persons is that Their feet are bare, although it often happens that either for artistic reasons or for the sake of constructional simplicity, they are concealed.

The most usual arrangement of the Holy Group is that in which the First Person holds before Him, and as it were shows to the universe, the crucified Second Person, whilst a Dove issues from the Father's mouth. In a less frequent grouping the Dove, "qui ex Patre Filioque procedit," is represented with one wing issuing from the mouth of either of the other Two Persons, who are necessarily, in this case, side by side. Sometimes all Three Persons have human forms, which may be all standing or all sitting, or otherwise disposed. In some examples the Holy Ghost appears as Man and Dove together. In one instance, from France, of the 16th century, the Dove, fluttering His wings, is held by the feet, falcon-wise, by the Man, who sits on a throne, and both are without a nimbus. In another instance, from the same country, of the 15th century, the Dove, with raised wings, rests on the Man's head, within the circle of His cruciform nimbus. The Bird has a similar

nimbus of Its own, and the Man, together with the other Two Persons, is erect.

Such representations are more frequent in the north than in the south of Europe. For one Latin, or for two Romanesque examples, there are thirty Gothic. And it is in the latter that the influence we have been attempting to trace is more particularly seen, where the Dove is made an adjunct of the Father, and is placed in such proximity that It appears to be whispering into His right ear, and so suggests, once more, the Verbum, the Divine Wisdom, the Wise Bird.

Of the illustrations here given, fig. 5 is of a normal group from a wall painting, assigned to the 15th century, discovered four years ago in Boughton Aluph Church, Kent. The red ground of the fresco is "powdered," in black characters, with the sacred letters **J.H.C.** The Father sits upon a canopied throne. His bearded head is adorned with a nimbus cruciger. His right hand is raised and makes the Latin Benediction. His left hand supports a crucifix. He wears a tippet over the shoulders. His feet are concealed. The Holy Ghost, as a white Dove, has just issued from the Father's mouth, and is flying downwards towards the Son. The lateral limbs of the cross are of excessive length and thickness. Its upper limb is not apparent, but the lower limb is long, and drops of blood are painted upon it. The head of the Crucified One has hair falling on either shoulder, a pointed beard, and a nimbus. He is clad in a large loin cloth. His feet are indistinct, but are probably crossed. Beneath the whole Group are three circles enclosed in a single circle, to symbolise Trinity in Unity.

The examples that follow are indicative of pagan influence. Of these, the first is a group from the sculptured tympanum of the south door of the Church of Pontorson, Normandy (fig. 6). The stone is much decayed, and some details are lost. The Father, standing barefoot, is bearded, without visible nimbus, and holds forth with both hands His Infant Son. The Holy Ghost as a Dove, co-equal with the Father in size as well as in merit, stands

at His right side, resting upon His right thigh, and uttering words of Divine Wisdom. This attitude of the Dove to the Father may be compared with that of the Eagle to St. John, in fig. 4.

The next is a highly remarkable and abnormal group from a sculptured tympanum that looks inwards above the inner door of the south porch of the church at Tarrant Rushton (fig. 7). The stone is not architecturally *in situ*, for some of its lower part has been cut away to adapt it to its present place. The Father occupies not the central position, but the heraldic right. He is enthroned on a faldistory, an ecclesiastical chair of dignity. The *faldstól* or folding-stool, a word that survives in the French "fauteuil," was much used by the Saxons. It is represented on a gem of the 9th century. Its wooden ends are turned in the favourite Saxon fashion, as seen in the seat occupied by St. John (fig. 2). In the Bayeux tapestry King Harold's chair of state is similarly formed, whilst that of Duke William has zoomorphic terminals, in true Norman style. A faldstool was "used by a bishop when officiating in other than his own cathedral church," and one was "placed at the south side of the altar for the Kings of England to kneel upon at their coronation." The Father sits facing forwards with hands raised; the right in the attitude of the Latin Benediction and the left holding the open Book of the Law.

The Son, in the shape of a Lamb, occupies the centre of the group and faces away from the Father towards the Third Person. He is without a nimbus. He carries the *chi-rho* or Greek cross, as a standard, on the right shoulder; and the Tree of Life is issuing from His lips. The single leaf that is left of it may be compared with the foliage that surrounds Jesus on the Gotland example (fig. 1). In the *Byzantine Guide* the artist is instructed how to represent the Parable of the Vine: "Christ, carrying the Gospel upon His breast, and raising both His hands in blessing, saith 'I am the Vinestock, and ye are the branches.' The Apostles are encircled by the branches of the Vine, which spring from His Body." In Christian art things usually issue from the body by the

mouth. The Dove thus proceeds from the Father. Demons thus escape from the possessed. The soul thus leaves the body of a dying man. On the tympanum of Moceas Church, already referred to, the Vine issues from the mouth of the Lamb.

The Holy Ghost is doubled. He appears both as a Man and as a Dove. We see a reminiscence of a Divinity with His Wise Fowl. As Man, He is enthroned on a chair of dignity, but as He faces towards the Lamb we have a side view of the faldistory or folding-stool. He holds in His left hand a closed book. The secrets of the Gospel are to be revealed by the Spirit in the shape of a Bird which He bears aloft in His hand, grasping It by the feet, falcon-wise, even like that which was carried by the priest of Aphrodite. And the Holy Dove, fluttering Its wings, turns with divine intelligence to Him who holds It ; and they Two, together with the Lamb, constitute a secondary group apart from the Father, for They are intent on saving mankind from the terrors of the Law. The Dove is without a nimbus, and if the First and Third Persons have one it is indistinguishable from a head-dress. It is impossible to say whether or not either of Them is bearded. They are clad in monastic garb, but Their feet, by the cutting away of the stone, have disappeared.

The last abnormal group is from a sculpture on the west face of the tower of Abbotsbury Church (fig. 8). Of this stone, also, it may be said that it is, architecturally speaking, not *in situ*. It may have been brought from the Abbey that once stood hard by.

The Father, as omnipotent, is seated on a central canopied throne. He is bearded and of imposing stature. He has a cruciform nimbus and a frontlet. He wears a tippet fastened across the chest by a brooch. His feet are bare. His right hand is raised in the posture of the Latin Benediction, and with His left He upholds the upper limb of the Cross, of which the lateral limbs are excessive in length and thickness.

The Son is crucified. He has a short beard and hair that falls on either shoulder. His head is inclined to the right. He is clad in a loin-cloth of moderate size. His legs are probably

DESCRIPTION OF THE FIGURES.

1. Christ suspended in a Tree. One of the eight panels on the font of Ottrava, West Gotland. A.D. 1,000. *National Museum, Stockholm.*
2. St. John and his Eagle. The uprights of his chair are, in Saxon fashion, of turned wood with spherical tops. St. Æthelwold's Benedictinal, 10th Century. *Archæologia xxiv., Pl. 14, p. 58.*
3. St. John and his Eagle. Bewcastle Cross, 7th Century. Stuart's *Sculptured Stones of Scotland, Vol. ii., Pl. xxiv.*
4. St. John and his Eagle. Ruthwell Cross, 7th Century. George Stephens, *pub. J. R. Smith, Pl. ii., fig. 2.*
5. The Trinity. Mural painting at Boughton Aluph, Kent. A.D. 1,480.
6. The Trinity. Sculptured tympanum, south door of Pontorson Church, Normandy.
7. The Trinity. Sculptured tympanum, interior of south door of Tarrant Rushton Church, Dorset. The stone is not architecturally *in situ*.
8. The Trinity. Sculptured stone, not architecturally *in situ*, on west front of the tower of Abbotsbury Church, Dorset.

Fig. 1.

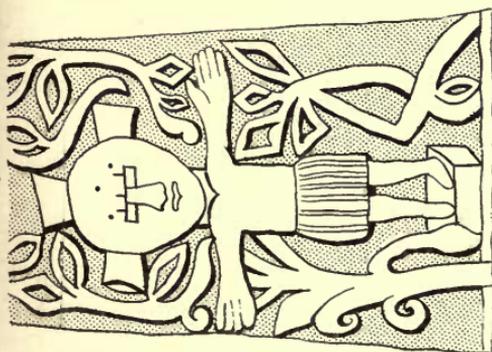


Fig. 3.

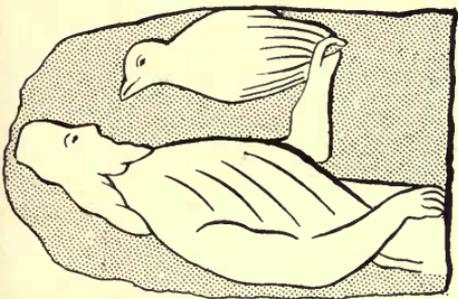


Fig. 4.

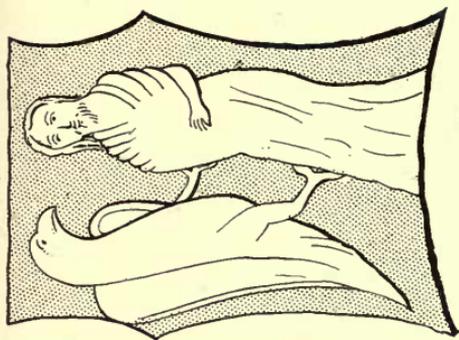


Fig. 5.

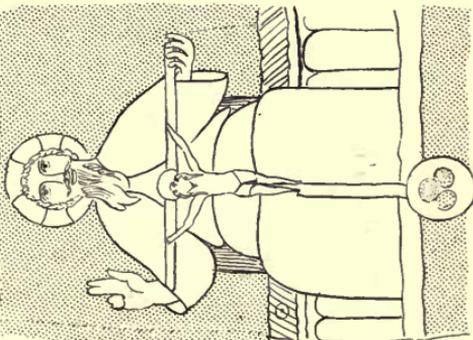


Fig. 6.

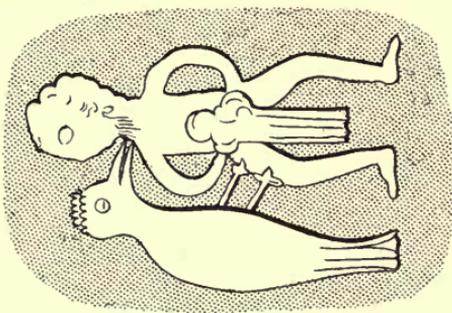
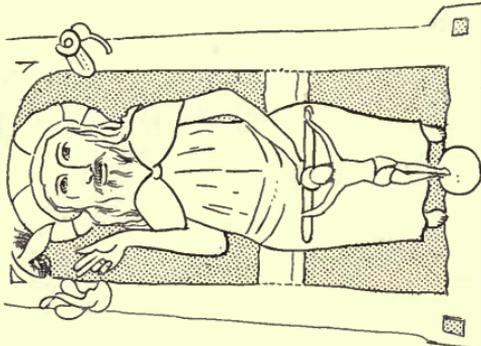


Fig. 8.



crossed. He seems to have no nimbus, but some sort of crown, perhaps of thorns. Beneath His feet, which are doubtless bare, is a globe, the world that He came to save.

The Holy Ghost is seen, as a Dove, flying downwards with outstretched wings and beak directed to the right ear of the Father, who turns His head a little, the better to receive the divine message, uttered within His nimbus which thus becomes common to the Two.

This group is enclosed by an arched moulding or frame which is cut on the same stone, and which has a capital on either side from which the arch springs. That on the heraldic right bears a branch of the Tree of Life, whilst that on the left holds an animal of Norman type, the writhing Monster of Sin or Death.

All these examples belong to pre-Reformation times. The Wise Bird is not often to be seen in Protestant churches except in remote parts of Sweden, where a Dove, suspended from the sounding board, hangs above the pulpit of the preacher ; and perhaps in those parts of England where the lectern is supported by an eagle of brass.

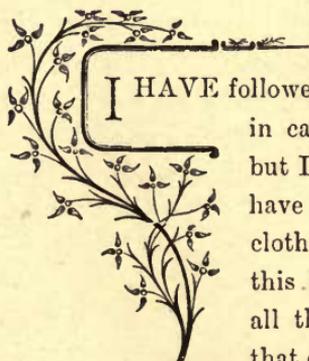




Dorset Clothes-Moths and their Habits.

By NELSON M. RICHARDSON, B.A., F.E.S.

(Read February 17th, 1897.)



I HAVE followed the illustrious example of our Treasurer in calling this paper *Dorset Clothes-Moths*, but I may mention that I shall not, like him, have any need of an appendix for those clothes-moths not yet found in Dorset, for this highly favoured county already contains all the known British species answering to that description.

The very startling statements that have been made to me on various occasions on the subject of clothes-moths, by ladies chiefly, but also by gentlemen, have made me think that, even to our enlightened Field Club Members, a few words on their habits and life histories would perhaps be acceptable.

In the first place it may be unnecessary to mention here that moths themselves do not eat clothes at all—they have no teeth or jaws or any appliances for such a purpose—but their mouth, where they have any, and a great many have nothing more than the merest rudiment of it, consists of a tongue, or, to speak scientifically, a pair of maxillæ, or long thread-like projections, more or less rough on the inside, so that they usually remain stuck together

and form a sort of channel or tube. This channel communicates with the actual mouth of the moth and, the tongue being inserted into a flower, the honey is sucked up and swallowed. I doubt whether, as a rule, clothes-moths take any nourishment after they have emerged from the pupa, though they have tongues more or less developed, generally the latter. They fulfil their mission in life by laying their eggs on some material suitable for the food of their larvæ, and then die. I do not think they are very long-lived moths, from ten days to three weeks being probably about the duration of their existence.

In the egg state also, it is hardly necessary to say, clothes-moths are perfectly harmless, but as soon as these little eggs hatch the work of destruction commences and never ceases till the larva, which is furnished with sharp and strong jaws, having eaten as much as its powers and the surrounding circumstances permit, has arrived at its full growth and can eat no more. The eggs of most of these moths are of a flattened oval shape and of a pearly translucency. They are laid loosely and not affixed to the food. The larvæ are bone coloured with brown or black heads and dorsal plates, and very similar to each other in appearance. When full fed, the larva finishes the work of destruction by biting off a great deal of wool or whatever material it has been feeding on, and forming with it a cocoon, in which it changes into a chrysalis or pupa. Those larvæ which live in cases merely spin up the mouth of the case before their change.

After lying in this quiescent condition for a time the patterns of the wings begin to appear through the thin brownish skin which covers them, and shortly this external shell bursts open and the moth wriggles out with all its parts fully developed except the wings, which are very small. These little wings have all their scales perfect and show the pattern on them distinctly, but are quite soft and have no stiffness in them. The moth crawls up the first object it can find so as to enable it to rest, if possible, in such a position that its body and wings may hang downwards. It is most extraordinary to see these tiny wings grow—they lengthen out in

a very short time, usually from ten minutes to half-an-hour, to their full size and soon become stiff so as to render the insect capable of flight.

Anyone who has watched clothes-moths and tried to catch them on a piece of fur or other article will have noticed that they have great powers of running, and trust much more to their legs than their wings to escape capture. They, especially those belonging to the genus *Tinea*, of Stainton (this genus is much split up by some authors), have very long and powerful hind legs, which one might almost fancy them using for jumping like a grasshopper, but I have never observed this mode of progression. They run, however, at a great pace over and through the wool, fur, &c., and have altogether a very slippery appearance and movement. I do not think I have ever seen this more strikingly exemplified than in the case of *Tinea pallescentella*, of which I found a few under the old wooden Ferry Bridge leading to Portland, the larvæ having perhaps fed on fish remains from the baskets in which fish were carried, which the fishermen kept there. The moth sat on the wood very quietly until you tried to catch it, but directly you got close it rushed away round a corner or down a crack or under a stone, and was most difficult to secure. I do not remember that I ever saw one fly, though I have been there at various periods of the night and early morning—in the daytime they did not appear at all.

I have already alluded to the wonderful statements which I sometimes hear on the subject of clothes-moths. I am sorry to say that there are people who are under the impression that *all* moths eat clothes, and who would (if they were not frightened of it) destroy a large hawk moth if they found it in their house, thinking that it had come to make a wholesale raid on their carpets. Others, more moderately, assign the damage to all the smaller moths indiscriminately. There is, however, even amongst entomologists a good deal of difference of opinion as to what moths should properly be included in the term clothes-moths, so that I think it best to take in order all that have or are supposed to have any claim to be so called, giving a short account of the habits of each.

Many larvæ will eat their way out of a muslin bag, and some have been known to eat holes in linen left out to bleach on the grass, but this was not in order to obtain food, but merely to get through an obstacle. I am not aware that any larvæ in this country regularly feed on linen, cotton, or silk material, but only on wool, hair, fur, skin, feathers, &c. I have heard of what I believe to be one genuine instance of their feeding on calico, but it is certainly very unusual.

Aglossa pingualis.—This species feeds usually on hay refuse in a silken tube, but Réaumur says he found them feeding on leather covers of books and dry bodies of dead insects. [See "Entomologist's Monthly Magazine," xx., 193.] They occur in most farm stables, but rarely in houses.

Tinea (Blabophanes) imella, Hb., is a very local species, and I am not aware that the larva has been observed in England. A correspondent of mine in Lancashire used to take the moth rather commonly close to a rubbish heap, in which the larva doubtless fed, but he was unable to find it. One specimen has occurred at Portland, the only recorded one for the county of Dorset. Though it may strictly be considered a clothes-moth, it is one of those which is sufficiently scarce to cause me to welcome it to my house if it appeared there. The only notice of the larva that I have met with is by Carl von Heyden, in 1826, as follows:—"I found these larvæ near Frankfort in November, in great plenty in an old felt shoe, which was lying in a field, almost covered with earth. The larvæ lived gregariously, in closely-crowded tubes, which are externally coated with earth. Some of the moths were developed in a few days; the remainder in the month of May following. ["Entomologist's Annual," 1868, p. 9.]

Tinea (Blabophanes) lombardica, Hering.—Whether this is a species closely allied to *ferruginella*, Hb, or only a form of that species seems still a little doubtful. It is the only form found at Portland so far as I am aware, the typical *ferruginella* not occurring at all in that locality. Major Hering, who, with others, feels satisfied of its specific distinctness, tells me that it has been

bred from débris of carpets, papers, &c., but I do not believe that it feeds on anything of this sort at Portland, as it occurs out in the open, away from houses, and though I have not yet met with the larva I expect it will be found on the seeds of some plant.

Tinea (Blabophanes) rusticella, Hb.—This species is a very common one, and found almost everywhere, not so much in houses, according to my experience, as in out-houses. It is said to feed on wool, cloth, and probably on various refuse. I suspect from places in which I have found it that it feeds, too, on rotten wood, like many of the genus. The only time that I have met with it under circumstances in which it could be fairly considered a clothes-moth was in an attic in which there were a good many preserved skins of animals. In these the *rusticella* larvæ had evidently been feeding, and there were quantities of the moths sitting on the walls and ceiling, as well as on the skins. But this is not generally a troublesome moth in a house, in fact, except in this particular case, I have hardly seen it indoors. It sometimes also feeds on carpets, as Mr. T. Wilkinson in "Entomologist's Annual," 1857, p. 121, records the fact that he found it in numbers feeding on a piece of half-rotten carpet in a cellar. He also implies that it eats rotten wood as above suggested.

In *Tinea tapetzella*, L., we have, in my opinion, the very worst of all our native clothes-moths, and one which entirely upsets the old proverb, for it is, I think, the handsomest of them all. When once known it cannot well be mistaken for anything else, its wings being half black and half white, quite a different style of colouring from any other British clothes-moth.

It is fortunately not quite so common as some species, but is by no means scarce, and where it effects a footing it does an alarming amount of damage in a short time.

The larva makes no case, but spins more or less of a silken tube as it proceeds, and perhaps partly owing to its size, its workings seem unusually broad and conspicuous. It used to occur only in my harness room when I first came to my present house. I think it has a special partiality for saddles and horse-cloths, perhaps from

the fact that it has a large appetite and finds plenty of food in them. The next place it invaded was a box-room in the house, where I found, to my horror, one day several *tapetzella* moths sitting about, and on investigation they were traced to an old piece of felt, which was full of caterpillars and cocoons. In spite of every precaution a few moths strayed about the house and appeared in several rooms. I hope that I have now got rid of them, but it is difficult to be certain. Their last known tenement was a pair of fur boots.

The larva of this species spins a very rough cocoon of silk mixed with pieces of its food. There is fortunately but one brood in the year, and that is, like all clothes-moths, somewhat irregular in its time of appearance, which takes place in early summer, the larvæ feeding most of the year.

Tinea misella, Z., may be distinguished by the beautiful violet gloss of its hind wings. It is a local species, and not as a rule very common. It is said to feed on preserved skins, as well as dried plant stems, fungi, rotten wood, manure, &c., but I can hardly call it a clothes-moth, and never heard of it being a trouble to any housewife.

Tinea pellionella, L., is a small species which varies a good deal, and has therefore received several names in its different forms. It is a little brownish moth, with a blackish spot towards the tip of the wing, and generally traces of two more between this and the base: sometimes all these spots are very indistinct. Another closely allied species, *Tinea merdella*, Z., is about the same size—(the size varies a good deal in different specimens and the females are occasionally much larger than the average)—as *pellionella*, and resembles it closely, except that it is much lighter in colour and more silky looking. There is good reason to suppose that these are forms of the same species, and as their structure, larvæ, and modes of life are, as far as I can see, exactly similar, and they often occur together, I will treat them as one species for the purposes of this paper. I should mention, however, that amongst great numbers that I have bred I have only once found anything

in the way of an intermediate form—the colour is usually very constant within certain limits in each form.

This moth is very uncertain in the time of its emergence from the pupa, and I do not think that Stainton is far wrong in giving February to November as the period during which it may be found. Meyrick gives two distinct broods, the first in June and July, the second in September and October, but in thus limiting it, I think he is mistaken, though no doubt there are two or more broods in the course of the year. The eggs, like those of other clothes-moths of this group, are laid loosely and not attached to the food.

On hatching, the little larva immediately sets to work to construct itself a case by spinning together with silk the bits of its food, wool, hair, &c., which it has bitten off for the purpose. The case is rather flat and about three times as long as broad, of a somewhat oval shape, rather roughly made. As it grows it enlarges this case to suit its requirements, by slitting it down the edges and putting on a border all round each side, and then joining together the two enlarged sides. It does its work gradually however and not all at once, so that one cannot perceive that the case is cut open. If the larva is furnished successively with wools of different colours it will make a most beautiful little case with the rings of colour arranged according to the fancy of its feeder, and it is so common that anyone who likes can try the experiment. It seems to eat carpet of almost any colour without ill effects, though I have been told that the brown dye of seal-skin was a preventive against its ravages. As Mrs. Richardson had a muff, of which it ate the lining and did not touch the seal-skin, this would appear to be a fact. If it gets amongst fur, it generally stays close to the skin as indeed do all these little pests, and bites off the hairs close to their roots, so that until one shakes the fur or takes hold of the hair and finds that it comes away, one has no idea that it has been attacked. They also eat the skin itself.

When the larva is full-fed it spins up the mouth of its case and turns to a chrysalis or pupa, but before doing this it sometimes

leaves its food and crawls up and attaches itself to the wall of a room, where its case may be seen hanging on long after the moth has emerged.

I do not know the larva of *Tinea fuscipunctella*, Hw., the next species on my list, but it is said to feed in a case of "dry refuse." Probably this means "hay refuse" and the rubbish one finds in a farm stable, for it is there that I have generally found it in the greatest numbers. If it does feed on clothes, of which I have no evidence, it is certainly not a troublesome species. It is generally looked upon as one of the clothes-moths, but I think it is a case of "birds of a feather" rather than a proved fact, the moth being a good deal like a handsome, well-marked *pellionella*.

Tinea pallescentella, Sta., I have already alluded to as occurring under the old Ferry Bridge at Portland, and feeding there probably on fish refuse. I must confess that I have not found the larva, which might perhaps be a difficult task as the moth is not very abundant, and now that the old bridge is replaced by a new one, I doubt if even the moth will appear there any more. But I find that it also occurs under the railway bridge, in the inmost recesses, and this would suggest that it might feed on rotten wood, as fish-baskets are not kept there as they were under the road bridge. It has been bred from grain and I have a remembrance of a note of its feeding on old bits of leather, but cannot find the reference at present. It is on the strength of this that I include it in my list and also because it is, I think, usually, but perhaps without foundation, suspected of being a true clothes-moth.

Tinea lapella, Hb. (*ganomella*, Tr.) and the much rarer and very beautiful *Tinea semifulvella*, Hw., have both been bred from birds' nests, the former commonly, where they feed on the wool, &c., contained in them, but though I once found a *semifulvella* in my house I never heard of either species attacking clothes or any other household woollen or fur material. I should be only too pleased to find a brood of *semifulvella* in the carpet.

In connection with these species I may allude to the time when the people in this country lived a less luxurious life than at

present and the clothes-moths had also to forego the comforts they now enjoy and pick up a scanty living from bird's nests or any other food that was suited to their tastes. This they still do to a certain extent, for most of the species are found occasionally far from any human habitation though they are always scarce in what may be termed their wild state, there being comparatively little food to support them.

A thorough-going clothes-moth and one which is occasionally very troublesome is *Tinea (Tineola) biselliella*, Hübn. It is a pretty little moth rather larger than *pellionella* and with spotless wings of a pale buff colour, sometimes tinged with grey. In my house it goes by the name of the "greatcoat moth," in remembrance of the ravages it committed upon one of those garments many years ago. The larva makes no case, but spins a loose silken tube as it winds its way through the wool or fur, and in the case of the greatcoat above referred to, showed a marked predilection for the seams of the cloth, eating a bare line along almost every seam. The reason of this was no doubt that there was more or less of a fold at each seam, and the larva was able to live in greater retirement: like all its companions in evil, it loves darkness. Some time ago I received some very fine and richly coloured specimens of this species which had been bred from a cargo of guano. My correspondent thought that they might be distinct from *biselliella*, but it is found in various parts of the world and I am told that in some it takes the form above described.

I have now done with the genus *Tinea*, which contains most of our chief foes, and come to two species which occur in most houses and often do much damage.

The first, *Cecophora pseudopretella*, Sta., is an obscure looking moth with the fore-wings of a brownish colour mottled with darker brown. It varies considerably in size like most clothes-moths, the largest specimens measuring nearly an inch across the wings. The larva does not, I think, attack woollen garments, though its depredations in the house are often extensive in other ways. It eats furs and skins, dried specimens of animals, birds, &c., includ-

ing moths, amongst which it makes great havoc if it gains admittance to the cabinet drawer, seeds of many kinds, corn, peas, &c., dried plants, live and dead chrysalides of butterflies and moths, figs, dates, groceries of many kinds, and if I had the power of exterminating any one species of clothes-moths, I think it is the one I should choose as the greatest general pest. It is, I believe, not an original native of Europe but has been introduced—according to Meyrick about 1840. The same author states that it occurs in Northern and North Central Europe, N. America, Australia, and New Zealand. I should think it would be very extraordinary if it had not, long ere this, been imported into Asia and Africa also, by the agency of man, for it must often get shipped in quantities in various cargoes.

Endrosis fenestrella, Sta., has a conspicuously white head and thorax, which distinguish it from all the other species I have mentioned, and from nearly all our other British moths. Its forewings are not unlike those of *Ce. pseudopretella* and have the same mottled appearance, but are rather whiter. It is also a decidedly smaller species and more delicately formed, *Ce. pseudopretella* being an unusually coarse and rather greasy looking moth.

The larva makes no case and the habits and food of the two are very similar, except that *E. fenestrella* is rather more limited in its food and does not, I think, attack skins. It may be found in the perfect state and freshly emerged, on almost any day in the year, though it is not very usual to see it in the winter. The larva is always feeding somewhere and if a few get shut up with a little food in a bottle, they will go on breeding for a long time, the specimens getting smaller and smaller as the food gets scarcer, until even they have to come to an end, and cannot get sufficient nourishment to reach the pupa state, though they devour their ancestors' remains with perfect equanimity. I think that this moth is one of the most universally distributed, being found, I expect, in pretty nearly every house in the kingdom. The owners may not see them, but let an entomologist enter and he will soon

detect their presence. I have been much struck with the wonderful power which is possessed by these last two species, especially the latter, of laying their eggs (which are laid loose) so that the larvæ get into tightly fitting boxes. How they manage it I hardly know, but I have often found the larvæ of *E. fenestrella* feeding in a card pill box with tightly fitting lid, when they must have got in when the box was shut. I can only suppose that the moth inserted its ovipositor between the lid and box and the young larva when hatched pushed its way in. If an inverted bell-glass is covered with a piece of muslin stretched over its mouth, and pupæ are inside, *E. fenestrella* will probably appear after a time and devour them. In this case the moth must drop its eggs through the muslin as it cannot get through to the pupæ.

From the foregoing remarks it will be seen, to sum up, that the chief clothes-moths to be dreaded are—

1. *Tinea pellionella* and *merdella* ; larva feeding in a case.
2. *Tinea biselliella* and *tapetzella* ; larva feeding with no case, but spinning silken tubes.
3. *Ecophora pseudospretella* and *Endrosis fenestrella*, larva without any case, feeding on a great variety of substances.

There are other species which are productive of much damage at times to our groceries and corn and other vegetable products and which are essentially found in what may be called a domesticated state, which I should have liked to include in my paper, but time and space are wanting, and they must wait for another opportunity.

I have only a few words to say on what, I fear most people will consider the most interesting portion of this paper—"How to destroy clothes-moths."

In the first place it is important to be able to see them at all. They are sufficiently large, but it is astonishing how often people will tell one they have no clothes-moths in the house, when they are obviously flying about the room in which they are sitting. Then it is necessary to recognise them and not to make oneself, and still more the poor insect, uneasy, by pursuing and killing

those harmless little brown moths of the genus *Depressaria* that so often take refuge in our houses in the winter.

The caterpillars, the real culprits, are often only betrayed by a loose feather, or bit of fur, or an irregular rising on the surface of a garment.

Turpentine, naphthaline, benzine, insect powder, and various compounds with long fancy names are very effective when applied of sufficient strength, the first being perhaps the most useful, and a sheet of paper wetted with turpentine and put in a drawer over furs will make them safe for a considerable time : but it is much more difficult to kill the larvæ in this way than to keep the moths at a distance, so that it is well to make sure that there are no living larvæ in the articles in the drawer before it is covered up.

I believe myself that there is no preventive equal to that of occasionally wearing or brushing or shaking or beating anything liable to moths' attack, for the bodies of the larvæ are very delicate and they are easily killed by such slight compressions and blows as they would receive in this way. By sprinkling on it one of the substances I have mentioned, and shutting it up in a tightly fitting box for a week or two, any article may be cleared of its insect pests. I may mention that I do not recommend camphor as I doubt its killing powers, though insects do not like it.

The eggs of moths are difficult to destroy in this way and too small to be easily seen, so that the only satisfactory plan is to make sure that one of the above substances is present in sufficient strength to kill the larvæ as soon as they hatch.

A great deal more might be said upon this subject, but I am perhaps entering too much on the domain of the housewife, and time also presses. I therefore end with a hope that my remarks may be of some practical use, even if it be only the sparing of the life of the innocent *Depressaria* by my hearers.





On a New Specimen of
The Mesozoic Ganoid Fish, *Pholidophorus*,
from the Oxford Clay of Weymouth.

By ARTHUR SMITH WOODWARD, F.L.S.

(Read Feb. 17th, 1897.)



PHOLIDOPHORUS is an extinct herring-shaped fish, specially interesting as being one of the most highly organised members of the great tribe of Ganoids, or fishes with enamelled scales. While agreeing with the typical Ganoids in retaining a fringe of fulcra on the fins, and while still exhibiting rhombic scales articulated by a peg-and-socket joint, it seems to be much more nearly a Teleostean in the structure of its mandible and vertebræ. In fact, it is the abundant occurrence of fishes like this among fossils which makes it impossible any longer to regard the familiar divisions Ganoidei and Teleostei as scientifically defined groups. The genus first appears in the Upper Trias, and ranges throughout the Jurassic Formations, finally becoming extinct before the period of the Chalk; and there is thus ample opportunity for studying its characters and observing the multitude of variations it undergoes in time and space.

EXPLANATION OF PLATE.

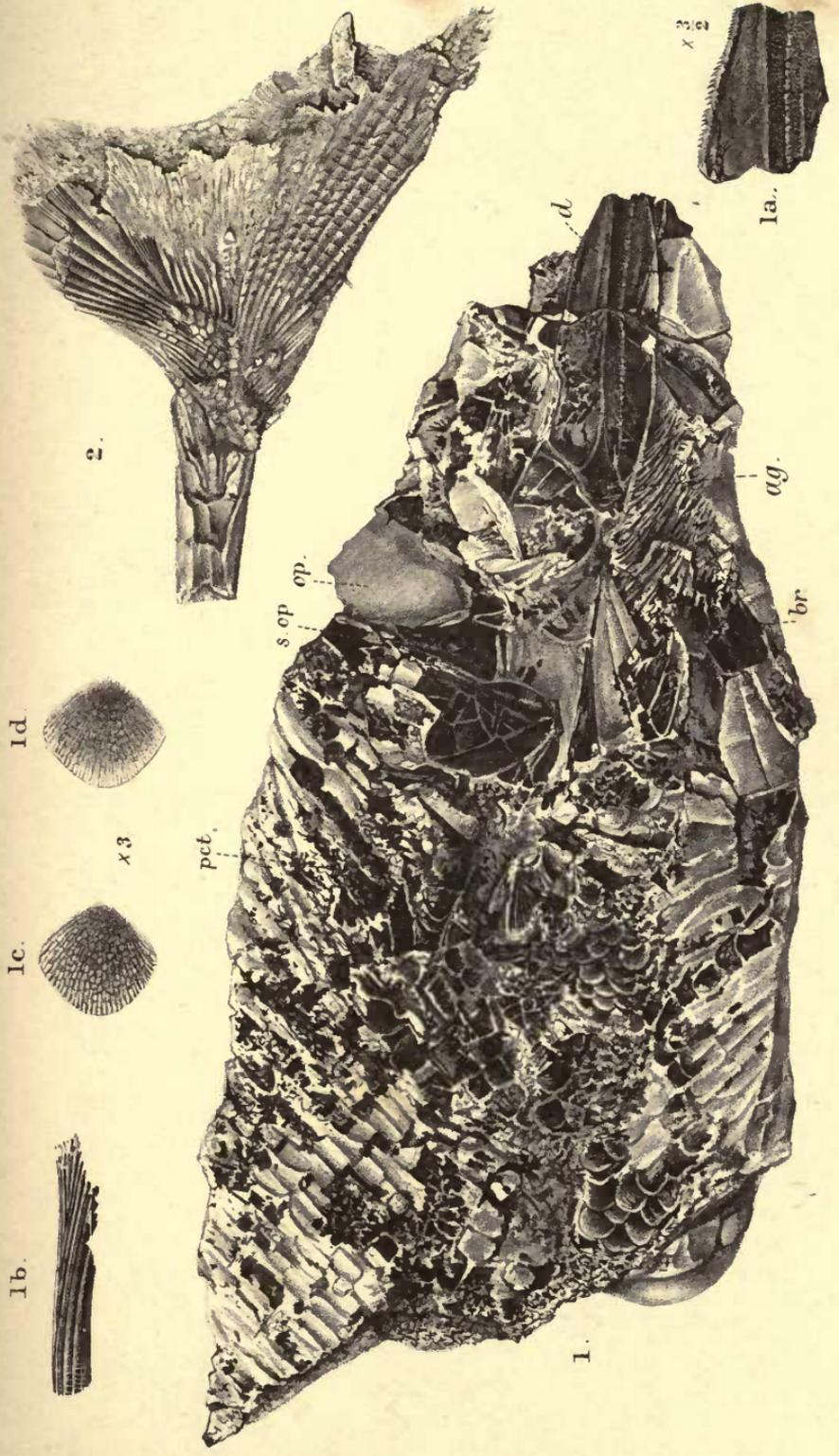
FIG. 1.—*Pholidophorus* sp. ; right lateral and partly ventral aspect of head and abdominal region of fish, nat. size.—Oxford Clay ; Chickerell, near Weymouth. *ag.*, angular bone ; *br.*, branchiostegal rays ; *d.*, dentary bone ; *op.*, operculum ; *pet.*, portion of pectoral fin ; *s.op.*, suboperculum.

1a. Portion of right dentary of same specimen, three-halves nat. size.

1b. Imperfect anterior rays of dorsal fin of same specimen, nat. size.

1c., 1d. Scales of same specimen, three times nat. size.

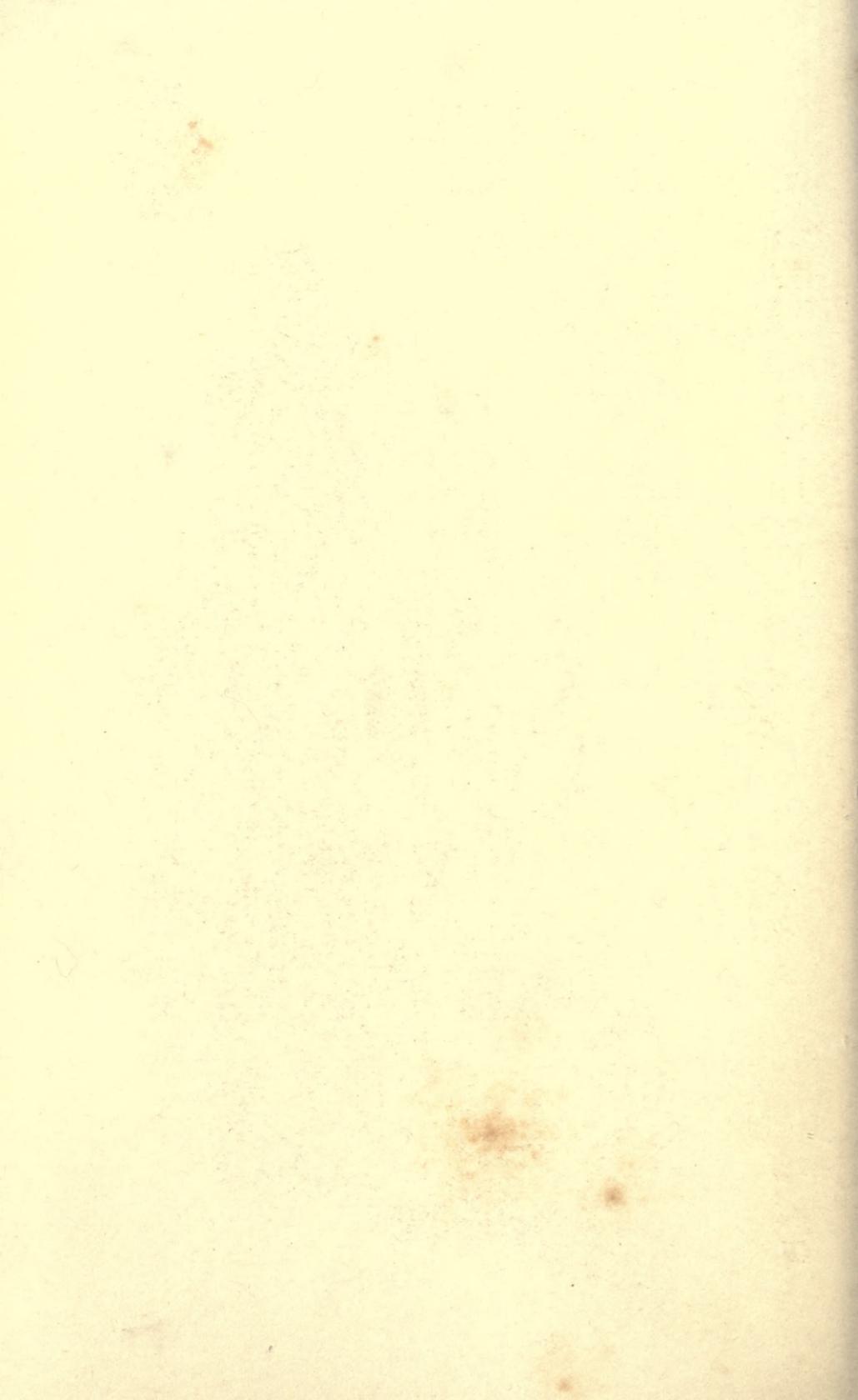
FIG. 2.—*Pholidophorus* sp. ; terminal caudal vertebræ and remains of caudal fin, nat. size.—Oxford Clay ; Christian Malford, Wiltshire. [British Museum, no. P. 4265.]



J. Green del. et lith.

PHOLIDOPHORUS.

Miocene, Brossimpr.



England has hitherto yielded most materials for this study from its Lower Jurassic Formations, particularly from the Lower Lias of Lyme Regis; while the adjoining Continent, on the other hand, has furnished comparatively few specimens of so early a date, but a very fine series from the Upper Jurassic, notably from the Lithographic Stone (Lower Kimmeridgian) of Bavaria. At last, there seems some prospect that discoveries in the English Upper Jurassic will soon rival even the latter; for many examples of *Pholidophorus* are now known from the Purbeck Beds of Dorsetshire, and others are gradually being recognised in the Oxford and Kimmeridge Clays. One fragmentary specimen obtained by Mr. Nelson M. Richardson from the Oxford Clay at Chickerell, near Weymouth, is an interesting addition to the increasing series, and forms the subject of the present communication.

The fossil in question (see accompanying Plate, fig. 1) is a vertically crushed and flattened specimen of the head and abdominal region entirely divested of enveloping matrix. The head is very imperfect and wants the end of the snout. The fractured remains of the cranial roof-bones, the mandible, opercular bones, and branchiostegal rays, exhibit an extremely fine tubercular, partly rugose ornament. The right mandibular ramus is comparatively well preserved (fig. 1), showing the very short articulo-angular element (*ag.*) uniting in a jagged suture with the long dentary (*d.*), which is marked by a series of pores indicating the course of the slime canal at the bottom of a shallow longitudinal groove. The dentary is much fractured, and the transverse section near the anterior end shows the characteristic inward reflection of the oral margin; the single series of closely-arranged, small, conical teeth, with backwardly curved apex, is also distinct (fig. 1*a.*) The opercular and branchiostegal apparatus is too imperfect for description, and no gular plate can be distinguished; but the uppermost five branchiostegal rays (*br.*) are shown to be much larger than the others, and even the foremost are laminar and imbricating.

Behind the opercular plates (*op.*, *s.op.*) there are crushed remains of enlarged post-clavicular scales, ornamented like the other external

bones; and the ordinary scales, so far as preserved, are very finely ornamented with rugæ and posterior pectinations (figs. 1c., 1d.) There are no enlarged ridge-scales either dorsally or ventrally. Those of the dorso-lateral and ventro-lateral regions are somewhat broader than deep, while those of the middle of the flank are much deeper than broad, though not very clearly shown. An insignificant fragment of the right pectoral fin (*pct.*) occurs, besides more satisfactory remains of dorsal fin-rays (fig. 1b.). There are traces of slender elongated fulcra at the base of the latter, and the three stout anterior rays only become articulated and divided far above their insertion, though then the sub-division is very fine and close.

The characters of Mr. Richardson's new fossil thus briefly described are quite sufficient to place it with certainty in the genus *Pholidophorus*; but unfortunately they do not suffice to determine how it shall be specifically named. Nor do other similar specimens from the Oxford Clay of Christian Malford, Wiltshire, now in the British Museum, appear to assist much in this determination. It can only be said that the species in question from the English Oxford Clay is very similar to *Pholidophorus macrocephalus* from the Lithographic Stone of Bavaria, and may possibly prove to be identical with this fish. The species may, indeed, range upwards into the Kimmeridge Clay; for one imperfect head of *Pholidophorus* from Kimmeridge Bay, now in the British Museum, exhibits remarkably similar proportions and ornamentation. The imperfect tail of one of the British Museum specimens is shown of the natural size in fig. 2. The stout neural and hæmal arches of the vertebræ are observed clasping each other; and there are remains of minute rhombic scales on the atrophied upper caudal lobe.





Dorset Monthly Rainfall, 1856-95.

By HENRY STORKS EATON

(Past President of the Royal Meteorological Society).



THE rainfall of Dorset for the 40 years, 1856-95, is estimated to be barely one-half of 1 per cent. (0·5) above the average of the 45 years 1848-92. In the last-mentioned period it was 0·31 greater over England generally than in the 165 years terminating in 1892. It may, therefore, be assumed with some degree of confidence that the annual rainfall from 1856 to 1895 is within 1 per cent. of the average of a long and indefinite period.

The object of the present paper is to place on record the monthly rainfall at various stations where it has been observed for several years in succession; and by converting the average results of all the gauges into percentages or ratios of the annual fall year by year for the 40 years 1856-95, and taking the mean of the whole, to ascertain the proportionate fall due to every month of the year apart from the total amount of rain collected.

Previous to 1856 the monthly registers are inadequate and have not been used. In that year five were established. The number then increased somewhat irregularly to 20 in 1878, and 36 in 1894. The reduction includes every station from 1856 to 1895 where the

register is complete for an entire year, and the 40 years are arranged in decennial periods.

There are altogether 88 stations—63 with registers of less than 10 years' duration, 18 between 10 and 20 years, five from 20 to 30 years, and two exceeding 30 years. Bridport accounts for seven of the 88, Swanage for four, Lyme Regis for three, and seven other centres have been provided with two stations at one time or another. To economise space they are not enumerated, but may be inferred from "Dorset Annual Rainfall, 1848-92," and from subsequent reports, which also give their height above ground and sea-level. Thus 70 centres are represented by 88 stations. The average duration of the registers is a small fraction over eight years.

An ideal station, not prejudicially influenced by the proximity of buildings or vegetation, where the surroundings remain unchanged, where the rain gauge once placed is never shifted from the original position, and where the same plan of observation is maintained year after year, is very desirable as a standard, but is never found in practice. A time comes when the longest register inevitably breaks down by the removal of the observer or from some other cause. The Melbury register, which alone covers the 40 years under discussion, is no exception. It is marred by the indifferent way in which it was at one time kept—a matter not of material consequence, perhaps, in ascertaining the annual fall, but most important in investigating the monthly distribution of rain; and the continuity was broken in 1892, as mentioned in the Report on Dorset Rainfall for 1894. In preparing Tables I. and II. in the Appendix, the returns from Melbury for 1885 and 1892 were excluded. However, it seems from a comparison with Cheddington that the amount of rain collected is about the same in the new position as in the old, and in the subsequent Tables the records of these years have been incorporated.

It is uncertain how far observers have followed the rule adopted by Mr. Symons of assigning to the previous day the rain usually measured at 9 a.m. In the earlier years more observers than

now seem to have terminated the rainfall month on the last day, and not, as is the present practice, on the first of the ensuing month. This want of uniformity is to be regretted, but the consequent irregularity is not very serious.

As the stations vary in number and locality, and the rainfall in amount from one year to another, the monthly ratios have been computed from all the stations of the year, equal weight being given to each year and the results combined. These ratios are representative of the whole county, and are probably more correct than if deduced from a single ideal station, had any such station existed.

The irregularity and seeming capriciousness of the fluctuations of the seasonal rainfall in the same direction for several years in succession, as in February in the decade ending 1895, when the precipitation was less than half that of the previous decade, proves how little dependence is to be placed on short averages. Many years' additional observations will be needed to arrive at the true relationship of the monthly rainfall, and there can be no approach to finality for the present generation of observers. Meanwhile, some interesting facts may be deduced from an examination of the 40 years under discussion. In this period a well-defined minimum rainfall in May is counterbalanced by a maximum double the amount in October. The rainfall increases from May to October, and, with a slight break in December, diminishes from October to May. It is in excess from September to January, while the temperature of the air is declining, and in defect for the remainder of the year.

Comparing Dorset with Greenwich, which may be taken as a typical inland station of the South of England, there is a falling off in late spring and summer. The lowest relative precipitation, being the same at both places, occurs two months later, and there is no secondary maximum in July and August. The rain from May to August does not much exceed the fall at Greenwich, perhaps from a comparative absence of thunderstorms. It is considerably more copious from October to February, the excess of winter rain being

slightly more pronounced in West Dorset. This is shown in the final column of the annexed tabular statement, where the average monthly ratio of nine stations west of Longitude $2^{\circ} 24'$, which bisects the county, is contrasted with nine East Dorset stations.

COMPARATIVE RAINFALL, DORSET AND THE R.O., GREENWICH,
1856—95.

	Depth.			Ratio.			
	Dorset (Table I.)	Green- wich.	Dorset greater	Dorset (Table II.)	Green- wich.	Dorset greater.	W. Dorset greater than E. Dorset.
	in.	in.	in.				
January ..	3.40	1.98	+ 1.42	975	800	+ 175	+ 65
February ..	2.48	1.43	+ 1.05	795	635	+ 160	+ 41
March ..	2.28	1.44	+ .84	670	582	+ 88	- 18
April ..	2.25	1.62	+ .63	669	677	- 8	+ 15
May ..	2.01	1.94	+ .07	583	784	- 201	- 50
June ..	2.25	2.04	+ .21	660	852	- 192	- 34
July ..	2.53	2.42	+ .11	734	978	- 244	- 51
August ..	2.69	2.30	+ .39	772	930	- 158	+ 13
September	3.06	2.18	+ .88	916	911	+ 5	- 28
October ..	4.06	2.74	+ 1.32	1172	1152	+ 20	- 40
November	3.65	2.19	+ 1.46	1084	915	+ 169	+ 27
December..	3.36	1.94	+ 1.42	970	784	+ 186	+ 59
	34.02	24.22	+ 9.80	1.0000	1.0000		

EXPLANATION OF TABLES IN THE APPENDIX.

TABLE I.—Number of Dorset Rainfall Stations, with the average rainfall in every year from 1856 to 1895. The depth of rain in different years is not comparable, owing to the constant changes of stations.

TABLE II.—Proportionate rate of fall, corrected for inequality in the length of the months by dividing the Rainfall, Table I., by the number of days—January by 31, February by 28 and in leap year 29, and so on, and then ascertaining the ratio to the annual fall.

TABLE III.—Total rainfall when a register has been uninterrupted through any Decade. The Decades are independent, but the rain at any Station in one Decade is comparable with the rain at the same Station in the others.

TABLE IV.—Ratio of the monthly to the annual Rainfall, deduced from Table III.

TABLE V.—Detailed monthly Rainfall in inches at every Station included in Table III.

TABLE VI.—Summary of Rainfall at Stations of 20 years' standing and upwards.

In several instances, where the rain was allowed to accumulate for two months in the absence of the Observer, the proportionate fall has been estimated by differentiation from the nearest station or stations, and is shown within brackets.

Decimal points have been omitted from the tables of ratios, except of the annual Rainfall in the last column of Table II. The number of ciphers to the right of the unit in the explanatory headlines shows how far the notation has been carried.

To find the proportionate rate of rainfall of any month to the 40 years' average multiply its ratio by that of the year.

For example—	January, 1872	...	·146	×	1·43	=	·209	
„	„	June, 1870	...	·023	×	·70	=	·016

The Author has endeavoured to arrange the Tables in such form that the records of years to come may be easily incorporated with those of the past.

TABLE I.—STATIONS AND AVERAGE RAINFALL IN IN., 1856-95.

	No.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1856	5	3.89	2.21	1.56	4.31	2.40	2.01	1.05	3.54	3.72	4.30	1.09	3.34	33.42
1857	5	2.71	1.13	3.23	3.50	2.10	2.01	2.45	1.18	2.66	6.23	1.76	1.26	30.27
1858	6	1.10	1.73	1.10	3.04	2.17	1.06	2.99	2.31	2.62	2.45	2.39	4.52	27.48
1859	6	2.29	2.97	2.23	2.86	1.10	1.14	1.82	2.87	3.70	3.93	3.61	3.68	32.02
1860	7	4.60	1.14	2.86	2.11	3.86	6.29	1.96	4.53	3.09	2.10	3.43	4.89	40.86
1861	8	.87	3.92	3.85	.45	1.23	3.95	4.36	.85	3.01	2.22	5.55	2.09	32.35
1862	8	2.85	.94	6.01	2.71	3.02	2.30	2.25	1.97	2.04	5.81	1.00	3.17	34.07
1863	9	4.90	1.06	2.07	1.26	2.23	4.27	.94	3.98	3.87	5.82	2.68	2.80	35.88
1864	12	2.43	1.68	2.96	1.49	1.10	1.35	.50	.98	2.66	1.82	3.72	2.97	23.66
1865	10	4.73	3.73	1.36	.81	2.95	2.17	1.89	3.88	.01	8.19	4.97	3.86	38.55
Dec.	..	30.37	20.51	27.28	22.54	22.16	26.55	20.21	26.09	27.38	42.87	30.20	32.58	32.874
1866	10	5.09	4.50	2.16	2.25	1.64	2.02	1.38	2.54	8.59	2.27	2.23	2.80	38.07
1867	12	4.70	2.90	4.25	2.33	2.07	1.22	4.49	1.97	2.32	3.51	1.23	1.57	32.56
1868	11	4.43	2.04	1.90	2.84	1.86	.65	.56	5.40	4.80	3.46	2.90	7.79	38.63
1869	13	4.70	3.02	2.29	1.14	4.94	1.20	.56	.73	4.82	2.09	2.03	4.19	31.71
1870	17	2.09	2.86	1.86	.49	1.47	.55	1.14	1.50	1.43	3.19	2.29	3.74	23.81
1871	18	3.00	2.07	2.06	5.38	.98	2.89	4.16	1.73	5.09	3.14	1.58	2.63	34.71
1872	17	7.20	3.19	3.64	2.45	2.56	3.83	3.91	1.60	2.25	6.64	5.91	5.39	48.57
1873	13	5.05	2.78	3.69	.79	1.01	1.77	1.96	3.02	2.12	2.79	4.63	.61	30.22
1874	13	3.06	2.83	.55	2.38	.67	2.08	1.37	2.58	4.73	5.75	3.34	3.93	33.27
1875	13	5.32	2.75	1.24	1.49	2.56	2.80	4.96	2.28	2.62	7.73	5.44	1.31	40.50
Dec.	..	45.24	28.94	23.64	21.54	10.76	19.01	24.49	23.35	38.77	41.77	31.58	33.96	35.205
1876	11	1.47	3.36	3.36	2.90	.34	1.81	.73	3.82	5.81	2.82	4.77	9.45	40.64
1877	15	7.35	1.44	2.07	3.88	2.59	1.12	3.22	3.45	2.91	2.51	8.59	1.93	41.06
1878	20	1.81	2.35	1.78	3.88	4.94	1.63	1.87	3.91	1.68	3.81	2.58	2.24	32.48
1879	21	4.79	4.61	.59	3.20	2.69	5.74	4.11	5.91	4.25	1.24	.27	.95	38.35
1880	22	.73	4.47	1.33	2.10	.94	2.14	3.86	1.14	3.86	6.44	3.73	4.80	35.54
1881	20	2.45	4.60	2.94	1.04	.93	2.66	1.86	6.28	2.25	1.91	5.61	3.67	36.20
1882	20	1.68	2.00	1.02	4.88	2.00	4.02	3.78	2.39	3.13	8.14	4.43	3.71	41.18
1883	24	3.80	5.02	1.24	1.15	2.03	2.60	2.81	.92	5.23	2.91	4.11	.88	32.70
1884	21	3.89	3.00	3.06	2.30	1.22	3.52	2.71	1.51	1.96	1.15	1.88	4.05	30.25
1885	21	3.02	4.27	1.64	2.56	3.32	1.82	.26	1.20	4.60	4.54	3.98	1.88	33.09
Dec.	..	30.99	35.12	19.03	27.89	21.00	27.06	25.21	30.53	35.68	35.47	39.95	33.56	36.149
1886	23	3.67	.76	3.60	2.19	3.63	.69	2.86	1.15	2.82	4.48	3.93	7.10	36.88
1887	26	3.41	.90	1.43	.95	1.86	.80	.88	2.31	2.82	2.34	3.68	2.72	24.10
1888	28	1.45	.93	3.80	1.71	2.09	3.21	4.26	2.20	1.42	2.30	7.87	2.94	34.13
1889	28	.92	1.95	2.55	2.57	1.48	1.90	2.54	3.02	1.29	5.45	1.70	2.66	28.03
1890	32	4.13	.89	1.40	3.31	2.04	2.72	3.10	2.90	1.89	1.06	2.84	1.70	27.98
1891	34	3.11	.04	3.00	.85	2.42	2.05	2.24	6.09	2.01	9.07	4.47	4.87	40.22
1892	29	1.95	1.48	.73	1.01	.84	1.29	2.59	3.40	2.94	5.37	3.76	1.93	27.29
1893	33	2.38	4.35	.42	.11	.89	1.10	4.63	1.12	2.01	4.21	1.88	3.44	26.54
1894	36	4.21	3.14	1.76	2.42	1.95	2.15	5.26	2.79	3.03	4.25	7.59	2.96	41.51
1895	36	4.25	.06	2.72	2.76	.29	1.59	3.03	2.76	.36	3.68	6.67	3.77	31.94
Dec.	..	29.48	14.50	21.41	17.88	17.49	17.50	31.39	27.74	20.59	42.21	44.39	34.09	31.867
Total		136.08	99.07	91.36	89.85	80.41	90.12	101.30	107.71	122.42	162.32	146.12	134.19	
Av.		3.402	2.477	2.284	2.246	2.010	2.253	2.532	2.698	3.061	4.058	3.653	3.355	34.024
Prop.		999	720	671	660	591	662	744	791	899	1193	1074	986	..

TABLE II.—PROPORTIONATE MONTHLY RAINFALL CORRECTED FOR
UNEQUAL NUMBER OF DAYS. YEAR = 1'000.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
1856	115	70	46	131	71	61	31	104	113	127	33	98	98
1857	88	41	107	118	68	68	80	38	89	203	59	41	89
1858	39	69	39	112	78	39	107	83	97	88	87	162	81
1859	70	100	68	90	34	36	55	87	116	119	113	112	95
1860	111	29	69	53	93	157	47	109	77	51	86	118	1'20
1861	26	131	116	14	37	123	131	25	94	67	173	63	95
1862	83	30	174	82	88	69	65	57	61	169	30	92	1'00
1863	135	32	57	36	61	121	26	109	110	160	76	77	1'06
1864	101	74	123	64	46	58	21	41	114	75	160	123	70
1865	121	105	35	21	75	57	48	99	0	209	131	99	1'13
Decade	889	681	834	721	651	789	611	752	871	1268	948	985	'967
1866	146	128	55	60	42	53	35	65	227	58	59	72	1'12
1867	142	97	128	73	62	38	136	60	73	106	38	47	96
1868	113	56	49	75	48	17	14	138	127	88	76	199	1'14
1869	145	103	71	36	153	33	17	23	154	65	65	130	93
1870	86	130	77	21	61	23	47	62	61	181	97	154	70
1871	85	65	58	157	28	84	117	49	148	89	46	74	1'02
1872	146	69	74	51	52	80	79	33	47	135	124	110	1'43
1873	164	100	119	27	33	59	64	98	71	90	155	20	89
1874	90	92	16	72	20	63	40	76	144	169	102	116	98
1875	129	74	30	37	62	70	121	55	66	187	137	32	1'19
Decade	1246	914	677	609	561	525	670	659	1118	1168	899	954	1'036
1876	36	87	81	72	8	45	18	92	145	68	119	229	1'19
1877	176	38	50	96	62	28	77	83	72	60	212	46	1'21
1878	55	79	54	121	149	51	57	118	52	115	81	68	96
1879	122	130	15	84	68	151	105	150	112	32	7	24	1'13
1880	20	132	37	60	26	61	106	31	110	178	106	133	1'04
1881	66	137	79	29	25	74	50	170	63	52	156	99	1'06
1882	40	53	24	120	48	99	90	57	77	194	109	89	1'21
1883	113	165	37	35	60	80	84	27	161	86	126	26	96
1884	126	104	99	77	40	113	88	49	66	38	63	132	89
1885	89	139	48	78	98	55	8	35	140	134	121	55	97
Decade	843	1064	524	772	584	762	683	812	998	957	1100	901	1'062
1886	99	22	97	61	97	19	77	31	78	120	109	190	1'08
1887	140	41	59	40	76	34	26	94	119	95	155	111	71
1888	42	28	110	51	60	96	123	63	42	66	234	85	1'01
1889	32	76	90	93	52	69	89	106	47	191	62	93	82
1890	145	35	49	120	72	99	109	102	69	37	103	60	82
1891	77	1	74	22	60	52	55	150	51	224	114	120	1'18
1892	70	57	26	38	30	48	94	123	110	194	140	70	80
1893	88	177	15	4	33	42	170	41	76	155	72	127	78
1894	99	82	42	59	46	53	124	66	74	100	185	70	1'22
1895	132	2	84	88	9	51	94	85	11	114	218	117	93
Decade	924	521	646	576	535	563	971	861	677	1206	1387	1043	'935
40 years	975	795	670	609	583	600	734	772	916	1172	1084	970	

TABLE III.—MONTHLY AND ANNUAL RAINFALL IN IN.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Decade 1856-65.													
Bridport	27·88	19·66	25·09	22·08	18·80	25·26	21·21	25·03	23·73	37·44	26·77	29·33	302·2
Littlebredy	37·49	25·64	32·36	26·80	25·20	30·08	24·86	30·41	31·77	48·08	34·39	39·98	387·0
Melbury	36·69	21·17	29·78	24·83	24·73	28·07	22·10	32·94	32·87	49·34	34·10	41·55	378·1
Portland	21·82	14·96	19·89	18·38	17·65	18·53	15·15	17·11	21·45	33·81	22·45	25·01	246·2
West Bucknowle..	28·40	18·42	26·17	17·84	23·00	25·70	18·64	23·23	26·89	41·92	30·49	28·99	309·6
Decade 1866-75.													
Bridport	39·70	26·25	20·61	18·89	18·64	17·71	21·77	20·37	32·37	38·41	29·50	32·94	317·1
Chalbury	40·94	28·13	22·11	20·92	19·46	18·80	24·54	23·33	37·34	39·29	29·70	29·97	334·5
Melbury	57·31	35·96	24·90	23·35	21·13	18·76	26·70	28·28	44·55	44·32	36·18	41·73	403·1
Shaftesbury	39·97	26·93	22·39	22·60	20·45	19·73	27·60	24·09	41·07	42·38	29·13	29·80	346·1
Decade 1876-85.													
Chalbury	28·42	30·14	16·42	24·41	19·74	25·71	22·54	27·14	30·66	29·95	35·79	30·34	321·2
Melbury	40·17	44·69	20·45	33·00	22·30	29·36	25·67	33·90	42·88	38·12	48·02	34·70	413·2
Osmington	30·88	35·21	18·60	27·04	19·39	24·61	22·75	30·70	34·65	36·32	40·93	35·66	356·7
Shaftesbury	28·35	34·02	19·48	30·00	24·19	28·76	29·88	32·64	35·59	35·46	38·32	32·54	369·2
Whatcombe	37·18	39·44	23·12	31·82	22·71	27·28	27·28	33·96	38·30	39·17	46·63	38·74	405·6
Decade 1886-95.													
Beaminster	35·12	18·14	25·61	21·26	20·82	17·35	34·28	33·21	18·63	43·88	49·32	37·90	355·5
Chalbury	26·57	13·15	18·99	18·31	18·08	17·04	28·50	23·98	19·36	39·49	38·48	30·51	292·4
Cheddington	38·72	18·13	27·35	24·04	23·74	20·54	40·88	38·33	22·80	49·15	56·97	41·43	402·0
Furzebrook	31·49	14·17	20·93	18·04	16·34	15·58	34·34	28·93	23·65	43·26	43·54	34·80	325·0
Gillingham	25·59	14·98	22·90	19·53	16·93	17·26	33·04	28·47	19·60	38·76	40·74	33·06	310·8
Langton Herring ..	26·47	12·45	18·17	15·21	14·57	17·83	27·37	24·59	19·72	39·16	40·92	30·58	287·0
Lytchett Minster ..	25·43	13·09	19·15	15·89	17·11	14·98	27·44	24·70	19·25	39·42	39·97	31·28	287·7
Melbury	33·30	14·90	25·25	19·60	18·65	18·12	32·61	35·03	22·29	45·08	55·62	41·20	361·6
Parkstone	27·35	13·53	19·44	15·67	16·84	16·51	31·19	25·00	17·59	42·27	40·25	32·27	297·9
Wareham	29·46	13·10	20·43	16·43	16·67	15·13	29·79	24·73	20·94	40·76	41·40	33·50	302·3
Weymouth	25·35	12·09	18·55	14·24	14·61	17·95	27·23	22·22	19·46	36·06	39·38	28·55	275·6

TABLE IV.—PROPORTIONATE MONTHLY RAINFALL. ANNUAL = 1·0000.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Decade 1856-65.												
Bridport	922	650	830	730	622	836	702	828	785	1239	886	970
Littlebredy	969	662	836	693	651	777	642	786	821	1242	888	1033
Melbury	970	560	787	657	654	742	584	871	869	1305	902	1099
Portland	886	608	808	747	717	753	615	694	871	1373	912	1016
West Bucknowle	917	595	845	576	743	830	602	750	868	1354	984	936
Decade 1866-75.												
Bridport	1251	828	652	596	588	558	686	642	1021	1211	930	1039
Chalbury	1224	842	661	625	582	562	733	697	1116	1174	888	896
Melbury	1422	892	617	579	524	466	662	702	1105	1099	897	1035
Shaftesbury	1155	778	647	653	591	570	797	696	1186	1224	843	860
Decade 1876-85.												
Chalbury	885	938	511	760	615	800	702	845	954	932	1114	944
Melbury	972	1082	495	799	540	710	621	820	1038	922	1161	840
Osmington	866	987	521	758	543	690	638	861	971	1018	1147	1000
Shaftesbury	768	921	527	812	655	779	809	886	964	960	1038	881
Whatcombe	917	972	570	784	560	672	673	837	944	966	1150	955
Decade 1886-95.												
Beaminster	988	510	721	598	536	488	964	934	524	1234	1387	1066
Chalbury	909	450	649	626	618	583	974	820	662	1350	1316	1043
Cheddington	963	451	680	598	590	511	1017	953	567	1222	1417	1031
Curzebrook	968	436	644	555	503	479	1056	890	727	1330	1339	1073
Gillingham	823	482	737	628	545	555	1063	916	630	1247	1311	1063
Langton Herring	922	434	633	530	507	621	954	857	687	1364	1429	1062
Lytchett Minster	884	455	665	552	595	521	954	859	669	1370	1389	1087
Melbury	921	412	698	542	516	501	902	969	616	1246	1538	1139
Parkstone	919	454	653	526	565	554	1047	839	590	1419	1351	1083
Wareham	975	433	676	543	551	501	985	818	693	1348	1369	1108
Weymouth	919	439	673	516	530	651	988	806	706	1308	1428	1036

TABLE V.—1856-65.

BRIDPORT.													
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1856	3.68	2.04	1.67	4.38	1.94	1.92	.89	3.62	3.26	3.63	1.02	2.46	30.51
1857	3.21	1.17	3.50	3.51	2.09	2.29	3.46	.56	2.26	4.89	1.47	.73	29.14
1858	.48	1.88	.93	3.05	1.83	.97	2.41	1.64	1.98	1.47	2.07	3.27	21.98
1859	1.38	2.22	1.76	2.25	.79	.65	1.79	3.64	2.29	3.30	3.25	2.63	25.95
1860	3.86	.97	2.73	2.36	3.25	5.52	1.62	4.01	2.40	1.45	3.28	5.18	36.63
1861	.60	3.92	3.44	.51	1.00	4.63	4.03	.70	2.73	1.70	4.58	1.83	29.67
1862	2.75	1.05	5.35	2.72	2.80	2.28	2.24	1.64	1.76	5.50	1.02	3.01	32.12
1863	3.92	1.15	2.19	1.32	1.84	4.07	.72	3.42	4.14	6.17	2.18	2.78	33.90
1864	3.40	1.56	2.23	1.29	.84	1.18	.49	.76	2.91	1.63	2.57	3.21	22.07
1865	4.60	3.70	1.29	.69	2.42	1.75	3.56	5.04	.00	7.70	5.33	4.23	40.31
LITTLEBREDEY.													
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1856	5.44	2.51	2.34	4.60	3.08	2.66	1.48	4.39	4.10	4.31	1.60	3.58	40.09
1857	3.38	1.29	4.36	4.38	2.56	2.14	3.10	1.31	3.30	7.78	1.83	1.80	37.23
1858	1.66	2.81	1.61	4.27	2.79	1.14	3.94	3.28	3.17	2.96	3.36	5.42	36.41
1859	2.71	3.66	2.68	3.52	1.17	1.03	2.60	3.13	4.55	5.20	4.43	4.29	38.97
1860	5.42	1.01	3.32	3.04	4.36	7.47	2.57	5.27	3.64	2.01	3.94	6.38	49.03
1861	.83	4.81	4.46	.48	1.54	4.27	5.54	.93	3.51	2.20	5.54	3.12	37.23
1862	3.21	1.15	6.40	2.80	3.18	2.38	2.66	1.61	2.13	6.65	1.22	3.83	37.22
1863	5.84	1.09	2.55	1.59	2.30	4.06	.97	5.14	4.19	5.59	2.44	2.86	38.62
1864	3.43	2.29	2.99	1.31	1.00	1.87	.38	.89	3.15	1.77	4.04	4.02	27.14
1865	5.57	4.42	1.65	.81	3.22	3.06	1.62	4.46	.03	9.61	5.99	4.68	45.12
MELBURY.													
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1856	3.11	2.79	.81	4.96	2.41	2.19	1.02	3.98	4.28	5.18	1.00	4.81	36.54
1857	2.59	1.33	3.87	3.98	2.63	1.41	3.22	1.39	3.01	7.34	1.09	1.70	33.56
1858	1.50	1.12	1.50	3.15	2.72	.70	2.57	3.71	2.97	2.63	2.75	5.05	30.37
1859	3.00	3.84	2.96	3.50	1.32	2.02	1.44	4.08	4.20	4.61	4.16	4.02	40.05
1860	6.45	.71	2.88	1.85	4.76	7.06	2.59	5.54	3.62	2.74	4.60	4.78	47.58
1861	.46	4.42	4.50	.35	1.62	3.98	5.68	.73	4.60	2.75	5.97	3.18	38.24
1862	3.30	.73	6.80	3.70	3.60	3.65	2.18	2.34	1.89	0.79	.54	4.04	39.56
1863	6.71	1.02	2.24	1.15	2.20	4.06	.95	4.95	5.20	7.35	2.60	2.97	41.40
1864	2.87	.94	3.00	1.50	.67	1.25	.22	.88	3.10	1.83	4.73	3.88	24.87
1865	6.70	4.27	1.22	.69	2.80	1.75	2.23	5.34	.00	8.12	6.66	6.22	46.00
PORTLAND.													
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1856	3.56	1.44	1.39	3.96	1.92	1.33	1.20	2.24	4.08	4.01	.75	2.81	28.69
1857	2.10	.49	2.13	2.91	1.91	1.38	1.13	.69	2.03	5.68	1.89	1.14	23.48
1858	.73	1.05	.59	2.36	1.72	.79	2.73	1.12	2.02	1.54	.99	4.32	19.96
1859	2.34	2.63	1.42	2.18	.96	.79	1.56	1.61	3.06	3.47	2.83	2.71	25.56
1860	3.43	.78	2.48	1.80	3.01	5.20	1.87	2.98	1.71	1.37	2.67	3.47	30.77
1861	.65	2.72	2.77	.25	.51	2.22	2.79	.71	2.23	1.18	4.68	1.36	22.07
1862	1.51	.92	4.43	1.75	3.11	1.45	1.82	1.02	1.66	5.18	1.12	2.25	26.22
1863	3.42	1.02	1.69	1.33	1.53	3.59	.67	2.66	3.50	3.93	2.23	2.55	28.12
1864	1.48	1.37	2.12	1.48	1.00	.84	.36	1.64	1.14	.93	2.37	3.33	17.06
1865	2.60	2.54	.87	.36	1.98	.94	1.02	2.44	.02	6.52	2.92	2.07	24.28
WEST BUCKNOWLE.													
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1856	3.64	2.29	1.59	3.63	2.68	1.93	.66	3.47	2.89	4.37	1.08	3.03	31.26
1857	2.25	1.38	2.57	2.71	1.33	2.82	1.34	1.93	2.73	5.45	2.51	.92	27.94
1858	1.41	1.95	.90	2.13	1.89	1.44	3.89	1.75	3.18	3.65	2.57	4.52	29.28
1859	2.16	2.41	2.41	2.70	1.43	1.13	1.46	1.61	4.21	3.49	3.62	3.61	30.24
1860	2.85	1.21	2.86	1.51	3.63	5.77	1.50	4.45	3.16	2.16	3.37	4.50	36.97
1861	1.33	2.78	3.72	.39	1.20	3.41	4.61	1.06	2.87	2.21	5.48	1.05	30.11
1862	3.03	.70	5.73	2.06	3.68	1.38	1.81	1.46	1.37	5.43	.47	3.04	(30.10)
1863	4.14	.97	1.71	.87	2.85	4.55	1.05	3.49	4.33	4.79	3.02	3.40	35.17
1864	2.56	1.53	3.47	1.04	1.39	1.26	.32	1.25	2.15	1.78	4.15	1.74	22.64
1865	5.03	3.20	1.21	.80	2.92	2.01	2.00	2.76	.00	8.59	4.22	3.18	35.92

TABLE V.—(CONTINUED.)

1866-75.

BRIDPORT.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1866	5.16	3.73	2.26	1.86	2.19	1.58	1.25	2.48	7.39	2.20	1.99	2.68	34.77
1867	4.54	2.60	3.73	2.58	1.86	1.06	3.78	2.24	1.81	2.80	1.54	1.91	30.45
1868	3.76	1.91	1.39	2.00	1.61	.40	.48	4.61	3.40	3.32	2.83	6.88	32.59
1869	4.59	3.07	2.25	1.11	4.74	1.14	.41	.25	3.92	2.03	2.09	4.37	29.97
1870	1.74	2.23	1.93	.53	1.44	.76	.66	.82	.99	3.52	1.86	3.84	20.32
1871	2.99	2.26	1.77	4.96	.99	2.04	3.96	.80	4.50	2.75	1.29	2.53	30.84
1872	5.94	2.53	3.00	2.18	1.88	4.12	3.93	1.16	1.76	6.76	5.76	5.04	44.06
1873	3.88	3.17	3.04	.78	.88	1.76	1.61	3.46	1.66	2.49	4.28	.34	27.35
1874	2.29	2.45	.54	1.82	.64	2.46	1.59	2.39	(3.59	5.35)	3.11	4.07	30.30
1875	4.81	2.30	.70	1.07	2.41	2.39	4.10	2.16	3.35	7.19	4.75	1.28	36.51

CHALBURY.

1866	4.84	4.57	2.22	2.10	1.24	1.96	1.19	2.14	8.71	2.12	2.23	1.87	35.19
1867	4.49	2.79	3.69	2.37	1.70	1.31	4.52	1.81	2.06	3.63	1.09	1.38	30.84
1868	4.54	1.85	2.06	2.90	2.12	.54	.43	5.68	4.12	3.44	3.10	7.49	38.27
1869	4.34	2.54	1.90	1.28	4.94	1.30	.54	.80	4.52	1.71	1.64	3.78	29.29
1870	2.02	3.54	1.69	.41	1.65	.31	2.06	1.94	1.55	4.04	1.87	2.77	23.85
1871	2.67	1.57	1.67	4.75	.66	2.78	4.88	1.61	5.01	2.27	1.43	2.67	31.87
1872	5.97	3.43	3.47	2.41	3.19	3.56	3.67	1.98	1.92	7.27	5.22	4.76	46.85
1873	4.25	1.98	3.28	.79	1.12	1.75	2.29	2.79	2.51	2.74	4.84	.66	29.00
1874	2.48	3.22	.34	2.43	.44	1.90	1.09	2.67	4.06	4.89	2.25	3.59	30.36
1875	5.34	2.69	1.79	1.48	2.40	3.39	3.87	1.91	2.88	7.18	5.03	1.10	39.06

MELBURY.

1866	7.29	5.40	2.57	2.75	1.37	2.32	1.50	2.52	11.66	2.16	2.28	3.50	45.92
1867	5.35	3.37	3.90	1.97	1.67	.82	4.90	2.34	2.28	3.83	1.00	1.85	33.28
1868	5.15	2.80	2.23	3.06	1.86	1.40	.25	5.49	5.10	4.46	4.17	10.30	46.27
1869	7.40	3.77	2.03	.90	5.82	.88	.45	.83	5.47	2.40	1.02	5.80	37.37
1870	2.50	3.60	2.40	.20	1.73	.50	.83	1.70	.58	5.40	3.20	4.76	27.40
1871	2.90	2.80	2.22	6.80	.88	2.40	5.35	5.45	5.83	3.80	(1.87	3.22)	43.52
1872	9.88	3.87	5.08	2.90	3.10	4.22	4.66	1.45	3.80	6.60	8.17	0.50	80.23
1873	7.40	3.50	3.02	.52	.93	1.50	1.74	3.20	2.43	2.22	5.29	.54	32.20
1874	4.13	4.05	.25	3.10	.30	2.00	.80	2.79	4.80	5.63	3.50	3.90	35.25
1875	5.31	2.80	1.20	1.15	3.47	2.72	6.22	2.51	2.60	7.82	5.08	1.36	42.24

SHAFTESBURY.

1866	6.03	4.50	2.31	2.91	1.78	2.98	2.26	3.07	7.78	3.15	2.72	3.51	43.00
1867	4.50	3.39	4.06	2.80	1.91	1.61	4.72	1.97	2.80	4.19	.73	1.68	34.36
1868	4.30	1.87	2.58	2.95	1.42	.24	.85	5.83	5.37	3.65	2.07	6.20	37.33
1869	3.90	3.12	2.06	1.42	5.55	1.60	.69	1.25	5.60	2.05	2.51	4.17	33.92
1870	2.02	2.69	1.84	.46	1.08	.55	1.69	1.86	2.12	5.06	2.09	2.31	23.77
1871	2.67	1.56	1.22	4.00	1.54	2.12	4.70	1.05	4.31	2.70	1.33	2.31	29.51
1872	4.88	3.42	3.23	2.55	2.47	4.20	2.74	1.54	2.32	6.21	4.75	4.82	43.13
1873	4.29	1.25	3.60	.69	1.31	1.43	2.33	3.29	2.09	2.78	5.27	.78	29.11
1874	2.94	2.39	.63	2.95	.88	2.22	1.71	3.19	6.15	5.69	2.56	2.61	33.92
1875	4.44	2.74	.86	1.87	2.51	2.78	5.91	1.04	2.53	6.90	5.10	1.41	38.09

TABLE V.—(CONTINUED.)

1876-85.

CHALBURY.													
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1876	1.38	2.98	3.72	2.98	.24	1.53	.69	3.47	5.11	2.61	5.13	9.24	39.08
1877	6.59	1.26	1.89	3.32	2.47	.87	3.40	2.91	2.67	2.08	7.58	1.88	36.92
1878	1.48	2.38	1.11	3.56	4.85	1.97	1.61	3.43	1.61	2.93	1.85	1.57	28.35
1879	4.32	3.87	.35	2.44	2.17	5.20	3.20	4.87	3.52	.84	.16	.81	31.75
1880	.47	3.74	.97	1.53	.87	2.31	3.81	1.65	3.31	5.12	2.57	4.22	30.57
1881	3.38	3.41	2.59	.80	.75	1.75	1.63	5.84	2.17	1.56	5.19	3.06	32.13
1882	1.14	1.55	.44	5.07	2.10	3.46	2.86	1.81	2.60	7.20	3.83	2.86	34.92
1883	3.24	4.34	.97	1.12	2.00	1.85	2.87	.92	3.83	2.44	3.50	.73	27.81
1884	3.51	2.61	2.93	1.72	1.15	4.51	2.15	1.35	1.62	1.27	1.08	4.24	28.74
1885	2.91	4.00	1.45	1.87	3.14	2.26	.32	.89	4.22	3.90	4.30	1.73	30.99
MELBURY.													
1876	1.72	3.91	3.18	3.42	.14	1.83	.52	5.02	6.65	2.78	5.70	10.62	45.49
1877	9.56	1.19	1.60	3.77	3.14	1.82	3.47	4.35	3.46	3.02	10.02	2.35	47.75
1878	1.63	2.75	1.45	3.63	6.65	1.26	1.18	5.11	1.50	4.32	3.01	2.40	34.89
1879	5.11	5.25	.44	4.12	2.62	6.62	2.82	6.18	5.35	1.03	.07	.56	40.17
1880	.38	6.06	2.09	2.14	.64	1.86	3.45	.23	4.80	6.73	4.92	4.70	38.00
1881	2.70	5.91	3.28	1.28	.62	3.42	2.88	6.95	1.55	1.48	8.18	4.10	42.35
1882	2.80	2.83	1.14	6.52	1.98	4.20	4.77	3.03	2.97	8.67	4.20	4.20	47.31
1883	5.97	6.56	1.40	1.28	1.68	3.40	3.28	.78	8.17	4.44	5.35	.63	42.94
1884	5.30	3.67	4.22	2.97	1.25	4.00	3.30	1.20	1.88	.58	2.20	4.06	34.63
1885	5.00	6.56	1.65	3.87	3.58	.95	.00	1.05	6.55	5.07	4.37	1.08	39.73
OSMINGTON.													
1876	1.36	3.87	3.02	2.75	.12	1.55	.57	4.22	5.59	2.46	4.66	10.44	40.61
1877	7.35	1.57	2.18	3.71	2.45	.69	3.19	3.24	2.27	2.66	9.52	1.80	40.63
1878	1.83	2.51	1.98	4.14	4.00	.63	1.89	3.25	1.95	3.77	2.41	2.44	30.80
1879	5.08	4.49	.55	2.73	2.29	6.46	3.65	6.45	4.47	1.23	.18	.89	39.07
1880	.77	4.09	1.50	2.18	1.30	1.61	3.53	.69	3.92	6.82	3.22	5.01	34.64
1881	1.85	4.52	3.16	1.08	1.05	3.01	1.75	5.98	2.54	2.41	5.36	3.45	36.16
1882	1.74	2.28	1.08	4.28	1.85	3.75	3.07	2.58	2.73	8.54	4.50	4.30	40.70
1883	3.55	4.70	1.12	1.23	2.42	2.00	2.43	.95	5.22	2.57	4.42	.82	31.43
1884	3.90	2.92	2.66	2.53	.76	3.19	2.29	2.31	1.55	1.11	2.29	4.63	30.14
1885	2.85	4.26	1.35	2.41	3.06	1.72	.38	1.03	4.41	4.75	4.37	1.88	32.47
SHAFTESBURY.													
1876	1.35	3.60	4.21	2.50	.52	1.68	1.18	2.66	3.64	2.91	3.87	6.48	34.40
1877	5.93	2.59	2.48	4.62	1.94	.67	4.04	3.68	3.46	1.83	7.74	1.89	40.87
1878	2.52	1.95	1.53	4.00	4.24	1.67	2.16	5.10	1.76	3.87	2.60	2.53	33.93
1879	3.72	4.07	.63	3.82	3.99	5.82	4.59	5.71	4.29	1.29	.51	1.38	39.82
1880	.77	4.52	1.21	2.56	1.52	2.88	4.38	1.20	3.68	6.66	3.19	4.67	37.24
1881	1.68	3.62	2.62	1.26	1.45	2.81	2.27	7.12	2.12	2.21	4.54	4.03	35.73
1882	1.93	1.87	1.37	4.59	2.15	4.33	4.10	2.48	3.94	8.28	5.59	4.19	44.82
1883	3.47	5.60	1.28	1.25	2.50	2.79	3.98	1.28	4.24	2.94	4.33	1.26	34.92
1884	3.77	2.62	2.50	2.64	2.11	4.54	2.95	1.92	1.95	.98	2.26	4.08	32.32
1885	3.21	3.58	1.65	2.76	3.97	1.57	.23	1.49	6.51	4.40	3.69	2.03	35.18
WHATCOMBE.													
1876	1.67	3.47	3.62	3.58	.47	1.67	.68	4.32	5.70	4.17	4.66	11.35	45.36
1877	8.86	1.65	2.48	5.06	3.38	1.32	3.73	3.76	3.00	3.05	9.86	2.93	49.02
1878	1.91	3.16	2.46	4.01	5.35	1.57	1.93	4.13	1.72	3.82	3.17	2.22	35.45
1879	5.61	5.50	.64	3.76	3.04	6.98	4.03	6.27	5.16	1.23	.32	1.14	43.68
1880	1.01	5.00	1.53	2.25	.95	2.41	4.30	1.16	3.89	6.57	4.89	4.97	39.02
1881	2.34	5.06	3.73	.98	.80	2.97	2.05	8.30	2.09	2.45	6.94	3.63	41.39
1882	1.64	2.53	.96	5.39	1.69	3.99	4.17	3.03	3.35	8.57	5.35	4.42	45.09
1883	5.29	6.37	1.67	1.39	2.18	2.31	2.72	.87	5.87	3.14	4.47	2.91	39.19
1884	4.97	2.93	3.37	2.10	1.60	2.47	3.46	1.43	1.67	1.30	2.07	3.70	31.07
1885	3.88	3.77	2.66	3.36	3.25	1.59	.12	.69	5.85	4.87	4.90	1.42	36.36

TABLE V.—(CONTINUED.)

1886-95.

BEAMINSTER.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1886	4.05	.98	4.43	3.10	3.07	.90	2.87	1.50	2.10	4.54	4.27	7.08	38.89
1887	4.26	.97	2.50	1.23	1.98	.44	.95	3.09	3.16	2.93	3.67	3.08	28.26
1888	1.55	1.58	4.12	1.88	2.14	3.58	5.60	2.13	.93	1.64	9.22	4.08	38.45
1889	.91	2.98	3.35	2.75	1.94	1.27	2.91	3.31	2.20	4.77	1.78	2.81	30.98
1890	5.22	1.41	1.63	4.35	2.94	2.63	3.67	3.13	1.25	.97	2.83	1.89	31.92
1891	3.66	.00	3.16	.88	4.04	2.20	2.72	7.08	2.12	10.63	5.25	5.30	47.04
1892	2.59	1.44	.84	.76	.51	1.60	3.09	3.83	2.12	6.47	3.07	1.30	28.52
1893	3.02	5.10	.35	.11	.97	.85	4.36	1.80	1.73	3.36	2.41	4.29	28.35
1894	4.73	3.51	1.97	2.94	2.80	2.46	4.69	4.63	2.59	4.16	8.12	4.11	46.71
1895	5.13	.17	3.26	3.26	.43	1.42	3.42	2.71	.43	4.41	7.80	3.96	36.40

CHALBURY.

1886	3.27	.78	2.81	2.00	4.41	.40	2.48	.83	2.60	4.49	3.40	6.91	34.38
1887	3.33	.72	1.28	1.27	1.96	.87	.77	1.90	2.83	1.80	2.94	2.79	22.46
1888	1.35	.76	3.21	1.80	1.85	2.73	3.31	1.76	1.38	1.85	6.03	2.43	28.46
1889	.73	1.61	2.79	2.93	1.27	2.20	2.58	2.09	1.05	5.19	1.15	2.30	25.89
1890	3.47	.67	1.39	2.97	2.38	2.85	2.90	2.69	2.49	.84	2.08	1.29	26.02
1891	3.08	.00	2.84	.96	2.01	2.07	2.13	6.06	1.29	9.06	4.63	4.68	38.81
1892	1.40	1.50	.71	.84	.95	1.27	2.02	3.48	2.77	4.96	3.57	1.52	24.99
1893	1.75	4.05	.28	.05	.83	1.11	4.08	.92	1.92	4.07	1.99	2.99	24.04
1894	3.61	3.06	1.60	2.67	1.93	2.01	5.02	1.62	2.72	4.13	7.00	2.92	38.29
1895	4.58	.00	2.08	2.82	.49	1.53	3.21	2.63	.31	3.10	5.69	2.68	29.12

CHEDDINGTON.

1886	4.02	1.18	4.82	3.00	3.45	.70	3.46	2.06	2.80	5.48	4.57	6.47	42.01
1887	4.00	1.08	2.72	1.32	2.48	.67	1.65	2.90	3.30	3.10	4.15	3.44	30.81
1888	1.70	1.02	4.28	2.54	2.97	3.89	6.35	2.73	1.08	2.02	9.73	5.33	43.64
1889	1.00	2.07	3.14	3.30	2.20	1.39	3.34	3.91	2.85	5.12	1.90	3.27	33.49
1890	5.75	1.33	1.71	4.51	2.24	3.78	4.74	3.70	1.98	1.21	4.19	1.68	36.82
1891	4.47	.00	3.08	1.07	4.23	2.55	4.24	7.25	2.42	12.19	6.24	6.13	53.87
1892	2.91	1.74	1.10	.89	.71	2.14	2.51	4.64	2.46	6.89	4.70	1.30	31.99
1893	3.92	6.01	.62	.08	1.31	.82	5.68	1.87	2.15	3.84	2.93	5.37	34.60
1894	5.61	3.61	2.18	3.33	3.64	3.13	5.41	6.08	3.19	5.12	9.30	4.61	55.21
1895	5.34	.09	3.70	4.00	.51	1.47	3.50	3.19	.57	4.18	9.26	3.83	39.64

FURZEBROOK.

1886	3.79	.52	4.08	2.15	3.64	.74	3.05	.92	3.84	4.31	4.59	7.60	39.23
1887	2.96	.85	.68	.83	1.40	.98	.70	2.79	2.45	4.58	1.93	2.84	22.99
1888	1.34	.78	4.02	1.83	2.13	2.64	3.72	2.98	1.83	2.82	7.93	1.65	33.67
1889	1.16	1.65	2.15	2.08	2.02	1.20	3.08	2.94	1.07	4.88	2.35	2.60	27.18
1890	4.35	.77	1.73	3.54	2.06	2.20	4.44	2.76	2.16	.99	3.02	.18	28.20
1891	3.96	.00	2.65	1.25	1.88	2.14	2.36	6.03	2.85	8.21	3.68	6.40	41.41
1892	1.95	1.45	.60	.97	.78	1.14	2.87	3.44	3.53	5.32	3.80	2.77	28.62
1893	2.53	4.63	.32	.12	.72	.94	5.01	1.39	2.24	4.97	2.07	3.06	28.00
1894	4.44	3.49	1.75	2.62	1.67	1.88	5.92	2.36	3.44	4.09	7.76	3.42	42.84
1895	5.01	.03	2.95	2.65	.04	1.72	3.19	3.32	.24	3.09	6.41	4.28	32.93

GILLINGHAM.

1886	3.89	.83	2.91	2.46	3.93	.96	2.34	1.33	3.12	5.06	3.69	5.99	36.51
1887	3.00	.52	2.70	1.24	1.96	.93	.74	1.81	2.41	1.92	3.92	2.98	24.13
1888	1.31	1.71	3.73	1.97	1.34	2.58	6.00	1.79	1.16	1.80	6.72	3.42	33.53
1889	.71	2.02	2.40	3.82	1.16	1.07	3.76	3.25	1.81	4.67	1.58	2.22	28.47
1890	3.60	.74	1.77	3.33	1.83	2.91	2.91	2.70	.94	1.66	2.38	1.68	26.45
1891	2.21	.05	3.84	.90	2.67	1.24	2.55	6.19	2.36	8.79	4.18	4.99	39.07
1892	1.85	2.07	.68	.99	.90	1.45	1.81	3.94	2.35	4.53	2.61	1.73	24.91
1893	2.25	4.07	.54	.16	.95	2.12	3.20	2.44	2.66	3.66	2.16	3.69	27.90
1894	2.96	2.83	1.84	2.16	1.85	2.82	6.64	1.66	2.10	3.38	7.35	3.56	39.15
1895	3.81	.14	2.49	2.50	.34	1.18	3.09	3.36	.60	3.29	6.15	2.80	29.84

TABLE V.—(CONTINUED.)

1886-95.

LANGTON HERRING.													
	Jan.	Feb.	Mar.	April.	May	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1886	3.58	.86	3.17	1.43	2.51	.71	2.53	1.13	1.98	3.93	3.13	6.24	31.20
1887	3.17	.71	1.27	.77	1.93	.36	.97	2.06	2.73	2.97	3.72	2.69	23.35
1888	1.35	.56	3.01	1.33	1.58	3.15	3.23	1.79	1.16	2.39	7.99	1.93	29.47
1889	.68	2.04	1.57	1.82	1.24	3.55	2.18	2.20	.88	4.33	1.48	2.38	24.35
1890	3.71	.76	1.02	3.00	1.74	2.51	2.66	2.19	1.41	1.18	2.63	1.63	24.44
1891	2.50	.03	3.58	.72	2.08	2.24	1.79	5.68	2.31	8.77	3.92	3.97	37.59
1892	2.00	1.25	.77	1.13	.60	.81	2.84	2.67	2.61	4.45	3.55	1.93	24.61
1893	2.04	3.66	.32	.15	1.13	.59	4.48	1.01	2.04	4.05	1.55	3.04	24.06
1894	3.37	2.56	1.13	2.50	1.45	1.91	4.31	3.17	4.06	3.82	7.10	2.14	37.52
1895	4.07	.02	2.33	2.36	.31	2.00	2.38	2.69	.54	3.27	5.85	4.63	30.45
LYTCHETT MINSTER.													
1886	3.16	.45	3.41	2.51	4.17	.90	2.33	.89	2.81	3.43	4.45	7.13	35.64
1887	2.69	.91	1.15	.90	1.69	.93	.76	1.66	2.45	1.59	3.62	2.23	20.58
1888	1.20	1.01	3.47	1.04	2.02	2.61	3.14	2.56	1.50	2.20	6.63	2.42	29.80
1889	.80	1.76	2.26	2.34	1.37	.63	1.99	2.32	.80	5.65	1.69	2.36	23.97
1890	3.81	.81	1.08	2.96	2.50	2.56	2.45	2.30	.75	2.63	1.47	26.00	
1891	3.07	.04	2.66	.91	2.18	1.59	1.63	6.34	1.67	8.24	4.36	4.87	37.56
1892	1.60	1.57	.63	.87	.71	1.47	1.81	3.14	3.05	4.93	3.05	1.97	24.85
1893	1.38	3.90	.67	.03	.69	1.07	4.53	.71	1.82	5.43	1.47	3.01	24.76
1894	3.94	2.61	1.58	1.94	1.48	1.70	5.72	2.07	2.66	4.08	6.14	2.29	36.21
1895	3.78	.03	2.24	2.39	.30	1.52	2.85	2.56	.19	3.02	5.93	3.53	28.34
MELBURY.													
1886	3.48	.25	4.10	1.98	2.30	.24	2.77	1.46	2.69	5.08	4.19	7.50	35.95
1887	3.48	1.00	1.87	1.03	2.35	.63	1.16	2.85	2.70	2.40	3.47	3.08	26.02
1888	1.06	.30	4.17	2.03	2.38	2.73	4.85	2.83	.53	1.67	9.07	5.30	36.92
1889	.65	1.93	3.04	2.47	1.44	1.00	2.23	3.77	1.88	5.35	1.95	2.73	28.44
1890	5.69	.80	1.34	3.72	1.90	3.23	3.66	2.85	2.16	1.10	3.75	3.15	33.35
1891	3.90	.00	3.05	.87	3.45	2.63	3.12	7.35	3.27	11.04	5.34	6.07	50.09
1892	2.76	1.36	1.21	1.06	.96	2.31	2.39	4.77	3.42	6.18	5.21	.70	32.33
1893	2.89	5.59	.49	.08	.97	1.44	5.28	1.75	2.52	3.54	2.48	5.48	32.51
1894	4.89	3.67	2.55	3.22	2.67	2.47	4.42	4.79	2.91	4.90	10.93	3.76	51.18
1895	4.50	.00	3.43	3.14	.23	1.44	2.73	2.61	.30	3.82	9.23	3.43	34.86
PARKSTONE.													
1886	3.41	.80	3.27	2.20	4.24	.44	2.78	.84	2.89	4.69	4.05	7.35	36.96
1887	2.72	.86	1.13	.75	2.07	.79	.58	2.45	2.51	1.77	3.34	2.23	21.20
1888	1.25	.83	3.45	1.16	1.81	2.95	3.33	1.88	1.43	2.50	6.87	2.23	29.69
1889	.84	1.70	2.22	2.28	1.08	.81	2.32	2.58	.86	5.96	1.48	2.42	24.55
1890	3.93	.77	1.22	2.63	2.06	2.77	2.98	2.78	1.62	.85	2.48	1.63	25.72
1891	3.05	.03	3.23	1.03	1.90	1.87	1.60	6.28	1.04	8.80	3.98	4.84	37.65
1892	1.63	1.56	.65	.79	.91	1.51	2.05	3.25	2.63	4.88	3.32	1.97	25.15
1893	2.12	3.99	.49	.03	.83	2.01	6.59	1.00	1.65	5.03	1.89	3.16	28.79
1894	4.34	2.91	1.59	2.37	1.66	1.89	6.09	1.96	2.71	4.47	6.76	2.27	39.02
1895	4.06	.08	2.19	2.43	.28	1.47	2.87	1.98	.25	3.32	6.08	4.17	29.18

TABLE V.—(CONTINUED.)

1886-95.

WAREHAM.													
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1886	3.47	.90	3.31	1.80	3.56	.59	2.81	.85	2.90	4.04	3.74	7.02	34.99
1887	2.93	.90	1.02	.86	1.52	.74	.75	1.84	2.59	2.12	3.04	2.57	20.88
1888	1.51	.59	3.62	1.38	1.93	3.10	3.89	1.77	1.76	2.14	7.77	2.70	32.16
1889	.95	1.50	2.35	2.47	1.34	.94	2.17	2.94	1.01	6.10	1.46	2.42	25.65
1890	4.32	.84	1.27	3.26	2.53	2.73	2.78	2.77	2.38	.85	2.78	1.75	28.26
1891	3.34	.05	3.55	.89	2.12	1.90	1.96	5.77	1.29	8.01	4.72	5.02	38.62
1892	1.84	1.42	.92	.96	.96	1.08	2.43	3.17	3.26	5.23	3.41	2.02	26.70
1893	2.08	3.91	.30	.13	.84	.84	4.75	.89	2.35	4.40	1.73	2.96	25.18
1894	4.09	2.97	1.32	2.13	1.57	1.68	5.30	2.52	3.27	4.19	6.22	2.78	38.04
1895	4.93	.02	2.77	2.55	.30	1.53	2.95	2.21	.13	3.68	6.53	4.26	31.86
WEYMOUTH.													
1886	3.49	.93	3.22	1.72	2.75	.85	3.09	.87	2.79	4.22	3.11	5.50	32.54
1887	2.85	.72	1.18	.82	1.91	.32	.86	1.74	2.46	2.83	3.46	2.42	21.57
1888	1.35	.60	3.02	1.10	1.63	3.35	2.97	1.89	1.09	2.68	7.21	2.08	28.97
1889	.80	1.39	1.54	1.87	1.53	3.84	2.04	2.21	.89	4.33	1.32	2.21	23.97
1890	2.61	.86	1.12	2.71	(1.50)	2.42	2.08	2.91	1.39	.84	2.52	1.32	(22.28)
1891	2.52	.00	4.00	.84	1.98	2.36	1.90	4.69	2.56	7.27	3.50	4.06	35.68
1892	1.96	.91	.58	1.17	.54	.64	2.77	2.35	2.89	4.40	3.76	2.43	24.40
1893	2.59	3.98	.41	.16	.93	.74	4.69	.63	1.83	3.14	1.30	2.33	22.73
1894	3.36	2.68	1.12	1.50	1.52	1.78	4.49	2.74	3.29	3.74	7.82	2.21	36.25
1895	3.82	.02	2.36	2.35	.32	1.65	2.34	2.19	.27	2.61	5.38	3.99	27.30

TABLE VI.—SUMMARY OF RAINFALL AT STATIONS OF 20 YEARS STANDING.

Depth of Rain in In. and Proportionate Rate of Fall, Annual = 1·000.

	No. of Years.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Observed.	Adopted.
		In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Abbotsbury ..	21	2·93	2·27	2·12	1·95	1·77	1·85	2·03	2·24	2·55	4·06	3·90	3·37	31·04	30·72
Bridport..	20	3·38	2·30	2·28	2·05	1·87	2·15	2·15	2·27	2·81	3·79	2·81	3·11	30·97	30·86
Chalbury ..	31	3·20	2·39	1·89	2·08	1·94	2·08	2·48	2·52	2·82	3·73	3·49	3·03	31·65	31·16
Melbury..	40	4·19	2·92	2·51	2·52	2·17	2·36	2·68	3·25	3·56	4·42	4·35	3·98	38·91	38·62
Osmington ..	24	3·48	2·69	2·12	2·29	1·99	2·12	2·34	2·63	3·14	3·92	3·83	3·54	34·09	33·74
Shaftesbury ..	29	3·05	2·59	2·13	2·46	2·19	2·20	2·93	2·84	3·39	3·88	3·36	2·99	34·01	34·17
West Bucknowle	24	3·07	2·10	2·18	1·96	2·14	2·15	2·12	2·23	3·31	4·03	2·64	2·93	30·86	31·41

Proportionate Rate of Fall corrected for Unequal Length of Months.

Abbotsbury ..	..	93	79	67	64	56	61	64	71	83	128	127	107
Bridport..	..	107	80	73	67	60	70	63	72	92	120	92	99
Chalbury ..	..	101	76	60	66	61	66	78	79	89	118	110	96
Melbury ..	..	106	81	63	66	55	61	67	82	93	112	114	100
Osmington ..	..	100	85	61	68	57	63	67	76	94	113	114	102
Shaftesbury ..	..	88	82	61	73	63	66	85	82	101	112	100	87
West Bucknowle	..	98	73	69	65	68	71	68	71	109	128	87	93

Abbotsbury, 1869-70, 1872-78, 1880-91. Bridport, 1856-75. Chalbury, 1865-95.

Melbury, 1856-95. Osmington, 1867-90. Shaftesbury, 1864, 1866-93. West Bucknowle, 1848-71.





The Assistance of the Sun in Finding Traces of Destroyed Earthworks and Buildings.

By H. J. MOULE, M.A.



ALMOST every one has heard how, years ago, a hot season drew the ground plan, so to speak, of the long-destroyed cathedral church of Old Sarum. And in that very same neighbourhood, in Salisbury Close, there was a startling case of a similar result in the Jubilee year. It appears that when, in Wyatt's destructive reign, the interior of the cathedral was woefully restored, and, outside, the bell-tower was improved away, another modern improvement was achieved. The Close had been for centuries a burial ground, and was thickly set with headstones. These were carefully buried—the memorials forgotten. But the Jubilee sunshine found them out. Over each stone a brown rectangle soon showed itself, and a very strange sight it was to behold the green thus variegated.

Now it seems not unfitting to lay before the Club the probability that in many places in Dorset the torrid summer of 1896 has done a like work. And further, it is respectfully asked if it may not be worth while to collect and record notes of such marks of forgotten antiquities. We may thus trace, of course, not only wall foundations and buried tombstones, as above said, but also sometimes the lines of levelled earthworks, if made, not of surface-soil, but of sub-soil, such as chalk.

“ Well, what have you yourself done ? ” it will be asked. Very little indeed. It was a disappointing surprise to find no marks of any consequence on Maiden Castle. No burnt lines were there on the turf to show the plans, either of the Roman house so well excavated by Mr. Cunnington, or of the minor dwellings and paved road of which he is understood to have found indications. The only plain sign noticed was that of a road passing through the western entrance.

At Poundbury, the only other camp examined during the drought, slightly more was seen. There also the sign of a road was observed. It passed from near the east end of the tunnel ; in other words, probably from the eastern entrance of the camp downward towards the spot where the barrack hospital now stands. This road, most likely, was only a farm road for access to Poundbury when it was under the plough. That eastern entrance is held to be modern, and, if so, a road through it clearly must be so too. And in an old print a barn is shown just about the spot in the now barrack yard to which the road seemed to point. Further, it was easy to see, as it has been in several summers of late years, the line of a third and now wholly levelled vallum on that eastern side of Poundbury. The line of scorching could be seen from the southern fence of the down to the railway, and corresponded with the fine section made by the company’s surveyor when the cutting there was carried out, and showed the great elaboration of the fortifications of old. Again, there was a puzzling, though distinct, line of scorching which turned westward at the end. It thus joined the second vallum, of which, you know, there is a small bank remaining, as also on the south and much more on the west. What was the object of the bank or vallum marked seemingly by the scorching as curving into that same partly-upstanding second vallum is a mystery. Just possibly, the series of ditches and valla, extremely elaborate on that east side and probably on the south and west sides also, may have been made still more so just at the angles by the insertion of an extra bank. Within the camp there was a rather general look

of patchy burning of the grass, but not much that could be set down as unmistakably witness to building or chalk-work below.

Of such witness there was, however, one case of each sort. Twenty yards or so north-east of the barrow there was a clear trace of the foundations of a building about 30ft. square, and very strange it looked. But most likely this building was of no great antiquity. Perhaps, it, like the road above noted, had to do with the farming of the land. Lastly, there was a most interesting proof, as we may safely take it, that the barrow is rightly so called, and is not a mere mound for some military purpose, as some have thought. During the drought, at least before all was burnt to a sameness of brown, this was to be perceived clearly. Standing on the top of the barrow you could trace, first faintly and then afterwards entirely, a clearly marked circle of scorching girding the barrow with what looked like mathematical precision. This could show nothing else, it seems, but that originally there was a chalk bank or dwarf vallum round it. Now this is almost certain not to have been added to any but a burial-barrow—not to a mound for a look-out or any purpose of that kind.

To these lines about the discovery of ancient remains by the agency of the sun's rays in scorching, perhaps a few words may be added on another way in which those rays may help us in the same research. What is meant is that when the sun is bright but low, and raking a tract of land, the light finds out unevennesses which at another time are quite undiscoverable. Yes, this may happen when not only lost to the eye at a distance, but when, although you are actually walking over the place where the vestiges are, they can neither be seen by sight or felt with feet. It seems not past hope that by this means a certain extremely curious antiquity may yet again be seen after long oblivion.

Many years ago our friend, Mr. T. B. Groves, clearly perceived a zig-zag line, apparently a line of road, leading up the western slope of Badbury Rings. Since then that slope has been under the plough, and the zig-zag has not been detected. But it is by no means certain that it may not yet be traced. If any of our

antiquarian friends live near Baddbury it might be worth while to try to catch the right moment. Possibly, by thus watching, they may even yet see the old cart road when the low sun sends tender but clear grey long shadows from every roughness of surface however minute. This hope is uttered by reason of what was actually seen last May. Right opposite Swanage, we all know, rises Ballard Down. It is a great element in a lovely view, grouping grandly, as it does, with Old Harry and the cliffs to the right, grey Whitecliff Farm among its trees to the left, and the sapphire sea in front. All this you see with joy and delight morning, noon, and evening. But it was only after many scores of gazings at that fair scene that one strange feature of Ballard Down was perceived. On a lovely afternoon, about five o'clock, the sun was shining almost in line with the face of the down, just raking the hillside. The very slightest tuft of furze or grass had its long, clear shadow. And presently such tender shadows softly lined out into almost startling view two zig-zag ridges and two scarps, all corresponding to each other and of most mysterious aspect. Each zig-zag consisted of one horizontal bank joining two vertical ones, one upwards and the other downwards. One of the scarps is at the foot of the steepest part of the down and the other at right angles to it, running up the western edge of a hollow or coombe in the hillside. They may be from ten to fifteen yards long each. Now it would, perhaps, be out of anyone's power fully and surely to trace the banks by scrambling about the steep. You almost doubt if they can exist. Yet go back to Swanage with your doubt and wait for the sun to get into position. He will draw these puzzling, inscrutable lines on Ballard side as plainly as you could with a pen on paper. What are they? What for? Who made them? When? Truly it cannot have been yesterday. Ballard Down is very steep. Gradual denudation must have had great destroying power, we know. Yet, denudation fully allowed for, the feeling, as you climb about searching for the banks, is that millenniums must have rolled by since they stood up in wholeness, as they now lie in erasure. War fences they could not be. Field,

garden-fences they could not be. Part of a cunningly-planned road they could not be. Part of a maze they could not be. For what forgotten purpose, by what forgotten race, were they fashioned? For many minds there must surely be a strange magnetism drawing them to these and such-like almost, yet not altogether, vanished, annihilated antiquities. It is so when at times the sea gives up King Philip's long sunken gold reals and silver ingots. How much deeper the emotion, as linked to vastly deeper antiquity, when other waves yield other relics! It must be a dull soul that moves not when not storm but sunshine—not from the West Bay but from the billow-like undulations of Dorset downs—shows once more the vanished work of Roman or Phœnician, of Kelt or of Iber.





The Origin of the Vale of Marshwood
and of the Greensand Hills of West Dorset.

By A. J. JUKES BROWNE, B.A., F.G.S.

(Published with the permission of the Director-General of the Geological Survey of Great Britain.)

(Read at Dorchester, Nov. 20th, 1896, and again on Pilsdon Pen,
June 8th, 1897.)



THE great sheet of chalk which, with the subjacent Greensand and Gault, stretches through so large a part of Southern England and underlies the whole of the Hampshire Basin, terminates abruptly in West Dorset. There is no doubt that the Upper Cretaceous Rocks once spread continuously over the Jurassic hills east of Bridport and across the Vale of Marshwood, and were united to the corresponding beds in East Devon, where the Chalk and Greensand are so conspicuous in the cliffs near Beer Head.

To some it may seem that this statement is rather too imaginative, since, at the present time, there is a broad intervening tract, from the centre of which all traces of Cretaceous strata have been removed, and around which only a few isolated patches or outliers of Greensand remain as relics of their former extension; yet to the eye of a geologist these very outliers, of which Pilsdon

Pen is one, are clear and certain proofs that a continuous sheet of the same material once overspread the whole area.

As it is intended that the Field Club should visit Pilsdon this year, it seems a fit occasion to discuss the geology of the district in relation to its present physical features, to explain the isolation and great elevation of Pilsdon Pen and the other Greensand outliers, and to account for the origin of the Vale of Marshwood.

It is well known that Pilsdon and Lewesdon Hills are the highest summits in Dorset, and they are also the highest Upper Greensand hills in England, Pilsdon being 907 feet and Lewesdon 894 according to the Ordnance Survey of 1892. They are situated on the watershed that divides the Valley of the Axe from the Valley of the Char, which occupies the greater part of the Vale of Marshwood. This "vale" is a broad plain, most of which lies between 100 and 200 feet above the sea; its floor consists of the clays of the Lower and Middle Lias, and it is encircled by steep slopes formed by the yellow micaceous sands of the Marlstone Beds, the cincture of the hills being only broken on the south by the gaps through which the rivers Char and Simene escape to the sea.

It may seem a paradox to say that the height of the Greensand hills and great hollow of the Vale of Marshwood are due to one and the same cause, yet it is true that they are so closely related to one another that the history of the one involves the history of the other. This history begins with the uplift of the strata which took place in Miocene or Pliocene times and bent the beds into a dome-shaped elevation, which is often called a *pericline*, *i.e.*, an area in which the strata are bent up so as to dip outwards in all directions from a central spot or axis.

I propose to ascertain the probable whereabouts of this centre by a consideration of the levels through which the base of the Upper Greensand passes in East Devon and West Dorset. It might be thought that this spot could be found more easily by examining the arrangement of the Jurassic rocks on the borders of the Vale of Marshwood, but though these undoubtedly show the existence of an anticlinal axis running in an east and west direction

from which the strata slope to north and south, the curve to east and west is not so apparent in them because they had received a decided easterly tilt before the Greensand was deposited on them. Moreover, the Jurassic rocks are broken by many faults, and only a few of these affect the Cretaceous strata, for most of them seem to date from the Purbeck and Wealden periods, when the above-mentioned tilting was produced.

It is therefore by the position and relative heights attained by the base-line of the Gault and Greensand that the periclinal uplift of this district can best be determined, and by transferring the boundary-lines from the published Geological Survey map to the six-inch county maps, we can easily trace the rise and fall of this base-line. The boundary-lines on the old Geological Survey map are not everywhere correct, but I have good reason to believe that this particular boundary is sufficiently accurate for our purpose.

Commencing with a traverse from west to east through Pilsdon and Lewesdon, and starting the base-line of the Greensand at Sektor, near Axminster, we find it there to be only about 320 feet above sea-level, and thence it rises gradually eastward till it reaches 580 feet at Birdsmoor Gate, 700 feet at the southern end of Pilsdon, and about 770 feet on Lewesdon. Between Lewesdon and Beaminster there are several faults breaking the Jurassic rocks, but it is not certain that any of them displace the Cretaceous series, and on Hackthorn Hill the base of the Greensand is close to the 500 feet contour. The distance from Lewesdon to this point is four miles, and, assuming the fall to be gradual, it is a little, but not much more, rapid than the rise from the west up to Lewesdon.

Taking next a traverse through the southern outliers near the coast, we find the Cretaceous base-line in Black Ven Cliff at about 320 feet above the sea. Thence it rises to about 350 feet in Stone Barrow, and 400 and more on Golden Cap and Langdon Hill, and finally to about 500 feet on Eype Down. Then comes a space of four miles occupied by low ground near Bridport, and when Greensand is next found on Shipton Hill its base has fallen to 400 feet, sinking still lower eastward to 300 feet at Askerswell.

Along this line of country then, as along the first, we seem to have a gradual rise and fall in the height of the Cretaceous base-line.

We will next trace the rise and fall of the same line from north to south. This is best shown on the western side of the area. North of Thorncombe village the base of the Greensand lies at about 450 feet, on the south side of that outlier in the same latitude it is nearly 500, by Lambert's Castle it is about 600 feet; thence it falls to 550 feet below Coney's Castle and to 350 feet at Stonebarrow, $2\frac{1}{2}$ miles further south.

On the eastern side of the district the regularity of the rise is broken by faults, but we find it rising to a maximum of 600 feet on Drakenorth Hill, east of Poorton, falling thence rapidly both to the north and to the south. Even where it is faulted up again on Eggardon Hill it does not seem to get much above 400 feet, and at Combe, near Litton Cheney, it is down to about 300 feet.

We may fairly assume that the centre of the uplift, or pericline, will be found by drawing lines between the points where the base-line reaches its greatest height, namely, from Lambert's Castle to Drakenorth Hill, and from Lewesdon to Eype Down. The intersection of these lines occurs a little east of Monkswood above the low ridge which forms the watershed between the Char and the head branch of the Simene brook. We may take this spot as the approximate centre of the pericline, which appears to have an elliptical shape, its longest axis being from east to west and its shortest from north to south. We can even form a good estimate of the height to which the base of the Greensand reached over this centre by prolonging the actual rise of the base-line in the Pilsdon outlier, for at the north end of Blackdown, by Stony Knap, it is at 500 feet, rising thence to 700 feet below the Pen, and if this rise were continued south-eastward to the spot above-mentioned it would bring the base to a height of 877 feet. Assuming the thickness of the Greensand there to have been 180 feet, the Chalk would have come in at about 1,150 feet.

The relative levels of sea and land varied, of course, at different epochs of Tertiary time, but we are quite warranted in believing

that there was a time when the Chalk and Greensand formed a continuous mantle over the rocks which now occur in West Dorset. Let us next consider how this mantle of Cretaceous material has been so largely removed from the district in question.

When the country was raised above the level of the sea at the close of the Oligocene period it must have undergone considerable erosion from the planing action of the sea waves, and if the flexures were commenced at that time the anticlines would suffer most. We know very little about the history of this part of England during the Miocene and Pliocene times, but the final result of the successive upheavals and denudations was to leave a surface of erosion which was planed across the flexures, and both upheaval and denudation had been carried on to such an extent that the Chalk had been either entirely or almost entirely removed from the central parts of the anticlinal areas.

This surface of erosion was what our American cousins call a *peneplain*, that is to say, it was not a level plain or plateau, but had its slight irregularities and slopes and had, moreover, a summit elevation from which it sloped in more than one direction. A consideration of the present watersheds and of the river courses in Dorset and the adjacent counties leads us to infer that the original watershed of this peneplain lay to the north and west of the line now occupied by the Chalk escarpment.* It probably trended from somewhere in the neighbourhood of Wincanton at a high level above Sherborne and Yetminster to Beaminster Down, and thence over Lewesdon and Pilsdon to the hills between Axminster and Lyme. The western part of this line, from Beaminster Down along the ridge on which Lewesdon and Pilsdon stand, is still the watershed between the streams which run southward and those which drain into the rivers Parret and Axe.

It will be noticed that this watershed does not coincide with the longer axis of the Marshwood pericline, but lies to the north of it.

* See "Origin of the Valleys of North Dorset," in Proc. Dorset N.H. and A.F. Club, Vol. xvi., p. 5.

In order, therefore, to understand the drainage system of this part of Dorset we must imagine a time when the surface of the land sloped gently both northward and southward from the line above mentioned. On this surface there was a certain accumulation of clay, pebbles, cherts, and flints, the heavy and insoluble relics of the Eocene, Greensand, and Chalk which had been destroyed; remnants of this deposit, which is generally called "the clay with flints," still remain on the tops of the higher hills.

The rain flowing down the southern slope of this surface gathered into streams, which cut channels for themselves through the Chalk and Greensand. They ran, of course, high above the present surface, and their courses were prolonged far to the southward before reaching the sea; indeed, during the Miocene and again in the later Pliocene time it is probable that most of the English Channel was dry land, and that these Dorset streams were merely tributaries of a large river which ran westward down the valley of the Channel.*

Now the slope along which these streams made their way was planed across the summit of the low dome or pericline, which has been described, and as we have calculated the base of the Greensand on this summit to have been about 100 feet higher than it is at Lewesdon, where the thickness of Greensand at present is not more than 130 feet, and as the surface sloped southwards from Lewesdon, there cannot have been much Greensand left over the central area of the pericline when the streams began to make their valleys. Hence, as they deepened their channels they would quickly cut through the Greensand on the central area and would soon enter the Jurassic beds on which the sand rests; these beds are the Midford Sand, the Upper Lias clay (which is thin), and the Marlstone Sands.

As soon as any stream cut into the Upper Lias the water on the overlying sands would issue in the form of springs. Thereby the volume of the streams would be increased and at the same time

* For a restoration of English geography at this time see "Building of the British Isles," by the Author, Plate xiii.

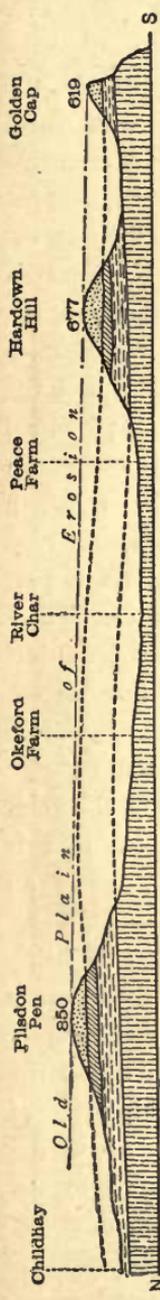


FIG. 2.—SECTION THROUGH PILSDON PEN AND HARDOWN HILL ALONG THE BROKEN LINE ON THE MAP.
For reference to Strata see Index to the Map. The dotted lines show the former continuation of Beds.

landslips would take place, as is always the case where springs issue from sand overlying a clay. The valleys would be rapidly widened, and during periods of upheaval they would be deepened also. Much of this work was probably done during the Glacial Period and was finally completed during the time when the raised beaches of the south coast were being raised to their present position. Over the western part of the pericline the Midford Sands and Upper Lias are absent; that is to say, they were planed off before the Greensand was deposited, and the latter rests directly on the Marlstone Sands. Here the process of valley erosion would continue till the base of these sands was reached, when strong springs would be thrown out by the underlying *margaritatus* clays, and these clays would be for a certain distance exposed along the valley bottoms.

We must remember that all this time the slope of the valley-ways was less than the southerly inclination of the beds on the southern curve of the pericline; hence the rivers, after cutting through the lower clays for a space, would again enter the Marlstone Sand and still further south would again enter the Upper Lias and Midford Sand, as shown in the accompanying diagram.

Now, where the sides of a valley consist of clay, they are rapidly acted on by rain and frost and are made to recede by frequent landslips, but where they consist of firm and dry sand there is very little slipping and the valleys remain comparatively narrow. Thus

it came to pass that a wide tract of clay was gradually exposed over the western part of the periclinal area, while to the southward the rivers pass through valleys with steep slopes on each side, the intervening tracts rising into a succession of hills, some of which are capped by patches of Inferior Oolite and others by remnants of the original covering of Greensand.

These southern hills are well seen by anyone standing at the foot of Pilsdon Pen, and they look as if they would present an impassable barrier to any river running southward from the watershed on which the observer stands.

The rivers which now drain the district are the Char and the Simene, while the Brit drains the eastern part of the periclinal area, and they all make their way through gaps in the southern hills. But, besides the valleys of these rivers, there is a wide gap at the head of the valley of the little river Chid, which runs through Chideock, and I think it probable that this gap was part of the valley of a river which had a more northern source. There is little doubt that in some cases one river-system extended itself at the expense of another, the lateral tributaries of the one encroaching on the area drained by the other, and sometimes entirely cutting off or capturing the headwaters of the adjacent river.*

The present course of the Char is so different from the comparatively straight courses of the Simene and the Brit, that it suggests the idea of its having absorbed the tributaries of an eastern neighbour. The col at the present head of the Chideock valley does not rise above 250 feet, the hills on each side being double that height, and I am inclined to think that there was a time, before the valleys were carved out to their present depth, when three rivers traversed the Vale of Marshwood, and that the ancestor of the Chid was one of them. The final sculpturing of the country took place during and soon after the close of the Glacial Period, and it was probably then that the capture by the Char of the upper tributaries of the Chid was accomplished.

* For a case in Lincolnshire described by the Author see *Quart. Journ. Geol. Soc.*, Vol. 39, p. 596, 1883.

In conclusion, I may briefly call attention to the points of resemblance and difference between the Vale of Marshwood and the Weald of South-eastern England. Both are elliptical periclinal areas, both have been truncated by planes of (presumably marine) erosion, and both have rivers which, after traversing the inner plain, pass through gaps in the southern escarpment to reach the sea. In the Weald, however, the watershed coincides roughly with the longer axis of the pericline, and the streams run both northward and southward, so that both lines of escarpment are trenched by river valleys. In the case of the Dorsetshire Weald the original watershed was outside and north of the central axis, so that all the streams ran southward and only the southern border is trenched by river-valleys.

The features of the northern range of hills have been produced by the detritive agencies of rain and frost, heat and cold. The greater height of the northern range of hills as compared with the summits of the southern range, is due to a combination of two causes: in the first place they are nearer to the central axis of the pericline, and in the second place they form part of a watershed which was the summit of a peneplain sloping southwards over the southern hills into the valley of the English Channel. It is, in fact, on this particular combination of a pericline truncated by a southward sloping plain that the physical geography of West Dorset primarily depends.

With respect to the isolation of Pilsdon and Lewesdon Hills, this has been effected by the excavation of the intervening spaces; in technical language they are "hills of circum-denudation." The interspaces are the heads of the valleys formed by the action of rain and springs on the slopes of the old watershed. The tributaries of the Axe have trenched it on the north, while on the south side the strong springs thrown out at the base of the Marlstone Sands have eaten backward some little way into the ridge of the original watershed, causing the actual water-parting to retreat northward. This recession has taken place principally near the villages of Pilsdon and Bettiscombe, while Lewesdon

may really be very nearly on the site of the original ridge of the watershed.

The same process has taken place near Beaminster, where the spring-heads which furnish the head-waters of the Brit have undoubtedly eaten deep into the Chalk and Greensand area, and there the escarpment is still receding, as the frequent scars of landslips testify.

It will be seen, therefore, that the history of the evolution of the present physical features of West Dorset involves the consideration of many agencies and many conditional phases. Here, as elsewhere, rain, rivers, snow, frost, and heat, have been the principal agents at work, but in order to understand how their operation has resulted in the particular arrangement of hills and valleys which we see around us, we must form some conception of the conditions under which they started to work, and we must remember that their working powers have always been guided and modified by the movements of the land, those slow movements of upheaval and subsidence to which every portion of the earth's crust has been repeatedly subjected.





Report on Observations of the First
Appearances of Birds, Insects, &c., and the
First Flowering of Plants

IN DORSET DURING 1896.

By NELSON M. RICHARDSON, B.A., F.E.S.



THE names of those who have this year sent in returns are as follows ; they are denoted in the Report by initials :—

- (J. C. M.-P.) J. C. Mansel-Pleydell, Whatcombe, near Blandford.
- (N. M. R.) N. M. Richardson, Montevideo, near Weymouth.
- (E. R. B.) E. R. Bankes, The Rectory, Corfe Castle.
- (O. P. C.) Rev. O. P. Cambridge, Bloxworth Rectory.
- (H. J. M.) H. J. Moule, Dorchester.
- (T. R. A.) T. R. Atkinson, Sherborne.
- (J. M.) Job Mullins, Wylde Court, Hawkechurch.
- (E. S. R.) E. S. Rodd, Chardstock House, Chard.
- (G. H.) G. Hibbs, Bere Regis.
- (D. C.) D. Curme, Childe Okeford, near Blandford.

- (S. C.) S. Creed, Cheddington, Misterton.
 (Miss P.) Miss Payne, Weymouth.
 (H. S. G.) H. S. Gray, Rushmore (Wilts); also at Motcombe,
 near Shaftesbury.
 (R. F. W.) Rev. Canon R. F. Wheeler, Hazelbury Bryan
 Rectory.
 (E. J. B.) Rev. E. J. Bodington, Osmington Vicarage.

The number of observers (15) is the same as last year, the two last having replaced the Portisham and Broadstone observers of 1895; and Mr. Gray has sent in, for the first time, observations at Motcombe.

RARE BIRDS IN 1896.

GREAT SPOTTED WOODPECKER.—One seen at Whatcombe June 13. (J. C. M.-P.)

SOLITARY SNIPE.—One shot at Wareham October 10. (J. C. M.-P.)

SABINE'S GULL.—One shot at Christchurch Harbour, Hants, by Mr. E. Hart, September 26. (J. C. M.-P.)

GRASSHOPPER WARBLER (*Acrocephalus navius*).—Note by (E. R. B.)—"I find no mention of this in the lists of birds of the Purbeck Society Papers (1855-69). It was frequently heard by myself in a copse close to Corfe Castle Rectory and in a neighbouring withy bed, from April 23 onwards, and there can be little doubt that a pair or two must have nested there."

LESSER SPOTTED WOODPECKER (*Dendrocopus minor*).—Note by (E. R. B.)—"A specimen of this bird, which is extremely rare in Purbeck, took up its temporary abode in Corfe Castle Rectory grounds in the spring and was frequently heard making its peculiar rattling noise every day from April 19 till May 7, when finding presumably that there was no chance of getting a mate, it moved on elsewhere. It was particularly fond of sitting and rattling on the dead limb of an old black poplar tree within a few yards of the house, and I repeatedly watched it in the act through opera glasses. It took no notice of people passing beneath, but always flew off as soon as it realised that I was engaged in watching it. While

rattling, the movement of the head is so extremely rapid, that it seems to me quite impossible that each tap can be due to a separate act of volition, and I have no doubt that the movement, when once started, is continued, so to speak, automatically for a few seconds."

WHITE WAGTAIL (*Motacilla alba*).—"A pair visited my garden and strutted about the paddock in the 2nd week in October." (E. J. B.), Osmington.

NIGHTINGALE.—Several observers notice the abundance of this bird, and (J. M.) states that he has never before observed it at Hawkchurch, though this year he heard seven singing at once. They remained, however, only for three weeks. He comments on the resemblance of the songs of the Black cap and Reed warbler to that of the nightingale and says that he thinks that a small bird known locally as the "*White Robin*" which sings sweetly at night, is also often taken for it. At Weymouth, Corfe Castle, Sherborne, Chard, and other localities there is no record. On the two occasions on which the nightingale has been observed by (N. M. R.) at Weymouth (Chickerell, in each case singly) in the last 12 years, the bird has only remained for about a fortnight and then departed, as at Hawkchurch.

Mr. Mansel-Pleydell says:—"Nightingales very abundant in our woods. Two nests, each containing four eggs, were built in the grove near the Whatcombe stables, all of which were hatched and went off on June 20th and 24th. At Bere Regis the young birds of two nests were hatched and fledged; one is now in the possession of Mr. Hibbs, a member of the Field Club. I saw it last month (November?) in perfect health, plumage, and beauty." Of this bird Mr. Hibbs says:—

"Besides the nightingales' nests and young given in report left undisturbed, I have reared from another nest (the young of which left the nest on my approach) a fine cock bird. When found early in June it was quite young, having only a few feathers. I succeeded in rearing it by giving it insects; it is now, December 26, in splendid condition, very tame and interesting, feeds from the hand, and begins at this cold season to sing a few notes." (G. H.)

The following notes are by (E. J. B.), Osmington :—

“ Swallows were with us without apparent diminution till October 15th, and at Warmwell in diminished quantities till the 17th. They were missed on the 18th in the inland parts, but on the 19th I saw some still in the warm shelter of the cliffs at Osmington Mills. After that I only noticed stragglers.

A pair of ravens passed over us early in the nesting season, and a pair of falcons again nested on the cliffs between here and Lulworth, fortunately in safety, though last year a coastguard informed me he was offered a reward for taking the eggs.

A curious fact about swifts. They are to be seen in plenty at Preston, but though I have constantly looked out for them I have never seen one in this village ($1\frac{1}{2}$ miles distant). Why should they never come up the hill ?

I verified this year Mr. Warde Fowler's statement about chaffinches' imperfect attempts to produce their song early in the year, though I cannot say whether what I heard was the young birds learning their song for the first time, or the old birds endeavouring with only partial success to remember theirs of last year. But certain it is that for the first fortnight their song was heard it was only the first few notes of the cadence, with an occasional success in rendering the whole.

Each species of tit except the bearded (which I have not seen in this neighbourhood) is abundant here.

The labourers speak of a large yellow bird “about the size of a blackbird.” That was to be seen in the haymaking season of 1895. They summoned one another to look at it. Was it a Golden Oriole ?

I proved this year that the Meadow Pipit sometimes covers over its nest with grass when alarmed.”

(J. M.), Hawkchurch, sends the following note :—

“ The universally mild winter of 1895-6, followed by a very early spring, caused many plants to flower much earlier than usual. The persistent drought which immediately followed had a visible effect on the young foliage of such trees as the Lime, Ash, Plane, &c.

The foliage of these trees not being so large as usual caused the trees to look thinly clad, and by Midsummer, through the intense heat, the fall of the leaf began. The terrific gales which came upon us in September stripped the trees of their foliage, so that by the beginning of October the trees in general presented a wintery appearance. There is an unusual abundance of fruit for bird food, such as the Hawthorn, Elder, Holly-berry, Blackthorn, Acorns, &c., while the Hazel Nut was well-nigh ripe by the end of August. Ornithologically speaking, the Cuckoo appeared about the usual time, *i.e.*, the 19th of April, the Nightingale, the Corncrake, as also the Goatsucker. While the former almost entirely withheld her song, the evening was alive with the clatter of the latter. It is curious that only one solitary specimen of the Glowworm came under my observation, *i.e.*, on the evening of the 6th of June."

The Redstart has been noted by three observers, at Sherborne, Hawkchurch, and Rushmore, and the Red-backed Shrike by one, at Sherborne only. Both these birds are apparently scarce in Dorset, the latter not having been noted since 1892, but the bird is probably not known to some of the observers. The Corncrake is not usually noted by more than a few observers, and it is a bird the song of which would probably be noticed if present in the neighbourhood. The birds which were earlier this year than in 1895 are the Flycatcher, Fieldfare, Blackbird (nesting at the early date of January 16 at Bere Regis), Chiffchaff, Whitethroat, Skylark (song January 1st at Cheddington), Turtle Dove, Woodcock, and Redstart, whilst the Nightingale, Cuckoo, Swallow, and others were later, the swallow being no less than 16 days later in Dorset, in spite of which the last date on which it was seen is five days earlier than in 1895 so that its stay with us this year seems to have been unusually short.

The dates of the first flowering of plants show a striking contrast to those of 1896, being with but few exceptions considerably earlier in 1897, often from three to five weeks. Those that are later are but from one to four days later in flowering, except the Ivy and Water Mint, which latter is only recorded in 1897 by one observer

(H. J. M.), and may very likely have been earlier elsewhere. In 1896 all the records but one were later than this year. Ivy is nine days later. The dates of earliest leaves, not being recorded by many observers, are omitted from the above statement. When a plant such as the Hazel, which usually flowers very early in the year, is in flower before January 1st it is well to record the fact, giving the date towards the end of the preceding year at which it first came into bloom. Near Weymouth the female flowers of the Hazel usually begin to bloom in December, and, unless cut off by frosts, continue to do so for some time at the early part of the next year. In recording the date a note should be added "In bloom since December —th of the preceding year," or words to that effect, as the December flowering cannot be regarded as a late or second flowering, but as the earliest of the season of bloom, though this does not correspond with the year of our calendar.

I have again given for convenience of reference a column containing the earliest Dorset Records.

Mr. Bankes sends the following note on the Lepidoptera during 1896 :—

"As regards the Lepidoptera, my opportunities of observing the larger species were perhaps fewer than usual, but it seemed to me a decidedly good year for them, as it certainly was for numbers of the smaller fry. The insect hunter had a great advantage in 1896, for owing to the exceptionally fine, calm, and brilliant weather all through the spring and summer he could hardly fail to meet with and secure any rare or local species that were to the fore. From information received from various parts of England, many of our rarer native Lepidoptera appear to have been unusually plentiful in most parts of the country, particularly in the south; but the reverse of this was the case in a few localities. Although our native species were as a rule in great force, hardly any insects, either rare or common, seem to have flown over to us from the continent, and consequently we look in vain for records of the capture of those rarities which are not true natives, and which are only met with in such years as 1892, when immigration on a very large scale took

place. I did not see a single specimen of the Clouded Yellow Butterfly (*Colias edusa*) anywhere."

Other notes sent in are:—

First Leveret seen February 10th. (WHATCOMBE) (J. C. M.-P.)

Perfectly coloured Lunar Rainbow seen on April 28th at Childe Okeford. (D. C.)

Remarkably dry spring and summer. The chalk counties of Dorsetshire, Wiltshire, and Hampshire suffered much from the drought; also in parts of Cornwall the drought was very great. A very wet, mild autumn and winter up to Christmas. (E. S. R.)

And the following note which Mr. Hibbs sends in reference to his record of a Glow Worm on March 27th, 1895:—

"In my return of first appearances of insects, 1894, the Glow-worm is given March 27 in Vol. 16, page 191. In the editor's report, page 187, its early appearance is referred to doubtfully, but it is quite correct as to its early appearance, but the date should have been a day earlier, March 26th. It was found on Easter Monday and carried three-quarters of a mile, and was most active and very luminous. (G. H.)"

EARLIEST DORSET RECORD OF PLANTS IN FLOWER IN 1896—(continued).

	Earliest Dorset Record.	J. C. M. P. Whatcombe.	N. M. R. Weymouth.	Miss P. Weymouth.	E. R. B. Corfe Castle.	O. P. C. Bloxworth.	H. J. M. Dorchester.	T. R. A. Sherborne.	J. M. Hawchurch.	G. H. Bere Regis.	D. C. Childe Okeford.	S. G. Cheddington.	R. F. W. Hazelbury Bryan.
Yarrow	{ Leaf .. Jan. 15	.. May 20	.. June 30	..	.. June 23(1)	..	..	..	.. July .. 7	..	Jan. 15	June 23	
Ox-eye Daisy	{ Flower .. Jan. 26	.. May 9	.. May 26	..	.. May 9	..	..	..	.. May 16	..	Jan. 26	May 23	
Monse-ear Hawkweed	{ Flower .. May 5	.. May 12	.. May 21	..	..	..	..	..	.. May 5	..	..	May 23	
Harebell	{ Flower .. May 2	.. June 14	..	..	..	..	..	..	..	..	..	Aug. 4*	
Greater Bindweed	{ Leaf .. Ap. 6	..	..	..	..	..	..	..	..	..	..	..
Water Mint	{ Flower .. June 1	.. July 1	.. June 19	..	..	..	..	..	.. Ap. 6	..	..	..
Ground Ivy	{ Flower .. Jan. 12	..	..	..	..	..	..	..	.. June 1	..	..	June 20	
Wych Elm	{ Leaf .. Mar. 11	.. Mar. 11	.. Ap. 6	.. Ap. 22	..	..	..	..	.. Ap. 3	..	Jan. 12	..	
Hazel	{ Flower .. Ap. 1	.. Feb. 19	.. Mar. 2	..	..	..	..	..	.. May 2	..	Mar. 20	..	
Red Female	{ Leaf .. Mar. 21	..	..	..	..	..	..	..	.. Feb. 4	..	Ap. 1	..	
Cowslip	{ Flower .. Jan. 2	.. Jan. 18	.. Jan. 2	..	..	..	..	..	..	..	Mar. 15	..	
Spotted Orchis	{ Flower .. Mar. 19	.. Mar. 19	.. Ap. 7	.. Ap. 11	..	..	..	..	..	..	Mar. 21	..	
Bluebell	{ Leaf .. Ap. 6	.. May 20	..	.. Ap. 15	..	..	..	..	..	..	Feb. 11	..	
	{ Flower .. Jan. 12	.. Mar. 27	.. Ap. 23	.. Ap. 18	..	..	..	..	..	..	Feb. 11	..	
	{ Flower .. Mar. 23	..	..	..	..	..	..	..	..	..	Mar. 23	..	

WEYMOUTH.—Sallow Mar. 3. HAWKCHURCH.—Ripe fruit. Hawthorn, Aug. 27 ; Ivy, Mar. 31 ; Elder, Aug. 6 ; Hazel, July 23. CHILDE OKEFORD.—Harebell and Honeysuckle in bloom, Oct. 10 ; Sallow in bloom and Honeysuckle and Lilac in fresh leaf, Dec. 31.

HAZELBURY BRYAN.—Apple in bloom, Ap. 26 ; Lilac in bloom, Ap. 23.

(1) At Swanage. (2) Abundant flowering. (3) In leaf and bloom on Dec. 26, 1895.

* Had been in flower a few days.

	Earliest	Dorset	Record	J. C. M.-P.	Whacombe.	N. M. R.	Weymouth.	E. R. B.	Corfe Castle.	O. P. C.	Bloxworth.	T. R. A.	Sherborne.	J. M.	Hawkchurch.	E. S. R.	Chard.	G. H.	Bere Regis.	D. C.	Childe Okeford.	S. C.	Chedlington.	H. F. W. Hazelbury Bryan.	H. S. I. Rushmore.	E. J. B. Osmington.
Flycatcher	Ap. 12	Nov. 6	Nov. 6	Nov. 6	May 15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fieldfare	Nov. 6	June 6 L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Blackbird	Jan. 1 S.	Jan. 1 S.	..	..	Feb. 17 s. (2)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Redwing	Jan. 16 N.	Jan. 16 N.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nightingale	Jan. 5	Jan. 5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wheatear	Ap. 14 S.	Ap. 18 (4)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Willow Wren	Mar. 24	May 2 N.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chiffchaff	Ap. 8	Ap. 11 S.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Whitethroat	Mar. 15 S.	Ap. 8 S.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Skylark	Ap. 10 S.	May 1 S.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Rook	Jan. 1 S.	Feb. 8 S.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cuckoo	Feb. 6 N.	Feb. 24 N.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Ap. 16 S.	Ap. 17 S.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	July 12 L.	Ap. 14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Swallow	Mar. 26	Ap. 14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sand-Martin	Nov. 3 L.	Ap. 18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Swift	Ap. 29	Ap. 30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Sept. 6 L.	Sept. 6 L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nighthawk	Ap. 23 S.	May 9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Turtle dove	Ap. 27	Ap. 27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Woodcock	Oct. 13	Oct. 13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	May 14 L.	Mar. 19 L.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cornrake	May 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wynneck	Ap. 21 S.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Red-backed Shrike	May 27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Redstart	Ap. 6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

N. Nesting. E. First Egg. S. Song first heard. L. Last seen.

WHATCOMBE.—Nightingales abundant. Two nests, May 7. Four young birds fledged in one nest June 20; in the other on June 24th. In June a field was frequented several days by Turtle Doves and Stock Doves; on one occasion there were 32 and 20 of each respectively. A Great Spotted Woodpecker seen June 13. A pair of Green Woodpeckers, after pecking out a hole in an ash about 18ft. from the ground and building their nest, hatched the brood, and young ones were seen on July 6.

WAREHAM.—Solitary Snipe shot Oct. 10; Sand-Martin Ap. 10; Swift, May 2.

CORFE CASTLE.—House Martin Ap. 26; Grasshopper Warbler Ap. 23. Lesser Spotted Woodpecker (*Dendrocopos minor*) Ap. 19—May 7.

BERE REGIS.—Robin's nest with 4 eggs, March 20. Young Thrushes left nest Mar. 25. Nightingale's nest with 5 eggs found; young hatched May 28, left nest June 9.

OSMINGTON.—A pair of White Wagtails (*Motacilla alba*) in 2nd week in Oct.

HAWKCHURCH.—J. M. has never observed the nightingale here before. This year he heard 7 at once, but all were gone in 3 weeks.

(1) First seen this winter on Jan 22, 1897; weather till then very mild. (2) Young birds seen Feb. 16. (3) Scarce. (4) Plentiful. (5) 2 seen on May 11. (6) A few stragglers seen later.

FIRST APPEARANCES OF INSECTS, &c., IN DORSET IN 1896.

	Earliest Date	J. C. M. P.	Whacombe.	N. M. R.	Weymouth.	E. R. B.	Corfe Castle.	O. P. C.	Bloxworth.	H. J. M.	Dorchester.	T. R. A.	Sherborne.	J. M.	Hawkchurch.	H. S. G.	Rushmore.	H. S. G.	Motcombe.	G. H.	Bere Regis.	D. C.	Childe Okeford.	S. C.	Cheddington.	R. E. W. Hazelbury Bryan.
Rose Beetle	July 20	..	..	July 20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cock-Chaffer	May 6	May 18	..	May 8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fern-Chaffer	June 14	June 11	..	June 26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bloody-nose Beetle	Mar. 10	Mar. 11	..	June 18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Glow-Worm	May 2	May 2	..	June 18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Common Hive Bee, h.	Feb. 11	Mar. 16	..	Mar. 19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wasp, queen, h.	Jan. 25	May 6	..	Mar. 1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Large White Butterfly	Mar. 20	Mar. 20	..	May 10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Small White Butterfly	Mar. 19	Mar. 22	..	Mar. 19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Orange-Tip Butterfly	Ap. 10	Ap. 10	..	May 18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Meadow Brown Butterfly	Ap. 23	May 30	..	June 1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wall Butterfly	Ap. 30	July 3	..	May 9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Brunstone Butterfly, h.	Mar. 10	Mar. 23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Painted Lady, h.	Mar. 22	Ap. 15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cinnabar Moth	May 15	May 21	..	June 9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Currant Moth	June 24	..	..	June 24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Viper, h.	Feb. 15	Mar. 14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Frog Spawn	Feb. 1	Feb. 15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

(A), Abundant. (S), Scarce.

WHATCOMBE.—Eleven Glow-Worms on a bank Sept. 11. First Levelet seen Feb. 10. WEYMOUTH.—Humble Bee, Ap. 18.

CORFE CASTLE.—*Lycena argyolus*, Ap. 21; *Pararge egeria*, Ap. 22. See also note by E. R. B. ante.

HAWKCHURCH.—Toads scarce this year (J. M.).

RUSHMORE.—*Lycena argyolus*, Ap. 24; *L. bellargus*, June 1. Neither species observed before by H. S. G. at Rushmore.

MOTCOMBE.—*Melitiza avarinaria*, May 31; new to district. CHEDDINGTON.—Humble Bee, Mar. 31.

(1) More plentiful than for some years past. (2) Fresh specimen July 13. (3) Several worm specimens seen on Swanage cliffs, and, as none had been seen there before, (E. R. B.) has no doubt that they had just migrated from the continent; no fresh ones, however, were observed in the autumn. (4) Butterflies in general fairly plentiful, but the Meadow Brown Butterfly, considering its usual abundance, has been rather scarce, especially on high and poor lands where there is not much grass (J. M.). (5) Swarm seen May 17 at 9.0 a.m. (6) A great many specimens of small size. (7) One seen flying about on December 27.



Returns of Rainfall, &c., in Dorset in 1896.

By HENRY STORKS EATON

(Past President of the Royal Meteorological Society).



SIX new Stations have been established, raising the total number to 43. Their approximate height above ground and sea-level is :—Burstock, 7in. and 500ft. ; East Fordington, 4ft. and 200ft. ; Sandford Orcas, formerly in Somerset, 1ft. and 200ft. ; Victoria Hotel, Swanage, 1ft. 11in. and 26ft. ; Rowlands, Wimborne, 2ft. 6in. and 110ft. ; and Markham, Wyke Regis, 1ft. and 80ft. At Dorchester and Powerstock, omitted from the list last year, the position of the gauges above ground and sea-level is respectively 6in. and 305ft. and 8in. and 200ft. No register has been discontinued.

Complete schedules of the daily observations on the Club forms have been received from all the Observers except from Bloxworth Rectory, Corfe Castle (Furzebrook), and Sandford Orcas.

Tables I. and II. need no explanation.

The statement of rainy days in Table III. does not include the three stations from which only abstracts have been received, nor where an entry of .01in. of rain occurs less than eight times in the course of the year. With these reservations the average of 156 rainy days is derived from 33 Stations. If the 42 complete

returns were taken into account the number would be reduced to 150.

The ratio of the rainfall to the average, of the same 20 stations as those given last year, is 89, a deficiency of 11 per cent. It varied between 106 at Hamworthy and 76 at Weymouth.

This has been a year of extremes. May was excessively dry everywhere ; even more so than last year, when the drought was unprecedented. In September, on the other hand, nearly as much rain fell at some stations as in September of four ordinary years. Very rarely does the rainfall in any month reach three times the average or 300 per cent. of the normal. The very wet month following the 20th of October, 1894, is the most recent instance of a similar fall ; but it happened at the most rainy time of the year, and, though the fall of rain was greater, the ratio to the normal is less remarkable. Previous to the present September it had only attained this high value thrice since registration began. In the disastrously wet November of 1852 the ratio at Melbury, the only Dorset station for which details exist, was 338, and in September, 1866, 321 at the same place. In December, 1876, it was 307 at Osmington. Now, in September, 1896, it has considerably exceeded three times the average in South-East Dorset, the highest ratio being 373 at Swanage and 372 at Hamworthy. The area involved in this excessive fall comprises the Isle of Purbeck and all South-east Dorset ; and from data in "British Rainfall" it seems to have extended with somewhat less intensity over South Hants and the Isle of Wight into West Sussex. In West Dorset the ratio diminished to 200 and to less in Devon ; and in the North-West it was nearly as low. From the paucity of observations no close comparison between 1866 and 1896 is possible for the whole County. In all except five cases the stations are different and therefore do not represent the same areas ; but from an average of 10 gauges in the earlier year and 24 in the latter, September, 1866, was apparently slightly the wetter month. The rain was nowhere less than two-and-a-quarter times the average, and was more evenly distributed than in 1896.

In the following statement the ratios are based on the adopted annual rainfall of the several stations and the factor for September (1940) given in Table III. :—

	Average.	1866.		1896.	
		Depth.	Ratio.	Depth.	Ratio.
		In.		In.	
Beaminster	39·31			7·40	200
Blandford	34·31	8·45	256		
Bloxworth Rectory	34·58			9·48	292
Bridport	30·86	7·39	255	6·17	213
Cattistock	42·53			8·08	202
Chalbury	31·16	8·71	297	9·17	313
Cheddington	42·56			8·68	217
Corfe Castle, Furzebrook	34·52			11·18	345
Creech Grange	36·70			11·60	336
Dorchester	36·52	9·34	272	8·22	239
Encombe	32·94	8·90	288		
Gillingham	33·12			6·80	218
Hamworthy	28·37			9·92	372
Langton Herring	30·39			6·76	236
Lyme Regis	34·16	7·45	226		
Lytchett Minster	30·49			10·13	353
Melbury	38·62	11·66	321	8·02	234
Parkstone	31·00			9·23	317
Portisham	32·79			7·09	230
Shaftesbury	34·17	7·78	242	7·51	234
Sturminster Newton	30·39			6·03	211
Swanage	29·74			10·43	373
Upwey	30·96	7·93	266		
Wareham	31·56			9·33	348
" Binnegar	33·12			9·11	293
West Bucknowle	31·41	8·32	282		
Weymouth, Nothe	28·58			5·94	221
Winterbourne Whitchurch, Whatcombe	35·36			8·57	258
Wyke Regis, Belfield House	30·89			6·61	228
Average		8·59	270	8·39	270

In the last three columns of Table III. the monthly averages and ratios are given for the 41 years ending 1896. The very unusual distribution of rain this year has considerably modified the monthly values derived from the 40 years 1856-95. The ratio for September is largely raised, and December comes out wetter than January. When projected graphically the curve of monthly rainfall is more even, and, by incorporating the latest returns, an uninterrupted increase of rain is shown from May to October and diminution from October to May.

The normal monthly rainfall at any place may be found by multiplying the annual fall by factors representing the ratio of the monthly to the annual fall taken as unity. The adopted annual rainfall 1848-92, and the factors in Table III., deduced from the

41 years' average 1856-96, have been employed in this Report unless where otherwise stated.

An example worked out for Chalbury will illustrate the process. The adopted annual rainfall is 31·16in. The observed rainfall in 32 years is 31·64in.

By multiplying the adopted rainfall by the factors in the last column but one of Table III., the monthly values in column *a* are obtained. Column *b* shows the observed rainfall from 1865 to 1896; and column *c* the observed annual rainfall distributed proportionally over the several months as in column *a*. In the final column, *d*, the monthly ratios have been calculated from column *b*.

RAINFALL AT CHALBURY.

	<i>a.</i> Computed. 1848-92.	<i>b.</i> Observed. 1865-96.	<i>c.</i> Computed. 1865-96.	<i>d.</i> Ratio. 1865-96.
	In.	In.	In.	
January	3·08	3·13	3·13	990
February	2·23	2·33	2·27	737
March	2·12	1·94	2·15	613
April	2·03	2·03	2·06	642
May	1·80	1·89	1·83	596
June	2·07	2·09	2·10	660
July	2·29	2·43	2·33	769
August	2·46	2·54	2·49	802
September	2·93	3·02	2·97	954
October	3·71	3·72	3·77	1176
November	3·30	3·41	3·35	1078
December	3·14	3·11	3·19	983
	31·16	31·64	31·64	1·0000

OBSERVERS' NOTES, &c.

Bloxworth.—The heaviest rainfall during any one period of 24 hours was on September 4th, 1·91in. In the previous 24 hours—i.e., September 3rd—1·16in. fell, and on September 21st 1·18in. After the four months' drought, April-July, we expected a heavy crop of after-grass from the rain of August and September, but it was unusually thin and poor. The rain being attended with a very low temperature was probably the cause of this. An unusual absence of thunderstorms this year.

Bridport—Thunderstorms in the afternoon, June 14th.

Chalbury—Rainfall amounted to nearly the average, but very unevenly distributed. Cannot remember so many heavy falls (six

of lin. and more) in one year. Highest temperature 79°, July 22nd ; lowest 25, February 23rd and 24th.

Cheddington—Fourteen years' average rainfall has been 40·26in. Rainfall of the year only 2½in. under average. There was no remarkably heavy rain or thunderstorm during the year. Highest temperature 81° on 15th of June and 13th and 21st of July. There was no snow worth mentioning.

Dorchester—Slight thunderstorm in the afternoon, July 7th.

Hamworthy—May 20th, Rain 0·11in., thunder ; June 4th, 0·46in., thunder ; September 8th, 1·96in. At 7.30 p.m. commenced one of the heaviest thunderstorms I have noticed in England although it only lasted four hours. It was a continuous series of storms. The lightning was so vivid that the whole country was more brightly lighted than with a full moon.

Hazelbury Bryan—September 8th, heavy thunderstorm ; 25th, strong gale of wind W.—S.W., maximum about 2 p.m. Many large trees blown down.

Langton Herring—Greatest rainfall in 24 hours 0·96in. on September 3rd. September 4th, 0·70in. ; 8th, 0·59in. Highest temperature 79° on June 14th, lowest 26° on February 25th and December 21st. Average 50·4, 0·6 above the mean of 25 years.

	Max.	Min.		Max.	Min.
January	44·9	37·4	July	70·6	55·9
February	45·8	35·6	August	68·0	53·6
March	51·8	41·3	September	63·3	52·9
April	58·1	42·8	October	52·1	41·9
May	64·6	46·8	November	45·6	35·9
June	69·3	54·2	December	44·2	36·5

[On ten days * seems to indicate slight rain not measurable.—
H. S. E.]

Marnhull—June 15th, shortly after 3 p.m. a labourer was killed by lightning.

Melbury—July was dry and much blight on trees. All the brassica tribe very much blighted. 25th grass all browned. Short crop of hay. Harvesting on 28th. Plums earlier than usual by two weeks. September 25th heavy north-west gale, which did much damage to trees and shrubs.

Parkstone—September 8th, exceptionally grand thunderstorm, with 2·12in. of rain, most of which fell between 9.30 and 11.30 p.m.

Powerstock—December 13th, rain 1·25in. The whole of this, the heaviest rainfall of the year, fell between 10 p.m. December 13th and 9 a.m. December 14th.

Shaftesbury—May 20th, thunder and hail. June 15th, thunderstorm. July 7th, thunderstorm. Rain 0·51in. August 1st, heavy thunderstorm. Rain 1·09in. September 8th, thunderstorm.

Verwood—No snow in the year. On June 15th we had a thunderstorm with a very heavy rainfall. The clock was striking 3 p.m. when the first drops began to fall, and for two hours it rained in torrents. My garden, little else but sand, seemed turned into a lake ; at 5 o'clock it suddenly cleared up. Just one storm and nothing more. Rain 0·78in.

[Rain measured on May 1st, 0·28in., belongs to April, the rain being put down to the day on which it is measured, not the previous day.—H. S. E.]

Wareham, Binnegar Hall—Rainfall of an inch or more in 24 hours :—September 4th, 1·66in ; 21st, 1·05in. ; 24th, 1·13in. ; December 13th, 1·14in.

Wimborne—[On 16 days the Observer marks a slight fall of rain by * without giving the amount.—H. S. E.]

Winterbourne St. Martin (or Martinstown)—From the 30th of March to the 3rd of June only 0·93in. of rain. No heavy thunderstorms nor any great extreme of temperature. A maximum shade temperature of 78° was recorded two or three times in July. A very early corn harvest commenced about the 13th of July.

Winterbourne Whitchurch, Whatcombe—June 15th, thunderstorm. A remarkable atmospheric disturbance September 24th and 25th accompanied by a violent and destructive hurricane from the north-west, when the barometer fell an inch in nine hours. Its fury culminated at 2 p.m. on the 25th, leaving in its wake a scene of desolation. The weather did not recover its equilibrium until the morning of the 26th, and the barograph showed oscillations until the evening.

TABLE I.—MONTHLY DEPTH OF RAIN IN INCHES IN 1896.

Observer.	Station.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Rev. A. A. Leonard	Beamminster Vicarage	1.34	.68	3.97	.63	.07	2.44	1.38	2.16	7.40	3.13	1.20	6.76
Rev. W. Farrer	Bere Regis Vicarage	.37	.37	3.15	.56	.14	2.00	.60	1.05	8.16	3.71	.77	6.40
F. D. Iys	" (Whitelovington)	1.23	.48	3.84	.74	.24	2.01	.63	1.32	9.04	3.45	.88	6.62
Rev. O. P. Cambridge	Bloxworth Rectory	1.14	.54	3.54	.74	.16	2.02	.63	1.38	9.48	4.27	1.12	6.51
H. Gordon	Bridport, Coneygar Hill	1.14	.55	3.01	.50	.07	2.30	1.08	2.15	6.54	2.74	1.19	5.14
C. E. M. Pinney	" West Bay Road (Portville)	.96	.49	2.89	.47	.09	2.41	1.08	1.80	6.17	2.60	.89	4.52
Rev. W. C. H. D'Aeth	Broadwindsor, Blackdown House	1.26	.67	3.89	.55	.05	3.05	2.07	2.05	7.85	2.92	1.34	7.82
Rev. J. W. C. Warren	Buckhorn Weston Rectory	.89	.31	3.38	.49	.14	1.55	.90	2.08	6.38	1.92	.89	4.17
H. I. Palairé	Burslock, Hursey	1.55	.77	4.76	.89	.11	2.49	1.63	2.35	9.36	3.29	1.02	7.90
Rev. G. H. Billington	Cattistock Lodge	1.05	.39	3.48	.67	.24	2.20	.77	3.21	9.17	3.47	.98	5.70
S. Creed	Chalbury Rectory	1.69	.87	4.63	.76	.08	3.10	1.86	2.88	8.68	3.35	1.45	8.63
I. W. Pike	Corfe Castle, Furzebrook	1.59	.46	2.59	.55	.16	2.61	1.10	2.28	11.18	3.85	.89	6.07
T. Tyler	Crech Grange	1.56	.31	2.90	.39	.16	2.78	.94	1.59	11.60	3.75	.85	6.44
G. J. Hunt	Dorchester Waterworks	1.59	.48	3.45	.43	.08	2.24	.90	1.31	8.22	3.49	.84	6.90
R. Hayne	Fordington	1.57	.49	3.69	.54	.09	2.09	.97	1.25	7.98	3.94	.88	7.53
S. H. Stephens	Gillingham	1.22	.42	3.50	.72	.08	1.77	1.14	2.66	6.80	2.57	.95	5.67
Rev. M. Henderson	Hanworthy (Belle Vue)	.73	.27	2.98	.72	.38	2.54	.55	2.12	9.92	3.06	.87	5.87
Rev. Canon R. F. Wheeler	Hazelbury Bryan Rectory	1.02	.66	4.43	.76	.13	2.93	1.41	1.59	8.40	4.04	1.30	8.85
G. Coffin	Holwell (Westrow)	.92	.48	4.00	.76	.24	2.23	1.41	2.12	6.30	2.93	1.26	6.12
Rev. G. Wellington	Horton Vicarage	1.16	.41	3.69	.76	.24	2.45	.95	2.78	9.09	3.30	.96	6.12
Rev. C. H. Gosset	Langton Herring Rectory	1.09	.37	2.72	.67	.15	1.91	.72	1.04	6.76	2.47	.76	5.65
F. Styring	Lychett Minster (The Yarralls)	.90	.28	3.09	.68	.26	2.25	.45	2.32	10.13	2.53	1.12	4.30
R. Kinton	Melbury Sampford	1.37	.73	4.43	.61	.12	2.51	1.72	1.43	8.02	3.89	1.47	8.22
E. H. Barnes	Parkstone (Heathlands)	1.00	.36	3.34	.94	.33	1.73	.75	2.43	9.23	3.43	.94	5.17

TABLE I.--(CONTINUED.)

Observer.	Station.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
W. Symes..	Portisham	1.51	.43	3.26	.56	.15	2.11	.86	1.53	7.09	2.46	.88	5.86
Rev. W. R. Waugh	Portland, Chesil	1.03	.25	2.91	.42	.17	1.24	.74	1.82	5.48	2.36	1.17	3.64
R. S. Clarke	Powerstock (West Milton)	1.14	.59	2.81	.61	.07	2.82	1.48	1.82	7.02	2.62	.89	5.80
Rev. W. Esdaile	Sandford Orms Rectory	.84	.45	3.54	.83	.12	2.34	1.24	2.02	6.25	2.04	.98	5.02
Miss L. Wand	Shaftesbury Hospital	1.19	.37	3.50	.77	.24	1.63	1.61	3.32	7.51	2.64	.84	5.25
A. R. Hallett	Sturminster Newton (Riverside)	.87	.28	2.80	.56	.26	1.75	.76	1.52	6.03	2.66	.84	5.72
Rev. H. Pix	Swanage	1.14	.26	2.90	.49	.30	2.08	1.34	2.05	10.43	3.18	.74	4.79
F. A. Bart	" (J. Gordon Villas)	1.17	.24	2.94	.43	.14	1.88	1.29	2.21	10.25	3.07	.64	4.86
H. B. Vincent	" (Victoria Hotel)	1.06	.22	2.87	.48	.28	1.97	1.32	2.03	10.38	3.11	.69	4.91
W. R. Fryer	Verwood Manor	1.38	.46	3.03	.67	.55	2.60	1.15	2.91	8.33	3.11	.85	5.35
S. W. Bennett	Wareham	.89	.30	3.27	.39	.14	2.57	.84	1.59	9.33	3.30	.95	6.23
O. C. Farrer	" (Binnegar Hall)	1.12	.38	3.11	.42	.07	2.22	.73	1.30	9.11	3.67	1.00	6.44
J. R. Eyles	Weymouth, Nothe	.85	.25	2.61	.52	.19	1.21	.64	1.00	5.94	2.53	.83	5.24
Major-General Maclean	Wimborne (Rowlands)	1.05	.36	2.92	.52	.22	1.73	.62	3.10	9.29	3.07	1.18	5.66
Captain J. E. Acland	Winterbourne St. Martin	2.31	.64	4.29	.71	.13	2.41	.95	1.72	9.57	3.03	1.04	7.37
H. Stillwell	" Steepleton Manor	2.18	.66	4.32	.58	.08	2.27	1.03	1.75	8.80	3.15	1.02	7.32
J. C. Mansel-Pleydell	" Whitchurch, Wharcombe	1.34	.52	3.78	.54	.28	2.44	.86	1.67	8.57	3.55	1.00	6.60
Mrs. Pretor	Wyke Regis (Belfield House)	.90	.50	3.00	.66	.18	1.69	.69	.95	6.61	2.74	.94	5.88
Rev. G. A. Rideout	" (Markham House)	..	..	..	..	..	..	.38	.91	6.78	2.72	.92	5.92
G. Grover ..	DEVON.	..	..	..	..	..	..	..	..	..	..	..	..
	Rousdon	1.08	.61	3.45	.35	.06	1.60	1.69	2.11	6.29	2.61	1.09	6.57
General Pitt-Rivers	WILTS.	..	..	..	..	..	..	..	..	..	..	..	..
"	Larmer Grounds	1.44	.56	3.64	.56	.18	1.94	.95	2.38	9.33	3.90	.96	6.52
"	Rushmore	1.56	.34	3.73	1.00	.23	1.92	.87	2.88	9.78	3.22	.70	6.21

TABLE II.—RAINFALL IN 1896.

Station.	Total.		Greatest Fall in 24 Hours.		Days of		Number of Days on which $\frac{1}{10}$ lin. or more was Recorded.											
	In.	Depth.	Date.	in. or more, only.	Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
Beaminster Vicarage..	31.16	1.46	Dec. 13	4	1871	15	7	28	11	3	12	10	11	26	16	8	24	
Bere Regis (Whiteflovington)	27.94	1.39	Sept.	4	1852	10	4	22	8	3	10	9	12	26	19	8	21	
Bloxworth Rectory	31.48	1.33	"	3	1863	11	6	23	10	6	10	9	12	26	21	7	22	
Bridport, Coneygar Hill	31.53	1.91	"	5	1836	8	4	21	8	4	7	5	11	26	16	5	21	
"	26.41	1.19	"	4	1840	12	8	22	8	1	10	6	7	24	16	7	19	
"	24.37	1.19	"	1	1838	10	8	22	8	1	10	6	7	24	16	7	19	
Broadwindsor (Blackdown House)	33.52	1.70	Dec.	6	1857	9	4	24	10	1	11	11	12	27	15	10	24	
Broadwindsor Rectory	23.10	.90	Sept.	0	1849	9	4	23	8	3	13	10	14	25	14	6	20	
Burstock, Hinsey	1.61	Dec. 13	"	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Burstock Lodge	36.49	1.81	"	4	1829	16	10	27	13	3	12	9	12	26	15	7	21	
Chalbury Rectory	31.33	1.84	Sept.	6	1853	8	3	20	10	4	14	11	15	25	18	12	24	
Cheddington	37.98	1.69	Dec.	4	1878	15	9	27	12	3	11	10	12	28	18	5	20	
Corfe Castle, Furzebrook	33.33	1.89	Sept.	4	1843	9	6	20	8	3	9	10	10	24	17	6	21	
Creech Grange	33.27	1.68	"	4	1824	11	4	15	4	5	8	8	9	23	15	4	18	
Dorchester Waterworks	29.93	1.09	"	2	1857	11	6	26	6	2	12	11	10	25	19	7	22	
Fordington	37.02	1.22	"	2	1860	13	6	27	10	2	12	9	10	25	18	6	22	
Gillingham	27.50	1.17	Dec.	13	1871	12	8	25	9	3	15	13	13	24	18	9	22	
Hamworthy (Beile Vue)	30.01	1.96	Sept.	5	1836	7	3	20	10	5	8	7	10	24	17	4	21	
Hazelbury Bryan Rectory	35.57	1.80	"	6	1854	11	6	24	9	3	13	10	10	23	20	7	18	
Holwell (Westrow)	29.29	1.25	Dec.	3	1822	9	3	23	10	1	11	5	11	23	14	5	20	
Horton Vicarage	31.91	1.65	"	4	1862	10	5	25	10	4	14	(9)	(14)	26	18	5	22	
Langton Herring Rectory	24.31	.96	Sept.	3	1859	12	5	26	9	3	9	10	10	25	19	8	23	
Lytchett Minster (The Yarells)	28.61	1.52	"	8	1830	7	3	20	9	4	8	7	12	22	17	6	14	
Melbury Minster	34.83	1.60	"	3	1894	8	4	21	9	2	9	8	7	26	15	7	18	
Parkstone (Heatherlands)	29.70	2.12	"	3	1861	9	5	23	10	5	10	11	12	27	18	8	23	
Portsmouth	26.70	.98	"	4	1861	11	7	26	9	3	12	10	10	25	18	8	22	
Portland, Chesil	20.43	.78	"	0	1851	9	6	24	6	4	12	10	8	26	13	7	21	

TABLE II.—(CONTINUED.)

Station.	Total.	Greatest Fall in 24 Hours.		Days of		Number of Days on which 0.1in. or more was Recorded.												
		Depth	Date.	In. or more, only.	Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
						in.	Sept.	Dec.	19	140	13	10	21	8	8	5	8	24	16	7	18
Powerstock, West Milton	27.67	1.25	Dec. 13	4	19	13	10	21	8	2	8	5	8	8	24	16	7	18
Stanford Ores Rectory	25.67	.98	Sept. 24	0	128	7	5	20	8	1	10	9	12	22	12	19	5	17
Shaftesbury Hospital...	23.87	1.29	" "	2	173	15	4	26	11	4	11	10	17	26	19	8	8	22
Sturminster Newton (Riverside)	24.05	1.19	Dec. 4	3	137	6	4	23	8	3	12	8	11	22	15	5	5	20
Swanage	29.70	1.71	Sept. 4	3	160	12	6	22	8	4	10	9	14	25	22	7	21	21
" 1, Gordon Villas	29.12	1.85	" "	4	146	9	4	22	7	4	10	7	13	24	18	6	22	22
" Victoria Hotel	29.32	1.77	" "	3	149	9	4	19	8	4	10	10	13	25	21	5	21	21
Verwood Manor	31.16	1.27	" "	8	168	11	7	26	9	5	13	11	15	29	17	6	19	19
Wareham (Castle Gardens)	29.80	1.88	" "	4	145	10	3	23	7	4	10	10	11	24	14	7	22	22
" (Hinnegar Hall)	29.57	1.66	" "	4	149	12	5	22	8	2	9	8	11	25	18	7	22	22
Weymouth, Nothe	21.81	.88	" 3&21	0	144	8	6	26	8	4	9	9	8	21	19	6	20	20
Wimborne (Rowlands)	29.72	1.65	" "	4	112	6	3	12	4	2	9	5	10	22	15	5	19	19
Winterbourne St. Martin	34.97	1.42	" 21	4	162	15	8	26	10	3	11	10	11	26	19	6	16	16
" Steepleton Manor	33.16	1.31	" "	3	166	13	10	27	9	3	11	9	11	25	19	6	23	23
" Whitchurch, Whatcombe	31.15	1.90	" "	4	159	10	7	23	9	4	11	10	12	24	20	7	22	22
Wyke Regis (Belfield House)	24.74	1.01	" "	2	157	9	8	27	10	4	12	10	9	25	19	5	19	19
" (Markham House)	"	.83	" 4&24	2	"	"	"	"	"	"	"	"	"	"	"	"	"	"
DEVON.																		
Rousston	27.46	1.27	Dec. 13	3	162	10	8	26	9	2	12	10	14	25	17	7	22	22
WILTS.																		
Larmer Grounds	32.36	1.76	Sept. 4	5	165	10	8	24	8	4	12	13	12	26	21	7	20	20
Rushmore	32.44	1.68	" "	6	161	10	4	22	9	5	12	11	14	29	17	8	20	20

TABLE III.—AVERAGE MONTHLY RAINFALL.

	1896.			Days of '01 in. or more.	41 Years, 1856-96.		
	Average of 42 Stations.	Proportionate fall (a). Difference from 41 years average (b).			In.	Proportionate fall (c). Do. corrected for inequality of days (d).	
		In.	(a)			(b)	(c)	(d)
January ..	1·214	41	- 53	11	3·349	988	961
February ..	·452	15	- 56	6	2·427	716	780
March ..	3·432	116	+ 48	24	2·312	681	682
April ..	·613	21	- 44	9	2·206	651	658
May ..	·172	6	- 52	4	1·965	579	570
June ..	2·211	75	+ 8	11	2·252	664	663
July ..	1·043	35	- 39	9	2·496	736	724
August ..	1·925	65	- 14	11	2·674	788	768
September ..	8·252	279	+ 185	25	3·187	940	963
October ..	3·152	106	- 12	18	4·036	1190	1169
November ..	·995	34	- 72	7	3·588	1058	1066
December ..	6·115	207	+ 106	21	3·422	1009	996
Year ..	29·576	1·000		156	33·915	1·0000	1·0000

TABLE IV.—STATISTICS OF THE TEMPERATURE OF THE AIR, AND OF THE HUMIDITY AND AMOUNT OF CLOUD AT WINTERBOURNE STEEPLTON MANOR AT 9 A.M., FORWARDED BY MR. H. STILWELL.

1896.	Temperature of the Air.							Humidity. = Saturation = 100.	Cloud. = Overcast = 10.
	In Stevenson Screen.					On Grass.			
	Averages.			Extremes.		Average Lowest.	Lowest.		
	Highest.	Lowest.	Daily.	Highest.	Lowest.				
	°	°	°	°	°	°	°		
January ..	45·1	35·2	40·3	55·0	26·0	30·4	17·4	91	7·8
February ..	45·6	32·5	39·1	52·1	22·2	27·5	14·1	90	7·3
March ..	51·2	39·5	45·2	60·9	20·2	35·4	22·3	86	7·5
April ..	57·1	40·0	48·1	64·5	29·1	34·3	23·0	79	7·0
May ..	65·0	42·2	52·9	75·1	29·2	36·2	22·1	66	3·8
June ..	68·4	49·8	58·4	80·0	34·7	43·2	28·0	73	0·0
July ..	70·0	50·2	59·4	77·8	39·1	43·4	31·4	70	0·0
August ..	67·6	50·0	58·3	75·0	41·4	41·3	32·4	75	6·4
September ..	61·5	50·4	55·7	68·2	36·8	43·6	30·2	88	8·5
October ..	52·4	38·7	45·3	63·2	25·1	30·9	16·0	84	6·1
November ..	45·8	32·5	39·2	52·4	25·0	25·3	17·0	86	6·8
December ..	44·8	33·6	39·4	49·2	24·0	26·5	14·0	91	8·2
Year ..	56·2	41·2	48·4	80·0	22·2	34·8	14·0	82	6·8

INDEX TO VOL. XVIII.

OF THE

Proceedings of the Dorset Natural History and Antiquarian Field Club.

By J. C. MANSEL-PLYDELL, F.G.S., F.L.S., &c.

A.

Abbotsbury Church, 136.
Acanthoceras mammillatum, 67.
Acoustic vases, 59, 61.
Æthelwold, Bishop, 129.
Aglossa pinguinalis, 141.
Agnus Dei, 64, 131.
 seal, xxiv.
Albian fossils, 68—98.
Aphrodite, doves of, 127.
Aqua lustralis, 117.
Aquilaia, 53.
Arachnida, 108—115.
Arctic fauna, lxiii.
Ardea bulbulcus, 120.
Argala, "Gigantic Crane," 120, 121.
Aristophanes, 123.
Aristotle, 122.
Arms of Dorchester and Dorset, 100.
Ash, the Holy, 118.
Astarte, 126.
Augustine, St., 129.
Axe Valley, 175.

B.

Baker, Sir Talbot, li.
Banks, Sir John, xli., xlii.
 Lady, xlii.
 Sir Ralph, xlii.
 G., Rt. Hon., xlii.
 W. A., li.
Baron, Dr., 63.
Basil the Great, 128.
Bayeux tapestry, 135.
Beaminster, 184.
Beckford, F. J., xlix., l.
Benediction, Greek, 132.
 Latin, 132, 134, 135, 136.
Bentinck, Cavendish, 53.
Bettiscombe, 183.
Bewcastle, 130.
Black Ven, 176.

Blashenwell deposit, lxviii.
Bond, Nat., xxiii.
 Thomas, xxxviii., xl.
Botany, fresh records of plants, lxxv.
Boughton Aluph Church, 134.
Bulleid, A., lxiii.
Burt, G., xlvii.
Byzantine Guide, 135.

C.

Carboniferous flora, lxxiii.
Cardiaster fossarius, xxiii.
Catacombs of Rome, 127.
Caulopteris punctata, xxxv.
Celestins of Metz, 60.
Challenger expedition, lxi.
Chickerell, 151.
Christian and Pagan worship, 116.
Chrysostom, St., 117.
Clavell, xlvii.
Coney's Castle, 177.
Coralline crag, lxviii.
Corals in Arctic Sea, lxiii.
Corfe Castle, xxxviii.
 " " derivation of name,
 xxxviii.
Coronella lævis, xxii.
Crane, gigantic (Argala), 120, 121.
Crawford Church and Abbey Barn,
 xxxv.
Cross, Greek, 135.
Cunnington, E., xxvii., xlix., lv.
Cycadeoidea gigantea, lxxi.

D.

Dab-chick, 125.
Dawkins, Boyd, lxiii.
Dead, book of, 121.
Deep-sea fauna, lxii.
Derceto, 126.
Diodorus, 126.

Dionysius of Halicarnassus, 125.
 Dipper, 125.
 Dorchester, Arms of, 100.
 Dorset, Arms of, 105.
 Dove, 124, 125, 126.
 Drakenorth Hill, 177.
 Dryden, Sir Henry, 60.
 Dürer, Albert, 63.

E.

Eaton, H. Storks, 153, 196.
 Edgecombe, Sir R. P., xxiv., 100.
 Edward the Martyr, xxxix.
 Edward II., xli.
 Elijah, 123.
 Ely Cathedral, 133.
 Endrosia fenestrella, 147.
 English Channel, 179.
 Erosion of Tertiary Age, 177.

F.

Faroës, 123.
 Fish of Dorset, 1.
 Fletcher, W. J., 61 (n.)
 Flóki, 123.
 Forbes, Miss Barbara, lxx., 66.
 Forbes, Prof. E., lxi., lxxvii.
 Fountain's Abbey, 59.

H.

Harling, East, 60.
 Hathor, 121.
 Hatton, Sir Christopher, xli.
 Hehopolis, 120.
 Helix cantiana, lxxv.
 Heron, 120.
 Hervey, Clarendieux King-of-Arms,
 100.
 Highton, Rev. E., xxxvi.
 Holy Spirit, representations of, 133.
 Holy-water, 118.
 Hooker, Sir Joseph, lxxiii.
 Hoplites interruptus, lxx., 67.
 Benettianus, lxx., 70.
 Horton, 62.
 Horus, 121.
 Hyginus, 126.

I.

Iceland, 123.
 Izdubar, 123.

J

John, St., 130.
 Jones, Herbert, xxxiv.

K.

Kabaines, Ralph de, xxxvii.
 Karrant, Johes, xxxvii.
 Kent, Earl of, xli.
 Keyser, C. E., 63.
 Khu, 121, 122.
 Kimmeridge Bay, 152.
 Church, xlvii.
 Kingsley, Charles, 65.

L.

Lamb, 62, 63, 131, 132, 135.
 Lambert's Castle, 177.
 Landnamabók, 123.
 Leper window, 61.
 Lewesdon Hill, 175, 176, 179, 183.
 Life, tree of, 122.
 Lilies, Arms of France, 102.
 Lindisfarne, 131.
 Lismore, book, 122.
 Long Barrow, Rawston Down, 1.
 Lovelly (Lovell), 61.
 Loven, Professor, lxxvii.
 Lowndes, Miss, lxx., 66.

M.

Mancroft, Norwich, 59.
 Mansel, Colonel, Smedmore, xxi.
 „ Pleydell, J. C., 67.
 Anniversary
 address, lix.
 „ Rev. O., xxxviii.
 March, H. Colley, 116.
 Marriott, Sir W. and Lady, xxxvii.
 Marshwood, Vale of, 174.
 Mecca, mosque of, 127.
 Minns, G. W. W., Rev., 60.
 Moths (clothes), 138.
 Moule, H., xxii., li., 169.
 Mountergate Church, Lincoln, 59.

N.

Neumayer, lxxiii.
 Newton Manor, xliii., 44.
 Newton, R. Bullen, lxxviii., lxx., 66.
 Noah, 127.

O.

(Ecophora) pseudospretella, 146.
 Okeford, Childe, 66.
 Fitzpaine, lxx., 66.
 list of fossils, 67—
 98.
 Ornithology, fresh records, lxxv.
 Osiris, 120.
 Oxford Clay, 150.

P.

- Pallas Athene, 124.
 Paphos, Temple of, 127.
 Paraclete, 129.
 Pax, 127.
 Penny, Rev. J., xxxv., 55.
 Perch, lxix.
 Perpetuus, Bishop of Tours, 128.
 Pholidophorus, lxix., 150, 152.
 Pickard Cambridge, Rev. O., 108.
 list of spiders,
 111—115.
 Pigeons, 126.
 Pilsdon, lxviii., 175, 176, 177, 178, 183.
 Pitt Rivers, General, lxxv.
 Pontorson Church, 134.
 Prestwich, Sir Joseph, xxi., lxvii.

Q.

- Quinisext Council, 1 2.

R.

- Ra, 121.
 Radford, Arthur, 62.
 Rainfall, 153, 196.
 tables, 158—167.
 Rawston Down, xxxiv.
 Long Barrow, 1.
 Church plate, 62.
 Reading Museum, xxix.
 Richardson, Nelson M., xxi., 185.
 Robinson, Sir Charles and Lady,
 xlirii., 44.
 Rood, Holy, 118, 119.
 Rushton Church, xxxv., 55.
 sculptured lintel-slab, 57, 62,
 135 (and plate opp. p. 136,
 fig. 7).

S.

- Sachs, lxxii,
 Sangrael, 129.
 Saxby, Rev. C. F., 63.
 Seektor, near Axminster, 176.
 Semiramis, 127, 128.
 Seward, A. C., lxx.
 Shaftesbury, xxxv.

- Shepherd, the Good, 118.
 Shipton Hill, 176.
 Silchester, xxix., xxxi.
 Simene, lxviii., 177.
 Smith, Miss Ella, lxxv.
 Stevens, Dr., xxix.
 Stockton Church, 62.
 Stone Barrow, 176.
 Swallow, 123.
 Swanage, 46.
 Church, xlv.

T.

- Tarrant, etymology of, 65.
 Crawford (see Crawford).
 Rawston (see Rawston).
 Rushton (see Rushton).
 Tertullian, 128.
 Thor, 130.
 Tinea, clothes moth (9 species), 141—
 148.
 Tree of Life, 128.

U.

- Upton, Lincoln, St. Peter's Church, 59.
 Uvedale, Thomas, 62.

V.

- Vectian, Lower Greensand, 66.
 Virgin, the, 127.

W.

- Watersheds, 178, 179, 183.
 Weald of England, 183.
 White, Theodore, xxxii.
 Wiedemann, 120.
 Wimborne Minster, 61.
 Monastery, 133.
 Windsor Arms, 102.
 Wise bird, Pagan—Christian overlap
 of the, 116.
 Woden, 118, 121, 122, 130, 131.
 Woodbury Hill Fair, memorandum
 book, xxiv.
 Woodward, A. Smith, lxviii., lxix.,
 150.
 Worsaae, 130.

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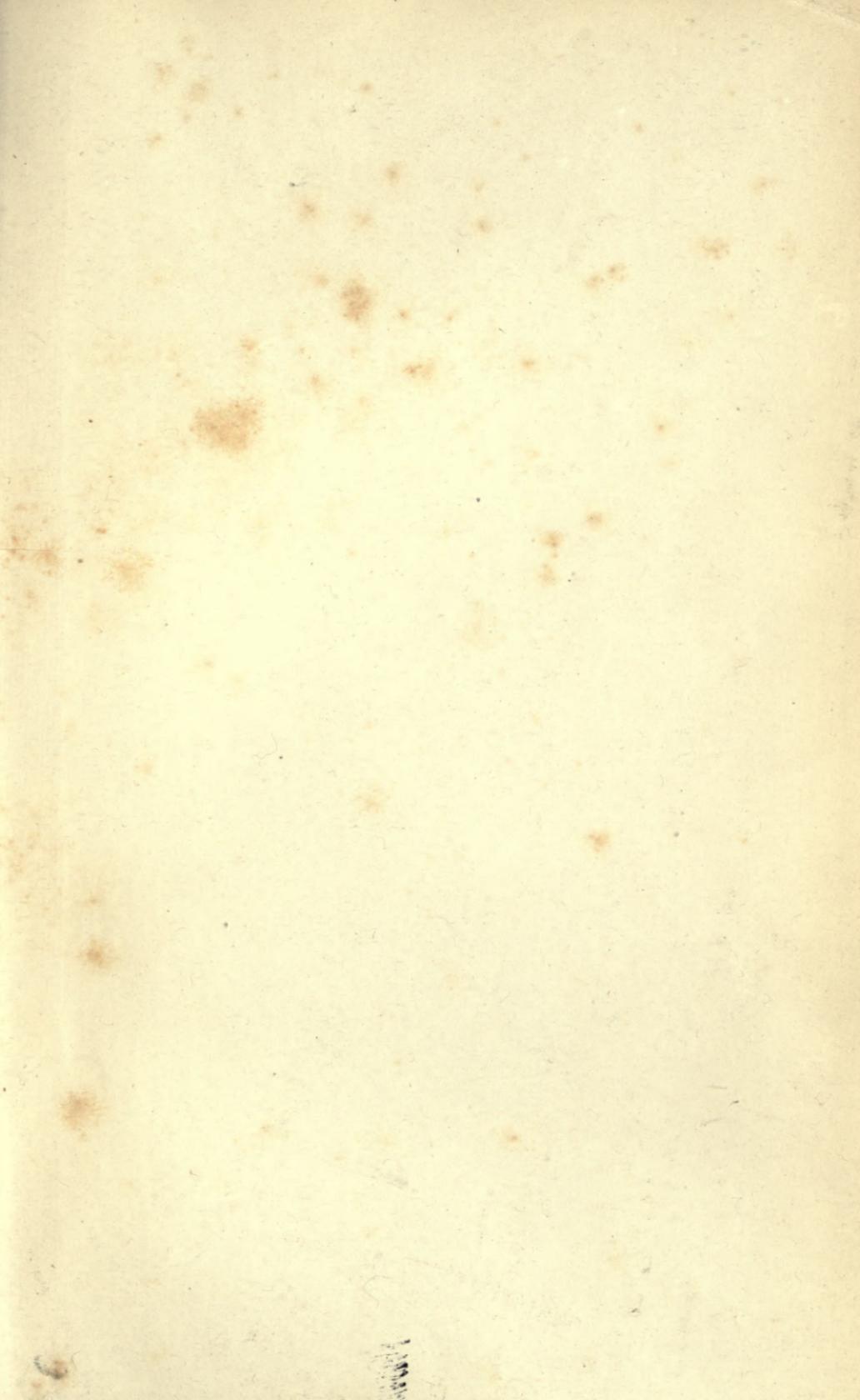
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