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PROCEEDINGS  
OF THE  
BATH NATURAL HISTORY  
AND  
ANTIQUARIAN FIELD CLUB.

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VOL. VI.

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BATH :

PRINTED (FOR THE CLUB) AT THE HERALD OFFICE, NORTH GATE.

1889.

PROCEEDINGS

OF THE  
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## TABLE OF CONTENTS.

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VOL. VI., No. 1.

	PAGE.
1.—CONTINUATION OF THE FUNGI OF BATH, BY C. E. BROOME, F.L.S. ... ..	1
2.—ON AN ABNORMAL FLOWER OF A PENSTEMON, BY C. E. BROOME, F.L.S. ... ..	35
3.—NOTES ON ROMAN PAVING FOUND IN BRIDEWELL LANE, BY T. BROWNE ... ..	37
4.—THE BOURNEMOUTH FIRS ; CONSIDERED AS THE REMAINS OF AN ANCIENT FOREST. WAS THERE EVER A FOREST OF FIRS ON THE HILLS AROUND BATH? BY THE REV. LEONARD BLOMEFIELD, M.A., F.L.S., F.G.S., &c. ... ..	39
5.—THE ALGÆ OF THE BATH THERMAL WATERS, BY G. NORMAN, M.B. ... ..	53
6.—THE EARLIEST MAP OF BATH, BY EMANUEL GREEN, F.S.A. ... ..	58
7.—ON RECENT DISCOVERIES MADE IN UNCOVERING THE ROMAN BATHS AT BATH, BY THE REV. PREB. SCARTH, M.A. ... ..	75
8.—UPON SOME SCULPTURE RECENTLY DISCOVERED AT THE CROSS BATH, BY THE REV. H. H. WINWOOD, M.A., F.G.S. ... ..	79

	PAGE.
9.—NOTES ON THE OCCURRENCE OF SALT SPRINGS IN THE COAL MEASURES AT RADSTOCK, BY J. MCMURTRIE, F.G.S. ... ..	84
10.—LIST OF FOSSIL MAMMALIA FOUND NEAR BATH, BY THE REV. H. H. WINWOOD, M.A., F.G.S. ...	95
11.—SUMMARY OF PROCEEDINGS FOR THE YEAR 1885-86, BY THE SECRETARY... ..	96

## No. 2.

1.—NOTES ON THE GEOLOGY OF BRENT KNOLL, BY HORACE B. WOODWARD, F.G.S. ... ..	125
2.—PLACE NAMES DERIVED FROM PLANTS (IN THE NEIGHBOURHOOD OF BATH), BY THE REV. CANON ELLACOMBE ... ..	130
3.—ADDRESS TO THE MEMBERS OF THE BATH FIELD CLUB IN REFERENCE TO THE DEATH OF C. E. BROOME, F.L.S., BY THE REV. L. BLOMEFIELD, M.A., F.L.S., F.G.S., &c. ... ..	144
4.—TRACES OF THE SAXON PERIOD IN BATH AND THE NEIGHBOURHOOD, BY THE REV. PREB. EARLE ...	153
5.—LETTERS ILLUSTRATING THE BATTLES OF CLAVERTON AND LANSDOWN, BY H. D. SKRINE, M.A. ...	167
6.—FURTHER NOTES ON THE CLAVERTON SKIRMISH, BY H. D. SKRINE, M.A. ... ..	180
7.—NOTES ON THE HAM HILL STONE, BY H. B. WOODWARD, F.G.S. ... ..	182

PAGE.

8.—FURTHER RESULTS OF METEOROLOGICAL OBSERVATIONS MADE AT THE BATH ROYAL LITERARY AND SCIENTIFIC INSTITUTION, BY THE REV. LEONARD BLOMEFIELD, M.A., F.L.S., F.G.S., &c, ... ..	185
9.—SUMMARY OF PROCEEDINGS FOR THE YEAR 1886-87, BY THE SECRETARY... ..	196

## No. 3.

1.—ON SOME OSTRACODA FROM THE FULLERS-EARTH OOLITE AND BRADFORD CLAY, BY PROFESSOR T. RUPERT JONES, F.R.S., F.G.S., AND C. DAVIES SHERBORN, F.G.S. ... ..	249
2.—LANDSLIPS AND SUBSIDENCES, BY W. PUMPHREY ...	278
3.—THE DESTRUCTION OF THE TWO CHURCHES OF ST. MARY IN BATH, BY AUSTIN J. KING ... ..	285
4.—A BATH POLL TAX 2 RICHARD II., BY EMANUEL GREEN, F.S.A. ... ..	294
5.—REMARKS ON SOME HEMIPTERA-HETEROPTERA TAKEN IN THE NEIGHBOURHOOD OF BATH, BY LIEUT.-COL. BLATHWAYT, F.L.S. F.Ent.S. ... ..	315
6.—RECENT "FINDS" IN THE VICTORIA GRAVEL PIT, BY THE REV. H. H. WINWOOD, M.A., F.G.S. ...	327
7.—NOTE ON WEBBINA IRREGULARIS (D'ORB.) FROM THE OXFORD CLAY AT WEYMOUTH, BY C. DAVIES SHERBORN, F.G.S. ... ..	332
8.—SUMMARY OF PROCEEDINGS FOR THE YEAR 1887-88, BY THE SECRETARY ... ..	332

		PAGE.
No. 4.		
1.—ON CHURCH DOORWAYS, BY THE REV. REGINALD A. CAYLEY, M.A. ... ..		363
2.—BATH LAY SUBSIDIES, HENRY IV. TO HENRY VIII., BY EMANUEL GREEN, F.S.A. ... ..		379
3.—THE DIVINING ROD, BY THOMAS FORDER PLOWMAN		411
4.—LIST OF TERRESTRIAL HEMIPTERA - HETEROPTERA TAKEN IN THE NEIGHBOURHOOD OF BATH, BY LIEUT.-COL. BLATHWAYT, F.L.S., F.Ent.S. ...		432
5.—SUMMARY OF PROCEEDINGS FOR THE YEAR 1888-89, BY THE SECRETARY ... ..		435

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# PROCEEDINGS

OF THE

# BATH NATURAL HISTORY

AND

# ANTIQUARIAN FIELD CLUB.

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NO. I. VOL. VI.

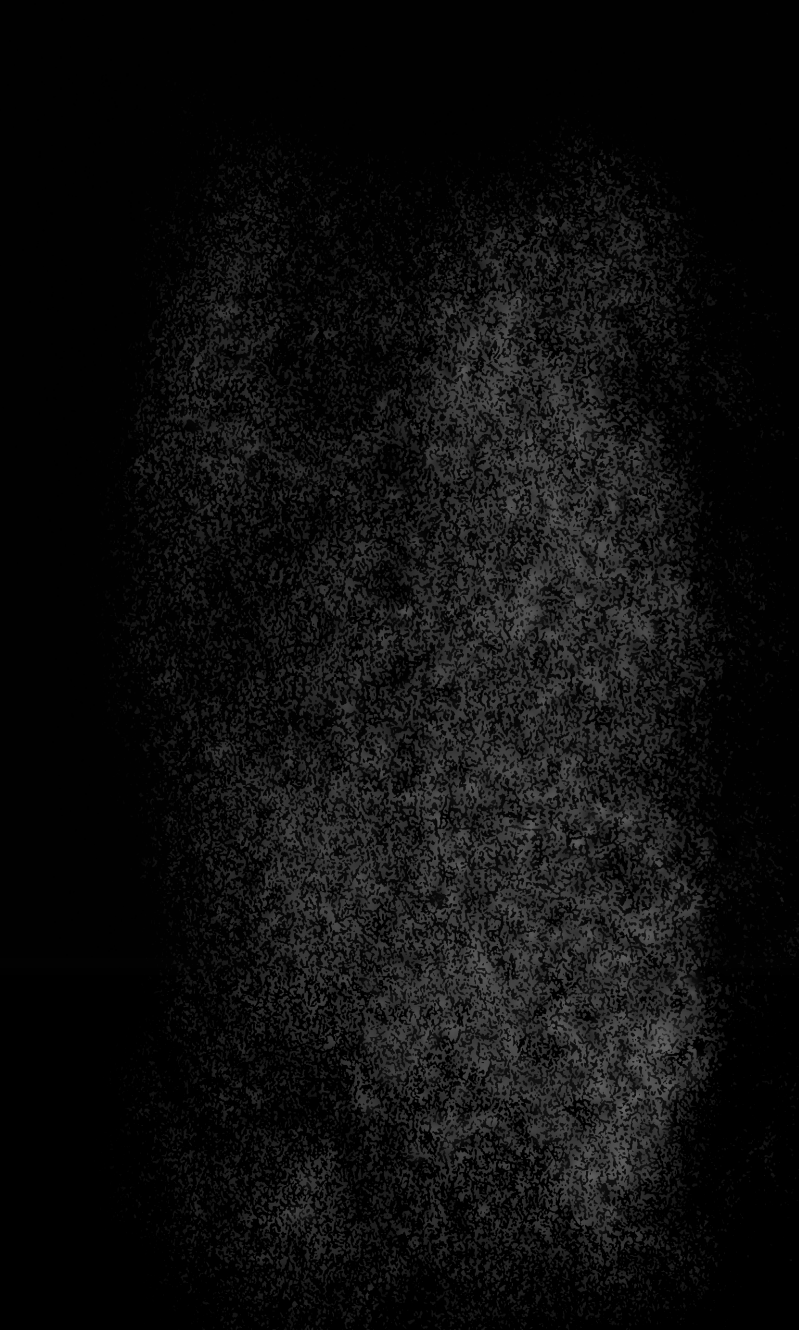
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1886.



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1886.



*Continuation of the Fungi of Bath.* By C. E. BROOME, F.L.S.

(Read March 18th, 1885.)

Continuing our Notices of the Fungi of the Bath District from a Paper read in March, 1883, before the Bath Field Club, we commence with the 26th Order of Mr. Berkeley's arrangement in the *Outlines of British Fungology*, Sphæriacei. The Order is characterized by producing its fruit, called sporidia, in little sacs, or asci, which grow in closed vesicles, perithecia, opening by a round or elongate mouth. This is perhaps one of the most interesting Orders of the Family Ascomycetes, especially to Microscopists, owing to the great variety it presents, both in the outward form and arrangement of the perithæcia, and in the nature of the sporidia which, in this section, often afford good specific characters, either in their mode of division, coloration, or in the number contained in each ascus. Sphæriæ are to be found in all parts of the world. They are most abundant in temperate climates; but they are by no means rare in the tropics, especially insect-sphæriæ, and such forms as approximate to *Xylaria Hypoxylon*, the finer states of which occur in the warmer climates; and it is probable that if tropical countries were thoroughly investigated, a great number of undescribed species would be the result. Ceylon has furnished us with conclusive evidence on this point, thanks to the exertions of my late friend, Mr. Thwaites, whose contributions to the mycology of that island have been recorded in the *Linneæan Journal* (Vols. XI., p. 494 and XIV., p. 29). The old unwieldy genus *Sphæria*, of which Fries described, in his *Systema Mycologicum*, upwards of 1,000 species has, since that time, been divided into numerous genera and subgenera by almost every author who has written on the subject. Many of these divisions are, however, of doubtful value; we shall, therefore, confine ourselves in the present enumeration to such as appear to be of most value, and are more generally

recognized. Fries divided them in the Systema according to their simple, or compound habits.

Those in the simple section are either innate in the bark of trees or plants, or at length emergent by a longer or shorter neck, with round or elongate mouths, or quite superficial on the surface of wood or sticks, and these are glabrous, or hairy, or tomentose, and sometimes seated on a shaggy subiculum. In the compound section the perithecia are aggregated together in the substance of wood, or leaves, or in the stems of herbaceous plants, assuming, at times, a circinate or quincuncial arrangement, or occupying carbonaceous receptacles which are immersed in the wood. Sometimes they are located in a flat, or globose, stroma, which, in the more perfect species, assumes a simple or branched, erect form.

To begin, however, with the more simple forms. We have in them instances of species without any true perithecia as in the genus *Dothidea*, where, however, that want is fully compensated by the various forms of fruit which have been traced to it in its early stages; thus in *Dothidea melanops Tul.* there are macrostylospores and microstylospores, as well as ascigerous fruit.

Again in *Diatrype stigma Fr.* *Stictosphaeria Hoffmanni Tul.* we have conidia lining the interior of irregular cavities of the wood, or bark, on which it grows; and, on the same stroma, ascigerous conceptacles containing sporidia of a form very similar to the conidia.

In *Cucurbitaria macrospora Tul.* the three forms of fruit are again to be seen, occupying one stroma. In *Melanconis macrosperma* the conidia are shown, in Tulasne's figure, growing intermixed with macrostylospores. The conidiiferous tufts of *Stigmatea fragariae* also present us with a beautiful microscopic object; this species grows on living strawberry leaves. I cannot pass over without notice a minute plant, the structure of which is very curious. It grows on the leaves of *Aira cæspitosa*, a coarse grass known to the Wiltshire farmers as Bull-polls, it has been described, as a new

genus, under the name of *Oomyces*, on account of its egg-shape. Madame Libert published it in her *exsiccata*, as *Sphæria carneo-alba Libert*. It is about a line high, bluntly conical, and of a pinkish-yellow colour; there is an outer, leathery receptacle, truncate at top, around the centre of which are four to seven dark dots; a cross section shows that these are the mouths of as many delicate, membranous perithecia which are closely packed in the outer conceptacle. The perithecia contain a number of elongate, cylindrical, asci, filled with very long, flexuous sporidia. It has been placed in a new genus on account of its compound character; the outer conceptacle containing free, ascigerous perithecia. In *Pleospora herbarum Pers.* and *P. polytricha Wallroth.*, belonging to the section *Denudatæ* of the genus *Sphæria*, the early states were considered autonomous plants; but it has been demonstrated that the conidia of the first constitute the genus *Mystrosporium* of Desmaziere, which again appears to give origin to *Cladosporium herbarum Link.*, a common pest in greenhouses, covering the plants with a sooty stratum. The conidia of the latter, *Pleospora polytricha Wall.*, being stipitate, and septate, present an elegant appearance under the microscope, and probably belong to *Acrothecium simplex B. and Br.* *Nectria cinnabarina Fr.* the conidiiferous state of which is known as *Tubercularia vulgaris Tode.*, is interesting, from its common occurrence on dead sticks, covering them with bright, scarlet spots. Another of the same genus *Nectria inaurata B. and Br.* has two forms of ascigerous fruit, a very unusual occurrence; it grows on dead twigs of holly. *Capnodium* and its allies, as *Fumago* and others, belong to the *Sphæriacei* since they produce their more perfect form of fruit in asci, their perithecia being furnished with a round mouth. To the unassisted eye these plants appear as a mere sooty stain on the leaves of trees and shrubs, thus spoiling their appearance. We may mention in this place that the conidiiferous state of *Hypoxyylon coccineum Bull.* was described by Persoon as a mould under the name of *Isaria farinosa Pers.*; but it has been since traced to the *Hypoxyylon*, it is

common on decaying Beech. The genus *Hypocrea* is intermediate between *Nectria* and *Cordyceps*, it is generally effused, and horizontal in habit, and more remarkable from the moulds which constitute its early state, or are associated with it, than in its perfect form. These moulds were considered autonomous species till Tulasne traced them to their true position; they constitute the genera *Botrytis*, *Verticillium*, and others. *Hypocrea inclusa* *B. and Br.* is curious from its place of growth. It is parasitic in the flesh of a small truffle, *Tuber puberulum* *B.*; its presence may be detected by a minute, rusty spot not larger than the head of the smallest pin, visible on making a section of the Truffle.

Another species, nearly related, is not uncommon on grasses; it surrounds the stalk with a bandlike, yellow stroma, crowded with perithecia. Tulasne has given it the generic name of *Epichloe*; it differs from *Hypocrea* in the sporidia being linear and continuous. In habit it resembles the latter. The genus *Hypomyces* differs from *Hypocrea* in fruit, and in being generally parasitic on other fungi. In a Monograph of the genus, Mr. Plowright observes that *Hypomyces luteo-virens* attacks the Agaric on which it is parasitic, at a very early period before it appears above ground, and so distorts it that it is impossible to say to what species it belongs: most commonly the *Hypomyces* do not attack other fungi till they are in a state of decay. Another species, he says, grows, not on the Agaric itself, but on the ground under, or near, the spot where it has decayed, the decay being the result of the growth of an earlier stage of the *Hypomyces*; in other words, the *Hypomyces*, in its conidial state, first attacks the Host-Fungus, and, by causing its decay, generates the pabulum necessary for the nourishment and perfection of the higher form of fructification.

The genus *Hypomyces* is interesting from the various phases through which many of its members pass. As a rule, the ascigerous, or perfect form is more rare,—the conidiiferous state the more common. *Hypomyces aureo-nitens* *Tul.* was of striking

beauty, as it occurred on a damp morning in North Wales, each of the conidia growing on a branched mucedinous mycelium, was surmounted by a minute drop of dew, glittering in the sun's rays like a diamond. *Hypomyces cervinus Tul.* is another pretty microscopic object, its macroconidia, or second form of fruit, are globose and echinulate; they may be seen everywhere on decaying *Boleti* in autumn, converting them into a mass of yellow powder.

The genus *Xylaria* has a branched, erect, clavate stroma, the early state of which, particularly in *Xylaria Hypoxylon*, often puzzles beginners; the tips of the branches are then covered with a white powder, consisting of conidia, which fall off on being touched, leading the student to consider the specimen as belonging to such of the Hymenomycetes as *Clavaria*; but later on the branches swell out at the tips, and numerous perithecia are developed in their substance, containing asci and ovate, coloured sporidia, thus showing the true position of the specimen in the series.

I shall just allude here to a curious fungus belonging to this section, although it is not British. It occurred on rotting Bamboo in Ceylon. It has been named *Astrocystis*, on account of its starlike habit; in form it resembles a Geaster, having a double perithecium, the outer coat splitting into several rays, which become recurved, as in that genus; the inner coat opens by a more or less, regular mouth, to allow the escape of the sporidia, which are those of an *Hypoxylon*. The similarity of habit may be regarded as an instance of—what is now much discussed—mimicry in nature; the structure and true affinities are here far apart.

The genus *Cordyceps*, or *Torrubia* of Tulasne, is one of the most interesting of the Sphæriacei, both from the variety of its habitats, or places of growth, and from the medicinal properties of one of the species. I allude to the Ergot of grasses. In a paper on this plant, published in the Journal of the Agricultural Society of England (Vol. x., 8-8, part II.), Mr. Carruthers says,

“The full grown Ergot is often overlooked in the barn, among the corn, owing to its resemblance to the dung of mice ; but it is worth especial pains in examining the seed to secure immunity from this parasite”—“Ergot might supply an interesting text from which to exhibit the worthlessness of speculation, as opposed to observation and experiment in dealing with natural science. Replacing, as it does, the seed of different grasses, and always attaining, when full grown, a greater size than the normal seed, it was, at first, thought merely to indicate an extra quantity of life and vigour in the particular seeds, which exhausted themselves in the production of the anomalous, horned grain ; no special qualities being then associated with these abnormal productions.

All along, however, the Ergot has been exerting its baneful influence on men and animals, without being suspected. Through its agency the inhabitants of whole districts in France had been visited with intermittent attacks of gangrenous diseases. England also has records of similar, although not so extensive calamities. In the same Journal it is stated that the loss to one breeder of cattle alone, in Shropshire, was £1,200 in three years owing to this cause. It has been determined that the power of Ergot in causing muscular contraction extends to all unstriped, or involuntary muscular fibre, and it has therefore been applied in treating certain maladies connected with the intestinal canal, and the arteries, because these organs are chiefly composed of this kind of muscular tissue. The comparative immunity of England from disease arising from Ergot is probably owing to the less quantity of rye grown for seed, and used in bread, than is the case in France. But its frequent occurrence on our grasses as on the Bromi, Alopecuri and Festuæ, expose our cattle to very serious losses. Ergot from the seed of *Dactylis glomerata* was sown, when gathered in autumn and kept under a bell glass through the winter ; in the following spring a large crop of *Cordyceps purpurea* was produced. Ergot of rye bought at a chemist's, although then quite dry, and sown as



above, germinated after a like lapse of time producing the same species. It is fortunate for us that this pest is much less frequent on wheat and barley than on rye.

Some species of *Cordyceps*, or *Torrubia*, attack wasps and other insects, and have given origin to what are known as "vegetable wasps," the insects flying about with the fungus attached.

*Cordyceps alutacea* Fr. may be alluded to as showing some of the difficulties attending the study of this group of Fungi. Fries regarded it as a *Cordyceps* from its form and habit; Tulasne, guided by its fruit, placed it in the genus *Hypocrea*, considering it parasitic on *Clavaria ligula*, clothing that species with a thin stroma in which the perithecia are immersed; but it may be said against that view, that *Clavaria ligula* has not occurred in England unaccompanied by its presumed parasite; and as *Cordyceps alutacea* is not uncommon in our fir plantations, it is scarcely possible that such would be the case were the *Clavaria* equally common. We may therefore fairly conclude that Fries was right in placing our plant in the genus *Cordyceps*, and that it is not merely a parasite on a *Clavaria*, but an autonomous species. *Cordyceps entomorrhiza* is parasitic on the larvæ of insects, Mr. Berkeley supposes that the sporidia fall on the caterpillars before they bury themselves to undergo their pupa change, or if at a later period they may be washed down through the soil so as to attain their proper habitat, as is now said to be the case with the *Peronospora* of the potato. At all events this must be the case where such species as *Cordyceps capitata* Fr. take possession of *Elaphomyces*, a subterranean fungus which is buried, sometimes deep in the ground. When the sporidia reach their proper habitat they germinate and pierce the skin of the insect, or the rind of the fungus, and occupy the whole of its body with an intricate mass of threads. They then throw out branching roots into the surrounding soil; from these roots an erect, club-shaped stroma arises, in which, at length, the perithecia are formed. Tulasne says that a second form of fruit, conidia, occurs at the

base of the stroma of *Cordyceps capitata* and *C. entomorrhiza*. *Cordyceps, Robertsii*, a New Zealand species, parasitic on the larva of *Hepialus virescens*, is one of the finest species belonging to this genus.

In the Order Perisporiacei the sporidia are set free by the decay of the perithecia, the species not being furnished with a mouth. Some of the plants belonging to the Order are beautiful objects for the microscope, but very prejudicial to our crops. Thus *Sphærotheca pannosa* *Lév.* covers the leaves and shoots of roses with a clothlike felt, thus preventing respiration, and causing the destruction of leaves and flowers. *Sphærotheca Castagnii* *Lév.* is equally destructive of our hop crops. *Phyllactinia guttata* *Fr.* is common on the leaves of various trees. *Erysiphe Martii* *Lk.* attacks our late crops of peas, often destroying them utterly in dry seasons. These plants are supported on the leaves by very elegant supports, or fulcra.

There remains only the Physcomycetes and Mucorini to be considered. The first Order is intermediate between Ascomycetes and Hyphomycetes, agreeing with the former in the free formation of its sporidia within a, generally globose, closed sac; with the latter in its free, fertile, threads which are never compacted into an hymenium. The species belonging to these Orders, like the greater part of moulds, grow on decaying substances, and frequently on such as are used for food. In some instances, perhaps, the germination of the sporidia induces decay, and certainly accelerates it. Certain species of *Mucor* promote fermentation in fluids, like the true moulds, as *Penicillium*. In the genus *Syzygites* common on decaying Agarics in woods, the fertile threads throw out little tubercles from their forked branches—the tubercles soon touch each other and coalesce; a dissepiment is formed on either side, the two intermediate membranes are absorbed, and, finally, the united cells swell and form an irregular sac, which soon produces an abundance of sporidia; thus resembling the connecting tubes of *Zygnema*

among Algæ. In the genus *Acrostalagmus* the sporidia grow from the apex of the peduncle which protrudes into the cyst, so that that genus varies somewhat from the character of the Order, in the absence of free formation of the fruit in a cyst. Something similar occurs in *Ascotricha*. Enough has, perhaps, been said to show that these low types of fungi possess some interest, and exhibit the wonderful variety of form and structure made use of by nature in her work, affording an inexhaustible field of research to the Botanist and Microscopist.

We will now proceed with a list of the species belonging to the Orders at present treated of, which have occurred in our District, and which carries us through its mycology according to the arrangement adopted by Fries.

ORDER 26. SPHÆRIACEÆ.

*Perithecia* carbonaceous or membranaceous, sometimes confluent with the stroma, pierced at the apex, and mostly papillate. Hymenium diffluent.

GENUS 288. *CORDYCEPS*.\* *Fr.*

Stroma vertical, fleshy. Fructifying head distinct, hyaline or coloured. Sporidia repeatedly divided, submoniliform.

*Cordyceps ophioglossoides* *Fr.* Spye Park, September, 1843, parasitic on *Elaphomyces muricatus*.

C——— *entomorrhiza* *Fr.* Hartham Park, April, 1843, on some caterpillar buried in the ground in fir plantations.

C——— *militaris* *Fr.* Hanham Woods, October, 1853.

C——— *myrmecophila* *Cesati.* Leigh Woods, Bristol, March, 1879.

C——— *microcephala* *Tul.* Leigh Wood, July, 1878. C. Bucknall.

C——— *purpurea* *Fr.* Raised from Ergot on grasses. Batheaston, June, 1854.

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\* *Cordyceps*, from *Kordule*, a club, and *cephalos*, a head

- C——— *pistillariæformis* *B. and Br.* *Annals of Natural History.*  
No. 969, t. 16, fig 22, on dead sticks still attached to a bush.  
Batheaston, March, 1860.
- C——— *alutacea* *Fr.* Lucknam Grove, in fir plantations,  
October, 1859.

GENUS 289. HYPOCREA.\* *Fr.*

Stroma horizontal. Perithecia tender, hyaline or coloured.

- Hypocrea gelatinosa* *Fr.* Langridge, March, 1875.
- H——— *rufa* *Fr.* Batheaston, November, 1859.
- H——— *vitalbæ* *B. and Br.* Batheaston, February, 1859. *Annals*  
of *Natural History*, No. 829, t. 9, fig 8, on *Clematis vitalba*.
- H——— *delicatula* *Tulasne.* Lucknam Grove, April, 1866 ;  
*Ann. des Sciences Nat.*, Ser. iv., vol. xiii., p. 18.
- H——— *farinosa* *B. and Br.* December, 1863. *Ann. of Nat. Hist.*,  
No. 592.
- H——— *inclusa* *B. and Br.* Hanham and Leigh Wood ; parasitic  
in the flesh of *Tuber puberulum* *B.* ; November, 1869. *Ann.*  
of *Nat. Hist.*, No. 970, t. 17, fig 23.
- H——— *lenta* *Fr.* St. Catherine's, November, 1866, on wood.

GENUS 290. HYPOMYCES.† *Tul.*

Parasitic on fungi ; mycelium byssoid ; perithecia globose,  
papillate ; asci 8-spored (rarely 2 or 4), without paraphyses ;  
sporidia lanceolate or elliptic, rarely obtuse, uniseptate, ejected  
in tendrils.

- Hypomyces ochraceus* *Tul.* Langridge, April, 1874.
- H——— *asterophorus* *Tul.* Leigh Wood (*Macroconidia*), C.  
Bucknall.
- H——— *aurantius* *Tul.* Batheaston, March, 1871, Langridge.

---

\* From upo, beneath, and kreas, flesh.

† From upo, beneath, and muke, a fungus.

- H—— *terminosus Tul.* Leigh Wood, October, 1879. C. Bucknall.
- H—— *luteo-virens Tul.* Ashton Court, Bristol, April, 1845 ; Bathford, December, 1864.
- H—— *lateritius Tul.* Leigh Woods, September, 1844.
- H—— *aureo-nitens Tul.* Lucknam Grove, December, 1864.
- H—— *Broomeianus Tul.* Batheaston, November, 1877.
- H—— *candicans Plowright.* Bathford, October, 1880. *Grevillea xi.*, 50.

GENUS 291. EPICHLOE.\* *Fr.*

Parasitic on grass, coloured ; perithecia fleshy, immersed in a mycelioid stroma ; sporidia linear.

*Epichloe typhina Berk.* on stalks of grass. Bathford, &c., July, 1877.

GENUS 292. XYLARIA.† *Fr.*

Vertical, more or less stipitate. Stroma between fleshy and corky, covered with a black or rufous bark.

*Xylaria digitata Grev.* Stapleton, June, 1879. C. Bucknall.

X—— *polymorpha Grev.* Rudlow, March, 1843.

X—— *hypoxylon Grev.* Lucknam, &c., October, 1854.

X—— *carpophila Fr.* Spye Park, October, 1843.

X—— *vaporaria Berk.* Cliffe Pypard, November, 1863 ; on cow dung laid in a heap, proceeding from a sclerotioid body.

X—— *pedunculata Fr.* Wraxall, near Bristol, March, 1845 ; Bathford Hill, November, 1863.

X—— *bulbosa P.* Lucknam, October, 1859 ; Bathford Hill, in plantations.

\* *Epichloe*, from *epi*, upon, and *chloe*, green grass.

† *Xylaria*, from *Xulon*, wood.

GENUS 293. PORONIA.\* *Fr.*

Between fleshy and corky. Fructifying surface margined, orbicular. Perithecia immersed, vertical.

*Poronia punctata Fr.* Batheaston, April, 1871; Hanham.

GENUS 294. HYPOXYLON.† *Bull.*

Stroma, corky or brittle, convex or plane, immarginate, at first clothed with a floccose veil, then with a black crust, distinct from the matrix. Perithecia vertical or divergent.

*Hypoxylon ustulatum Bull.* Batheaston, on old stumps.

H———— nummularium *Bull.* Stapleton, near Bristol, October, 1853; Leigh Wood, September.

H———— luteum *Fr.* St. Catherine's, April, 1867; Warleigh February, 1862.

H———— gastrinum *Fr.* Batheaston, December, 1862; Rudlow, February, 1843.

H———— concentricum *Grev.* Batheaston; common on ash timber.

H———— coccineum *Bull.* Batheaston, on beech timber.

H———— multifforme *Fr.* Batheaston, November, 1875.

H———— argillaceum *Fr.* Batheaston, winter, common on ash sticks.

H———— fuscum *Fr.* Very common on sticks.

H———— rubiginosum *Fr.* On bare trunks, &c.

H———— serpens *Fr.* Common on dead wood.

H———— coprophilum *Fr.* Batheaston, October, 1864; on cow dung.

H———— udum *Fr.* Leigh Wood, April, 1877. C. Bucknall.

H———— atro-purpureum *Fr.* Leigh Wood, April, 1877. C. Bucknall.

---

\* *Poronia*, from poros, a pore.

† *Hypoxylon*, from upo, beneath, and xulon, wood.

## GENUS 295. DIATRYPE.\*

Stroma partly formed from the matrix, and not distinct from it; perithecia sunk, elongated above into a distinct neck; and frequently rostrate.

*Diatrype pantherina* (B.) Leigh Wood, April, 1879. C.  
Bucknall.

D——— *scobina*, Nke. Brockley Coombe, May, 1879. C.  
Bucknall.

D——— *bullata* Fr. Batheaston; common.

D——— *undulata* Fr. Rudlow, April, 1865; on dead sticks.

D——— *stigma* Fr. Rudlow, January, 1843; very common.

D——— *disciformis* Fr. Rudlow, January, 1843; very common.

D——— *favacea* Fr. Spye Park, March, 1859.

D——— *verrucaformis*. Batheaston, March, 1872.

D——— *scabrosa* Fr. Near Bristol, March, 1872.

D——— *sordida* Fr. Spye Park, February, 1851.

D——— *quercina* Fr. Batheaston; winter.

D——— *ferruginea* Fr. Shockerwick, March, 1854.

D——— *ceratosperma* Fr. Swainswick, March, 1856.

D——— *strumella* Fr. Batheaston, April, 1852.

D——— *corniculata* B. and Br. Lucknam, March, 1853.

D——— *podoides* Fr. Leigh Wood, February, 1877. C.  
Bucknall.

D——— *aspera* Fr. Shirehampton, January, 1878. C.  
Bucknall.

D——— *angulata* Fr. Shirehampton, March, 1880. C.  
Bucknall.

D——— *ilicina* Cke. (Diaporthe). Durdham Down, May, 1878.  
C. Bucknall.

D——— *lirella* Mont. (Diaporthe). Boiling Wells, Bristol,  
June, 1881. C. Bucknall.

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\* *Diatrype*, from *dia*, through, and *trupe*, a hole.

D——— *Laschii* *Nke.* (Diaporthe). Leigh Wood, May, 1883.  
C. Bucknall.

D——— *euphorbiæ* *Cke.* (Diaporthe). Leigh Wood, May, 1883.  
C. Bucknall.

GENUS 296. VALSA.\* *Fr.*

*Perithecia* carbonaceous, perfect, circinating, elongated into converging necks; ostiola erumpent, joined together, or ending in a common disc.

*Valsa* *prunastri* *Fr.* Rudlow, January, 1843; on sloe.

V—— *stellulata* *Fr.* Batheaston, March, 1859.

V—— *syngenesia* *Fr.* Batheaston, March, 1870.

V—— *detrusa* *Fr.* Wraxall, January, 1845.

V—— *fibrosa* *Fr.* Rudlow, May, 1843.

V—— *nivea* *Fr.* Bathampton, March, 1864.

V—— *leucostoma* *Fr.* Batheaston, February, 1851.

V—— *controversa* *Fr.* Leigh Wood, January, 1880. C. Bucknall.

V—— *taleola* *Fr.* Shirehampton. C. Bucknall.

V—— *circumscripta* *Mont.* Near the Avon, March, 1880. C. Bucknall.

V—— *pini* *Fr.* Leigh Wood, December, 1866.

V—— *profusa* *Fr.* St. Catherine's, April, 1852.

V—— *coronata* *Fr.* Spye Park, February, 1851.

V—— *chrysostroma* *Fr.* February, 1850; on hornbeam.

V—— *suffusa* *Fr.* Spye Park, August, 1859.

V—— *leiphæmia* *Fr.* Rudlow, May, 1843.

V—— *salicina* *Fr.* Swainswick, January, 1852.

V—— *ambiens* *Fr.* Rudlow.

V—— *stilbostoma* *Fr.* Rudlow; var. *platanoides*.

V—— *tetratrupha* *B. and Br.* Spye Park, March, 1859; on alder.

V—— *fenestrata* *B. and Br.* Spye Park, March, 1859.

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\* *Valsa*, a word used by Adanson, derivation uncertain.



- V— tetraploa *B. and Curt.* Batheaston, February, 1850.  
 V— rhodophila *B. and Br.* Leigh Wood, C. Bucknall  
 V— pulchella *Fr.* Brockley Coombe, January, 1845.  
 V— quaternata *Fr.* Near Chippenham, February, 1850; on  
 beech.  
 V— hypodermea *Fr.* Batheaston, December, 1851.  
 V— hapalocystis *B. and Br.* Batheaston, April, 1850, on plane.  
 V— bitorulosa *B. and Br.* Batheaston, December, 1851.  
 V— tiliæ *Tul.* Leigh Wood, May, 1881. C. Bucknall.  
 V— gastrinoides (*Anthostoma*) *P. and Wr.*, Grevillea X. 71.  
 Leigh Wood; Bristol Fungi, pl. II., fig. 11. C. Bucknall.  
 V— pustula *Desm.* Leigh Wood, June, 1882. C. Bucknall;  
 Bristol Fungi, fig 9.  
 V— conjuncta (*Nees*) *Fr.* On *Rubus idæus*; Batheaston,  
 February, 1850.

GENUS 297. MELOGRAMMA.\* *Fr.*

Perithecia confluent with the stroma, more or less free above, destitute of any neck; contents oozing out, and often forming cirrhi.

GENUS 298. DOTHIDEA.† *Fr.*

Perithecia none. Nucleus contained in globose cavities, immersed in the stroma, with a decided neck and papillæform ostiolum.

- Dothidea ribesia *P.* Langridge, April, 1872; on currant.  
 D— rosæ *Fr.* Batheaston, &c.; common on roses.  
 D— filicina *Fr.* Leigh Wood, May, 1878. C. Bucknall.  
 D— striæformis *Fr.* Batheaston, January, 1857.  
 D— rubra *P.* Rudlow, September, 1843.

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\* Melogramma from Melas, black, and gramma, a letter or mark.

† Dothidea, from dothien a tumour, and, eidos, a resemblance.

- D—— *ulmi* *Fr.* Rudlow, November, 1841.  
 D—— *trifolii* *Fr.* Westbury, Bristol, April. C. Bucknall.  
 D—— *Johnstoni* *B. and Br.* Sandy Lane, May. C. Bucknall.  
 D—— *chætodium* *Fr.* Batheaston, February, 1851.  
 D—— *graminis* *Fr.* Derry Hill, winter.  
 D—— *brassicæ* *Desm.* Batheaston, &c.

GENUS 299. ISOTHEA.\* *Fr.*

Nucleus without any perithecium, coloured or black, covered by the transformed substance of the matrix, or immersed in it.  
*Isothea pustula* *Berk.* Batheaston, winter; on oak leaves.

GENUS 300. HYPOSPILA.† *Fr.*

Perithecia globose, black, mouthless, altogether innate, concealed by the blackened substance of the leaves, and when that falls away, splitting across.

GENUS 301. STIGMATEA‡ *Fr.*

Parasitic. Perithecia globose, black, innate, slightly prominent. Nucleus firm, at first mouthless, then bursting with a roundish aperture.

*Stigmatea geranii* *Fr.* Batheaston; on various Geraniums.

S—— *robertiani* *Fr.* On *Geranium robertianum*.

GENUS 302. OOMYCES§ *B. and Br.*

Perithecia erect, contained in a polished, coloured sac, which is free above. Ostiola punctiform, apical.

*Oomyces carneo-albus.* *B. and Br.* *Sphæria Libert.* On leaves of *Aira cæspitosa.* Batheaston and Bowood, autumn and spring. *Ann. of Nat. Hist., No. 590.* *Libert excicc, No. 241.*

\* *Isothea*, beautiful.

† *Hypospila*, from *upo*, beneath, and *sylon*, a stain.

‡ *Stigmatea*, from *stigma*, a spot or mark.

§ *Oomyces*, from *Oon*, an egg, and *muke*, a fungus.

## GENUS 302. NECTRIA.\* Fr.

Stroma none; or, if present, bearing the coloured, naked perithecia on its surface.

*Nectria cinnabarina* Fr. Batheaston, common.

N—— *coccinea* Fr. Batheaston, common.

N—— *cucurbitula* Fr. Batheaston, winter.

N—— *sinopica* Fr. Batheaston, January, 1856, on ivy.

N—— *aquifolia* Berk. Ashwick, April, 1854, on holly.

N—— *inaurata* B. and Br. Ashwick, April, 1854, on holly.

Ann. of Nat. Hist., No. 781.

N—— *citrino-aurantia* Lacroix. Decem., 1873, on willow twigs.

N—— *ochracea* Fr. Batheaston, Langridge, January, 1872.

N—— *aurantia* Fr. Batheaston, winter, 1869.

N—— *Albertini* B. and Br. Bathford, April, 1865.

N—— *flavida* Fr. Batheaston, March, 1877.

N—— *furfurella* B. and Br. Batheaston, February, 1869, on old cabbage stalks. Annals of Nat. Hist., No. 1,331.

N—— *Peziza* Fr. Rudlow, August, 1842, common.

N—— *sanguinea* Fr. Rudlow, February, common.

N—— *episphæria* Fr. Batheaston, winter, on old, decaying hypoxyla.

N—— *Rousselliana* Mont. Batheaston, March, 1859, on box leaves.

N—— *graminicola* B. and Br. Batheaston, April, 1854. Annals of Nat. Hist., No. 897, fig.

N—— *helminthicola* B. and Br. Bathford, January, 1859. Annals of Nat. Hist., No. 896, on Helminthsporidia.

N—— *ochraceo-pallida* B. and Br. Batheaston, February, 1877. Annals of Nat. Hist., No. 607, on dead elm.

N—— *erubescens* Desm., on holly leaves. Clifton, Oct., 1879.

C. Bucknall; with a figure. Fungi of the Bristol District.

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\* *Nectria*, from *necto*, to join together, the perithecia of some of the species being united by a definite stroma.

- N—— muscivora *B. and Br.*, on mosses. Bristol. Annals of Nat. Hist., No. 608.
- N—— mammoidea *P. and Ph.* Walton Hill, July, 1881. C. Bucknall.
- N—— dacrymycella *Nyl.* Blaize Castle, May, 1882. C. Bucknall.
- N—— arenula *B. and Br.* Batheaston, February, 1851, on *Aira cæspitosa*. Annals of Nat. Hist., No. 622, with a figure.

GENUS 303. SPHÆRIA.\* *Hall.*

Perithecia black, pierced at the apex, mostly papillate, superficial or erumpent, without any stroma.

Series I. SUPERFICIALES.

Byssisedæ.

- Sphæria thelena *Fr.* Box quarries on timber underground. April, 1872. William Broome.
- S—— aquila *Fr.* Batheaston, common on sticks. April.
- S—— tristis *Tode.* Batheaston, common on sticks. March, 1861.
- S—— phæostroma *Mont.* Batheaston, January, 1859.
- S—— racodium *P.* Spye Park, February, 1851.
- S—— vervecina *Desm.* Rudlow, Dec., 1842, on the ground in woods.
- S—— EPOCHNII *B. and Br.* Warleigh. Annals of Nat. Hist., No. 1,177, with a figure, t. 5, fig 36.

Villosæ.

- S—— ovina *P.* Batheaston, March, 1869, on rotten wood.
- S—— brassicæ *Kl.* Batheaston, April, 1869, on cabbage stalks.

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\* Sphæria, from sphaira, a sphere.

- S—— *canescens* P. Lucknam Grove, April, 1866, on rotten wood.
- S—— *hirsuta* Fr. Batheaston, January, 1869, on wood.
- S—— *macrotricha* B. and Br. Bathampton, February, 1851. Annals of Nat. Hist., No. 619, with a figure.
- S—— *Chætomium* Eda. Batheaston, winter, on *Carex pendula*.
- S—— *eres* B. and Br. Spye Park, February, 1850, on dead carices. Annals of Nat. Hist., No. 621, with a figure.
- S—— *exilis* A. and S. Lucknam Grove, March, 1859, on pine.
- S—— *pilosa* P. Bathford, December, 1875, on decayed wood.
- S—— *hispidula* Tode. St. Catherine's, January, 1852, on decayed wood.
- S—— *membranacea* B. and Br. Langridge, April, 1874, on wood. Annals of Nat. Hist., No. 1493.
- S—— *barbula* B. and Br. Belmont, near Bristol, March, 1859, on pine. Annals of Nat. Hist., No. 870, t. 10, f. 20.
- S—— *exosporioides* Desm. Batheaston, March, 1859, on dead leaves of *Carex pendula*.
- S—— *felina* Feks. Batheaston, March, 1869, on dead stalks of *Rubus*.
- S—— *cupulifera* B. and Br. Langridge, April, 1869, on decayed elm stumps. Annals of Nat. Hist., No. 1,333, with a figure.
- S—— *pellita* Fr. Leigh Wood, April. C. Bucknall.
- S—— *capillifera* Currey. Leigh Wood, autumn. C. Bucknall.

## Denudatæ.

- S—— *bombarda* Batsch. Rudlow, October, 1843, on wood.
- S—— *spermoides* Hoffm. St. Catherine's, 1869, on wood.
- S—— *papaverea* B. and Br. Batheaston, October, 1869, on an elm stump. Annals of Nat. Hist., No. 612, with a figure

- S—— moriformis *Tode.* Rudlow, February, 1843, on wood.
- S—— innumera *B. and Br.* St. Catherine's, March, 1871, on wood.  
Annals of Nat. Hist., No. 2,578. Tulasne *Carpologia* II. p. 253, t xxxiii.—f. 7 to 9. (*Chaetosphaeria*).
- S—— stercoraria *Sow.* Batheaston, January, 1867, on horse dung.
- S—— pomiformis *Pers.* Rudlow, November, 1841, on old apple trees. Annals of Nat. Hist., Series iv., Vol. 7, pl. xxi., fig. 28, conidia.
- S—— obducens *Fr.* Batheaston, January 7, 1852, on wood.
- S—— pulvis-pyrius *P.* Batheaston, October, 1860, on wood.
- S—— rhytidodes *B. and Br.* St. Catherine's, January, 1852.  
Annals of Nat. Hist., No. 873, with a figure. On ash pollards.
- S—— perexigua *Lév.* Leigh Wood, April, 1877. C. Bucknall.
- S—— pulveracea *Ehr.* Batheaston, February, 1859.
- S—— myriocarpa *Fr.* St. Catherine's, May, 1864.
- S—— vesticola *B. and Br.* Batheaston, December, 1858, on old cloth. Annals of Nat. Hist., No. 874.
- S—— rubicola *Currey, M.SS.* Batheaston, March, 1869; *Lin. Trans.* 319.
- S—— caudata *Currey.* L.c., with a figure.
- S—— ostioloidea *Cke.* on *Hymenochæte.* Leigh Wood, January, 1878. C. Bucknall; *Greville* iv., 113.
- S—— *Stevensoni B. and Br.* Stapleton, June, 1882. C. Bucknall. Annals of Nat. Hist., No. 1,926. *Fungi of the Bristol districts*, No. 1,016.
- S—— platyspora (*Sordaria*) *Ph. and P.* Leigh Down, May, 1879. C. Bucknall.
- S—— equorum (*Sordaria*) *Winter* in *Hedwigia*, 1871. Leigh Down, May, 1878. C. Bucknall.
- S—— merdaria (*Sordaria*) *Fr.* Leigh Down, May, 1878. C. Bucknall.

- S—— *minuta* (Sordaria) *Winter*, l.c., var. *tetraspora*. Leigh Down, January, 1881. C. Bucknall; with a figure, pl. 4, fig. 6.
- S—— *curvula* *De By.* (Sordaria) Hedwigia, 1871. Stapleton, February, 1881. C. Bucknall.
- S—— *pleiospora* *Winter*, Grev. x., 72. Leigh Down, January. C. Bucknall; with a figure.
- S—— *Winteri* *Ph. and P.* (Sordaria). Leigh Down, January, 1881. C. Bucknall.
- S—— *bisporula* *Hans.* (Sordaria). Leigh Down, March. C. Bucknall.
- S—— *sparganicola* *Pl. in littera* (Sordaria). Yatton, July, 1881. C. Bucknall; on *Sparganium ramosum*.
- S—— *microspora* *Ph. and Pl.* (Sordaria). C. Bucknall. Leigh Down, with a figure, December, 1881. Grevillea x., 73.
- S—— *polyspora* *Ph. and Pl.* (Sordaria), Grevillea x., 73. Leigh Down, December, 1881. C. Bucknall.
- S—— *intermedia* *Awd.* (Sporormia). Leigh Down, April, 1879. C. Bucknall.

#### Pertusæ.

- S—— *pertusa* *Fr.* St. Catherine's, February, 1852.
- S—— *brachythele* *B. and Br.* Batheaston, February, 1859, on dead elder. *Annals of Nat. Hist.*, No. 877, with a figure.
- S—— *mastoidea* *Fr.* Batheaston, January, 1857.
- S—— *vilis* *Fr.* Batheaston, January, 1757.
- S—— *pædida* *B. and Br.* Langridge, April, 1859, on beech wood. *Annals of Nat. Hist.*, No. 1,396, with a figure, pl. x., fig. 13.

#### Series II. ERUMPENTES.

##### Cæspitosæ.

- S—— *cupularis* *P.* Batheaston, January, 1869.
- S—— *Saubinetii* *Mont.* Batheaston, April, 1859, on elm sticks.

- S—— *naucosa Fr.* Batheaston, January, 1860.  
 S—— *nigerrima Blox.* St. Catherine's, April, 1867. Parasitic  
 on various *Diatrypes*. This seems to be the same thing as  
*Dothidea Jerdoni*.

## Obturatæ.

- S—— *obliterans B. and Br.* Batheaston, on bare fir poles.  
 Annals of Nat. Hist., No. 890, with a figure.  
 S—— *eulmifraga Fr.* Rudlow, winter, 1851.

## Lophiostomæ.

- S—— *macrostoma Fr.* Spye Park, April, 1859, on holly.  
 S—— *caulium Fr.* Batheaston, December, 1858.  
 S—— *Arundinis Fr.* Batheaston, March, 1854.  
 S—— *angustilabra B. and Br.* Annals of Nat. Hist., No. 881,  
 with a figure. Leigh Wood, April, 1852. C. Bucknall.  
 S—— *bicuspidata Cke.* Bristol, near the Avon. C. Bucknall.

## Ceratostomæ.

- S—— *rostrata Fr.* Batheaston, December, 1866.  
 S—— *lampadophora B. and Br.* Combe Hay, May, 1859, on  
 elm stumps. Annals of Nat. Hist., No. 882, with a figure,  
 Batheaston, on white thorn.  
 S—— *ligneola B. and Br.* Batheaston, on decayed oak.  
 Annals of Nat. Hist., No. 883, with a figure.  
 S—— *ampullacea Cke.* Leigh Wood, February, 1877. C.  
 Bucknall.

## Series III. SUBTECTÆ.

## Immersæ.

- S—— *hypotephra B. and Br.* Batheaston, January, 1861, on  
 oak palings. Annals of Nat. Hist., No. 624, with a figure.  
 S—— *velata P.* Leigh Wood, April, 1882. C. Bucknall.  
 S—— *verecunda Currey.* Near the Avon, April, 1878. C.  
 Bucknall.



## Endophlœæ.

- S—— decedens *Fr.* Batheaston, on hazel.  
 S—— apiculata *Currey.* Batheaston, on bramble.  
 S—— fraxinicola *Currey.* Brockley Coombe, May, 1869. C.  
 Bucknall.  
 S—— rubelloides *Plowright.* Cheddar, June, 1882.  
 S—— melanotes *B. and Br.* Leigh Wood, December, 1841.  
 Annals of Nat. Hist., No. 623, with a figure.

## Endocaulæ.

- S—— inquilina *Fr.* Langridge, March, 1853.  
 S—— phomatospora *B. and Br.* Batheaston, Nov., 1850, on  
 potato haulm. Annals of Nat. Hist., No. 647, with a figure.  
 S—— spiculosa *P.* Batheaston, January, 1860, on goose-  
 berries.

## Obtectæ RAMEALES.

- S—— siparia *B. and Br.* Spye Park, February, 1850, on birch  
 twigs. Annals of Nat. Hist., No. 625, with a figure.  
 S—— unicaudata *B. and Br.* Batheaston, February, 1859, on  
 Clematis Vitalba. Annals of Nat. Hist., No. 885, with a  
 figure.  
 S—— salicella *Fr.* Near Chippenham, March, 1859, on  
 willow.  
 S—— Argus *B. and Br.* Spye Park, on birch wood, Feb.,  
 1850. Annals of Nat. Hist., No. 626, with a figure.  
 S—— aucta *B. and Br.* Spye Park, April, 1852, on alder.  
 Annals of Nat. Hist., No. 625, with a figure.  
 S—— gigaspora *Desm.* Batheaston, February, 1860, on maple.  
 S—— conformis *B. and Br.* Spye Park, March, 1850, on  
 alder. Annals of Nat. Hist., No. 635, with a figure.  
 S—— trivialis *B. & Br.* Batheaston, March, 1854, on hazel.  
 Annals of Nat. Hist., No. 632, with a figure.

- S—— *peristens B. and Br.* Batheaston, March, 1850, on *Rosa canina*. *Annals of Nat. Hist.*, No. 637, with a figure.
- S—— *futilis B. and Br.* Batheaston, March, 1857. *Annals of Nat. Hist.*, No. 638, with a figure.
- S—— *oblitescens B. and Br.* Spye Park, January, 1851, on *Cornus*. *Annals of Nat. Hist.*, No. 887, with a figure.
- S—— *melina B. and Br.* Batheaston, March, 1850, on ash wood. *Annals of Nat. Hist.*, No. 888, with a figure.
- S—— *clypeata Nees.* Batheaston, Leigh Wood, February, 1845, on *Rubus*.
- S—— *appendiculosa B. and Br.* Batheaston, March, 1850. *Annals of Nat. Hist.*, No. 613, with a figure, on *Rubus fruticosus*.
- S—— *rusci Wall.* Batheaston, winter, on *Ruscus aculeatus*.
- S—— *obtecta Currey.* Batheaston, November, 1878, on alder. *Annals of Nat. Hist.*, No. 979, with a figure (=S. *celata Currey-Cke*).
- S—— *hemitapha B. and Br.* Batheaston, Feb., 1852, on oak. *Annals of Nat. Hist.*, No. 885, with a figure.
- S—— *rhodobapha B. and Br.* Batheaston, April, 1869, on dead branches. *Annals of Nat. Hist.*, No. 1,334, with a figure.
- S—— *quadrinucleata Currey.* The Gully, Bristol. C. Bucknall.
- S—— *deflectens Karst (Teichospora) Myc. Fennicæ, Stapleton.* December, 1878. C. Bucknall. *Grevillea x.*, 73, with a figure.

## Herbicolaë.

- S—— *tomicum Lév.* Batheaston, January, 1850, on *Aira cæspitosa*.
- S—— *acus Blox.* Batheaston, Jan., 1859, on stems of dock.
- S—— *clivensis B. and Br.* Bristol, near the Avon, April, 1878. C. Bucknall. *Annals of Nat. Hist.*, No. 643, with a figure.

## Caulicolæ.

- S—— *acuta* *Moug.* Batheaston, on nettle stems.
- S—— *doliolum* *P.* Batheaston, on herbaceous stems.
- S—— *complanata* *Tode.* Rudlow, on herbaceous stems,  
winter, 1842.
- S—— *hæmatites* *Roberge.* Batheaston, March, 1854, on  
*Clematis vitalba.*
- S—— *acuminata* *Sow.* Rudlow, May, 1843, on thistles.
- S—— *Thwaitesii* *B. and Br.* Batheaston, January and March,  
1864. *Annals of Nat. Hist.*, No. 646, with a figure.
- S—— *tenebrosa* *B. and Br.* Batheaston, on *Arctium lappa*,  
April, 1859. *Annals of Nat. Hist.*, No. 649, with a figure.  
*parsnip.* *Annals of Nat. Hist.*, No. 643, with a figure.
- S—— *nigrans* *Rob. and Desm.* Batheaston, June, 1847, on  
*Dactylis glomerata.*
- S—— *tosta* *B. and Br.* Rudlow, February, 1843, on *Epilobium.*  
*Annals of Nat. Hist.*, No. 648, with a figure.
- S—— *cariceti* *B. and Br.* Batheaston, December, 1858, on *Aira*  
*cæspitosa.* *Annals of Nat. Hist.*, No. 983, with a figure.
- S—— *planuscula* *B. and Br.* Batheaston, June, 1857,  
on *Umbelliferae.* *Annals of Nat. Hist.*, No. 891, with  
a figure.
- S—— *rubella* *P.* Clifton, April, 1878. C. Bucknall.
- S—— *superflua* *Awd.* Durdham Down, May, 1878. C.  
Bucknall.
- S—— *ulnasporea* *Cke.* West Town. C. Bucknall.
- S—— *agnita* *Desm.* Bristol, near the Avon, May, 1880. C.  
Bucknall.
- S—— *infectoria* *Fekl.* Bristol, near the Avon, May, 1880. C.  
Bucknall.
- S—— *endopteris*, Plowright (in littera). Leigh Down, April,  
1882; Bristol district, Fungi of, on *Pteris aquilina*, with a  
figure. C. Bucknall.

- S—— *Ogilviensis B. and Br.* Leigh Wood, June, on *Senecio jacobæa*. *Annals of Nat. Hist.*, No. 642, with a figure. C. Bucknall.
- S—— *herbarum P.* Batheaston, on various plants.
- S—— *typhæcola Cke.* *Grevillea v.*, 21. ; Pill, April, 1882. C. Bucknall.

## Foliicolæ. Rostellatæ.

- S—— *setacea P.* Rudlow, February, 1843, on oak leaves.
- S—— *tubæformis Tode.* Batheaston, March, 1843, Spye Park.
- S—— *gnomon Tode.* Batheaston, March, 1852.
- S—— *avellanæ Schmidt.* Batheaston, January, 1867.
- S—— *ostruthii Fr.* St. Catherine's, December, 1850.

## Sphærostomæ.

- S—— *phæosticta B.* Batheaston, January, 1850, on *Carex pendula*. *Annals of Nat. Hist.*, No. 651, with a figure.
- S—— *anarithma B. and Br.* Batheaston, June, 1867. *Annals of Nat. Hist.*, No. 893, with a figure.
- S—— *palustris B. and Br.* Batheaston, January, 1850, on *Carex paniculata*. *Annals of Nat. Hist.*, No. 654, with a figure.
- S—— *eucrypta B. and Br.* Batheaston, January, 1850, on *Carex pendula*. *Annals of Nat. Hist.*, No. 652, with a figure.
- S—— *rumicis Desm.* Batheaston, December, 1851, on dock.
- S—— *helicospora B. and Br.* Spye Park, Batheaston, June, 1867, on *Carices*. *Annals of Nat. Hist.*, No. 653, with a figure.
- S—— *brassicæcola B. and Br.* Batheaston, on cabbage leaves (*Asteroma brassicæ Chev.*). *Annals of Nat. Hist.*, No. 656, with a figure.
- S—— *punctiformis Fr.* Batheaston, on dead leaves; winter.
- S—— *alliarie Awd.* Stoke, near Bristol, April. C. Bucknall.
- S—— *italica Sacc.* Clevedon, Mr. Green (*Sacc, sylloge*, No. 1,107, *anthostoma*).

GENUS 304. SPHÆRELLA.\* *De Not.*

*Perithecia membranaceous*, immersed or semi-immersed, scarcely papillate, sporidia elliptical or oblong, two or more celled, rarely simple, hyaline, pale or colourless.

*Sphærella maculæformis* (*P.*) *Cke.* Batheaston, on dead leaves.

S——— *errabunda* (*Desm.*) *Awd.* Batheaston, May, 1871, on beech leaves.

S——— *carpineæ* *Fr.* Batheaston, on hornbeam. *Annals of Nat. Hist.*, No. 655, with a figure.

S——— *hederæcola* *Fr.* Batheaston, May, 1851 (*Depazea*).

S——— *dianthi* *Desm.* Batheaston, March, 1851, on carnations.

S——— *inæqualis* *Cke.* Durdham Down, March, 1879. C. Bucknall.

S——— *taxi* *Cke.* Leigh Wood, February, 1878. C. Bucknall.

S——— *oblivia* *Cke.* Brockley Coombe, May, 1879. C. Bucknall.

S——— *latebrosa* *Cke.* Leigh Wood, May, 1879. C. Bucknall.

GENUS 305. MASSARIA.† *De Not.*

*Perithecia subcarbonaceous*, Ostiolum papillæform, Sporidia septate or simple, oozing out and staining the matrix.

*Massaria inquinaus* *Fr.* Batheaston, on elm branches.

M——— *fædans* *Fr.* Batheaston, with conidia, February, 1852. (*Sph. amblyospora* *B. and Br.*)

M——— *macrospora* *Desm.* Box, March, 1843, on beech.

M——— *eburnea* *Tul.* Batheaston, December, 1858, with conidia (*Septoria princeps* *B. and Br.*) *Annals of Nat. Hist.*, No. 940, with a figure.

M——— *fimeti* *Fr.* Bathford Hill, on rabbits' dung.

M——— *holoschista* (*B. and Br.*) On alder, Spye Park. *Annals of Nat. Hist.*, No. 977, with a figure.

\* *Sphærella*, a diminutive of *Sphæria*.

† *Massaria*, so named in honour of Dr. Massare, a botanist.

GENUS 306. HYPOCREOPSIS.\* *Winter*, Hedwigia, 1875.

Compound ; perithecia immersed in a fleshy red stroma, covered on the surface by a reddish down ; ostiola erumpent, darker ; asci oblongo-ventricose, sessile, 4 to 8 spored ; sporidia elliptic, simple, hyaline. Hedwigia Vol. 5, p. 123.

*Hypocreopsis pulchra*, *Winter*. On sheeps' dung, Bathford Hill, October, 1874.

GENUS 307. HERCOSPORA.† *Fr.*

Perithecium subcarbonaceous, cup-shaped, open above, covered by the bark, and differently coloured ; papilla heterogeneous, erumpent.

GENUS 308. PYRENOPHORA.‡ *Fr.*

Nucleus slowly formed, immersed in a sclerotoid mass which performs the office of a perithecium, Ostiolum at length slightly prominent, Sporidia multiseptate.

*Pyrenophora phæocomes* *Fr.* Rudlow, June, 1843, on *Alisma plantago*.

GENUS 309. GIBBERA.§ *Fr.*

Perithecium between waxy and horny, at length free, radiato-rimose from the centre, always closed.

*Gibbera pulicaris* *Fr.* On various branches, common.

G——— *Saubinetii* *Mont.* Batheaston, on twigs of elm, &c.

GENUS 310. DICHÆNA.|| *Fr.*

Perithecia subcarbonaceous, elliptic, closed, bursting by a longitudinal fissure. Nucleus and asci diffuent, innato-erumpent.

*Dichæna rugosa* *Fr.* On living barks of oak and beech.

\* *Hypocreopsis*, from its resemblance to *Hypocrea*.

† *Hercospora*, from *erkos*, an inclosed space and *sporos* a seed.

‡ *Pyrenophora*, from *puren*, a core or kernel, and *phoreo*, to bear.

§ *Gibbera*, from *gibber*, hunch-backed.

|| *Dichæna*, from *dis*, twice, and *chaino*, to crack or gape.

GENUS 311. CAPNODIUM.\* *Mont.*

Parasitic, Mycelium creeping, black, consisting of branched, articulated, even or moniform threads. Perithecia elongated, frequently branched, composed of confluent threads, the tips of which are often free.

*Capnodium elongatum* *B. and Desm.* On pear leaves, common.

C——— *sphaericum* *Cke.* Leigh Wood, February, 1878. C.  
Bucknall.

## ORDER 27. PERISPORIACEI.

Perithecia subglobose, always closed, except in decay, mostly membranaceous. Nucleus never diffluent.

GENUS 312. PERISPORIUM.† *Fr.*

Peridium subglobose, without any manifest thallus or appendages. Asci clavate. Spores indefinite.

*Perisporium vulgare* *Cda.* Batheaston, on old rope, November, 1864.

GENUS 313. LASIOTRYPS.‡ *Kye.*

Erumpent. Central peridium between fleshy and horny, proliferous, collapsing above, attached to radiating fibres. Secondary peridia ascigerous. Asci cylindrical.

GENUS 314. SPHÆROTHECA.§ *Lév.*

Mycelium arachnoid. Perithecia globose, containing a single globose ascus. Appendages numerous, floccose.

*Sphærotheca pannosa* *Lév.* On the leaves and shoots of roses, very common.

S——— *castagnei* *Lév.* On hops.

\* *Capnodium*, from *capnōdes*, smoky.

† *Perisporium*, from *peri*, around, and *sporos*, a seed.

‡ *Lasiobotrys*, from *lasios*, hairy, and *botrus*, a bunch of grapes.

§ *Sphærotheca*, from *sphaira*, a globe, and *theca*, a receptacle.

GENUS 315. PHYLLACTINIA.\* *Lév.*

Parasitic. Perithecia hemispherical, at length depressed, seated on a persistent or evanescent membranaceo—granular receptacle. Appendages straight, rigid, acicular, at length bent back. *Phyllactinia guttata Fr.* On various leaves, Batheaston, common.

GENUS 316. UNCINULA.† *Lév.*

Mycelium floccose. Perithecia globose. Appendages rigid, simple, bifid or dichotomous, uncinata, at length bent upwards. *Uncinula adunca Lév.* On poplar and other leaves, common. U—— *bicornis Lév.* On maple leaves and other leaves, common.

GENUS 317. MICROSPHÆRA.‡ *Lév.*

Mycelium arachnoid. Appendages straight, dichotomous. Branchlets swelling at the tip, or filiform. *Microsphæra penicillata Lév.* Bathford, September, on hazel.

GENUS 318. ERYSHIPHE.§ *Hedw.*

Mycelium arachnoid. Appendages floccose, simple, or irregularly branched. *Erysiphe tortilis Lév.* Rudlow, September, common. E—— *communis Schlecht,* on various leaves. E—— *macularis Fr.* Batheaston, July, on hops.

GENUS 319. CEPHALOTHECA.|| *Fekl.*

Symb. Mycol. der theinischen Pilze.

Perithecia simple, free, carbonaceous, very fragile, composed of

\* *Phyllactinia*, from *phullon*, a leaf, and *aktin*, a ray or spoke of a wheel  
† *Uncinula*, from *uncinus*, a hook.

‡ *Microsphæra*, from *micros*, small, and *sphaira*, a sphere.

§ *Erysiphe*, from *Erysibe*, mildew.

|| *Cephalotheca*, from *cephalos*, a head, and *theca*, a receptacle.



small pentagonal or hexagonal, radiato-striate cells, globose, and at first clothed on all sides with villose hairs, then glabrous, brown or black at the apex; asci at first seated on the tips of branched threads forming globose clusters, afterwards free, 8-spored. Sporidia heaped together, then free, simple, ovate or subfusiform *Fekl.* I find globose asci seated laterally on irregular hyphæ, filled with globose sporidia.

*Cephalotheca sulfurea Fekl.*, on the underside of damp boards in Mr. Percival's grapery at Henbury, near Bristol. The villæ are bright, sulphur-coloured, the threads and sporidia pale sulphur. *Annals of Nat. Hist.*, No. 1,729, with a figure.

GENUS 320. CHÆTOMIUM.\* *Kze.*

Perithecium thin; brittle, mouthless. Asci linear, containing dark, lemon-shaped sporidia.

*Chætomium elatum Kze and Schmidt.* Leigh Wood, Bristol, Oct., 1859, on an old, cast-off dress.

C——— *graminis Rabenh.* Rudlow, November, 1842.

C——— *rufulum R. and Rr.* Batheaston, May, 1871, on an old paper box under a bell glass. *Annals of Nat. Hist.*, No. 1,397, with a figure.

C——— *chartarum Ehb.* Batheaston, April, 1862, on damp paper in a tin box.

GENUS 321. ASCOTRICHA.† *Berk.*

Perithecium thin, free, mouthless, seated on loose, branched, conidiiferous threads. Asci linear, containing dark, elliptic, sporidia. *Annals of Nat. Hist.*, No. 116.

*Ascotricha chartarum Berk.* Batheaston, June, 1874. The conidia are at first developed in a mucous (hollow ?) globose mass, which at length disappears, on damp paper.

\* *Chætomium*, from chaite, a hair.

† *Ascotricha*, from ascos, a sac, and thrix, a hair.

GENUS 322. EUROTIIUM.\* *Lk.*

Perithecia reticulated, vesicular, coloured, attached to mucedinous threads, asci delicate.

*Eurotium herbariorum Lk.* Batheaston, on plants in herbaria.

This is considered merely an ascigerous state of *Aspergillus*.  
St. Catherine's on damp sticks and leaves in the woods.

## ORDER 28. ONYGENEI.

Peridium formed of loosely interwoven threads. Sporidia at length forming a compact, dusty mass.

GENUS 323. ONYGENA.† *P.*

Parasitic on animal substances. Peridium stipitate or sessile, paper like, at length splitting. Asci delicate. Sporidia at length forming a dusty mass.

*Onygena apus B. and Br.* Hanham, on bones buried in the soil in woods.

## FAMILY VI. PHYSOMYCETES.‡

Threads free, or only slightly felted, bearing vesicles which contain indefinite sporidia,

## ORDER 29. ANTENNARIEL

Threads black, more or less felted, moniliform and equal in the same felt, bearing here and there irregular sporangia.

\* *Eurotium*, from *euros*, mouldiness.

† *Onygena*, from *onux*, a hoof, and *ginomai*, to spring from.

‡ *Physomycetes*, from *phusa*, a bladder, and *muke*, a fungus.

GENUS 324. ANTENNARIA.\* *Lk.*

Threads felted, black, articulated, often moniliform. Walls of sporangia mostly cellular. Spores chained together, immersed in gelatinous pulp.

*Antennaria semiovata* *B. and Br.* Hanham, on fronds of *Filix mas*, September, 1853. *Annals of Nat. Hist.*, No. 784, with a figure,

GENUS 325. ZASMIDIUM.† *Fr.*

Sporangium thin, carbonaceous but brittle, growing on a septate, byssoid, equal mycelium. Mouth subumbilicate. Spores simple. *Zasmidium cellare*. Common in wine cellars, forming brown, byssoid tufts, rarely forming any fruit.

## ORDER 30. MUCORINI.

Threads free, bearing terminal or lateral appendages.

GENUS 326. ASCOPHORA.‡ *Tode.*

Sporangia collapsing, and at length hanging down over the fructifying apices like a hood. Fruit sometimes of two kinds.

*Ascophora mucedo* *Tode.* On bread, common.

GENUS 327. MUCOR.§ *Mich.*

Threads free, Sporangia at length bursting, but not dependent. *Mucor amethystinus* *Berk.* Rudlow, October, 1847, on rotting pears.

M—— *ramosus* *Bull.* Box, October, 1863, on rotten wood.

M—— *mucedo* *L.* On paste, very common.

M—— *fusiger* *Lk.* Rudlow, October, 1843, on rotten Agarics.

\* *Antennaria*, from antenna, a sailyard.

† *Zasmidium*, perhaps from *zosma*, a kind of seaweed.

‡ *Ascophora*, from *ascos*, a vessel, and *phero*, to bear.

§ *Mucor*, mould.

GENUS 328. HYDROPHORA.\* *Tode.*

Threads erect, tubular, sparingly articulate, equal above, terminated by a vesicle which is at first watery and crystalline, then turbid, and at length indurated and persistent from the conglomeration of the spores.

*Hydrophora stercorea* *Tode.* On dung, common.

GENUS 329. ENDODROMIA.† *Berk.*

Vesicle very delicate, perforated by the stem, filled with delicate, branched, radiating threads, and globose spores, with a nucleus endowed with active motion.

*Endodromia vitrea* *Berk.* Hook, f. l., 1841, iii, t. 1, fig. C.; has not occurred in the district.

GENUS 330. SPORODINIA.‡ *Lk.*

Stem dichotomously branched. Vesicles solitary, terminal, at length splitting horizontally. Columella large. Spores simple, growing on the columella. This genus has not occurred in our district.

GENUS 331. ACROSTALAGMUS§ *Cda.*

Flocci branched. Branches verticillate. Vesicles terminal, pierced by the threads, from the tips of which the spores are produced within the cells.

\* *Hydrophora*, from *udor*, water, and *phero*, to bear.

† *Endodromia*, from *endos*, within, and *dromos*, a running about.

‡ *Sporodinia*, from *sporos*, a seed, and *dineuo*, to whirl about or move. Link remarks "continuatio Wild, c. I. p. 94, 'Ehrenberg vidit massam sporulosam e floccis in sporangium moveri.'"

§ *Acrostalagmus*, from *akros*, pointed, and *stalagmos*, a drop, or a state of dropping.

*Acrostalagmus cinnabarinus* Cda. Batheaston, on decaying plants.  
*Verticillium lateritium*. One of the Mucedines is found to be a form of this species, with naked spores. See Corda *Icones* c. ii., 15, t. 10, fig 66.

GENUS 332. SYZYGITES\* *Ehb.*

Threads branched above. Vesicles of separate branches conjugating, and forming a distinct sporangium.

*Syzygites megalocarpus* *Ehb.* Has not occurred in our district, at least in its perfect state.

GENUS 333. ENDOGONE.† *Lk.*

Hypogeous. Flocci collected into a globose, spongy mass. Vesicles globose, solitary, or collected in little fascicles at the ends of the branches.

*Endogone pisiformis* *Lk.* Near Bristol, in woods, autumn.

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*On an abnormal Flower of a Penstemon.* By C. E. BROOME, F.L.S.

(*Read March 18th, 1885.*)

A flower of a *Penstemon*, communicated to me by C. Timmins, Esq., in May, 1884, presented the following peculiarities:—

The calyx was leafy, the calyx leaves nearly those peculiar to the species, the corolla was situated closely above the calyx and was composed of segments partly green and partly blue, one stamen with its filament was normal; the other four stamens were converted into distorted green, leafy appendages; the style

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\* *Syzygites*, from sun, together, and zugon, a yoke.

† *Endogone*, from endon, within, and gone, seed.

was prolonged into a green stalk about one inch in length, which was furnished with two leaves of the normal form. About two-thirds up there was a flower bud, above which the stem was again continued for about a quarter of an inch, and surmounted by a whorl of four leaves with an axillary flower bud as before.

The above were the features presented by the specimen sent me, and they would seem to come under Dr. Master's case of proliferation of the flower mentioned in page 115 of his *Teratology*. Where the centre of the flower is occupied by a bud or branch, the growing point, or termination of the axis, which ordinarily ceases to grow after the formation of the carpels, has here taken on new growth. The mixed colours of the corolla, in the present instance partly green and partly blue, were of interest as tending to show the true nature of the floral leaves, viz., that they are merely the ordinary leaves of the plant converted into petaloid leaves. I do not find the genus *Penstemon* among those in which such reversion has been recorded, it has been observed, however, in other genera belonging to the order *Scrophulariaceæ*, as *Verbascum*. Similar transformations are not uncommon in other orders.

Dr. Masters gives a remarkable instance in a flower of a cherry in which there was a gradual change from the floral to the foliar condition; there were five distinct lanceolate sepals, the arrangement of whose veins betokened that they were leaf-sheaths rather than perfect leaves, ten petals partly foliaceous and sheath-like as to their venation, one of them funnel-shaped. The stamens were ten in number, their connectives prolonged into foliaceous appendages so that the filament represented the stalk of the leaf. The pistil was entirely absent, and its place was supplied by a branch with numerous perfectly formed stipulate leaves. The genus *Plantago* presents numerous instances of this kind of transformation, its monstrosities are not uncommon in our gardens, and that of *P. major* is frequent in our fields, it is also common in cultivated roses.

It seems probable that the proliferation of the parts of flowers arises from over luxuriance of growth, since a check given to vegetative development, as by root pruning, &c., tends to the production of flowers and fruit, as is well known to gardeners, and the converse doubtless holds true, and plants which increase freely by scions, &c., are less free to blossom and produce seed.

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*Notes on Roman Paving Found in Bridewell Lane. By T. BROWNE, ESQ.*

*(Read March 18th, 1885.)*

At the request of our Secretary, I have brought together a few notes on the fragments of tessellated Roman Pavement that were found in August, 1884, in digging the foundations for a new building in connection with the Mineral Water Hospital.

The largest piece was found near the south-west corner, and under the old front wall of what had been a public-house known as the "Sedan Chair," at a depth of about 7ft. 9in. below the pavement of the lane. The Paving was an irregular fragment that would be included in a measurement of 6ft. each way. A careful exploration was made for some distance all round, in hopes of finding more; but nothing further was discovered. The original Paving seems to have been largely destroyed in the making of a drain from the old public-house to the sewer, no doubt many years ago.

A small fragment was also found at about the same depth near the north-west corner of the building, and almost in a line with the other, and at about the same level.

On comparing the depth at which the Paving was found with that which was discovered in 1859, when the Blue Coat School and Mineral Water Hospital were built, it appears that these fragments are about 3 ft. below the level of the old Roman

Paving which was then found, and is still preserved *in situ* in the basement of the Hospital.

The annexed photograph of the large fragment will give some idea of the patterns of the work. It will be seen that this was very richly designed, with a series of large octagons measuring 2ft. 8in. across, and containing in the interior of each a series of circles in small stones, and between the circles and the margins were foliated patterns worked in coloured stones. Apparently there must have been considerable variety of design in the whole of the original Paving, for we have here only one complete octagon, and fragments of two others, and the patterns are different in each. The small squares and triangles filling in the spaces between the several octagons and the outer borders are filled in with rows of tesserae with reversed squares of colour.

On the outer border there is a line of dark tiles, and beyond this again we found a margin of tiles laid herring-bone fashion and of which three rows could be traced. This was no doubt intended to fill up the space between the ornamental centre and the walls of the room; but no trace of the walls could be found.

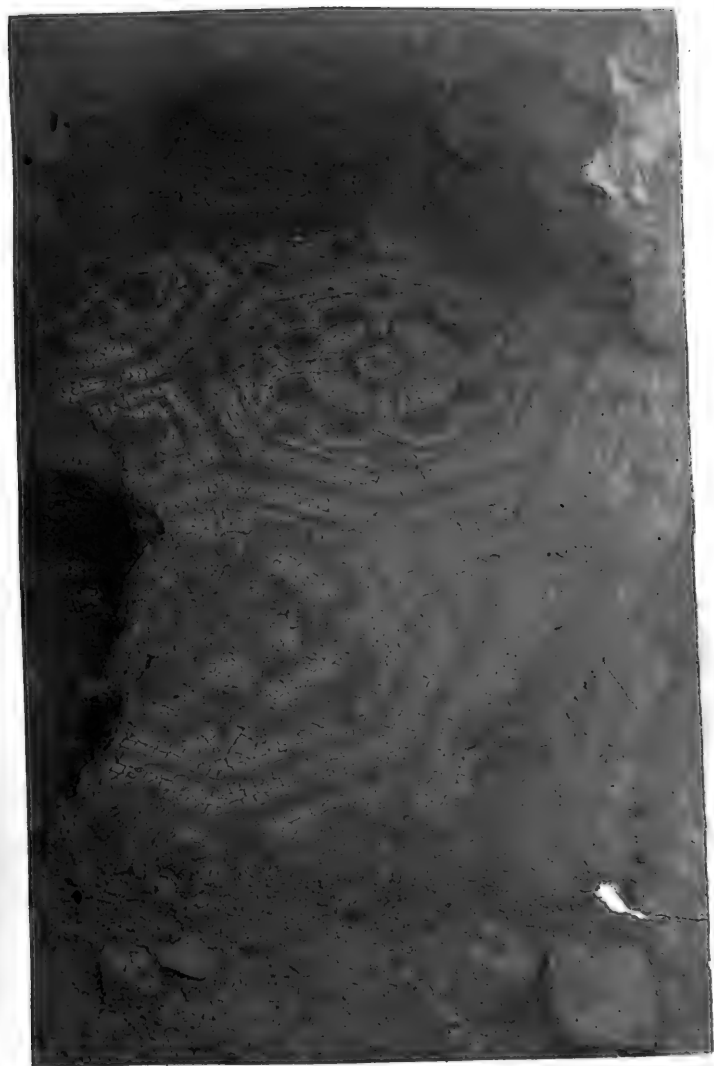
The Paving was bedded upon fine red concrete made from pounded bricks and lime—at least six inches thick, and resting upon the earth.

The Pavement has been carefully lifted up in pieces, and secured to a fresh base of cement; and it was found to be in such a loose, rotten state, and the surface so damaged that it was most difficult to lift up anything but small portions at a time. A few of the tesserae have thus got slightly misplaced; but as a whole the patterns are nearly as perfect as when first discovered.

A portion has been brought here for the inspection of the members.

The small fragment of Paving found at the north-west corner is of a much plainer character, and consists of a series of squares with dividing lines and border, and was probably from a room not considered worthy of a more ornamental Paving.







The tesserae in both cases appear to consist of pieces of white and blue lias, red brick or tile, and a purply red sandstone, all of which were probably obtained not far from Bath. Many of the stones are decayed and rotten, and would scarcely bear handling when once uncovered, no doubt from the effect of wet and corrosion in the ground, and subsequent drying in the air.

Of course the question naturally arises whether these fragments have any connection with those found some 25 years ago at the adjoining Hospital and Blue Coat School, and I think there can be very little doubt that they all belong to the remains of a Roman building of some importance, but of which no sufficient remains are left to enable us to form any definite idea of its extent or plan.

A great many irregular masses of concrete were found on the site (apart from these fragments) at different points, but they had been so broken and disturbed that no theory or idea of any regular plan could be derived from them, although they all appeared to be similar in character and of the well-known Roman composition.

The governors of the Hospital have taken great interest in the discovery of these fragments of Paving, and have had them permanently preserved in their new building.

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*The Bournemouth Firs; considered as the Remains of an Ancient Forest. Was there ever a Forest of Firs on the Hills around Bath? By the Rev. LEONARD BLOMEFIELD, M.A., F.L.S., F.G.S., &c., President.*

(Read December 9th, 1885.)

No one who has been at Bournemouth, and noticed the fir trees that give so peculiar a character to that place—if he take any interest in the subject,—can fail to desire some information as to their origin and history. Yet he would find it difficult to get his curiosity satisfied, and be obliged, in great measure, to work out

the question for himself as he could. During a visit paid to Bournemouth this last summer (1885) I was surprised to find how few persons seemed to know much about these firs or cared to consider the matter. The usual guide books scarce afford any help, except on one point, to which I shall revert hereafter. They speak of the firs as having been always there and forming part of the place, and they go no further. Persons, however, who say this do not consider of what modern growth the whole place and its surroundings are, whether as a place of sea-side resort for the public, or for permanent residence on the part of the large numbers who have made it their home; nor set themselves to inquire what was the state of things previously,

As the place appears now, broad roads, equal to any in England, are seen branching off in various directions with elegant houses or villas on either side, at intervals, each having its own grounds and garden; the firs that have been left simply growing by the sides of the roads, or along the sides of the gardens, where they often form a boundary, as it were, between two contiguous properties. These roads and houses are mostly on the cliffs, or they run back more or less away from the sea; the town—properly so called—being at the bottom, nearly at sea-level, and, much like the towns in other watering places, calling for no particular remark.

What now was the character of the place before all these roads and buildings came into existence? I was informed by a lady living in the neighbourhood, that an aged acquaintance of hers had known the locality ever since the early part of this century, when hardly a single building had been erected, or the first step taken towards bringing it into its present condition. It was in its wild primitive state—an enormous forest of Scotch Firs, with scarce any break, reaching for miles away from the sea into the surrounding country. Who, now, planted all these firs, supposing them for a moment to have been planted? Not one man, nor many men. Is it likely either that the several owners of the

different properties, over which the forest must have extended in those days, would have all come to one agreement in this matter? Let us bear in mind the contiguity of this forest of firs to the New Forest in Hampshire. The latter was formerly much more extensive than it is at the present day. "By some it is thought probable that William, instead of actually creating the forest, simply added to the extent of a vast tract of woodland which previously existed there."\* Wise, too, states that the forest "occupied nearly the entire S.W. angle of Hampshire:"† if so it must have been conterminous with the Bournemouth forest, or mixed up with it. And though the New Forest is more distinguished at the present day for its oaks, beeches, and birches, &c. than for its *coniferæ*, it must surely have had formerly a large growth of firs in addition to the trees above mentioned, or at least in certain parts of the forest. Lymington Heath is spoken of in the "New Forest Guide Book," as "a vast stretch of heather and gorse extending down to the Beaulieu estate, broken here and there by a few barrows and a "solitary fir tree, presenting a wild, inhospitable and dreary scene." To my thinking, these solitary fir trees here and there are the sole survivors of a much larger number formerly growing in that part of the forest. According to a statement in the *Times* newspaper, "there are hundreds of thousands of Scotch Firs in the New Forest at the present time."‡ Probably a large number of these have been planted, but the circumstance shows how congenial the soil and other conditions of the forest are to the habits of the fir.

As for the firs in the original Bournemouth forest, they must have been practically innumerable. It is said that even at the present day, notwithstanding the clearances that have been made,

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\* New Forest Hand Book, 2nd Ed., p. 8. See also *Leland, Itineraries*, 2nd Ed., vol. vi., p. 88.

† History of the New Forest, p. 20. ‡ *Times*, September 19, 1885.

‘upwards of three million pine trees remain in the different districts of Bournemouth and its immediate surroundings.’\*

The gravels and sands, which cover so large a portion of the Bournemouth district, seem naturally favourable for the growth of the Scotch fir, and seedling plants abound everywhere, which if left to themselves would soon grow up into a thick plantation.

There are a few groups of firs lying some way east or north east of the pier—one group especially, at the termination of the cliff road, and just within the one-mile radius, of a somewhat rectangular form, and reaching quite to the cliff’s edge—which distinctly give the idea of having been self-originated and undisturbed by man. In this last group, away from all buildings, the trees present a very uniform appearance. They are near together, and of a fair height; but from never having been thinned out, are drawn up into mere poles, with a considerable brush of foliage at top, the ground underneath being quite bare of grass or any other herbage.

There are, again, a few trees very much larger than any of the above; one especially, known to the inhabitants of the neighbourhood by the name of “The Four Evangelists,” from its spreading out, a few feet from the ground, into four large branches. This tree, thought by a friend resident in Bournemouth to be the largest in the district, stands in the angle formed by Grove Lane and the road leading from Christchurch to Herne Court. I measured it with the help of another party, and found it to be 13 feet and a half in girth, at about three and a half feet from the ground.† It is between three and four miles from Bournemouth, and had probably grown up, in times far back, near the border of an old forest, or in some open space, where with more light and air, it had room for expansion.

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\* Fortnightly Review, Sept., 1885, p. 386.

† Loudon mentions firs in the Scotch forests 18 and 20 feet in girth, but does not say at what height from the ground. *Arboretum Britannicum*, vol. iv. p. 2169.

There are other trees under conditions very different from those of the trees last mentioned ; trees on the edge of the cliff, exposed to the full force of winter storms, dwarfed, bent and distorted in various ways ; others, below the cliffs, struggling, as it were, for life amid the shelving sand heaps threatening, to all appearance, to drag them gradually down into the sea.

I have entered into the above details, as affording strong ground, in my opinion, for believing that the Bournemouth firs are *true natives* of that part of the country,—in opposition to those who assert that the Scotch fir, though indigenous in Scotland is not indigenous in England. Let us now go into this argument which dates back to the well known statement in Cæsar's Commentaries that there was the same timber in Britain as in Gaul, except the fir and the beech—"præter fagum atque abietem." This remark of Cæsar's, however, is of little worth. First, he could have seen scarce anything of Britain except Kent and the Thames district ;\* secondly, in addition to the fir, he mentions the *beech* as not found in Britain, where he is certainly wrong, as witnessed by Windsor, Epping, Savernake, and many other native woods and forests ; thirdly, firwood is recorded "to have been found under the foundation of some Roman roads."† In truth, firwood is abundant in many of the ancient mosses in England, and old roots of the Scotch Fir are found in the bogs of Ireland.‡ In an Article on the *Coniferæ* in the *Edinburgh Review* it is stated that "remains of the Scotch Fir "are plentifully distributed in the northern peat bogs ; and that "the tree appears to have covered large districts, and to have "flourished continuously on the same spot for long periods of "time . . . . It has maintained its place, not by the long

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\* "Cæsar's account (of Britain) is necessarily confined to Kent, the district known to him." *Scarth's Roman Britain*, p. 5.

† *Notes and Queries*, vol. i. (Sixth Ser.), p. 78.

‡ *Withering, British Plants*, and other Authors.

“endurance of individual trees, but by successive propagation. It was the prevailing tree not only in England and Scotland, but over much of the north of Europe.” In the sunken forest at Cromer, in Norfolk, in a deposit of a period immediately preceding the glacial, even the spruce fir is found as well as the Scotch. This was proved by the cones being submitted to the scrutiny of the celebrated Robert Brown, the first botanist of his age, who pronounced them to be those of the spruce.\*

The Spruce, however, did not survive the glacial period, and is consequently, in this country, extinct; but the Scotch Fir continues on to the present day, its range being now confined mainly to the Scotch mountains, though formerly extending to several of the northern counties of England. Gerard, in his “Herball,”† speaking of the “firre tree,” says—“I have seen these trees growing in Cheshire, Staffordshire and Lancashire, where they grew in great plenty, as is reported, before Noah’s Flood; but then being overturned and being overwhelmed, have lien since in the mosses and watery moorish grounds, very fresh and sound

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\* See an Article on the *Coniferæ*, *Edin. Rev.*, Oct., 1864, p. 347; also a Lecture by the late Professor Rolleston, on “The modifications of the external aspects of Organic Nature produced by man’s Interference,” 1880, p. 13. See, further, Winch’s “Essay on the geographical distribution of Plants through the counties of Northumberland, Cumberland and Durham, 8vo., 1825.” In this essay are some remarks of much interest on the subject in question. The author says—“On some of the elevated moors of this district the roots and trunks of very large pines (*P. Sylvestris*) are seen protruding from the black peat moss, being exposed to view by the water of these bogs having drained off and left the peat bare, but this tree is no longer indigenous with us.” He then adds—“It is worthy of remark, that the Scotch Fir does not at this day attain the size of these ancient pines, though planted in similar moorland situations, even though the young trees be protected, and the plantations situated at a lower level.”

† Ed. 2, by Johnson, 1636, p. 1364.



“until this day.” We may smile at a part of this statement, but what Gerard had seen himself is a direct proof of the matter in question ; and there are other statements that bear evidence the same way. Merrett, in his “*Pinax Rerum Naturalium Britannicarum*,” published in 1666,\* under the head of *Abies*, the Fir tree, writes—“in Alpibus Scoticis, et quondam in plurimis Angliæ locis Borealibus.”—Ray, in his “*Synopsis Stirpium Britannicarum*,” first published in 1696, nearly repeats the same words. Wordsworth, the poet, in a private letter, gave it as his opinion that the “Westmoreland mountains were formerly “covered in some places to their very summits by pines (the “Highland Pine).” He speaks of many that had survived, and were living when he was a boy.† Selby, in his “*British Forest Trees*,” considers that formerly the Scotch Fir “occupied most “of the elevated tracts of the kingdom, though the natural “forests now remaining are confined to the mountainous districts “of Scotland.”‡ Hooker, in his “*Student’s Flora of the British Islands*,”§ says of the *Pinus sylvestris*, “Highlands, ascends to 2,200 feet, rare in a native state ; formerly native over many parts of Britain.”

Coming down now to the southern counties of England, we have important testimony in two local Floras of comparatively recent date, “*Mansel-Pleydell’s Flora of Dorset*,” published in 1874, and Townsend’s “*Flora of Hampshire*,” published in 1883. It is on the confines of these two counties that Bournemouth is situated, and in consequence each author has something to say on the subject of the fir trees.

Mansel-Pleydell speaks of the Scotch Fir as common on heathy places, but considers it a doubtful native of Dorset. Nevertheless he states it is to be found in all the four adjacent counties of Devon, Hants, Somerset and Wilts.||

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\* P. 1. † *Notes and Queries*, vol. 3 (2nd Ser.), p. 445. ‡ P. 399.  
 § 2nd Ed., 1878, p. 368. || *Flora of Dorsetshire*, p. 232.

Townsend, though he too calls the Scotch Fir "a doubtful native," speaks of it as "common on the heaths around Bournemouth," and shortly afterwards says "there are abundant evidences that the pine formerly grew wild throughout the county." In another place he says—"it seems to me possible that living pine trees in some parts of the county may be descendants from the wild plant."†

Such is the testimony afforded by botanists, in favour of the Scotch Fir being indigenous in England as well as Scotland. Other testimony is afforded to the same effect by local names. Taylor, in his "Words and Places," thinking to confirm Cæsar's statement above alluded to, ventured the assertion that—"In no single instance throughout the Anglo-Saxon charters do we meet with a name implying the existence of any kind of pine or fir, a circumstance which curiously corroborates the assertion of Cæsar, that there was no fir found in Britain."‡ I have the high authority of Mr. Earle, the Professor of Anglo-Saxon, for saying that here "Taylor is wrong;" and Mr. Earle has kindly looked out for me several names of places all of which he considers as undoubtedly derived from the fir: such are *Firbank* in Westmoreland,—*Furbecke* (or *Firbeck*) in West Riding, and *Firbie* (or *Firby*) and *Furgarh* in East Riding, Yorkshire,—*Furbie* (or *Firby* or *Firsby*) in Lincolnshire,—*Furcombe*, in the parish of Farnborough, Berks,—*Furlé* (or *Furleigh*) in Sussex, Pevensey Rape.

In addition to the above local names, I mentioned to Mr. Earle two others in the south of England,—*Furland*, a tithing of Crewkerne in Somerset, and *Furland Hill*, one of a range of hills between Brixham and Dartmouth: both of which he had no doubt, were also named after the fir tree.

But I come now to a still more important fact, in especial connection with the fir trees at Bournemouth. It is the circumstance

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\* Flora of Hampshire, pp. 321-2.

† *Words and Places*, Ed. vi., p. 249.

I alluded to in the beginning of this paper as mentioned in the Bournemouth guide books. We read that "the remains of a submerged forest may, under certain conditions of the beach, be seen at the mouth of the valley, on the western side of the pier. This was especially the case in the early months of the year 1871, when some four or five of the remains of the trees, of which near thirty were at one time exposed, were removed for examination, and were proved to be the *Pinus Sylvestris* or common fir of the district, with an occasional alder. The condition and position of these remains prove that at some comparatively remote period the valley extended a considerable distance beyond its present sea board, and was covered with trees of a similar character to those now common to the locality."\*

Of this submerged forest a detailed account has been given by the late Sir Charles Lyell, in his "Principles of Geology."† The forest is said, by him, to have been laid open during a low spring tide in 1831. "It is situated between the beach and a bar of sand about 200 yards off, and extends 50 yards along the shore, cropping out from beneath a bed of sand and shingle. It also lies in the direct line of the Bournemouth valley, from the termination of which it is separated by 200 yards of shingle and drift sand. Down the valley flows a large brook traversing near its mouth a considerable tract of rough, boggy, and heathy ground, producing a few birch trees and a great abundance of the Bog Myrtle (*Myrica gale*). In that part of the submerged peat, which was exposed at low water, were seen twenty or more large stumps of fir, from one to two feet in height, the roots and bases of which still retain their bark. The sap wood of these is soft and spongy, but perfectly white, and exhibiting its original character; the heart wood is exceedingly hard and tough." After some other details he goes on to observe that "as the sea

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\* Sydenham's Guide to Bournemouth, 15th Ed., p. 76.

† 12th Ed., vol. ii., p. 536.

“is encroaching on this shore we may suppose that at some former period the Bournemouth valley extended further, and that its extremity consisted, as at present, of rough and boggy ground, partly clothed with fir trees.” His conclusion seems to be that the whole “had been sunk and submerged in modern times by the undermining of the sandy strata on which the peat and trees rested, and did not imply a general subsidence or change of level in that part of the coast.”

Another submerged forest, of the same character as that of Bournemouth, and due to the same causes, is said by Sir Charles Lyell to occur on the north side of Poole Harbour. In truth, as stated by Geikie and others, submerged forests occur in places all round our coasts, testifying to what an extent living forests must have formerly prevailed in this island. Speaking of the Scotch Fir in particular, Geikie says—“In ancient times it must have grown indiscriminately throughout the length and breadth of Britain, since we meet with it in the English mosses, as well those of southern as of northern districts.”\*

There were, according to Hutchins, some very large forests in Dorset formerly—one forest is said to have “extended over the whole island of Purbeck”†—and we cannot but suppose fir trees to have abounded there as in the adjoining county of Hants.

Taking all the above facts together, in connection with what was stated in the earlier part of this paper respecting the number and condition of the firs still growing at Bournemouth, we can hardly doubt the existence of an immense forest of firs on this part of the south coast of England, reaching over long distances east and west, in prehistoric times; and which, continuing on by spontaneous propagation, has remained in great part to the present day.

But there is another part of this enquiry yet to be considered.

\* *Great Ice Age*, p. 307.

† *History of Dorsetshire*, vol. i., p. 171.

How far north did this forest extend? As the fir abounds to this day in the Highlands of Scotland, of course it was not climate that determined its northern limit. Its advances in that direction could only have been checked by the progress of civilisation and agriculture. It is hardly possible to fix the boundary line exactly; but as a rude approximation towards it, I interested myself in tracing on the return journey from Bournemouth to Bath, for what distance on either side of the line, the firs might still be noticed. The speed of railway travelling forbids any accurate observations of this nature; and possibly I may have been mistaken in some instances. But certainly the firs were distinctly seen, though in gradually diminishing numbers, for a very considerable distance. They were in abundance—large patches of them here and there—as far as Wimborne; afterwards (but the patches fewer in number, or the firs only standing here and there in rows), they were noticed up to Blandford. There is a manifest reason, however, for their falling off here.

The sands and gravels of the Bournemouth tertiary beds are exchanged, after a while, for the underlying chalk which is far more profitable for agricultural purposes, and which must have long since led to a clearance, of the firs on that account, if on no other. I have just said that some of the trees may be seen standing in rows, and it looks as if they had been purposely left so, when the clearance was made, to serve as a border line between two contiguous fields or holdings. One can hardly imagine them to have been *planted* for such a purpose, as farmers in general (certainly in the eastern counties) consider low hedges, and not a row of trees, essential for good corn crops, allowing a free circulation of air overhead, and thereby in great measure preventing mildew.

Passing Blandford there was a decided falling off in the number of the firs for the rest of the journey; only a few observed here and there at rare intervals. I am almost sure I saw some at Templecombe and Wincanton, and others in the vicinity of one

or two stations nearer Bath. Some of these last might certainly have been planted ; but taking them in connection with the large numbers that we had passed on different parts of the line since leaving Bournemouth, it seemed to myself as if there must have been originally one continuous growth of firs the whole way ; and the question occurred to me—Did the firs ever reach to Bath itself ? And then I remembered a few old scattered, scraggy, forlorn-looking firs growing on Combe Down when I first came into this neighbourhood five and thirty years ago. These firs had always been a puzzle to me. Who planted them there ? supposing them to have been planted. Who cared to set them on a sort of no man's land, or if not so, strictly speaking—on an open down, where persons wander at will, and the trees are subjected to the rough usage of every passer by ? No doubt the trees had a history once, but they looked, when I last saw them, as if awaiting extinction,—life's day all but run out. May there not have been more firs once, and in full vigour ? And is it not possible they may have had some connection, I do not say with the Bournemouth firs, but with a large growth of firs existing ages back over all the downs by which Bath is surrounded, and as truly plentiful and indigenous in those days as in Bournemouth itself, or any other part of Great Britain ? The Combe Down trees, in that case, must have had a long ancestry, and they alone survive to tell the tale of the past, reminding one of the solitary firs on Lymington Heath above spoken of. There is something of sadness felt on hearing of things in which we take an interest being found or seen for the last time. The botanist mourns for the loss of some rare plant no longer to be met with in spots where he used to gather it. And the tree as well as the flower may evoke a feeling of this kind ; or steps may be taken, as they have been taken in some cases, to preserve a few individuals still remaining. The rare and beautiful Ladies' Slipper Orchis, formerly met with in many places in the north, is now, I believe,

restricted to one wood in Yorkshire, where (I have heard) the owner of the ground watches over and strictly preserves the few plants growing there still.

More to our present purpose, however, is a record of the last Scotch Fir seen in Ireland. It is said that "in ancient times all Ireland was full of woods on every side;"\* and there is no question but there were formerly forests of firs there, as well as in England. More† gives a few localities in which till lately they were still found; adding—"There is one large and old fir tree, supposed to be a last relic of the ancient forests, still growing on an open bog . . . in Mayo, and which was lately fenced in and carefully preserved by the Earl of Arran, who is the owner of the land."

I do not propose any such close imprisonment for the few remaining firs on Combe Down. But I think they should be looked after, and some record kept as to their existence before they quite disappear. Babington makes no allusion whatever to these Scotch Firs in his "Flora of Bath." Should not the matter be taken up by our Club, expressly instituted for the investigation of the Natural History and Antiquities of the neighbourhood of Bath? There may be antiquity in trees as well as in stones. My own botanising excursions have necessarily for many years been discontinued; and I was about to ask if some other of our members would not make it an object of one or more of their weekly walks to take a general survey of the downs, and to note what trees they might still find there and the condition they were in. I have, however, been anticipated in this matter. One of our members, Mr. Frederick Inman, on hearing of what I wanted, forthwith kindly volunteered his services; rambled over all the downs in turn, and sent me in a statement of what he had found. He has got together a good many details of much interest, and such

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\* See "Ireland's Natural History" by Boate (1652), p. 119

† "Cybele Hibernica," p. 276.

as would furnish matter for a separate paper which I hope he may be induced to give the Club at some future time. I will only here give a short summary of what he has ascertained. Setting aside fir trees growing in the proximity of houses, or in adjacent woods containing other trees besides firs, where it would be difficult to distinguish between such as were wild and such as had been planted; he finds, on the open ground, scattered trees upon Kingsdown, Banner Down and Lansdown. I have already spoken of the Combe Down Firs, and Mr. Broome informs me that he had seen formerly a few old trees, some merely stumps, in the vicinity of Sham Castle. On Hampton Down, on the edge of the hill near the Rifle Butts, where Mr. Inman remembers to have seen formerly about a dozen trees, only three stumps of trees are now left. This looks as if the race of old original firs was dying out. There are several trees scattered about the top of Banner Down in one place, where the ground looks more "as if it had been covered with these trees at one time than any other place at the top of 'the hill.'"

There are no firs on Solsbury Hill. This may, perhaps, be well explained by Solsbury having been in ancient times, according to Mr. Earle, "the site of a well-inhabited and populous British city,"\* which circumstance would necessarily have led to an early clearance of any natural forest that grew on its summit and slopes.

Taking Mr. Inman's notes as a whole, I consider there is evidence to show that these trees once existed in much larger numbers; and, in connection with all that I have said in the early part of this paper, sufficient to warrant the question—"Was there not formerly, in prehistoric times, if not later, a forest of Scotch firs covering all the hills by which Bath is surrounded?"

I cannot but think the answer to this question, if answer be possible, would be in the affirmative.

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\* Bath Ancient and Modern, p. 9.



*The Algæ of the Bath Thermal Waters.* By G. NORMAN, Esq., M.B.

(Read December 9th, 1385.)

The interest attaching to the occurrence of Fresh Water Algæ in thermal waters is due, not so much to the discovery of numerous fresh species, as to the mere fact of the existence of Algæ under such exceptional circumstances, and of their being able to grow and flourish at a temperature that would be fatal to members of the same genus or even species taken from a normal habitat. For instance, if a portion of *Oscillaria* were taken from the canal or river in our neighbourhood and subjected to a temperature of 150 degrees it would undoubtedly be killed outright, whilst at the thermal springs of Karlsbad, *Oscillaria* grows freely in water of the temperature of 160°.

Algæ have been found in many of the thermal springs of Europe; but the most important one both on account of the heat of the water, and of the variety of genera to be found in it, is that of Karlsbad, already mentioned. Here the calcareous and silicious deposits surrounding the spring are covered with Algæ which also line the troughs conveying away the water into the river. In these various situations a large number of genera and species of Algæ including diatoms are to be found, and some of the species of *Oscillaria* and *Mastigocladus* are peculiar to this water.

At another very hot spring, the Herculesbad of Mehadia in Austria, no less than nineteen species of Algæ have been found, including five species of *Oscillaria*. These waters are saline-sulphurous in character and vary in temperature from 80° to 180°. In the spring itself only a few forms exist, amongst them the *Oscillaria*—the others are found in the outflow only.

Closely allied with this is the organic matter found in the sulphurous thermal waters of the Pyrenees called "Sulfuraire de Fontan" or "Baregine" which has been lately shewn to consist almost entirely of felted masses of *Oscillatoria*; this is especially seen at Cauterets, where the temperature is as high as 140°. Numerous Algæ have also been observed in and around the

margins of the hot springs of Iceland, fully exposed to the influence of steam and boiling water—they consisted principally of *Oscillatoria* and species of *Confervæ*. Dr. Hooker in his *Himalayan Journal* describes *Confervæ* as present in the hot springs of Belcuppee. He says—"Confervæ abound in the warm stream from the springs and two species, one ochreous brown and the other green, occur on the various margins of the tanks themselves and in the hottest water; the brown is the best Salamander and forms a belt in deeper water than the green; both appear in broad luxuriant strata, whenever the temperature is cooled down to 168° and as low as 90°." On the same expedition Dr. Thomson and Captain Strachey found Algæ in the springs of Pugha in Tibet, which attain a temperature of 174°, and at the hot springs of Mormay, with a temperature of 110°. The Rev. J. M. Berkeley, who examined these specimens, says of them:—"The vegetation in the three sets of springs was very different. As regards the *Confervæ*, taking the word in its older sense, the species in the three are quite different, and even in respect of genera there is little identity; but amongst the *Diatomaceæ* there is no striking difference except in those of the Behar springs, where three out of the four did not occur elsewhere. In the Pugha and Mormay springs the species were either identical with or nearly allied to those found in neighbouring localities, where the water did not exceed the ordinary temperature . . . . The species are less numerous . . . . than might be supposed from the vegetation of those European hot springs which have been most investigated."

In America, Horatio Wood describes two new species of Algæ, *Nostoc calidarium*, and *Chroococcus thermophilus*, found in the hot springs of Benton, California, the temperature of which is 160°; and in the Yellowstone River district are some remarkable boiling mud springs which are coloured bright green by the multitude of Algæ contained in them—this observation was made by

Professor Ramsay of University College, Bristol, during the Canadian meeting of the British Association, and mentioned by him at a meeting of the Bristol Naturalists' Society.

Lastly, Professor Moseley, whilst naturalist to the Challenger expedition, obtained Fresh Water Algæ from the boiling springs of Furnas, at S. Michael's in the Azores. He describes the Algæ as growing on the sides of clefts in the ground, about a foot wide from which, sulphuretted hydrogen, steam, and water so hot as to scald the hands, are discharged in jerks and splashes.

Close to these were shallow pools of hot water, in the bottom of which were hollow channels from which hot gases and water were discharged; the edges of these were green with deposits of Algæ, which, however, were difficult to get on account of the heat of the water. In another place were swamps of hot mud, with pools of hot water, too hot to bear the finger in, constantly discharging gases and surrounded with crystals of sulphur, and here also Algæ were found. He estimates the heat of the water in the hottest parts to be as high as  $194^{\circ}$ , and in others from  $176^{\circ}$ — $149^{\circ}$ ; but no accurate observations were made there. About thirty species of Algæ were found, including some new ones; it was doubtful whether any *Oscillaria* was amongst the collection.

As regards the Bath Thermal Waters, although they have been fully and frequently dealt with from historical and medical points of view, I am not aware of any recorded observations concerning their natural history, with, however, this exception, that both Harvey and Hassall in their respective manuals of the "British Fresh Water Algæ" mention one species of *Oscillaria* as peculiar to the Bath Waters, viz., *O. tenuissima*, which is described as occurring in irregular, broad, velvet-like patches of a dark green colour. The irregularity of its appearance arises from the filaments being collected together into little ascending tufts, apparently rooted in the muddy deposit of the water. Each tuft proves on examination to consist of simple, uniform, even filaments, crowded together and quite pellucid, and equally

destitute of joints and branches ; their diameter is not more than the eight or ten thousandth part of an inch. In various parts of the baths I have found an Alga corresponding very much to this description, although Cooke, in his recently published manual of the "British Fresh Water Algæ," discards this species with many others, remarking that "the species of *Oscillaria* are at present distinguished by very artificial characters, which are by no means permanent, in which respect the genus is not in a much better condition than it was forty years ago."

The observations I have up to the present been able to make may be classed under three heads, according to locality, viz. :—  
1. The Algæ of the Roman Bath. 2. The Algæ of the King's Bath. 3. The vegetation of the Central Well.

1. *The Roman Bath.*—The conditions under which Algæ grow here are very favourable ; the temperature of the water which is just tepid, and the sheltered position, with exposure to the sunlight, encourage luxuriance of growth to the utmost. The consequence is that one species of *Cladophora*, viz., *C. insignis*, has almost monopolised the bath, to the exclusion of many other species. Professor Nordstedt, to whom a specimen was sent, says that it is the finest species of *Cladophora* he has seen, and rivals the typical specimens in his collection. Growing upon the *Cladophora* are numerous diatoms, the principal of which is *Amphiprora paladosa*. This is so abundant as to produce the appearance of a white fringe on the Algæ when seen in bright sunlight. Mr. Grove says it is a remarkably fine specimen, as large as his typical specimens from the shores of the Tay, and the frustules look healthy and full of endochrome. Besides this are found *Surirella ovalis*, *Synedra tenera*, *Nitzschia amphioxys* and *linearis*, and a few other minute forms. The only other Alga I have been able to find has occurred in small, darkish green patches around the margins of the bath, and may possibly represent the *Oscillaria tenuissima* already described.

2. *The King's Bath.*—This, I believe, would prove a very

productive field for the smaller filamentous and unicellular Algæ ; but owing to the zeal of the caretakers of the bath to prevent the floor and walls becoming slimy and slippery, by means of weekly scrubbing and occasional lime washings, the algal vegetation is very scarce. However, by scraping the sediment from the floor of the bath when the water has been let out, I have been able to find portions of several species of Algæ ; and the fact of their being able to grow in spite of the warfare carried on against them, justifies, I think, the opinion I have expressed as to the habitat being a favourable one.

The principal genus is a Phormidium, or Lyngbya, as it is now termed by Cooke, of which there are two species, a larger and a smaller, probably *P. corium* and *inundatum*, also a few filaments of *Nostoc* and some unicellular Algæ, principally *Glæocystis*. On the under sides of the wooden seats in the bath is a plentiful supply of the fungus *Merulius lacrymans*, common dry rot.

3. *The Central Well*.—This is the centre of highest temperature in the baths, the water being generally about  $118^{\circ}$ , flowing up directly from the source to fill the King's Bath. The whole of the inside wall of the well presents a curious appearance, being lined throughout by a thick coating of the fungus *Merulius lacrymans*, which itself is stained by the iron deposited by the mineral water, and pierced by numberless filaments exceedingly fine in character, of the small *Phormidium* before mentioned. Under the microscope this arrangement may be well seen ; but the Alga is so small that it is with difficulty detected by the naked eye. There are various patches of Algæ around the mouth and outer walls of the well ; but none different, as far as I at present know, from those found in the King's Bath.

I regret that, owing to the late period of the year at which I took up this subject, and to the pressure of other duties, I have been unable to do as much justice to my subject as I should have wished ; but I propose to continue my observations, and to supplement this paper on another occasion.

*The Earliest Map of Bath.* By EMANUEL GREEN, F.S.A.*(Read 13th January, 1886.)*

In the British Museum there is a manuscript, a quarto volume, entitled: *The Particular Description of England, with the Portratures of Certaine of the Chieffest Citties and Townes.* Having been given by Sir Paul Methuen to Sir Hans Sloane, it now reposes in the Sloane Collection, being numbered 2,596. The author of the book was one William Smith, who, after being at Oxford, studied heraldry and antiquities, became Rouge Dragon, and died in 1618. He seems in his wanderings to have copied the plans of different cities when he found them already done, and when not so, to have drawn them for himself. The plans given are all coloured. Bristol, placed with the county of Gloucester, is labelled:—Measured and laid in Platforme by me, Wm. Smith, at my being at Bristow, the 30th and 31st July, Ano. Dom, 1568. Canterbury is dated 1588; and as the title page is dated 1588, it may be fairly assumed that the work was then finished. It may be mentioned that the volume has been privately printed; but so privately and so small an impression that the fact is barely known.

Bath, described as but a "little Cittie, yet one of ye most auncientest in England," is here reproduced. Taking it in hand as a novelty, as if the sight were quite new, it is seen to be a walled city. Then comes the desire to know all about those walls. The Domesday survey does not mention it, as it does a few other places, as being a walled city. Two years later, in 1088, our histories mention, as Florence of Worcester and other Chroniclers record, the coming of a party from Bristol in rebellion against William Rufus, when Bath was burned, plundered and devastated: William of Malmesbury says, depopulated and the spoils treasured up at Bristol. These are very strong words. There is again no intimation in these accounts that it was a walled city, or that it offered resistance as if it were so. Passing

now over some seventy years, we come to a Chronicle of extreme interest, the *Gesta Stephani*,\* hitherto altogether overlooked. Covering the time of Stephen, a terrible time, imperfectly known through our present histories, this Chronicle is of particular interest, as, contrary to those more known, it is in Stephen's favour. Unlike the others too, which treat more of northern affairs, the western events being but shortly mentioned and from general rather than personal knowledge, this one treats the western events fully, the author writing as having been an eye witness of what he records. Who the author was is unknown; but he was clearly cotemporary—probably a Norman—and connected either with the Court or the King.

After describing Bristol and the Castle, and telling us that the latter, "vast and fearful" to beholders, was made terrible to the district by a garrison of freebooters and robbers, he adds:—"There is a city six miles [error for twelve] from Bristol where the hot springs circulating in channels beneath the surface are conducted in channels artificially constructed and are collected into an arched reservoir, to supply the warm baths which stand in the middle of the place—most delightful to see and beneficial for health. The city is called Batta, the name being derived from a word in the English tongue which signifies Bath, because infirm people resort to it from all parts of England for the purpose of washing themselves in these salubrious waters, and persons in health also assemble there to see the curious bubbling up of the warm springs and to use the baths."

The date of this charmingly pretty account is 1138, and it is the earliest mention of the scene. By a little imagination we can see Bath, "The" bath back to the Conquest, and had the writer added that in a gallery hard by minstrels minstreled, we should have before us almost as perfect a picture as through any much later description.

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\* By Sewell.

Bath being held for Stephen, the Bristol men in rebellion wished to get it, the more especially as it could be easily fortified (*eo quod facilis esset ad muniendum*). A party therefore marched out stealthily in the dusk of early morning, carrying ladders and other implements for scaling the wall (*scalis que secum et aliis machinulis ad murum conscendendum convectis*), and took post under cover of a hollow, while scouts reconnoitred to choose the most advisable point for attack. Geoffrey Talbot, and Gilbert de Lacy, his cousin, were selected as scouts, and went out hoping to do their work unobserved; but the guards within espying them they sallied out upon them, and after a struggle secured Geoffrey as their prisoner—took him and put him in fetters and threw him into their deepest dungeon; Gilbert, stronger and more wary, escaped and returned to tell of the mischance. A curious picture this, these resolute citizens struggling with the two knights, who were, presumably, in the chain armour of the time. Then one would like to know where this dungeon was. Determined to liberate Geoffrey, the Bristolians approached Bath and summoned the Bishop (Robert) to come out and treat with them, promising him safe conduct and safe return. The Bishop “dwelling in his house with simplicity,” giving credit to their words, went out accordingly, when he was quickly seized and held a prisoner. He was then covered with abuse, and threatened with hanging unless he released Geoffrey. As soon as it was known within that the Bishop was captured, the citizens closed the gates and manned the walls (*conclusis portis ad muros defendendos concurrerant*); no assistance or succour consequently could be sent out and the Bishop was obliged to order that Geoffrey should be set at liberty. The Chronicler endeavours to excuse this, first, as being a clemency more becoming a bishop, and also because reason did not require him either to expose himself to insult, or to sacrifice his life. For Geoffrey, however, he had no blessing, but duly doomed him to the usual torment. The Bishop, being free, became emboldened, and charged his



captors with violation of their pledge, threatening them with discomfiture in all future enterprises. To all this they answered with jeers, and reminded him of his simplicity in supposing they were pledged; then throwing back perhaps a little of the Bishop's own teaching, they argued that, being already a perjured lot, their pledges went for nothing.

The robberies and cruelties of the Bristol garrison becoming too notorious, King Stephen determined to reduce it. Setting out hurriedly, he unexpectedly arrived at Bath. The Bishop on his approach went out to meet the royal cavalcade; and at once had to soften the King's anger against himself, for having let Geoffrey go. After telling his story, how grossly insulted he had been and well nigh hanged, he was restored to favour, and the King accompanied him into the city. Stephen examined the entire circuit of the walls, commanded them to be raised higher and outworks to be constructed, and marked a special spot very capable of defence which would defy assault (*ideoque muros altius sustolli, propugnacula in devectum surrigi*). Then, says the Chronicle, he marched to Bristol—"the seat of fraud." The Bath men, meanwhile, gallantly and vigorously maintained themselves, using every means to make the walls and ramparts impregnable (*muros et aggeres omni resistendi artificio inexpugnabiliter firmare.*) Keeping the walls always manned, they sometimes sallied out at night, placing parties in ambush, whilst by day the country folk and the men at arms overran the Bristol lands, sometimes appearing in force even at the gates, or setting fire to churches or houses, or whatever would burn.

Bristol, however, was not taken, and the King marched on to other work.

Our own records are few for this date. Passing, then, some seventy years, we come to the reign of King John. The custom of the Kings to journey with their Courts from place to place prompts a search for the movements of John, as, after the year 1200, documents may possibly be found. In 1206 some arrange-

ments apparently were in progress for a western journey, as the King sent to the Bishop of Bath and Wells twenty-four palfreys and twelve stable boys, and also a servant with one horse and one stable boy. Twelve palfreys and four stable boys were ordered to be removed from Taunton to Wells; five others and two stable boys were moved from Winchester to Glastonbury, and ten others with three stable boys were to be placed at Bath; also six marks were paid for three tonells of wine sent from Bristol to Bath, with nine shillings for carriage.\* There is no record, however, of a visit in this year.

In 1207, the Bailiff of Bath was directed to see if the king had two dolia of wine at Bath; and presumably he had not as the Constable of Bristol was ordered to send that quantity to Bath, and place it in the house, which was the Bishop's house.† There seems again to be no record remaining of a royal visit in this year.

In 1209, however, John was at Bath for two days, May 13th and 14th; but no account of his stay can be found.‡

In 1212, John paid another visit, being in the city on the 17th October; and for this time there happens to be an account of the petty or smaller expenses. Besides a hundred and fourteen warreners, of whom two had three farthings per day, there were twenty-five dogs in the care of a huntsman, costing for two days, fifteenpence; then there was the huntsman himself at sevenpence halfpence per day; and twenty-four keepers who, for the two days' stay at Bath, had four shillings; the total being 16s. 10d. There was also charged for hire of a cart with two horses, bringing fruit from Gillingham to Bath, from Bath to Bristol, and from Bristol to Lacock, three days, two shillings. To Odo who stayed a night at Bath with the wardrobe and the "harness" of the wardrobe, and one night at Bristol, eightpence. To five carriers of the wardrobe, five shillings, and to nine others, nine shillings. There

\* Close Rolls, 7 John, m. 1.      † Close, 9 John, m. 15, m. 12.

‡ Itinerary.

was also a payment to Agnes, the laundress, of twelvecence; and there was an outlay of sevenpence, *pro tribus urinalibus* for the use of the king; there is another entry, *pro urinalibus et chassis ad urinalia imponendi*. An entry a little later, not specially relating to Bath, but giving an idea of what must have been the case, accounts for fifty-five stable boys who had between them six shillings and fourpence per day, and sixty-two horses costing for forage, hay, corn, and shoeing for the night, sixteen shillings and fourpence halfpenny. Six carters divided twelvecence per day, and fifteen horses consumed sixteen bushels of oats; the charge for a night's livery, hay, oats, forage, lights and litter, being three shillings and twopence.

In 1213, March 13th, John was again at Bath, but the expenditure is only briefly recorded. Five shillings were paid for fowl for the falcons, and five pounds were given between the head falconer and his associates. A day or two later the falconers were paid ten marcs for flying their birds. Eighty tonells of wine were obtained from Bristol, thirty-seven at 26/-, and forty-three at 24/-\*

This roll is unique, and of extreme interest; no other record affords such minute information, even down to the loss of five shillings when the king played at "Tables." To dwell too long on it would be out of place, yet, besides the insight into prices, the picture is ever curious, with the cavalcade, the incessant movement, usually twenty or thirty miles a day; the hounds and huntsmen; the falconers and falcons; then the preparation in advance, and the hubbub and arrival of the party in the little—very little city.

In 1216, John was again at Bath, and for the last time. Going from Bristol to Hinton, then to Sherbourn, he was at Wells, 27th August; Bath, 28th; Bradford, 29th; and Chippenham, 1st September.† There is no record of the expenditure.

In 1223, Henry III. apparently had an intention to visit the west,

\* Rotulus Misæ, 14 John. † Close, 18 John.

as he ordered the Prior of Bath to repair his houses there, at a cost of sixty shillings, and to account for the same to the exchequer.\* He appears to have been there, however, in 1235, as a patent was dated therefrom in that year.† There seems no other record of the visit, except an entry on the Pipe Roll of the following year be taken as a result of personal inspection. By this the Prior of Bath rendered his account for £13 11s.—a considerable sum at that time,—spent by order of the king in repairing the king's houses and the wall around the King's bath (*in domibus Regis in villa Bathonie que reparatione indigent, et muro circa balneum Regis ibidem reparandis*).‡ This is so far the first known mention of the King's bath under that name, and it shows the origin of the name as being not from usage as generally supposed, but from ownership, distinguishing it from the Prior's bath so named from the same cause.

Henry III. died abroad, having been absent from England for some years. Edward I. on succeeding, in 1273 made inquiry in every Hundred concerning the rights or dues of the Crown, and to discover the neglect in payment or performance during the late king's absence. Relating to Bath there are three returns; two for the city and one for the Hundred "*Forinsecum*" or outside the city. The last is sometimes written as the Hundred *Forinsecum de Berton Bathonie*; or, the Hundred *Forinsecum Bathonie de la Berton*. In some documents it is noticed as the *Barton Regis extra civitate*. By adopting the early mode of contracting, and taking the first and last syllables of "*Forinsecum*" we get Forum; and thus Bath Forum is simply Bath outside the city and has nothing to do with a forum, as has been stated.

As to Bath City, the juries found that King John had given the city and the Hundred "*Forinsecum*" to the Prior of Bath; and then we get a return well showing the utter neglect into

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\* Close, 7 H. III., m. 5. † Pat. Roll, 19 H., III., m. 5.

‡ Pipe Roll, 20 H. III., dors.

which everything had fallen, and showing clearly how reasonable the enquiry was. It was found that Henry de Courteney had built a noble chamber on the city wall, for which he had taken the stone from the wall. That the miller of the Prior took stone from the wall for repairing the pool of his mill. That the Prior took stone for building an almshouse. That he, as also had other Priors before him, made lime from the walls at the Southgate; and other Priors had made lime at the Westgate for eight perches towards Monksmill; and that the defunct Prior had carried stones to the Priory, to the damage of the whole city. That the Master of the Hospital of St. John took stone for his house; that Thomas Wlbeyn, William le Commandur, Roger Budde, William Faber, John Koker and William Cocer carried away stone from the walls to construct or repair their houses. That Peter Forester took stone for the pool of his mill, and Thomas Sweyn took stone to build the house in which Thomas Sweyn his son lived, and that Gunilla le Marescal held a house built of the stone from the wall: all being declared to the damage of the city and of the King. It was also found that the King's own houses within the gates of the Abbey were deteriorated and destroyed, and to repair them to their pristine state would cost ten marcs beyond the cost already expended on two houses within the metes of the Priory. It was also found that Robert Cherin had a tenement within the city and a meadow without, for which he kept the gate on the bridge in time of war.\* This is an early mention of such a bridge. No order for repairs seems to have followed these enquiries, and so the picture here drawn must have been seen by the King himself when he came to Bath three years later, on the 15th September, 1276. He stayed the 16th, and then went on to Keynsham the 17th, and then to Bristol. He was in Somerset again in 1278, but did not visit Bath. In 1285, coming now from Bristol, Edward was in

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\* Hundred Rolls.

Bath for four days, the 3rd, 4th, 5th and 6th January, and then went on to Marlborough.\* There seem to be no accounts existing relating to these visits.

Passing on to another reign, in 1369, 43 Edward III., there was a prospect of a war with France, and the king was asked to set his house in order. A petition presented to Parliament, prayed that all fortresses, cities and towns should be hastily surveyed and put in "sauve garde;" and that a command should be given to all Mayors and Bailiffs to have their walls, ditches and gates duly furnished.† This was done accordingly, and a letter was ordered, 4th June, to be sent to the Mayor of Bath concerning enclosing the city.‡ Then came the letter or patent on 8th July, directed to Nicholas de Berkeley, chiv., and the Mayor and Bailiff of Bath, and Henry de Forde. That whereas the walls and towers of the city are in divers places destroyed and broken, the walls being threatened with imminent ruin; and whereas the ditches around the walls are obstructed by trees and herbs growing in them, and are used for dungheaps and ordure (*fimos et fimare*), and other sordid filthy things thrown therein; unless a quick remedy be applied, as well by us as by the said city and parts adjacent, heavy dangers and damages are likely to happen immediately or at any moment. Being willing to remove these damages and dangers, as has been requested, We assign you to survey the walls and towers and ditches aforesaid, and to repair and mend the defects existing in the same; and to clear the said ditches from the trees and herbs growing in the same; and to cut and clear out all sordid matter and filth. And, with power to compel and distrain; to cause all those who have land, tenements and rents in the city or suburbs, or those who are resident, or carry on business therein and gain by reason of their stay, to contribute to the said reparation and clearing,—viz., each one

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\* Itinerary. † Rolls of Parliament, vol. ii., p. 300.

‡ Pat. 43 Ed. III., pt. 1, m. 23.

according to his status or ability as reasonably as may be, so that none have consideration. And to you and each of you we command that you set about the work with all diligence. We give orders also to all and singular the men of the city, by tenor of these presents, that they appear and attend to assist us or our deputy in making and executing the said work, as by you or others for us on our part shall be required.\*

The way in which cities were taxed in early times is of interest; but unfortunately no special plan was ordered or granted by this patent, and the plan adopted is therefore unknown. Patents for murage, pavage and pontage are found for several other cities, but not one for Bath. Sometimes such aid was got by taxing all articles brought through the gates; thus a cart paid sixpence; skins, 1d.; skins of lamb, hare, &c.,  $\frac{1}{4}$ d.; salmon, congers and eels,  $\frac{1}{2}$ d. One city, 6 Richard II., was granted the privilege of not sending a burgess to Parliament for five years, the cost saved to go towards building the walls.† The payment to a burgess ranged apparently from two shillings to four shillings per day; the sheriffs getting eight shillings.‡

In 1377, 1 Richard II., the Commons again prayed, as a necessary preparation for war, that cities having walls should repair and make them defensible; all who had property in them, Religious houses as well as others, and merchants for their merchandize, to be reasonably taxed, following the usual custom, "come y ad estee usee devant cest heure." This was ordered accordingly, and a writ issued to the Mayor and Bailiff of Bath to survey and repair; but coming so soon after the more imperative order of 1369, it must have been unnecessary, except perhaps as reviving dormant energy.

A patent issued in 1417 raised hopes that some good account of the city would be found. It was for repairs of walls, ditches,

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\* Pat. 43 Ed. III., Pt. ii., m. 39. † Colchester, Pat. Pt. ii., m. 26.

‡ Rolls of Parliament.

gutters, water courses, and stone bridges between the city of Bath and the town of Bristol, which by constant flux and reflux of the sea, and inundations and encroachments of the water, and neglect of reparation were greatly damaged and broken.\* Beyond the above facts there is, however, no further special allusion to Bath.

These notes clear the way for understanding the early maps. With a little imagination, a little filling-in of domestic habits and domestic events, a fairly clear image of the city is seen, including "The" bath, for the first time back to the Conquest. Whatever the condition in which the walls and the city were left after the damage of 1088, both were perfect in 1138, in the time of Stephen. After this there seems to have been a general easy neglect, until during the absence of Henry III., say after 1235, heavy damage was actually done, as declared in 1273, when the walls appeared waste and the stones the common property of any who chose to take them. So all remained yet another ninety odd years, until 1369, when the great reparation was ordered and the ditches cleared. To this date, 1369, we may feel inclined to assign the using up of the Roman stones, recorded by Leland some 250 years later, as seen by him in the walls; and, after another repairing, these would be the walls seen by "The Most Illustrious Lord the Lord Richard" when he was in Bath in July, 1658. Thus the mediæval period passes, and we come to a time with which we are more in touch, a time more readily understood of all men, the time of the view or plan now to be considered.

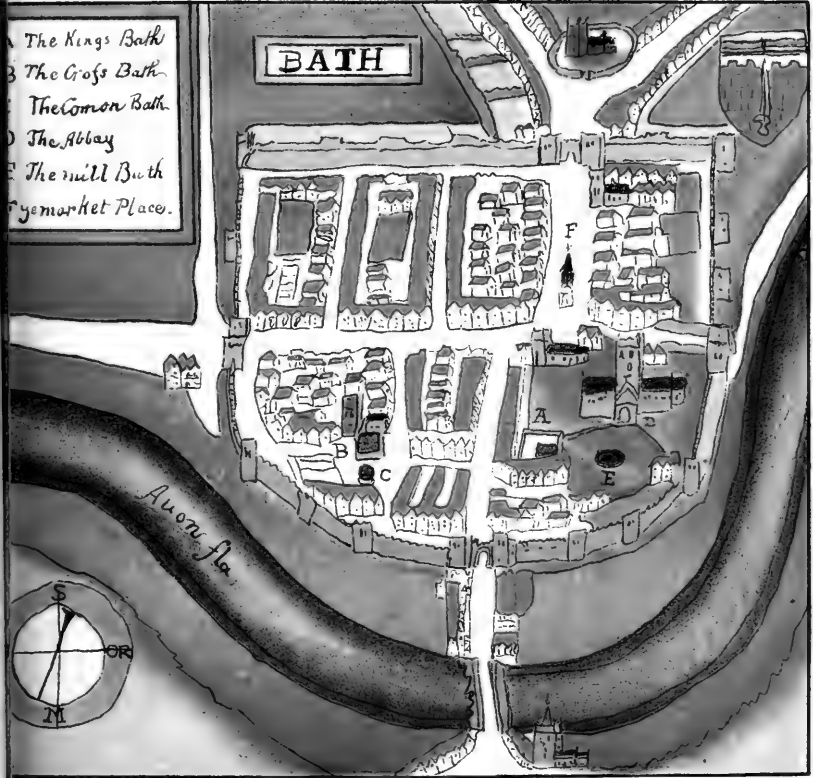
Giving this plan a glance, it is seen not to be exact, as it shows the Abbey church without the Abbey or Priory house. The grounds around the church are represented as all grass, unfortunately so, as Leland writing some thirty-five years earlier, records that "a great square tower with other ruins" of the once

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\* Pat. 5 Henry V., m. 34, dors.



Somerſetſhyre





existing bishop's palace on the south-west of the monastery were then to be seen. Had Smith marked these, supposing they were there in his time, we should know the exact site of the palace, the "bishop's house" of King John's time. Possibly they were removed under the Act of 1540, 32 Hen. VIII., cap. 18, for re-edifying townes, which declared that in Bath, as well as other cities named, houses had fallen down decayed and so "doe lye as desolate and vacante groundis, many replennyshed with unclennes and filthe." After proclamation made they were to be re-edified or repaired within three years; but here re-building would not be likely, and the greater improvement would be to remove altogether.

On a further examination of the plan it is seen that although the bridge is shown, the gate is omitted—the great gate with a stone arch at the centre of the bridge; recorded in 1273 as being kept as a service for certain land and a tenement.

Another peculiarity must be noticed, as this Smith's map attempts to show the suburb southward over the bridge, this being the more remarkable as not only does he so but he marks a church just at the foot of Holloway, at the corner on the left turning towards Widcombe. What does this mean? Was there ever a church here? Going first to the dissolution documents and the accounts of particulars for grants or for leases, there is found full notice relating to the "cathedral" and the site of the Priory, and the Grange, and le Hayes, and le Ham and pasture for three hundred and twenty-two sheep called the hogflock. Then there were pastures in Walcot and Barton; and a pasture on Launcedown with all commons; and pasture for a flock of three hundred and sixty ewes called the eweflock of Barton.\* Selecting Widcombe more especially, there was the farm of the manor of Widcombe and Lyncombe with the lands and feed called Bewchencliff, or Beauchyncliff, or Bychincliff, or Beachyncliffe, with Prior

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\* Particulars for Leases, Ed. VI., sec. i.

park and other meads and pastures.\* Going still backwards, the *Valor* mentions Stalls with the chapel of Widcombe annexed ; and earlier still, in the Wells registers the same thing is found. In 1322, Bishop Drokensford's register mentions the admission of the Vicar of Stalls with the chapel of Widcombe, with all the tithes of Widcombe and Lyncombe. So is it in other registers. There is no record of a church or chapel on the site here marked by Smith. Smith's plan may be considered perhaps, not as a map plotted exactly as a survey, but rather as a view—a bird's-eye view—"a portrature" as if taken from Beechen cliff. This church may then be accounted for, the intention being, not to mark exactly a site, but, after the manner of early maps, to mark that here in this suburb was another parish ; and this would then be the parish church of Widcombe. In this case too, as it happens, this was, ecclesiastically, really a part of Bath. It is not forgotten that there was the chapel for lepers, the chapel of St. Mary Magdalen in Holloway. This is found noticed in 1256 as the chapel of St. Mary "extra civitate Bathonie," thus perhaps marking it as the otherwise unrecognised church of St. Mary extra muros, often mentioned in the local records.\* But it need not be confounded with the site or suggested site of the church now considered.

One note must be made, as from the above documents we get the origin of the name Beachen cliff—this being Beau Chine cliff, chine meaning one side of a gorge such as this is ; and so from Beauchine we drop to Beechen or Beachen, as from Beauchamp we get to Beecham ; without any origin from the beech tree, as many suppose.

The intention in these notes is not to examine minutely any differences in the early maps, as that may be better done by one more capable and with more minute local knowledge ; but there is yet one point which must be attentively considered, and here too must be quoted for once, one local author, but quoted only to

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\* Particulars for Grants, Hen. VIII. † Pat. 40, H. iii, m. 7.

criticise. John Wood in his description of Bath, on page 84, vol. i. of 2nd edition, has given an engraving of what he calls:—"A copy of Doctor Jones's view of the city of Bath, as it was published in the year MDLXXII." He gives it boldly as being a view taken in the reign of Queen Elizabeth to illustrate Jones's book, "The Bathes of Bathes Ayde;" and considering it suitable for illustrating his own text, he adds—(p. 84) "I have therefore copied it." First, here the title to this map is Wood's own; with attentive reading that is clear, and so it must not be confounded or taken as being the copy of an original, as a hasty general reader may readily do. On pp. 85-86, Wood has described this map by the usual method of using capital letters; and then he has marked by the use of other small letters or figures of his own, certain localities which, as he says, are "neither named nor referred to by Dr. Jones." Thus alluding to a certain house, he writes, "it stood by the fig. 5 in Dr. Jones's view"—adding—"some of the parts of which view he (Jones) thus described." Then he refers to the capital letters as being Jones's.

Now all this is false. Dr. Jones's book does not name or refer to the city, nor does he by means of letters or figures refer to any spot or locality in it. There are no such letters in the book, nor is there any description of or allusion to any such subject as a map. The treatise is entirely on the baths, as the heading of the four chapters or books given in the dedication clearly show. The first book treats of the descent of Bladud, and of the sicknesses the baths help; the second book shows the divers opinions concerning the cause of the waters; the third expresses things natural and non-natural, and the signs of the sick for the better consultation whether the baths will help them or not; and the fourth book declareth aphorisms and rules how the baths shall be used. Again in vol. ii., p. 305, Wood says when speaking of Bellot's hospital, "it was built on the ground marked "k" in Jones's view," thus conveying two entirely erroneous impressions; first, that the "k" on the map is Dr. Jones's own letter, and also that Bellot's hospital

must have been founded before 1572, the date given for the map, whereas Bellot's hospital was not founded until 1609. Again, writing here in vol. ii. he has forgotten that in vol. i., p. 86, in the description there, whilst "i" marks the site of Counter's tower, and "l" the site of St. Catherine's hospital, the "k," which should come between these letters and mark Bellot's hospital, is omitted from the letterpress, although it appears on the engraved map. An excellent example this of how a thing may be conspicuous by its absence, as had the "k" been in its place it must at once have attracted attention; Bellot's hospital, as already noticed, not being in existence. This little fact seems to show that Wood knew what he was doing; that this omission was deliberately made. Comparing now this Jones's map with two other early ones, Speed's and Johnson's, any little differences will be seen.

Speed's—entitled, "The plott of the famous and most wholsom waters and citie of the Bathe," was published in a corner of the map of Somerset as issued in his volume, entitled, "The kingdom of England described." Some of his maps are dated 1605, some 1608, some 1610, others are undated. Somerset is undated, but usually the year 1610 is assigned for it; yet when the date is used it should be stated as being only approximate, or else the figures should be put in brackets to convey that correct impression. To print such date on the map and so imply no doubt, is to falsify it, and convey an impression which may be erroneous.

Johnson's was published in 1634 in his *Thermæ Bathonicæ*,—an extremely rare little book which treats not only of the baths, but, *De urbe et Thermis*,—and is the first map published in book form.

Wood in lettering his Jones has shifted two or three letters slightly at the beginning, but it may be noted that the letter "x" marks the site of the Leper's bath, and "y" the Hot bath, whilst in Speed these letters are reversed, "y" marking the Leper's bath and "x" the Hot bath. Johnson follows Speed exactly except in these two letters, and just as Wood's Jones differs here in these two letters from Speed, so does he differ, to correspond with Johnson. Further,

Speed shows the ferry outside the North gate complete, the uprights being seen on either shore, with the ferry on the river. Johnson shows only the uprights on the shore, without the ferry, and so does Wood's Jones. Here again Johnson differs slightly from Speed, the difference exactly occurring in Wood's Jones. Another peculiarity is that in the Timber green near Gascoigne's tower; the timber lying about as shown in Speed's, has not been moved in Johnson, the seven logs shown in the one are still seven logs in the other, lying too in exactly the same positions. As Johnson is exactly like Speed, so again is Wood's Jones exactly like Johnson. Speed, too, marks some trees such as by Monk's mill, with two small houses; Johnson marks the houses, but not the trees. Here again, as Johnson differs from Speed, so does Wood's Jones agree with Johnson.

This so called Jones's map has been misnamed and misdated; it is simply Johnson's of 1634. There is not, and there never was a Jones's map of Bath.

Besides a personal knowledge of several copies of Jones's book—a scarce work notwithstanding—the above argument is founded on or taken from Wood's 2nd edition, this being the one usually quoted or referred to, the complete edition in four parts. The earlier edition or Part i., issued in 1742, it not often seen, and as being only a part would not be bought or sought by a general reader. For this reason it has been overlooked that the 2nd edition is the first in which the so called Jones's map appears, for, on referring to the 1st edition of 1742, Part i., p. 83, the map there given, is given honestly as Johnson's. The paragraph describing it actually begins:—"In the year 1634, Dr. Thos. Johnson wrote a description of Bath and therein inserted a draught of the same, a copy of which I have caused to be engraven." The map is then given as in Johnson without any heading or name. It is the same map as given in the 2nd edition, but there called Jones's. The small letters on it mark the same spots, not only without any reference to Jones or

his pretended omissions, but actually with direct allusion to Dr. Johnson. The letter "k" noticed for its absence from the letterpress in the 2nd edition in the description of the so called Jones's, duly and properly appears here in its place in the letterpress as well as on the map, and marking Bellot's hospital; fair evidence that it was purposely omitted in the 2nd edition.

That the two maps are the same may be seen from the fact that both have two "w's"; one near the Guildhall having no reference, the other marking the Cross bath. The difference in them is that Wood has added small figures in the 2nd edition in extending his references, and also the line on the margin naming it Jones's, for which, as can be seen by the pressure indent, the plate just allowed sufficient space.

Wood gives no reason for this alteration, attempts no explanation whatever. Thus he leaves the conclusion open that he was not misled, but that he supposed the change would not be noticed. Further, it must be clear, that he either never saw Jones's book, or that if he did so, he has wilfully practised a fraud.

Smith's view now brought to notice, for it is rather a view, a "portrature," than a map, is, clearly, independently made. The walls are shown more bastioned than in the other maps, and the timber green, although green, is without timber. Whether it were "measured and laid in platform" like Bristol and at the same time as Bristol, viz., 1568, cannot be stated. No exact date can be given for it. If not done in 1568, it may be taken as not done after 1588. As it is the earliest known thing of the kind, there seems no great reason why the Bristol date of 1568 should not be given to it, as no change took place in the form of the city during the twenty years named. If it cannot be accepted as quite exact, yet better than any other map since, it conveys a very exact idea hardly realized by us to-day, of what must have been the original appearance of this very ancient and pretty, but yet very little, city of The Bath.



*On Recent discoveries made in Uncovering the Roman Baths at Bath.*  
By the Rev. Preb. SCARTH, M.A.

(Communicated 13th January, 1886.)

In the proceedings of the Bath Field Club, Vol. iv., no. 4, p. 357, will be found an account of the excavations made at the baths, by Major Davis, who gave some very interesting details to the Club. This was in 1881, and as further important discoveries have been made since that date, it is well that an account of them should find a place in the records of the Field Club.

The Roman sewer had then been fully examined and utilized for conveying away the waste water from the thermal spring, and this led to the discovery of the Roman tank for receiving the hot springs, as described by Major Davis ; but since then the large Rectangular Bath has been exposed to view, together with the Ambulatory (or Scholæ) which surrounds it, and the three recesses on the north and south sides of the Ambulatory. The whole seems to have formed a vast Hall for bathing,—111ft. 4in. long by 68ft. 6in. wide, and about 6ft. 8in. deep. The bottom of the bath, like that of the tank or reservoir which received the hot springs, is covered with sheet lead, and is 73ft. 2in. by 29ft. 6in. The sheets of lead covering it are about 10ft. by 5ft., and are supposed to have been laid rather to keep the hot water which rises through the earth from entering the bath, than to make the bath water-tight. Six steps lead down into the bath, but do not appear to have been covered with lead. At the bottom step in in the N.E. corner, was a *bronze sluice*, with an opening 13in. by 12in., which may now be seen in the Pump Room ; an overflow was provided also.

The extreme surface of the water, according to Major Davis's measurement, was 83ft. 8in. by 40ft. 2in., and formed a parallelogram, except that the N.W. angle was cut off by the steps being carried obliquely in three tiers for a length of 7ft. Some of the

stones of the bath are 10ft. long,—square sockets appear cut in some of the steps, as if to support a baluster to a handrail.\*

At present the offices of the Poor Law Board stand above rather more than one-third of this bath ; but it is hoped that before long this building may be purchased, and the offices removed elsewhere, so as to allow the whole area to be laid open.

Six piers of wrought stone stand on each side of the bath, the width of the platform surrounding the bath is 14ft. This has been arched, as the remains of the roofing have been found in large fragments, composed of hollow tiles, wedge shaped. It is probable that the whole was originally covered—the roof of the central bath being higher than that of the platform surrounding it. The present piers remain only to the height of 6 or 7ft., and appear to have been strengthened by additions. Fragments of the capitals of the pilastres have been found from which the arches took their spring, and some portions of a frieze, also the figure of a lion, which seems to have served as an antefix.

Since the large bath above described was exposed to view, further discoveries have been made at the western end, near to the large tank or reservoir below the King's Bath. These consist of a Hall, 55ft. long by 36ft. wide, in the centre of which is a *circular bath* with steps leading into it ; the depth is the same as the great bath. To the south of this are vaulted chambers, as may be seen in the plan given in the guide to the Roman Baths, drawn by Major Davis, to whom very much is due for the spirit and energy he has shewn in elucidating these remains.

The steps which surround the circular bath and form seats, are quite perfect, and the bath is now filled with water. To the south of this a drain has been found by which the overflow from the baths was carried off. This circular bath has been connected with the large Roman reservoir, which also supplied

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\* See Paper by Major Davis in Trans. of Bristol and Gloucester Arch. Soc., vol. viii., pt. i., p. 89 and following.

the large Rectangular Bath. The short columns supporting the roof of the Ambulatory which surrounded this circular bath, are found perfect in one or two instances ; but the arched roof that must have rested on them has been removed.

This circular bath occupies the western end of the large Rectangular Swimming Bath, as the Rectangular Bath, found in the last century, formed the eastern end.

The workmanship of the circular bath does not seem so massive or well put together as that of the large bath. They may perhaps eventually be found to be of different dates, though both are undoubtedly Roman, and form portions of a grand arrangement for bathing.

A circular bath is not common in Roman bathing establishments, but semi-circular baths are very common ; and circular chambers of very large proportions were attached to baths as Sudatories and halls. This may be seen at Rome in the Pantheon, which was a circular hall, with chambers attached, for the purposes of the Sudatorium, or Vapour Bath ; also the same may be seen at the baths of Dioclesian, where one or more have been turned to the purpose of a Circular Church.

Contiguous to the Circular Bath, and beyond the Ambulatory surrounding it, a chamber has been opened, which seems to have been used for heating purposes. The remains of a Hypocaust have also been found. It is probable that this Circular Bath (as well as the Rectangular one) was supplied with cold water from a spring, not mineral, but which could be used for ordinary washing or other purposes. Much, however, remains yet to be discovered, and more must be laid open before the exact purposes and arrangement of these baths can be accurately ascertained. The lead coating of the Circular Bath, which probably also covered the steps or seats that surround it, had been removed in past times.

Major Davis, in his paper recently read to the Bath Literary and Philosophical Society, supposes that the entire establishment of

the Roman Baths was contained in a parallelogram of 440ft., or 460ft. from east to west, with a width of from 140ft. to 160ft. from north to south, and the total area would then be nearly 6,500 sq. ft.; but this would not include the outer Courts or Gardens, and the whole probably covered two acres.

It has also been stated that the area marked by the Mediæval Walls—believed to stand on the foundation of the ancient Roman—is too small for a Roman town, and comprehended the baths only; but as their circuit is nearly a mile in extent, there was ample space not only for the forum, baths, and other edifices, but for a population of considerable extent, knowing how closely they were packed in ancient times. The area allowed for the baths seems to be a fair allowance of space, though considerably less than was assigned to their area in a paper read last year to the Literary and Philosophical Society, which supposed the area of the Roman Baths to have extended over the whole space of the enclosure within the walls, from E. to W.

The Roman Baths only occupied the southern front of the forum which is now represented by the Abbey Church Yard; but the space occupied by the ancient forum is much encroached upon by modern buildings. If the mediæval walls followed the line of the Roman, they enclosed an area of  $22\frac{1}{2}$  acres; and if the Roman Baths extended over  $2\frac{1}{2}$  acres, there remain 20 acres for the forum, streets, temples and other buildings of the ancient town.

We cannot but hope that the investigation of these baths will be continued, and that their remains may be carefully preserved. The coins and vessels hitherto found have been few, considering the extent of the area now laid open; but such discoveries are always uncertain, as the baths were probably in use for a limited time after the Roman domination had ceased, and were well ransacked for articles in later times, before they became permanent ruins.

The inscribed Metal Plate, of much interest, found in the





bath, is not yet admitted to be satisfactorily explained. If access to this plate could be allowed to certain competent scholars, something more might be known as to the correctness of the reading.

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*Upon some Sculpture recently discovered at the Cross Bath.* By REV. H. H. WINWOOD.

(Read January 13th, 1886.)

In the *Bath Herald*, of September 12th, 1885, was a letter upon "Fresh discoveries at the Baths," describing the recent "find" of a stone with carving on three sides. "At a depth (the writer says) of very nearly 20ft. in the excavations at the Cross Bath, was dug up on Tuesday, 8th inst., a stone, 30in. high by about 17in. wide and 10in. in thickness, with carving on three sides. The carving on the first side is little more than incisive work, the second side is sculptured in high relief, the third side is fractured—showing it was attached to other masonry, and the back is a carving in low relief, having no connection as to scale with the principal work. The incisive carving (No. 1) is a tree with spreading roots and branches, the trunk being entwined by a serpent. Two figures occupy the front of the stone; they are headless and almost armless. The figure of a man partially covered below the waist by some drapery is on the right reclining on a bank beneath a tree. The figure on the left is that of a woman (nude), and is erect reaching something from the tree, but the other arm has perished. Between the figures is a vase or wallet. On the back of the stone is a large dog (?) somewhat like the Danish boar hound, except that it has a tail like a collie turned up over its back (some architectural foliage and that may be another tail), the Sculpture (and now comes the startling theory), I believe to represent the temptation and fall of Adam. It is possible that it may be Hercules and the Hesperides; but the male figure is by no means Herculean. The

“discovery is the first found in Bath that may be said to be of “Christian or rather Biblical character, and certainly the only “important one of similar character found in Britain.” So far for the letter with its ingenious conclusion. This brought forth one or two other letters from another antiquary, written from a distance, in which an equally hasty suggestion was made that the stone described was probably the portion (lower shaft) of a Saxon cross of which two other portions were in the Museum of the Institution.

Having inspected the carved stone myself several times and looked at the pieces of Sculpture in the Museum, I could not possibly reconcile either of the above statements with the actual facts of the case. Not deeming myself sufficiently competent to controvert the views set forth by two such authorities, a lucky chance presented itself, or rather a *Deus ex Machinâ* appeared in the person of Professor Sayce, who accompanied me to the Roman Bath where this interesting stone is fast being injured (if not destroyed) by exposure to the action of the weather, stated his impressions as to the Sculpture at the time and has since written to me on the subject.\*

The following communication clears up the whole matter and brings conviction to every reasonable mind :—

“I have not had time before to write down for you my notions about the curious altar-like stone found last summer in the Cross Bath, which we examined together a few weeks ago. I believe it must have come from a chapel dedicated to Æsculapius, a deity very likely to be worshipped in the neighbourhood of the hot springs. The serpent entwined around a staff, which is engraved on one of the faces of the stone, is his well-known symbol. The dog represented on another face was also associated with Æsculapius.

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\* It is but fair to add that on January 8th a note from the writer of the first letter states that “he has altogether changed his views as to this Sculpture.”







According to Festus, dogs were employed in the temples of that god because he had been "suckled" by one of them, and the monuments of Epidauros, and of the Asklêpion at Athens, as well as the coins of the Magnetes show us the dog in combination with the serpent. Inscriptions recently discovered at Epidauros prove that dogs acted there as the ministers of Asklêpios. The piece of Sculpture on the third face of the stone seems to me to represent Apollo and Kôrônîs the mother of Asklêpios. It may be compared with a bas-relief, once built into the walls of Bath, and figured by Guidott who makes out that it depicts a shepherd and his mistress! On the newly found stone the male figure seems evidently intended to represent Apollo. Can any traces of a crow be detected among the branches of the tree above the head of the reclining female figure?"

The Rev. Preb. Scarth, having examined the Sculpture and formed an independent opinion thereon before hearing Professor Sayce's interpretation, read the following notes at the Anniversary dinner of the Club February 18th.

"The statement of Solinus respecting the "Calidi Fontes" in Britain, "Opiparo exculi apparatus," has received singular confirmation, after an interval of 1,500 years, by the discovery of an interesting Sculpture in the form of an Altar, but not quite so massive as Roman Altars of the same dimensions usually are.

"This stone has two Sculptures on opposite sides, front and back, and one on the side,—the other side seems to have been fixed into masonry.

"The Sculptures are much defaced, but shew signs of early Roman art, being executed with much spirit. The stone has a plinth which projects, and the subjects are on panels, the figures being in relief.

"The whole surface of the front face is occupied by two figures, the one standing and the other reclining.

"The standing figure is that of a man extending the right arm, and holding what on minute examination is found to be a lamb,

above the head of the reclining figure. The reclining figure rests on one elbow (the left) and extends the right arm, while the head is turned away, as if to reject the offering. This is a female figure; the lower portion of the body is draped, one leg being extended the other bent.

“In the space between these figures is a large bowl, on one side of which appears to be a serpent.

“On the side of the stone, reaching from the base to the upper portion, is a tree, around which is coiled a serpent, with the head downward.

“On the opposite side of the stone, in the upper portion, is a wide panel, extending over half the surface. On this is a dog with a bushy tail, in the act of walking; at the back of the dog is a tree.

“Below this Sculpture in relief, the surface is quite plain, apparently without any lettering, though, unfortunately, like the rest of the stone, much injured. The top portion of the stone projects considerably over the panel.

“In a letter to the *Bath Herald* (September 12th, 1885) this Sculpture was considered to be a representation of the fall of our first parents! but a careful study of the stone at once shews it to be connected with the Heathen Mythology.

“This was discovered at once by Professor Sayce, who on examining it, made the suggestion to the Secretary of the Field Club, in a letter addressed to him, that it was a representation of Apollo and the nymph Kōrōnis. Before seeing his communication, or knowing the explanation he had given, I had on two examinations of the stone come to the conclusion that it must be Æsculapius (the Greek Asklepios) offering a lamb to the goddess Hegiēa. The serpent feeding out of the crater, or large cup, and the serpent entwined round the tree, are emblems of Æsculapius, and the dog also is connected with the worship of that god. Hegiēa was worshipped in the Temple of Æsculapius at Argos, where these two divinities had a sanctuary; also at Athens and





at Corinth ; also the Goddess Hegiëa is usually represented as feeding a serpent from a bowl or cup. The bowl, or large cup, upon the Sculpture may also indicate the healing waters of the Bath Thermal Spring.

The dog also is not only a symbol of Æsculapius, the god of healing, but represents also the Dog Star, (*κων*) adopted by the Romans from the Greeks, and indicating the passage of the sun into the constellation Leo. The season known as the "Dies Caniculares." The dog may therefore here be an emblem of the heat of the thermal springs.

It is not unworthy of remark how the "serpent" enters continually into the ancient Sculptures found in Bath. The drawings of the Sculptures given by Guidott in his work, formerly to be seen in the city walls, contain two representations of figures, one of which, apparently a female, carries two serpents ; this figure is nude, the other, apparently a male figure, is clothed and carries one serpent. Two heads are represented as covered with hair formed of serpents, and serpents are sculptured in the hair and beard of the head of Medusa, which formed the centre of the pediment of the temple,—the remains of which are now in the portico of the Literary and Scientific Institution. All these seem to be emblematic of the healing properties of the thermal springs, which have been for so many hundred years celebrated, and granted, as Solinus expresses it, "ad usus mortalium."

The chief Altars found in Bath are dedicated to the goddess *Sul*, or *Sul-Minerva*. The British goddess being associated with the Roman. But the Roman Minerva was the same as the Greek Athena, and Athena was the goddess of health as well as of the arts and sciences. According to Proclus, a late Roman writer, Η ΑΘΗΝΑ ΝΙΚΗ προσαγορευεται και ΥΓΙΕΙΑ. Athena or Minerva is called victory and health, and this leads me to the conclusion that the Sculpture represents Æsculapius making an offer to Hegiëa, the goddess of health, and that she is the presiding goddess of the thermal springs.

These remarks are only offered until some more satisfactory explanation can be found for the meaning of a Sculpture which appears to me to be of no common interest, and which should be carefully preserved among the other interesting lapidary records of Roman Bath.

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*Notes on the occurrence of Salt Springs in the Coal Measures at Radstock. By J. McMURTRIE, F.G.S.*

*(Read 10th February, 1886).*

While engaged during the past year in carrying out a deep sinking in the Coal Measures at Radstock, the writer encountered certain Salt Springs not previously met with in the parish, and believing it to be a comparatively rare occurrence in the Carboniferous series, he has thought it of sufficient importance to bring it under the notice of the Bath Field Club. Had these springs been met with in working coal near or under the sea, as in the Whitehaven, Newcastle and other coal fields, their presence would not have occasioned any surprise; but their occurrence in an inland coal field, twenty-one miles from the nearest sea board, is very remarkable, and it has given rise to much speculative inquiry as to their probable source.

In order to explain the position in which these Springs were met with, it is necessary to point out the geological features of the locality in which they occur, which are probably familiar to some who have turned their attention to the subject, but may not be so to others.

Although Radstock is known chiefly in connection with coal, a geological stranger visiting the place would be surprised to find that, after examining every hill and valley within the parish he had entirely failed to discover any trace of Coal Measures, excepting those unsightly shale tips which now disfigure what was once a picturesque rural parish. The explanation of all this is that the



Carboniferous rocks, having undergone many changes and much denudation, were in later but still very remote geological times overlaid by newer formations which now cover the entire surface of the parish, capping the higher ground with Inferior Oolite and Lias, while the lower slopes and the bottoms of the valleys are occupied by the Rhœtic beds and Keuper Marls.

The Middle Pit, in which the sinking operations referred to have been carried on, is situated about 100 yards on the North side of the Radstock Market Place, and is easily recognised by its tall, circular stone chimney, which visitors may have noticed on their right in driving into Radstock from Bath. The shaft, being situated in the bottom of the valley, did not meet with the Lias and Rhœtic beds, but passed at once into the Keuper Marls, which are here 89 feet in thickness, and rest on a bed of Conglomerate immediately overlying the Coal Measures. These Marls, fed by the rain and streams from above, and resting on a water-tight bed beneath, yield a large quantity of water; but it is ordinary spring water, without any special mineral ingredient.

It is hardly necessary to state that it is these same Marls which, in the Midland Counties, yield almost all the Rock Salt and Brine Springs which we possess in England. Although only about 170 feet in thickness in the Radstock area, the New Red Sandstone of Cheshire attains a thickness of 1,700 feet; and it is the upper 700 feet of this formation which contains the Salt Mines and Brine Springs which, in Worcestershire and Cheshire, yield annually from 160,000 to 170,000 tons of prepared Salt. But although geologically identical, no trace of either Rock Salt or Salt Springs has ever, so far as the writer is aware, been met with in the Keuper Marls of Radstock.

Immediately under the New Red Sandstone, but not at all conformable with it, lies the upper or Radstock group of the Somersetshire Coal Measures, to win which the Middle Pit was originally sunk, and which has here been worked successfully for

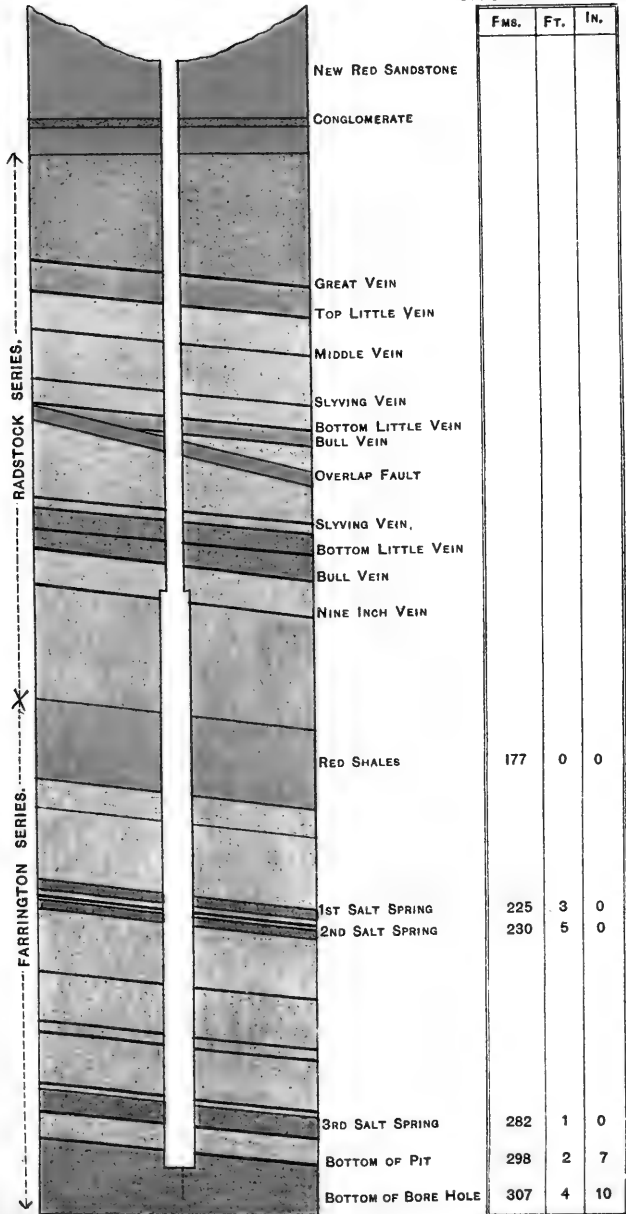
many years. The strata comprised in this series yield very little water, the Conglomerate at the base of the New Red Sandstone serving as a nearly water-tight covering, through which only a very moderate quantity of water ever passes. The only feeder worth naming occurs in a thick bed of Sandstone overlying the Middle Vein ; but the water produced here and elsewhere in the series is entirely free from Salt, of which the writer has never discovered any trace.

The Middle Pit was originally sunk to the lowest seam of the Radstock group, which was here met with at a depth of 875 feet, and beneath which there lay an unknown country. The sinking operations carried on under the direction of the writer began at that point on the 8th of May, 1884, and having been carried down through the second or Farrington group of the Somersetshire Coal Measures, reached a depth of 1791 feet from the surface on the 25th of January last ; the ground below this point having since been proved by a boring to a total depth of 1846 feet. It is not the object of the present paper to describe the geological features met with in this exploration, nor to record in any detail the strata passed through ; but it may be noted that the thickness of barren ground, intervening between the lowest vein of the Radstock series and the first workable vein of the Farrington group, was here found to be 628 feet, and that it contained the well known beds of Red Shale which invariably lie between the two groups.

It may also be stated in passing, that the result of this sinking has entirely falsified the expectations of some who had turned their attention to the subject. It had long been held in certain quarters that wherever the Farrington veins have been worked beneath the Radstock series, the former have been thin and inferior ; and that the Farrington veins are only valuable in the margin outside the outcrop of the Radstock group. The writer could never see any good ground for this contention, believing that the range and thickness of the seams composing the Farrington group could not be affected by strata by which they were not overlaid for

# SECTION OF MIDDLE PIT, RADSTOCK.

SCALE 280FT TO AN INCH.





long ages afterwards. He considered the contention in question especially valueless, because in all probability the entire area now occupied by the Farrington group was originally covered by the Radstock series; and the fact of one part having been denuded while another area had escaped denudation, could not in his judgment affect the thickness of the seams lying beneath.

And without expressing any sanguine opinion as to the commercial value of the undertaking, which a little time will probably establish, the writer can only say that the result of this sinking, carried out in the very centre of the Radstock basin, has entirely disproved the evil predictions referred to; the thickness of coal proved being fully equal to what has been met with in other parts of the district.

To return however to the subject of the paper, the strata immediately under the Radstock series yielded little or no water, and what little there was appeared to be quite fresh. The Red Shales already referred to were cut at a depth of 190 feet below the 9 inch vein, and were found to be 170 feet in thickness, presenting no feature of special importance. The first indication of Salt water was in a bed of Sandstone met with at a total depth of 1353 feet, and it yielded 90 gallons an hour. At a depth however of 1385 feet from the surface, and in a bed of Grey Sandstone, 21 feet in thickness, a much more considerable spring of water was met with which was found to be highly impregnated with Salt. In approaching this bed the miners were first warned of the presence of these Springs, by the water issuing with considerable force from the bore holes made for blasting purposes, in some instances spouting up to a height of several feet, and evidently indicating considerable pressure. On reaching the rock from which the water came, it was found to be full of joints and fissures from which the water issued on all sides in considerable quantity, amounting at first to 1,000 gallons per hour; but gradually decreasing until it did not much exceed 400. Although the water was excessively salt, as members will find who taste the

sample produced, an examination of the rock from which it issued shewed that it contained no trace whatever of Rock Salt.

An attempt was made to stop back the water, which was found both expensive and troublesome in sinking, and for that purpose the shaft was lined for 30 feet with iron casting, technically called "tubbing," the operation being attended with some degree of success. In thus damming back the water, it was necessary to carry a small vent pipe from the casting, as high up the shaft as the water would rise, in order to carry off any pent-up gasses; and it was found that the water rose up the pipe to a height of 102 feet. The pressure under this head of water was so considerable, that the water forced its way through joints and fissures in the strata, and did not rise any higher; but it is probable that the natural level of the water may have been much higher than was indicated by the height of the water in this pipe.

Through the kindness of Mr. Coomber, principal of the Merchant Venturers' School in Bristol, whose valuable assistance the writer is glad to have this opportunity of acknowledging, he is enabled to supply the following analysis of the water. Writing on the 5th February, Mr. Coomber states as follows:—

"I have made a qualitative analysis of your sample.

"There is almost as much matter dissolved in the sample as in sea water.

"Next to the Chloride of Sodium present (Sea Salt), Lime Salts occur in greatest quantity. There is a considerable quantity of Carbonate of Lime held in solution by Carbonic Acid.

"Potassium Salts also occur in quantity. Alkaline Carbonate is present, and perhaps both Potash and Soda are present in this form.

"There are also present in small quantity Iron, Alumina, Magnesia, Lithia, Sulphuric Acid and a trace of Phosphoric Acid."

And Mr. Coomber has supplemented this by the following more exact analysis received to-day :—

“I regret to say that I have been unable to get an exhaustive quantitative analysis of your sample of water completed in time for your paper upon it, but its qualitative examination is complete, and almost all the weighings made that have any teaching regarding the sample.

“The principal constituent of the water is Chloride of Sodium. Other constituents present in quantity are Lime, occurring both as Calcium Chloride and as Carbonate of Lime held in solution by Carbonic Acid.

“Potassium Chloride is also present in appreciable quantity as well as Silica.

“Lithium and Iron occur in very small quantity, and there are also present exceedingly small traces of Magnesium and of Sulphates and Phosphates.

“Iodides, Bromides, and Nitrates are entirely absent.

“The specific gravity of the sample is 1.02899.

“The total weight of the solids dissolved (dried at 180c°), is 1292.34 grains per gallon.

“The weighings that have been made are the following :—

“ Calcium Chloride	... ..	149.27	grains per gal.
“ Carbonate of Lime	... ..	11.99	„
“ Sodium Chloride, with a small amount of Potassium, Chloride and Silica	... ..	1091.49	„
		<hr/>	
		1252.75	„

The writer does not possess sufficient chemical knowledge to discuss as fully as he could wish the chemical aspect of the question; and the analysis having only come to hand this morning, there has not been sufficient time to give it adequate consideration; but the following remarks may serve to direct attention to one or two points in the analysis.

The specific gravity may be compared as follows:—

Pure Water being ... ..	1·000.
Sea Water is ... ..	1·027.
Bath Mineral Water is ... ..	1·0025.
And Radstock Salt Springs ...	1·02899.

Then as to Solids,—the Bath Mineral Waters contain only 144·018 grains, according to Merck and Galloway, while other writers give even less; but the Radstock Salt Springs yield, according to Mr. Coomber's analysis, 1292·34 grains per gallon.

It may be further noted that nearly all the ingredients in the Bath Mineral Waters are present in these springs, although in very different proportions.

Soon after this Spring was tapped, it was found, much to the annoyance of the Engineer in charge, that certain boilers which were partly fed by the water from this mine had become encrusted with Salt. A specimen of this encrustation is now produced, and the quantity of Salt it contains is very remarkable—considering that the water before reaching the boilers was diluted with about twenty times its volume of fresh water from other sources.

As the sinking proceeded, another Salt Spring was met with about 302 feet below the one I have already described, and at a total depth of 1,693 feet from the surface. In this instance also the Spring indicated very great pressure from beneath, for not only did the water rise some height out of the bore holes, but the beds of shale in the bottom of the shaft were heaved up bodily through its agency. No separate analysis of this Spring has been obtained; but it was apparently similar in character to the one previously met with. Its yield was found to be 100 gallons per hour; but a corresponding decrease seems to have taken place in the upper Spring, with which it may possibly be connected, as the total quantity continued as before at about 400 gallons per hour, and it has so remained down to the present time.

Although new in Radstock, the occurrence of Salt Springs



seems to have been discovered in several previous sinkings to the same series in other parts of the district.

The writer has not been able to obtain particulars of some of the earlier shafts, which were sunk many years ago ; but he is indebted to the Managers of various neighbouring Collieries for the following information on the subject.

At Braysdown Colliery, where, about the year 1862, the shaft was sunk from the Radstock to the Farrington series, the Manager reports as follows :—

“The water found in the sinking to the Farrington series was a little Salt before we came to the Red Shales ; after passing through these it was and is at the present time intensely Salt ; it was very much like brine, from the Red Shales down to where we left off sinking.

“The water is most destructive to iron and steel, destroying their properties by eating them away, exposing the grain of iron as if it was wood, and making it very hard and uncertain. It covers wood with a coat almost like sheet iron, and preserves it from decay. At the sides of the roads where it runs, it leaves a thick sediment very much the colour of blood, but perhaps a little darker. This I believe to be largely composed of iron, and it is very heavy indeed.

“These Springs of water do not increase with us in any case, and if they decrease it is very little indeed, having remained much the same for the last twenty-four years.”

At Foxcote Colliery, where the same ground was afterwards proved, a similar result was experienced. The then Manager informs me that “at a depth of 531 feet from the surface, and in a very hard bed of Grey Sandstone, 33 feet in thickness, he met with a Spring which yielded 700 gallons per hour. Also that 87ft. 9in. below this bed he had another Spring, which yielded 96 gallons per hour ; and again, at a point 391 feet lower down, he cut a third Spring, yielding 80 gallons per hour, which so increased in going downwards that the sinking had to

be abandoned at a total depth of 1,212 feet from the surface. The water from all these Springs was extremely Salt. The Manager tested it on several occasions by boiling a gallon of it, and when the water was boiled away, he had a common tea cup full of Salt left on each occasion."

At the Old Mills Colliery, on the other hand, where two shafts have been sunk through exactly the same ground, although a good deal of water was met with, it was uniformly fresh; and it remains so to this day. In this instance, however, the circumstances are somewhat different, the Secondary beds overlying the Coal Measures being very thin, and the shaft having passed direct from the New Red Sandstone into the Farrington Measures, without any of the Radstock series occurring between.

It may be instructive to compare the depths at which these Brine Springs have been met with in the different localities to which I have referred, taking the sea level as the datum for comparison.

	Middle Pit.	Foxcote.	Braysdown.	Old Mills.
	Depth in Feet Below Sea Level.	Depth in Feet Below Sea Level.	Depth in Feet Below Sea Level.	Depth in Feet Below Sea Level.
To I. Spring.	1,110	176	} 708 to 1,241	} 242 Feet (water fresh).
" II. "	1,142	264		
" III. "	1,450	655		

As to the probable source.—The frequent occurrence of these Salt Springs in the Deeper Measures in and around Radstock, has naturally given rise to some speculation as to their probable source; and whatever their origin may be, it seems tolerably

certain that they cannot derive their supply from the Keuper Marls above. In the memoirs of the Geological Survey mention is made of crystals of Rock Salt occurring in these Marls at Hallatrow, and at one or two other places, which, apart from other evidence, may be taken to indicate their identity with the same formation in Worcestershire and Cheshire, where it is so rich in Salt; but having examined the New Red Sandstone at many points in and around Radstock, the writer has never found even an isolated crystal of Rock Salt; and it may be stated with tolerable certainty that nothing in the nature of Salt Springs exists in the Keuper Marls of this neighbourhood.

In proof of this it may be stated, that all the wells in the lower parts of Radstock and adjoining parishes have been sunk in these Marls, the water obtained being perfectly suitable for domestic purposes; and, as already stated, the shaft sinkings through the same ground shew a like result.

It also seems clear that the source of supply cannot be in the upper or Radstock Coal Measures, which have been worked extensively for many years, without any trace of Salt Springs being met with.

It also seems evident that these Springs cannot have their origin in the beds of Sandstone from which they flow, for the writer having observed them very closely has never found the slightest trace of Salt in those rocks.

It also seems unlikely that these Springs can come from the Pennant rocks which lie at no great distance beneath, for it is well known that they contain no Rock Salt; and although they are commonly very heavily watered, they generally derive their supply from the rainfall near the outcrop; the water being so pure that the Bristol Water Company at one time proposed to acquire a celebrated Spring in an Iron Mine in the Pennant, at Frampton Cottrell, in order to augment the supply of Bristol.

The more the facts are considered, the more difficult it seems to be to account for these Springs; the origin of which must

probably remain a matter of conjecture. Notwithstanding the distance from the nearest coast line, and the fact that the outcrop of the Farrington series is far inland, it is possible that the source may be the waters of the Bristol Channel, which may find their way along the lines of faults or other underground fissures to this inland district. The great difference of level, however, between these Springs at diffeant Collieries hardly seems to favour this theory. But is it not also possible that we have in these Salt Springs, long hermetically sealed, a remnant of that ancient sea which swept away the upturned edges of the Coal Measures, before the New Red Standstone began to be deposited.

In conclusion, the writer would only allude to one or two circumstances connected with these Springs, which may or may not have some bearing on their origin. Sir Charles Lyell, in his *Elements of Geology*, page 362, remarks that "As in various parts of the world red and mottled Clays and Sandstones, of several distinct geological epochs, are found associated with Salt, Gypsum, and Magnesian Limestone, or with one or all of these substances, there is in all likelihood a general cause for such coincidence. Nevertheless, we must not forget that there are dense masses of Red and Variegated Sandstones and Clays, thousands of feet in thickness, and of vast horizontal extent, wholly devoid of Saliferous or Gypseous matter. There are also deposits of Gypsum and of common Salt, as in the Blue Clay formation of Sicily, without any accompanying Red Sandstone or Red Clay."

Now it is a strange coincidence that the beds of Grey Sandstone in which these Radstock Springs rise, occur near, and, for the most part, immediately under the Red and Mottled Shales which intervene between the Radstock and Farrington series; but this may be a coincidence only, and it may be questioned whether either of the theories indicated offers any adequate solution of the origin of these Springs, which will probably remain a matter of doubt and uncertainty.

*List of Fossil Mammalia Found near Bath.* By REV. H. H. WINWOOD, F.G.S.

Read 10th February, 1886.

Since the Paper, on "the Mammalia and other remains from the drift deposits in the Bath basin," was read before our Club by the late Charles Moore in 1869, some fresh sections have been opened in the gravel beds, and several additions made to the list of extinct animals. I have, therefore, thought it might be useful to record the result of those discoveries in a tabulated form for the sake of easy reference.

GENUS AND SPECIES.	WHERE FOUND.	WHERE DEPOSITED.
<i>Elephas Primigenius</i> or <i>Mammoth</i>	Gravel beds Larkhall. Freshford. Lyncombe & Widcombe Cemetery. Newton St. Loe. Saltford. Morefield cutting, Somerset and Dorset Railway. Twerton. Bath Park. Lambridge.	Bath Museum. Prior Park Museum. H. H. W.'s collection.
<i>Elephas Antiquus</i>	Larkhall.	Bath Museum.
<i>Rhinoceros tichorinus</i> , long haired, two horned Rhinoceros.	Freshford, Morefield cutting. Larkhall. Lambridge.	Bath Museum. H. H. W.'s collection.
<i>Ovis Moschatus</i> , Musk Sheep.	Gravel beds, Freshford.	Bath Museum.
<i>Cervus tarandus</i> , Reindeer.	Freshford.	H. H. W.'s collection.
<i>Bos Primigenius</i> .	Head entangled in fishing net, river Avon, near Melksham, 1838.	Town Hall, Melksham.
<i>Bison Europæus</i> .	Gravel beds Freshford. Hill, Box.	Bath Museum.
<i>Equus Caballus</i> , (fossils).	Gravel beds Freshford. Oolitic fissures, Middle Hill, Box, <i>et passim</i> .	Bath Museum. H. H. W.'s collection. Prior Park Museum.
<i>Sus scrofa ferus</i> , Wild boar.	Larkhall, Freshford. excavations for cellar, Westgate Street.	Bath Museum. H. H. W.'s collection.

*Summary of Proceedings for the Year 1885-86.*

MR. PRESIDENT AND GENTLEMEN,

In reviewing the events of the past year, the first fact to record is the absence again from the Anniversary programme of the evening's social gathering. The Committee appointed to carry this out were unable to do so by difficulties which they found to be insurmountable ; with the exception of this incident, a subject of regret to many, the Proceedings of the year may be considered fairly successful. The Papers read at the afternoon meetings sustained their usual character, and the attendance was more encouraging ; though there is still room for improvement in this respect, as barely one-fourth of the whole number of members were present. Natural History has been well represented, and it can not be deemed invidious to others if especial allusion be made to the admirable paper on the "Bournemouth Firs" by our venerable President. The vigour of his mind and the lucidity of his pen seem not in the least abated ; and may he be long spared to us to enrich our "Proceedings" with the results of his keen observation, accuracy of statement and eloquent simplicity of language !

AFTERNOON MEETINGS.

The afternoon of March 18th was given up to Mr. Broome who continued his account of the Fungi of Bath and its neighbourhood, and contributed another of those valuable papers on Mycology, the study of which has been his life-long pursuit, and has acquired for him well earned reputation (*vide* page 1). This was followed by a short description of an abnormal flower of *Penstemon* sent to him for examination by a member of the Club (*vide* page 35). Canon Ellacombe's remarks on "Study of Varieties with reference to Field Club work" was postponed till the Quarterly Meeting on 7th April, when

Excusing himself for having but little to lay before them, and that

little not being new, he said, that clubs like the one he was addressing ought to be a club of observers, and as their president had often impressed upon them the duty of observing, he would venture to bring before them some examples of matters which required their observation. They need not go out of their way to do this, but everything they met with in their regular walks or excursions that was a deflection from a given type, anything abnormal or eccentric ought to be at once catalogued ; by so doing local clubs would do much good. There were three or four objects he would specially call their attention to as worthy of this observation. First, Architecture ; It had long been laid down that an accurate date could be fixed for Norman, Early English, Decorated, and the Perpendicular styles ; but the conclusion he had at length arrived at was that though these dates were most valuable, yet they must be received with great modification. It was often thought that architects worked by a certain fixed law in Mediæval times and never departed from this law and standard, but he thought architects then were much like architects now, and they went in for imitations of a past period. Then as now in their church restorations they were as reckless as the destroyers of our own day ; in fact, they had not any hard and fast rule. Though it was difficult to prove the cases in which architects previous to date had anticipated the style peculiar to that date, yet in some instances it could easily be traced, *e.g.*, Norman architects by the intersection of two round arches built pointed arches as much as those of a subsequent period. To come to latter instances ; why in Decorated architecture should there never be a vertical line as some suppose ? Look at Gloucester Cathedral, there Perpendicular work was found at least 100 years before the accepted date of that style. Fan tracery, so distinguishing an English feature, was considered not to have come in till *temp.* Henry VII., except in Gloucester Cathedral, where we find it in work of the 14th century (1360). Then again we have architects directly imitating work of an earlier period ; take for instance the so-called Norman work at Bradenstoke Priory, and the Norman work introduced into the Perpendicular wall at Kilmersdon. To come nearer home take the case of Bitton (his own church), originally an Ante-Norman building, where the Bishop Buttons of the 14th century literally smashed up the old Norman work, the 15th century architects destroyed the old chancel and west front, and

those of a later period put a Norman corbel table into a Perpendicular wall. The churches at Dauntsey and Iron Acton contain likewise copies of older work, and this is very conspicuous in the buildings of Oxford. Hence the conclusion he wished to impress upon the members was that the date of a building could not be always determined by the style of its architecture. He ventured to think that the interest in the Somerset and Devonshire churches was much lessened by this fact of many of them being simply an imitation and reproduction of each other. Then there was another point worthy of observation, the stone which was found in the old buildings; beneath the variety in the stone often lurked a great history, *e.g.*, in one church granite was found mixed up with the stones peculiar to the neighbourhood. This led to the discovery that the original founder had property in Cornwall, whence, doubtless, this foreign material was derived. The mention of this led him on to the second subject, *i.e.* (2) Geology. Here every variety in the strata should be noted. Were the strata always uniform, one bed following another in regular succession, how little should we know about the study; but the variation in their succession caused by the disturbances and topsy-turvy movements of some of the beds added so very much to the interest of the study; the greater the variations the greater the interest, *e.g.*, the disturbances in our own Mendips, as at Vobster. Though not professing to be a geologist himself, yet when in the north of Ireland, between Port Rush and the Giant's Causeway, he could not fail to be struck with the varieties in the colour of the rocks—white rocks stained by red streaks and capped by black. Then there were the varied movements of a river; take, for instance, the Avon, which ought naturally to flow in a straight line, but witness its many windings, study the causes of these windings, follow the turns; consider why the water retires here and encroaches there, and you will have a good key to the geology of the district between Bath and Bristol. Then again the gorge of the Avon, which drained off the ancient lake which must have existed there once; viewed from the Hogsback it looked a mere crack in the rocks, yet consider how this came about, and the vast alteration in the surrounding country were this gorge to be dammed up, as it might easily be by some Brunell of the period. Finally, the third subject he wished to notice was his favourite one (3) Botany. Of this



he certainly knew more than Geology. How full was the study of all sorts of deviations from the accepted forms of classification, both in the flowers, the leaves, and the roots, called "vegetable monstrosities," until Darwin taught us that all these variations were but the gradual workings of nature pointing back to old forms once existent, or forward to some evolution about to come. Note every variety, whether of leaf or flower, accumulate facts, they will all fall into their right place at some time or other. This was the one of the chief lessons that great observer taught us. Carnivorous plants notice especially; they not only killed but digested the insects. This food was necessary for their existence. The *utricularia*, with its fibrous roots and the little bladders at the end has recently been discovered to be a feeder on fish, these appendages being used for that purpose. Notice, too, all those plants that are visited by insects and find out the reason of these visits. The colours of plants should be observed; the two opinions about them are that they were originally (1) all green, (2) all yellow. Green, he thought, was the more ordinary colour, and that most of them arose from green originals; the richer colours (the golden autumnal tints) arising from decay and death. All yellow flowers were *entomophilous*—fertilised by insects—all green, *anemophilous*—or fertilised by wind—according to Sir Joseph Hooker. The observations of Col. Jones of a few white spots on lady-ferns led to an important result as to fertilisation. In conclusion, he would impress upon local clubs the necessity also of noting the variation in language, local phrases, peculiarities and expressions, which were fast passing away.

Mr. BROWNE agreed with Canon Ellacombe as to his remarks respecting the imitations in some of the churches mentioned, but the subject was too great a one to deal with on the spur of the moment.

After some remarks from Mr. BROOME, the warm thanks of those present were given to Mr. Ellacombe for his admirable address and hope expressed that they might see it in a more permanent form for their future instruction.

The SECRETARY (Rev. H. H. Winwood) exhibited some fossils, which he found during a visit last autumn (1884), to the Rocky Mountains. Having briefly pointed out, on the maps recently

published by the Geological Survey of Canada, the geology of those regions, he said—

The Canadian Pacific Railway, which would shortly connect the Atlantic Ocean on the east with the Pacific on the west, had lately opened out a tract of country in the heart of the Rockies hitherto but little known ; and it was his good fortune to accompany Professor Selwyn, Dr. Dawson, Professor Boyd Dawkins and other geologists in a geological ramble down the Kicking Horse Pass in search of some fossil evidence, which would help to determine the age of the beds. The Secondary and Tertiary strata, so horizontal in the Prairie country to the east, became much disturbed and folded at the "foot hills" of the Rockies, until on approaching the head of the Kicking Horse Pass, some 5,000 feet high, the older beds—which here come in and are supposed to be of Devonian age—became tilted up in some places quite vertical, if not reversed altogether. These beds, consisting of Quartzites and calcareous rocks, were diligently searched for fossils in vain ; but just after crossing the high trestle bridge over the Kicking Horse River, on the left of the track a micaceous slab of rock with apparently an easterly dip had been exposed, and certain markings thereon like worm tracks attracted his attention ; on examining these he found also the trace of something evidently organic, which after some time and trouble was chiselled out. The exact nature of the fossil he was unaware of at the time, but a short distance further west on the same side of the track he found a band of calcareous rock six inches thick, crammed full of portions of *trilobites*. On returning home he shewed them to Dr. Hicks, well versed in the Archæan rocks of England, and was informed by him that the first specimen contained the tail of a *Paradoxides* upon it, and that the calcareous fossiliferous band was full of portions of the same genus, and of *Conocoryphe* and other allied forms, thus shewing that these rocks contained a Primordial fauna, and that they belonged to what Dr. Hicks calls the Menevian zone, so ably worked out by himself in Wales. He further stated that in his opinion these beds were not far distant from an Archæan axis. This was a fortunate discovery, as it will enable future explorers to take these beds as a datum line, and it is expected that Dr. Dawson, who was then about to survey that portion of the track, will have by this time been enabled to define the position of the other beds both eastward and westward. Specimens of the fossils were exhibited.

The first of the winter meetings took place on Wednesday afternoon, December 9th, when the President (the Rev. L. Blomefield) read a paper on the Bournemouth firs (*vide* page 40). Before beginning his subject he exhibited a nest of the water-ouzel presented to the institution by Mr. Bankart. This "dipper," he said, allied to the thrush and the blackbird, is essentially a waterbird, whilst the latter are land birds. It may be seen by the sides of rapid streams, and diving into the water like a moorhen. It endeavours to keep at the bottom of the water as much as possible in search of its food, consisting of water beetles and fresh water shells. Its nest is built in the rocky inequalities by the banks of streams, and is composed of a tangled mass of brown rootlets. The specimen in question was from the Yorkshire moors. The bird is a native of Somerset, and especially frequents the rocky streams on its borders near Devon. The President took the opportunity of expressing a wish that some one connected with the county would present a local specimen to the museum in Bath.

The Rev. Canon ELLACOMBE, who had taken the chair, expressed the pleasure it gave the Club, and especially himself, at hearing another of the President's papers, so full of interest and originality. Though a labour of love to him yet they all felt that he must have taken no ordinary trouble in preparing it, and he was glad to see so large an audience on the occasion. He had never doubted that the Scotch fir was indigenous. The *Pinus pinaster* too, associated with the former at Bournemouth, had been admitted into the English flora. Mentioned in old writers as the pine apple tree, it had now lost this name when the present fruit was discovered in America. Owing to the rapid onward march of the Scotch fir it is a wonder that it has not spread even further. Kingsley alludes to the way which the pollen of this tree propagates itself in his charming essay "My Winter Garden." The growth of the Scotch fir on our neighbouring hills was alluded to by many of the members present,

and the President said the tracing of its former existence in the neighbourhood might well be one of the objects of the Club's weekly walks.

Mr. NORMAN then gave some notes on the Algæ of thermal waters, with especial reference to those of Bath (*vide* page 53).

In the discussion which followed, the PRESIDENT congratulated the writer on his researches into the natural history of our hot springs, and urged him to continue his observations therein, so that their natural history, both animal and vegetable, might in course of time be well known. Some remarks on the temperature of the water followed, and a wish was expressed that the scientific observations which it was believed were being systematically carried on should be made public, so that those locally interested in the question might be able to obtain some trustworthy data as to the variation, if any, in their volume and temperature.

The third meeting took place on Wednesday, January 13th, Mr Skrine in the chair, when Mr. GREEN read a paper on "The Earliest Map of Bath" (*vide* page 58); another of those valuable historical leaflets with which Mr. Green has favoured the club from time to time. The original, he said, was to be found in the British Museum. No exact date could be given for it, but it was made about 1568 by one Wm. Smith, a herald and antiquary, who in his account calls Bath "A little cittie, yet one of ye most anncientest in England." A *fac-simile* of the map being produced it was now duly examined, some discrepancies and some differences from later maps being pointed out, although minute criticism was not attempted or intended.

The next paper was from Mr. Scarth upon "Recent Discoveries in Bath connected with the Ancient Roman Baths" (*vide* page 75). As pressing engagements prevented Mr Scarth from being present himself, his notes were read by the SECRETARY. They principally related to the discovery of the oval bath, and the extent which the whole system of baths occupied in Roman times.

The third communication was from Professor Sayce with

reference to the sculpture on the altar stone lately found at the Cross Bath (*vide* page 79). The ingenious but somewhat rash views enunciated in a letter to *The Bath Herald*, of September, 12th, 1885, with regard to this stone, followed by the equally erroneous suggestions in a letter to the same Journal dated September 14th, 1885, were refuted and the true interpretation of the sculpture given. Instead of the figures thereon being of a Christian character they are essentially Heathen, and depicted scenes of heathen mythology well known to classical students.

In the discussion that followed on Mr. Green's paper, Mr AUSTIN J. KING bore testimony to the great value of the paper with which Mr. Green had favoured the Club. It was undoubtedly the case that Wood's misstatement concerning the early map of the city, which he wrongly attributed to Jones, had been generally accepted as true, and had given rise to many misconceptions and misunderstandings, and they should be very grateful to Mr. Green for removing this false history, and for reproducing the original plan of Smith. The plan itself was full of interest. The church shown at the bottom of Holloway certainly could not be the chapel of S. Lawrence, for that stood on the bridge, and was a mere oratory. It could not either be the church of S. Mary, *extra muros*, for although the exact site of this was not known it appeared clear that it was on the city side of the Avon. If, however, the plan was made rather from views than measurement, the exact position might be misstated. When this church was destroyed was not known, but it was certain that it was not used for ecclesiastical purposes during the reign of Elizabeth. There seems no doubt that until the commencement of the 18th century the houses outside the walls remained substantially as shown on Smith's plan—a straggling street between the South gate and the bridge, and a little cluster of houses near S. Michael's Church. These houses belonged for the most part to the parish of S. Michael before the Reformation. They then passed to the Crown, as part of the nominal possessions of the Priory, and

comprised the "56 tenements" granted by Elizabeth to the municipality as trustees for the church. The Town Council appropriated the houses and still retain them. The parishioners took legal proceedings to assert their rights, but their purses were not deep enough, and the Corporation prevented the case from coming to a hearing.

The CHAIRMAN said those who heard Bishop Clifford's paper would remember that he said there were no walls except round the baths, and that there was no trace of its having been a fortified city but it seemed there must have been considerable space enclosed, and there was no reason why it should not have been done in the times of the Romans.

Alderman BARTRUM thought the map which Mr. Green had kindly brought before them was one of exceptional interest, and he had cleared up many of the difficulties which those who had taken an interest in these subjects must have experienced. What had struck him as strange was the similarity between the city as it is, and as it was depicted on that map.

Mr SHUM said it was rather curious that the map, which Mr. Green had shown them, exceedingly accurate as it was generally, did not mark S. Lawrence's church which afterwards appeared on the bridge.

Mr. GREEN replied to the discussion, and, in the course of his remarks, regretted that the Roman Baths were left uncovered, allowing the weather to act upon and injure the stones. It was a question for a club like theirs to take up, and another question was the style of architecture which was to be adopted in the new building to be erected at the baths. From what he had read in a local paper it seemed to him that it was to be Jacobean, but he did not see why they might not, at any rate, endeavour to reproduce the old state of things. He protested against any other style of building being erected on a classical site.

Photographs of the altar stone were exhibited, and the SECRETARY alluded to the injury already taking place to the

sculptures through exposure to the weather, and expressed a hope that they would be placed under cover either at the Institution or elsewhere.

The fourth and concluding afternoon meeting for the session took place on Wednesday, February 10th, at the Institution, when Mr. McMURTRIE, of Radstock, communicated some notes on the occurrence of Salt Springs in the Coal Measures at Radstock (*vide* page 84). He said it was an unusual thing for Salt Springs to be found in an inland coal pit. Recently, however, whilst extending the shaft of the "middle pit," not far from the Market Place at Radstock, three different springs of salt water had been met with—1,110, 1,142, 1,450 feet, respectively, below sea level. The geological features of the locality were described, and the important fact alluded to that coal had been found at the depth of 1,791 feet, the boring having been carried still further to a depth of 1,846 feet. From an analysis of the water it was shown that with the exception of its temperature and extreme saltiness, its constituents were not dissimilar to the Bath waters. Whence, however, came the sodium? The stratum of New Red lying on top of the shaft, and which generally was associated with Rock Salt, Mr. McMurtrie said had no trace of Salt crystals in it. Was the salt then derived from the Channel, 21 miles distant at the nearest point? He thought this a possible solution, though it had its difficulties.

Questions were asked respecting the temperature of the water, and suggestions made that observations should be taken to ascertain whether any variation had taken place.

The SECRETARY thought that the source of the Salt Springs might be situated in the New Red beds, cropping up to the surface at some distance off, and at a higher level.

Mr. SKRINE, who was in the chair, thanked Mr. McMurtrie for his instructive paper.

The next communication was from the Rev. H. H. WINWOOD on the fossil Mammalia of the district (*vide* page 95). Since

Mr. Moore's paper had been read to the Club, several additions had been made by himself and others (he said) to the list of extinct animals found in the "mammal drift" of the neighbourhood, and he thought a list of these, together with their localities, might be of use to the Club. Giving a short description of the "mammal drift" which was found in our valleys, and the associated fossil bones therein, specimens of which were exhibited, he called attention to the change in the climate since the time that the Mammoth, the Rhinoceros, the Musk sheep and Reindeer, roamed amongst our hills and valleys, and remarked on the singular absence of any of the works of man in the shape of palaeolithic implements in these gravels. Abundant in other localities, the most careful search had failed to find them in our neighbourhood. Allusion was made to the recent decease of Dr. Errington, of Prior Park, whose collection of remains of extinct animals was shown in the museum there, found chiefly in the Moorfield cutting on the Somerset and Dorset Railway; and with whose enthusiasm in the science of collecting Mr. Winwood had often had opportunities of becoming acquainted.

#### EXCURSIONS.

*Devizes and Potterne.* The Secretary having been disabled by an accident from joining this excursion, is indebted for the following notes to the kindness of Dr. Mantell, Colonel Chandler and Mr. Onslow Watts. The party, which seemed to be fairly numerous, started on April 28th, by the 10.25 a.m. train for Trowbridge and Devizes. Having nearly an hour to spare at the former place, a visit was paid to the Rectory house. The Rector conducted the party to the celebrated mulberry tree in the garden, called Crabbe's tree, still surviving, but looking rather *crabbed*—as some one suggested—thence into the house to Crabbe's study,—a pleasant-looking room, with bookcases and everything just as they were in the Poet's time. As there was not anything else particularly worthy of notice, the train for Devizes was



taken, and the two churches, St. John's and St. Mary's, were visited. Dr. Hart Burges, the Rector, kindly pointed out their architectural peculiarities, and read a Paper, of which the following is an abstract :—

St. John's Church, so far as his information from reliable sources went, was considered one of the most interesting parochial churches in Great Britain ; and contained specimens of five distinct styles of architecture. The oldest of these are the chancel tower and transept, built about the same time as the Castle, by the celebrated Roger of Sarum, 1130 A.D. The small arcades on the outside of the tower, as well as those within the belfry, the nail head chevron, embattled fret, and intersecting arches are indications of the date. The east and west arches of the tower are semicircular, while the north and south are pointed, but evidently built at the same time. Oblong in form, the measurement from north to south being half as much again as from east to west as is sometimes found in these central towers, it is considered to resemble Tewkesbury Abbey. The fineness of the jointing in the masonry of the tower is another indication of Roger's work. The original form was that of a cross, with lantern tower in centre, and nave without side aisles, chancel being vaulted. Side aisles and cutting away of the basement of turret staircase took place in the 15th century. Duke Humphrey's residence in the Castle having given an impetus to ecclesiastical architecture, the transept windows were supposed to have been altered at this period. The north-east and south-east private chapels are of somewhat later date, the more florid one being attributed to Beauchamp, who held the town and Castle for Edward IV. The transepts have been much cut about for the insertion of Perpendicular windows. On the outer walls of the chancel, within the present church, the original Norman corbel table may be seen. The present east window is a recent restoration. The Norman nave has almost entirely disappeared. The church plate has been recast some years since 1804. The registers commence 1559. One monumental brass of John Kent, 1630, is worthy of note. There are eight bells.

St. Mary's Church, consisting of a chancel, nave, two side aisles, western tower and south porch, was evidently erected at various periods. The chancel is supposed to have been built soon after the

Conquest. The walls are  $4\frac{1}{2}$  ft. thick, faced on each side and filled with rubble. The present Perpendicular windows (16th century) are supposed to have replaced the five small original semicircular windows resting externally on a plain string course. A corbel table remains on north and south walls. Remains of an arcade can be traced round the interior walls. The porch, next in order of date, is a very beautiful specimen of Transition; and the outer doorway, showing the characteristic Norman mouldings and deep splay on an arch of Early English form, is of great interest. The large and lofty nave is built upon the Norman foundations. On the outside, rising from the eastern end of the ridge of the roof in the usual position of the sancte bell, is a beautiful statue of the Virgin and Child. The fine oak roof was exposed during the restoration, as also was the rood loft door over the chancel arch. The tower is quadrangular, and there are six bells. The church plate has been re-cast. The churchwardens accounts commence in 1499; the register in 1569.

After this a short walk of about 2 miles was taken to the picturesque village of Potterne; the fine early English church, containing a tub shaped font, and the old 14th century house, bought by Richmond, the artist, were inspected, and Devizes left at 6.24 for Bath.

*Brockley Combe.* Twenty members and their friends started by the 10 a.m. train for Nailsea, on May 19th. After a pleasant walk of about 2 miles to the southern and lower end of Brockley Combe, Mr. Duckworth writes—

Here the path wound for a mile through a picturesque valley between steep limestone rocks; but the fern (*polypodium calcareum*) of which the members were in search was not found there. At the top of the Combe they emerged on an open down, along the sides of which they observed near the top several small clusters of circular pits, like those near Pen Selwood and Weston-super-Mare. After reconnoitring to the left, they made a straight tack of a mile to the right, which, they afterwards discovered, would have led them directly to the head of the Goblin valley. From the highest point of the down they obtained a good view of Weston-super-Mare, and of the Welsh Coast. At an isolated house with

a farm yard they asked the keeper's wife to tell them their way. She, not altogether liking the look of the Field Club, who might be poachers in disguise, seemed apprehensive for her poultry, and was much relieved when her husband was observed returning with his gun. He pointed out the direction, but the forces were so scattered in seeking for convenient routes of descent upon the Goblin, that only three faithful followers remained to aid their gallant captain, when with drawn trowel he charged at the grey boulders on their left and captured the position. The *Polypodia* were drawn up on the slope in loose skirmishing order to the number of about 50, and they had to be dislodged by cutting away the ground from under them. This was with some difficulty accomplished, and many fine prisoners were taken. Their feet were long and branching. After a full resistance they suffered themselves to be secured in paper bags. Passing through a doorway in the middle of the valley, they at length reach an open space where two ways meet. The right way was the wrong one, as two of the members discovered to their cost, having followed it till it led them back to this very spot again. It is now 3 miles to Nailsea Station and 4 to Yatton Junction, from which points all return to Bath after a most enjoyable day, marred only by a drizzling rain during the afternoon.

*Romsey and Rufus Stone.* The excursion to Southerndown and Kidwelly Castle, fixed for June 16th, having been for various reasons postponed, the excursion to Romsey and Rufus Stone took place on that day instead.

The predicted storm never having come off, the members mustered strongly on the morning of Tuesday, at the station. Owing to the facilities kindly afforded by the authorities of the G.W.R., a through-coach was provided for the party to Romsey, and that station was reached at 11.25. Two brakes were soon well filled, and a start made without delay for the Abbey. Passing the Berthon lifeboat yard, a friendly hail from the Vicar was responded to with alacrity by one of the brakes speedily emptying its contents into the yard, whilst the second pursued its own way somewhere. The Rev. E. Lyon Berthon, the enthusiastic inventor of the portable folding lifeboats, has spent the best part of a quarter of a century in perfecting his admirable

invention, and if enthusiasm merits success he ought to succeed. There certainly seemed to be plenty of orders on hand, for the yard was all alive with shipwrights and boats in various stages of progress.\* The second brake having turned up, or rather turned out, Mr. Berthon showed the members the various inventions in his line—large lifeboats that will hold 14 horses and 40 men; small yacht dingies and fishing boats; duplex boats, serving as tents on shore and folding up into handy sizes to be carried, when separate, on either side of a camel or a horse, rejoicing in the name of *skenoscaphos*; and small canoes for one person—in fact, inventions capable of much expansion and future utility, made of two skins of waterproof canvas, filled with air by the mere act of opening and setting them up, and ribbed with Canadian elm. The boats have many advantages over other lifeboats, both in their capabilities of floating and sustaining blows without injury. A little book containing the necessary information as to their size and price was distributed. The invention is now in the hands of a Company. It was not far from the bustle of the yard to the quiet precincts of the Abbey; and for those who had not seen before one of England's finest Norman abbeys, a great treat was in store for them. Mr. Berthon, if great in the yard, was still greater here in the interior of the Abbey he loves so much, and every stone of which seemed to be as familiar to him as the boats he had watched building. Step by step the history of the building was given, commencing with the beginning of the 12th century, and passing on through the Transition, Early English, Decorated, down to the period when the recent ugly parapet disfigured the outside walls of nave and aisles. A stone crucifix in one of the side chapels was pointed out as a portion of the original church, and the date of the 10th century suggested for

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\* Mr. Berthon writes that the Company have, since our visit, received orders from the Orient S.S. Company; and their big ship—the "Orient"—5,500 tons, is now (June) on her way to Sydney with Berthon boats.

it. In the present vestry, originally a side chapel, an altar cloth of the 15th century work, once a cope with the "Romsey passion flower worked on it," attracted the attention of the curious in needlework art. Much as the members wished to linger amid the massive Norman pillars, and listen to the Vicar dwelling upon the uniformity, beautiful in its variety, of the old Norman ornament, yet much of the day's work was still before them, and they had to bid their kind-hearted cicerone adieu, and move on to the New Forest. After passing the bronze statue of Lord Palmerston and the gates of Broadlands, where that eminent statesman lived, the first halt was at the gates of Embley Park, to admire the avenue of rhododendrons now in their wealth of flower. This was memorable as once the home of Florence Nightingale. A lovely drive through oaks and hollies, rich in their early summer foliage, was taken to Stony Cross, about eight miles from Romsey. Here the brakes were left, and a short half-mile walk over springy turf and by boggy hollows, home of the *drosera rotundifolia* and bog myrtle (the former seemed to have been hugely enjoying its carnivorous propensities, as the bodies of many slaughtered insects were found on their thick hairy leaves), and Rufus Stone was reached, the reputed site of Rufus's death. The original oak was replaced by a stone, the stone by the present hideous three-sided iron pillar, on one face of which the following inscription is cast:—"Here stood the oak tree on which an arrow, shot by Sir Walter Tyrrell at a stag, glanced and struck King William the Second (surnamed Rufus) on the breast, of which he instantly died, on the second day of August, Anno Domini 1100." Probably more enthusiasm was felt over the Forest scenery than over the fabled site of the death of a red haired Norman. Photographers of the party had been busily at work, and were apparently successful in their attempts to catch the impressions of the moment. The return to Romsey, somewhat quicker than the drive out, being effected in safety, some needed refreshments were had at the White Horse, and the members arrived at Bath at 9.8 p.m., after an instructive and pleasant day.

During the drive through the Forest, a small pool of water attracted the attention of the members by its peculiar blood-red colour. This arose from the fresh water alga *chlamydococcus pluvialis* interesting from the fact, as Mr. Norman tells us, that some of the cells were in the amœboid or locomotive condition, and moved freely about across the field of the microscope. Mr. Norman sends also the following list of the least common plants found during the day:—*Ranunculus hederaceus*, *lingua*, and *flammula*; *Drosera rotundifolia*; *Polygala vulgaris* and *calcareæ*; *Genista anglica*; *Galium saxatile*; *Carduus acaulis*; *Salix repens*; *Myrica gale*; *Habenaria bifolia*; *Erica tetralix* and *cinerea*; *Nardus stricta*; *Eriophorum polystachyon*.

*Tewkesbury*.—The Midland Railway Company having placed one of their commodious saloon carriages at the disposal of the club, rendered the excursion to Tewkesbury on Tuesday, July 14th, very agreeable. The necessity of an hour's halt at Gloucester enabled those who were not already familiar with the beauties of the Cathedral to pay it a hasty visit, and to add somewhat to the contents of the Treasury box, by the poll tax levied upon the members of whom there were some 18 or 20. Before arriving at Tewkesbury, distant glimpses were seen of the Malvern hills standing out blue and jagged, and the smoke from the Forest of Dean Coal fields rose up far away to the left murky but distinct in the clear air. Arriving at the station about 1.30, a hot walk through the picturesque streets of the town, lined on each side with overhanging timber and plaster gable-ended houses brought the members to the abbey churchyard. A curious rude looking monument on the right hand, reminding those familiar with Eastern lands of certain Pagan cults, attracted attention until the arrival of the Rev. F. R. Carbonell, who, in the absence of Canon Robeson, courteously conducted the members over the Abbey. Beginning with the west end, the magnificent deep Norman arch with its six recessed shafts (the seventh hidden by the more recent Perpendicular wall and exposed in part during

the restoration) was as usual the subject of discussion. The insertion of the Perpendicular window has obscured the original design, but it seemed to be the opinion of those competent to form one, that the designer originally intended the wall to be pierced with Norman windows or arcaded, and that two western towers should flank it on either hand—the masonry on the inside seemed to strengthen this idea. On the south the foundations of some old buildings connected with the monastic establishment have been quite lately laid bare, and the remains of the cloister exposed to view. Recent alterations have thrown open the south side very materially, and the view of the whole building at the south-east end has been much improved. From this point the original form of the Abbey was plainly seen. Begun early in the 12th century, and consecrated 1123, it was cruciform taking the form of the Latin cross. The long limb of the cross was the present nave with its aisles and western turrets ; the transverse limb was formed by the central tower and two transepts, each of which had an apse on its eastern side. The shorter limb of the cross was formed by the existing choir and an aisle surrounding it, which followed the same apsidal form as the choir, but on a much larger scale. To these have since been added a *chevet* of chapels in the Decorated period, somewhat obscuring the old design. Entering at the north porch, the beautiful interior burst upon the view ; and the judicious restoration made since the Club visited the Abbey in 1869, and finished under the superintendence of Gilbert Scott in 1879, was manifest in every detail. It was difficult to realise the former appearance of the interior ; the now fine perspective from the west end, then hidden by a screen and organ, and the proportions dwarfed and obscured by hideous high pews. The monuments of the Despencers, Sir Guy de Brien, Abbot Wakeman—and the chantry chapels erected in memory of the founder FitzHamon, and of Richard Beauchamp (first husband of Isabel Despencer, afterwards the Countess of Warwick), for which the Abbey is so famous, elegant examples of Early

Decorated and Late Perpendicular, attracted the admiration of all. The unique *sancte* bell canopy on the face of the north wall of the chancel arch was especially admired, and the remains of the beautiful Sedilia on the south of the chancel. On passing out of the north porch several masonic signs were noticed on the old masonry, and the structural peculiarities of the tympanum of the Norman doorway. Hours could easily have been given up to the further elucidation of the structure, but it was necessary to pass on; and so, under the guidance of Mr. Carbonell, the party walked through the vicar's garden, whence a charming view of the fine arcaded Norman tower and exterior was obtained, and along the dusty road to the "bloody meadow," site of the last decisive battle of the Houses of York and Lancaster in 1471, where the hopes of the latter were finally extinguished. After thanking Mr. Carbonell for his kindness in placing his time at the disposal of the members, and for the instruction they had received from his thorough acquaintance with the history of the building, they returned by the way they came, pausing at the "Y" street the supposed site of the death of Edward Prince of Wales, to the station, arriving at Bath at 8.25, after an instructive and pleasant day.

#### WALKS AND BYE-EXCURSIONS.

On March 3rd some of the members walked to Twerton, and at the invitation of Mr. Carr visited his Cloth Factory—and were shown the process of manufacture from the earliest stage of cleansing the wool to the final one of trimming and folding up the various qualities of cloths. The adjoining works of Mr. McMichael were also kindly thrown open for their inspection, and the different stages of carpet making explained. But few Bath residents are aware what important industries are thriving so close at hand.



A lunch was hospitably provided for the members at the Vicarage and amongst other objects of interest laid out for inspection in the Vicar's study, was the Register of the Parish, in which the first entry was that of a burial A.D. 1538—and the remaining portion of the fine tusk of *Elephas Primigenius* found by Mr Harrison in a gravel pit near Twerton and described by the late Chas. Moore in *The Bath Herald* of 1881. When first discovered it measured 8½ft. on the outside curve; but has been since reduced (notwithstanding Mr Harrison's care) to 4ft. 2in. Since this visit of the Club it is gratifying to record the fact that Mr Harrison has presented it to the Bath Museum at the Royal Literary and Scientific Institution, where it may be seen in one of the glass cases at the south end of the gallery. The members visited the site of the discovery on their way back to Bath in drenching rain.

On March 24th a walk was taken to the Fuller's Earth Works at Combe Hay, by Holloway and Entry Hill; turning into the field opposite the Cross Keys and following the line of the Wansdyke to the road leading down to Combe Hay. On the left of the path the works which had originally existed here were abandoned, the "tips" of blue clay alone indicating the site. On the right of the road a new opening had been made about 7 months ago, to a depth of some 55 feet in the Great Oolite, by Mr. Butler, the proprietor. There were about 25 feet of good stone, succeeded by "blue rock" and clay at bottom. The works on the top of the rise opposite the newly made road to Combe Hay were still being carried on.

On March 31st fifteen members took advantage of a lovely day, went by train to Corsham, and walked thence to Biddeston about 2 miles; inspected the interesting Church with its 12th century Bell Turret, south doorway and font; tried to read some old English lettering on the plaster of the wall of a blacksmith's house to the east of the church; and returned to Corsham, viewing the pictures at the Court on their way.

On April 21st a bye-excursion was arranged for Bristol. The party was met at the joint stations by Mr. Harold Lewis and Mr. W. E. Jones, Assistant City Surveyor, who had kindly undertaken to direct the perambulations of the visitors. From the station the party quickly made their way to the Church of St. Mary, Redcliffe. It was impossible in the short time at disposal to do justice to this magnificent pile of architectural beauty and historic interest. A brief but careful survey of the interior was first made. The portions of the old or 13th century Church, viz., the inner north porch was first examined. This, with the hexagon north porch beyond, is so gorgeously decorated in gold and colour as to entirely destroy that quiet dignity and repose—that old time venerable appearance—which all lovers of the past would rather see undisturbed. Standing at the west end, looking eastward, the beautiful proportions and exquisite detail of the Church may be seen at a glance; the engraving of their work by the 15th century builders, viz., clerestory of nave on the older work below was pointed out, and the succession of architectural style clearly traced from the tower at the west end 13th century work, nave and transept 14th century, thence to the lady chapel at the east end, a fair specimen of the lifeless and debased Perpendicular. A few specimens of old stained glass are still preserved in the windows of transepts, with some admirable modern work serving a double purpose, not only telling its own story, but emphasising the wretched design and hideous colouring of a few of the last generation's attempts.

The beauty and variety of the carved bosses at the intersections of roof-vaulting ribs were greatly admired, as also some fine and well preserved 18th century wrought-iron work.

Great satisfaction was expressed at the evident care and attention bestowed on the Church and its surroundings by those in charge.

A walk round the exterior from the south porch, through the

undercroft to the north east corner of the enclosure, reveals at once the exceptional beauty of this magnificent pile ; quite continental in its proportions, broken up into infinite variety of pinnacle, buttress and gable, crowned by the magnificent tower and spire. With all its variety of outline and its exceptional wealth of detail, its strength and beauty lay in the *repose*—except where the eye is attracted to the useful but sadly incongruous tin tallboy over the vestry chimney.

From Redcliffe the party went to Canynge House, in Redcliffe Street, where by the courtesy of Mr. Charles Jefferies they were enabled to examine a most interesting and beautiful roof, tiled floor and other relics of the house of William Canynge, one of Bristol's greatest merchants and most eminent divines.

Thence they proceeded to Temple Church, believed to have been founded by the Knights Templars, about 1145. The oldest part of the present Church cannot be dated earlier than the 14th century. A Chapel at the east end of the north aisle, known as the Weavers' Chapel, which, with a certain piece of ground adjoining, was granted to the ancient Guild of Weavers 1299. The interior of the Church, with the exception of the Weavers' Chapel and a few Decorated windows, may be said to be of the 15th century or Perpendicular period. The tower is remarkable on account of its leaning ; it is 14th and 15th century work ; is about 120 feet high and has an inclination of 5 feet. There is some interesting wrought-iron grille work and an old brass candelabrum in the chancel.

A walk through Maryleport Street, one of the most picturesque and best preserved streets in the City, where there are some excellent specimens of 15th, 16th and 17th century half-timbered town houses, led the way to St. Peter's Hospital, formerly the mansion of the Nortons in the 15th century, a magnificent piece of domestic architecture of that date. It passed into the hands of the Corporation of Bristol in 1698, and was converted into a Workhouse for the poor. There is much interesting work of

the early 17th century in the wainscotting, chimney-pieces, &c., and the splendid roof of the original building may still be seen.

The Church of St. James was then visited—one of the oldest foundations in Bristol; it was part of the Benedictine Priory erected in the 12th century. The present nave and west end is the only part of the original Church existing. It is singularly impressive with its huge piers and semi-circular arches and simple clerestory, covered (as is usual) with a 15th century wooden roof. The south aisle is of debased Perpendicular 17th century work. The north aisle is a modern addition from designs by the late Sir Gilbert Scott. The tower is 15th century, exceedingly plain, and stands at the east end of the Church.

The party then proceeded through Trenchard and Host Streets to the Hospital of St. Mark, or the "Mayor's Chapel," founded by Maurice de Gaunt in the 13th century; very little of the original work remains, and what little there is is sadly mutilated. The most interesting part of the Church is the Poyntz Chapel (now used as a vestry), which, as a specimen of early 16th century work, is superlatively beautiful and refined, and one of the best in the country. In the south aisle are the recumbent effigies of the founders, as also some excellent examples of monuments of the 15th, 16th and 17th centuries, with a curious hagioscope, giving a view of the high altar, and a pannelled and richly decorated recess, which has the appearance of a reliquary.

Time was now slipping away, and with a glance at the Church of St. John Baptist, built on the wall and forming one of the gates of the city, a move was made to the Council House, which contains a most interesting and valuable collection of ancient charters and MS. books, including the well known Ricart's Calendar, the Great Book of Wills, and the Little Red Book, dating from the 14th century; ancient state swords and maces, letters from celebrities of the 14th to the 19th century, pictures by old masters, one or two by Van Dyke, Lawrence, Kneller, and others.

On the steps of the Council House the visitors parted from their resident friends in order to catch the five o'clock train to Bath, but not before they had expressed their hearty thanks to Mr. Jones, for the trouble he had taken on their behalf and his able and interesting explanations of all that they saw. The Secretary is indebted to Mr. Harold Lewis for the above notes on the Bristol excursion.

*St. Gregory's College, Downside.*—On December 29th about 20 members availed themselves of the courteous invitation of the Benedictine Fathers to visit their Monastery, and the Secretary is indebted to Captain Huth for the following account of the visit:—

We started at 9.10 and arrived at Chilcompton at 9.45, numbering altogether 19, including Father Wright who accompanied us. A walk of about a mile brought us to the Monastery, where we were received in the first place by Father Finch, and requested to write our names and addresses in the Visitors' Book. We were then shown over the old manor house of which the small reception room formed a part, and which might be called the nucleus of the Monastery, as it is the only old part of the magnificent range of buildings. Mr. Inman and his son here left the party to take some photographs of the exterior under very favourable circumstances as regards the atmosphere; while the rest of the party, now joined by two or three other monks, were conducted over the whole of the Monastery—the library, refectory, dormitory, playrooms, museum, lecture room, school room, private studies, &c., and the church. The latter struck us much for its grandeur and purity of style; the tower is yet in an unfinished state; there is a very fine circular window of stained glass over the altar. Many of us ascended a winding staircase to the gallery running round the building inside in the thickness of the wall, a great height from the floor; and while there had an opportunity of judging of the tone of the organ which is of great volume, though not very large, and was well performed on by the monk organist. We were shown some very beautifully embroidered vestments, chasubles, copes, &c., some dating before the Reformation, and said to be 500 years old; also some "Persecution" vestments, made of very thin material, so that they

could be rolled up and hidden away at a moment's notice. The monks seem indeed to pride themselves on the fact that it was their Order (the Benedictines) that was turned out of Westminster Abbey. Among other things notable was a painting by Corregio (a Christ's head); a very fine ivory crucifix of early date, presented by Admiral Sartorius (this had formerly belonged to some Spanish church); an old deed by one of our earliest printers, dating from Boston in Lincolnshire, making over some property to the Order—and which they lately sent for inspection to the British Museum, an offer by the authorities of £25 for it being refused. One of the curiosities shown was a marvel of calligraphy, it was apparently a pen and ink etching of the Crucifixion, nor would anyone with the best eyesight believe it to be anything more; but on inspection with a very powerful glass it was seen to be composed of the most minute writing it is possible to conceive. The monks claim, I believe, to be in possession of a large piece of the true cross. The Libraries were very rich in books, many thousands of volumes ranged in bookcases according to subject, and some valuable editions of the "Fathers."

The Museum was richly stocked with geological specimens, fossils, shells, minerals, stuffed birds and fishes, and articulated skeletons of various small animals, forming a very fine collection in Natural History. It was in this part of the building we were joined by the Prior Father Ford, who received us very hospitably. In this room, too, were shown us some good rubbings of early English brasses.

The arrangements connected with the school seemed to be very perfect. The Dormitories were divided into "stalls," each containing a bed—a row on each side of the room, with a wide space—warmed with pipes, and thoroughly ventilated in the roof. Besides the school room, the boys have a large playroom, with a few simple gymnastic appliances, or if they want to be quiet during play hours, there are small studies provided for them; each filled with light reading, story books, &c. In the out-buildings is a steam laundry and a *silo*, the grass of which obtained the first prize last year for condition; there is also a bathing pond, flagged with stones.

At about 12.30 we were shown into the Refectory, where we all sat down to bread, cheese and beer, and having thanked the Prior in the name of the Club for his courtesy and hospitality, to which he replied,

saying how glad he was to see us, we walked to Midsomer Norton village and looked at the church, which has nothing much worthy of note except a stone statue of Charles II. on the tower, and thence to the station leaving by 2.10.

Some more detailed notes supplied by Father Wright are worthy of being recorded.

The community are descendants of the old monks of Westminster. After the Reformation they lived at Douay, in France, until driven out by the French Revolution, when they returned to their native country, in March, 1795.

A temporary home was given them at Acton Burnell, in Shropshire, the seat of Sir Edward Smythe, until 1814, when they removed to Downside. A substantial square stone house sufficed for College and Monastery for the first ten years. The following buildings were added at different dates:—

The old chapel group, built in 1823, from the designs of Goodrich, of Bath, contains the chapel, now used for the students; the monks' refectory, now the museum; the "Petre Library," used by boys in the upper forms; and two large dormitories.

The College group, built in 1854, from the designs of Charles Hansom, of Clifton, contains the boys' play room, study room, several class rooms, and libraries for the lower forms. Over the study room, the theatre, and the boys' private rooms, etc.

The refectory group, built in 1876, from designs by Messrs. Dunn and Hansom, contains the boys' dining hall, a fine room, 75ft. by 40ft. and 25ft. high. The walls hung with portraits of bishops and priors who have been members of the community. Above it a dormitory, 105ft. long by 40ft. broad, containing 38 beds; also, the Procurator's office, infirmary, etc.

The "Petre Cloister," built in 1876, to connect the College with the Monastery.

The Monastery, built in 1876, with additional storey in 1884.

The party then entered the Monastery by the east door, and visited the following in order:—

The Monks' Cloister, with fine groined stone roof, and ancient tiled floor, 160ft. long by 14ft.

The Calefactory, or monks' recreation room, size 36ft. by 20ft., 18ft.

high. Some valuable oil paintings on panel, a large stone fireplace surmounted with a statue of St. Benedict. On the table some old M.S.S.—(1.) Date June 13th, 1366, relating to an appointment in the diocese of Lincoln. (2.) Date 1539, concerning the rental, etc., of properties belonging to Bath Abbey. (3.) A bull of Pope Urban VIII., relating to St. Gregory's, 1626. (4.) The Boston Letter of Confraternity, a valuable and unique specimen of Early English printing, c. 1535, by Richard Fakes.

Also a silver-gilt monstrance, formerly used in the Chapel Royal St. James, 1678.

The Lecture room, used by the community for lectures in Holy Scripture, Theology and Canon Law.

The Prior's room.

The Library, containing 30,000 volumes. A curious picture of the crucifixion, composed entirely of handwriting, so minute as to be almost invisible.

The Sacristy. Several vestments with ancient embroidery, from Westminster Abbey. A richly coloured ivory crucifix, some old pre-Reformation vestments, a handsomely embroidered modern cope.

The Church. The building begun in 1879. Two transepts opened in 1882 are 85ft. long, and form the present church; height to stone groining 66 feet. When finished the total length (without nave) 220 feet, and will contain about 20 chapels with their altars. The massive tower, not yet complete, is 145ft. high. The altar in the north transept, now used as the high altar, is dedicated to the Blessed Sacrament; and the rich carvings and stained glass are all in connection with this Mystery of the faith. All the other altars are only temporary, and the chapels in an unfinished condition.

The visitors made a tour of the triforium, while the Rev. Choirmaster played the organ. They then left the church by the west door, and went to—

The foundations of the lady chapel and choir of the church, the crypt, and position of the future high altar.

Leaving the foundations and passing round the back of the Monastery, they next went to—

The boys' bathing place—a sheet of water 100 feet long by 45ft. broad, and varying in depth from 3 to 6 feet.

From the bathing place they went to the College, going in at the Peter cloister door.



The boys' Carpenters' Shop, the Refectory and Dormitory overhead, the Theatre, containing some good oil paintings, the boys' private rooms, and the second dormitory were visited in turn.

Downstairs again, the "Petre Library," fitted up with every accommodation and comfort; next—

The Museum. Any detailed list of its contents would be too long to be of service.

The party returned to the refectory for slight refreshment.

The Tuesday walks have been kept up by some of the younger and more energetic members of the Club with great vigour; and though the Secretary has not received such information as might have been expected from the keen intelligence of those who joined them, yet he is thankful for information sent him by two of the members bearing upon the investigations of the Club. The first note has reference to the chambered tumulus at Stony Littleton, on a former visit found to be in a state of dilapidation at one end. Major Evans reports that some of the members walked there on October 6th, and ascertained that Lord Hylton had ordered it to be repaired a twelve month ago. This had been done by propping up the roof, where it had fallen in, with old stones, "in the manner of an arch," and thus securing it from further ruin. At the same time some injury was reported as having occurred to one of the angles of the outer wall, caused by sheep jumping up on the mound.

The second was from Mr. Henderson, who reported that during a walk on Tuesday, 7th April, he, in company with three other members of the Club, started a couple of hares in the park at Newton St. Loe, one of which swam across a stream somewhat wider than the canal. Mr. Henderson considered the fact of a hare taking to the water, unless hotly pursued by dogs, one of rare occurrence, though he had himself seen a hare swim the Burhamputra River in Eastern Bengal, at a spot where it was wider than the Thames at London Bridge. Upon this Mr. Blomefield remarks "that most of our mammalia will

occasionally take to the water, though some, of course, much oftener and more readily than others. A mole (blind) has been found out at sea some little distance from the shore, making for a near island. A friend of his had a cat that was in the habit of plunging into a pond after fish."

It now only remains to allude to the satisfactory state of the numbers and Finances of the Club, the latter showing a balance of £40 on the right side.

The Club album has received several photographs from Dr. Mantell and Mr. Powell of objects of archæological and geological interest visited during the year; and the library has had many additions from the various kindred societies with which publications are exchanged. Amongst these valuable contributions, none surpass or can even equal the volumes issued by the Department of the U.S. Geological Survey.

H. H. WINWOOD,

*Hon. Sec.*

# RULES

OF THE

## Bath Natural History & Antiquarian Field Club.

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1886.

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- 1.—The Club shall be called “THE BATH NATURAL HISTORY AND ANTIQUARIAN FIELD CLUB,” and shall consist (for the present) of not more than One Hundred Members.
- 2.—The object of the Club shall be to make Excursions around Bath, with the view of investigating the Natural History, Geology, and Antiquities of the neighbourhood.
- 3.—The Founder of the Club, the Rev. LEONARD BLOMEFIELD, shall be considered the permanent *President*; and a *Vice-President, Chairman, Secretaries, and Treasurer* shall be chosen each year from among the Members at the Anniversary Meeting on the 18th February.
- 4.—Quarterly Meetings for the election of Members, and for other business, shall take place on the *First Tuesday* in April, July, October, and January.
- 5.—There shall be a Committee of Management, consisting of the officers and three other Members of the Club (the latter to be elected annually), whose business it shall be to consider and determine all matters connected with finance, and printing the Proceedings of the Club, or papers read at any of its meetings; or any business requiring consideration previous to the Quarterly Meetings.
- 6.—There shall be Four Excursions during the year, to be fixed at the Anniversary Meeting, *subject to alterations* at any previous Quarterly Meeting, if agreed to by all the Members present—six to form a quorum. A list of such Excursions, with the respective places of meeting, shall be suspended in the Vestibule of the Bath Literary and Scientific Institution. Such Members as feel disposed shall also meet every *Tuesday*, at the Institution, at 10 a.m.

- 7.—The hour of meeting shall not be changed, except for the convenience of taking particular trains, when it is arranged to go by rail to any place ; in which case the altered time shall be posted at the Institution not later than Twelve o'Clock on the Tuesday previous.
- 8.—In arranging the Excursions, due regard shall be paid to Natural History and Antiquities, so as to secure an equal share of attention to each subject ; with this view, when the same Excursion does not include them both, they shall, so far as practicable, be taken alternately.
- 9.—Special Meetings shall be appointed for the Reading of Papers or Exhibition of Specimens, notice being given to the Secretary at, or previous to, any one of the Quarterly Meetings, by Members having such communications to make to the Club.
- 10.—Persons wishing to join the Club may be proposed by any Member at one of the Quarterly or Special Meetings, and elected (by ballot) at the next meeting afterwards ; three black balls to exclude. The Committee shall have the privilege of electing Four New Members during the year, provided there are vacancies.
- 11.—Any Members of the Club may invite a friend to accompany them on the proposed Excursions.
- 12.—It shall be the business of the Secretary to take Notes of the Day's Excursion, and to draw up a summary of the Year's Proceedings, previously to the next Anniversary ; he shall also see that the proper Notices of Excursions are suspended at the Institution, and communicate with the Members by letter, when occasion shall require. The Treasurer's accounts to be passed at the Anniversary.
- 13.—A Subscription of Ten Shillings shall be paid yearly by each Member, with an Entrance Fee of Five Shillings, to defray any expenses the Club may incur otherwise than by journeys and refreshments. This Subscription to be considered due on the Anniversary. Newly elected Members to pay such a Subscription for the current year at the time of their election.
- 14.—Members whose Subscriptions are in arrear for one year shall be considered as having withdrawn from the Club, if, after application, the same be not paid up.
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H. H. WINWOOD,

*Hon. Sec.*

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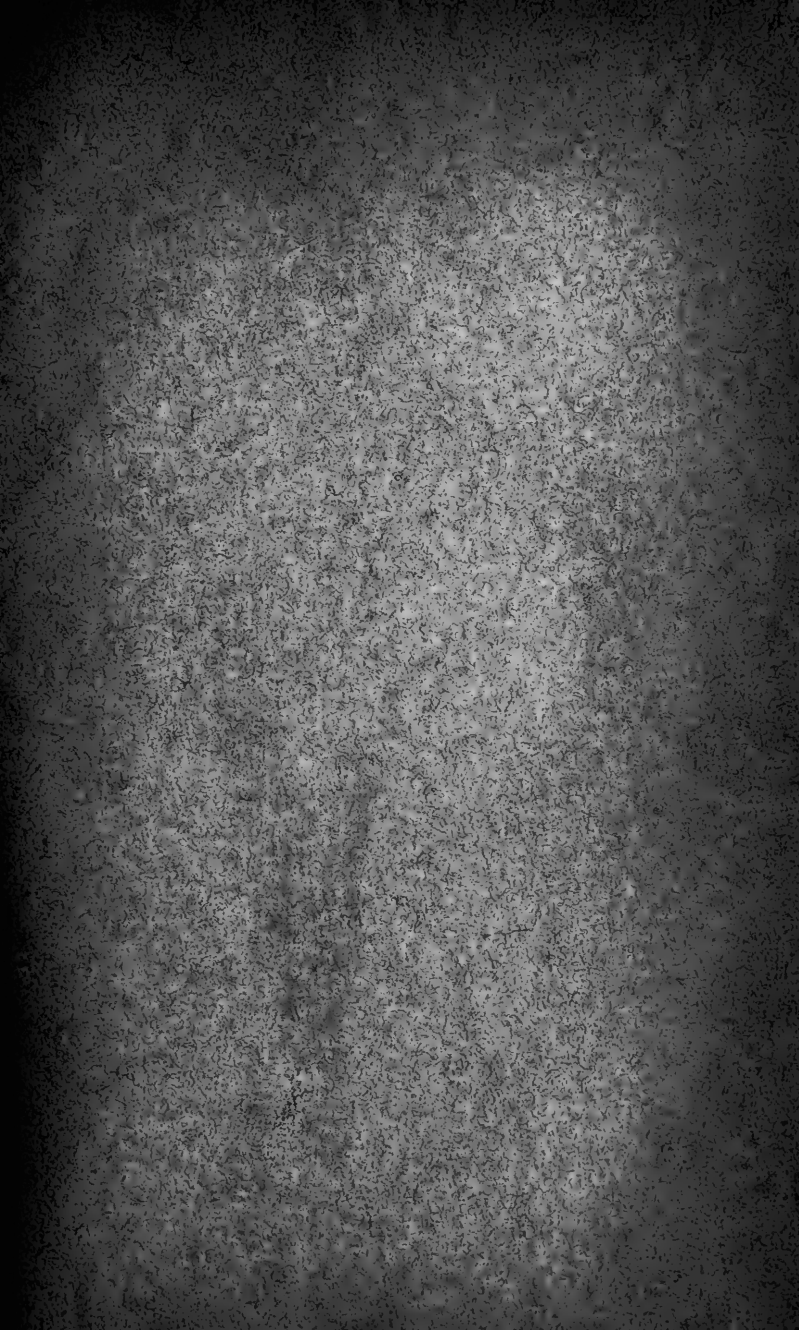
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28 OCT 1886





# CONTENTS OF NO. I. VOL. VI. 1886.

—:O:—

	PAGE.
1.—CONTINUATION OF FUNGI FOUND IN THE NEIGHBOURHOOD OF BATH, BY C. E. BROOME, F.L.S.	1
2.—ON AN ABNORMAL FLOWER OF A PENSTEMON, BY C. E. BROOME, F.L.S. ... ..	35
3.—NOTES ON ROMAN PAVING FOUND IN BRIDEWELL LANE, BY T. BROWNE ... ..	37
4.—THE BOURNEMOUTH FIRS, BY THE REV. LEONARD BLOMEFIELD, M.A., F.L.S., &c. ... ..	39
5.—THE ALGÆ OF THE BATH THERMAL WATERS, BY G. NORMAN, M.B. ... ..	53
6.—THE EARLIEST MAP OF BATH, BY EMANUEL GREEN, F.S.A. ... ..	58
7.—ON RECENT DISCOVERIES MADE IN UNCOVERING THE ROMAN BATHS AT BATH, BY THE REV. PREB. SCARTH, F.S.A. ... ..	75
8.—UPON SOME SCULPTURE RECENTLY DISCOVERED AT THE CROSS BATH, BY THE REV. H. H. WINWOOD	79
9.—NOTES ON THE OCCURRENCE OF SALT SPRINGS IN THE COAL MEASURES AT RADSTOCK, BY J. MCMURTRIE, F.G.S. ... ..	84
10.—LIST OF FOSSIL MAMMALIA FOUND NEAR BATH, BY THE REV. H. H. WINWOOD, F.G.S. ... ..	95
11.—SUMMARY OF PROCEEDINGS FOR THE YEAR 1885-86, BY THE SECRETARY ... ..	96



25 FEB 1888

# PROCEEDINGS

OF THE

# BATH NATURAL HISTORY

AND

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VOL. VI., NO. II.

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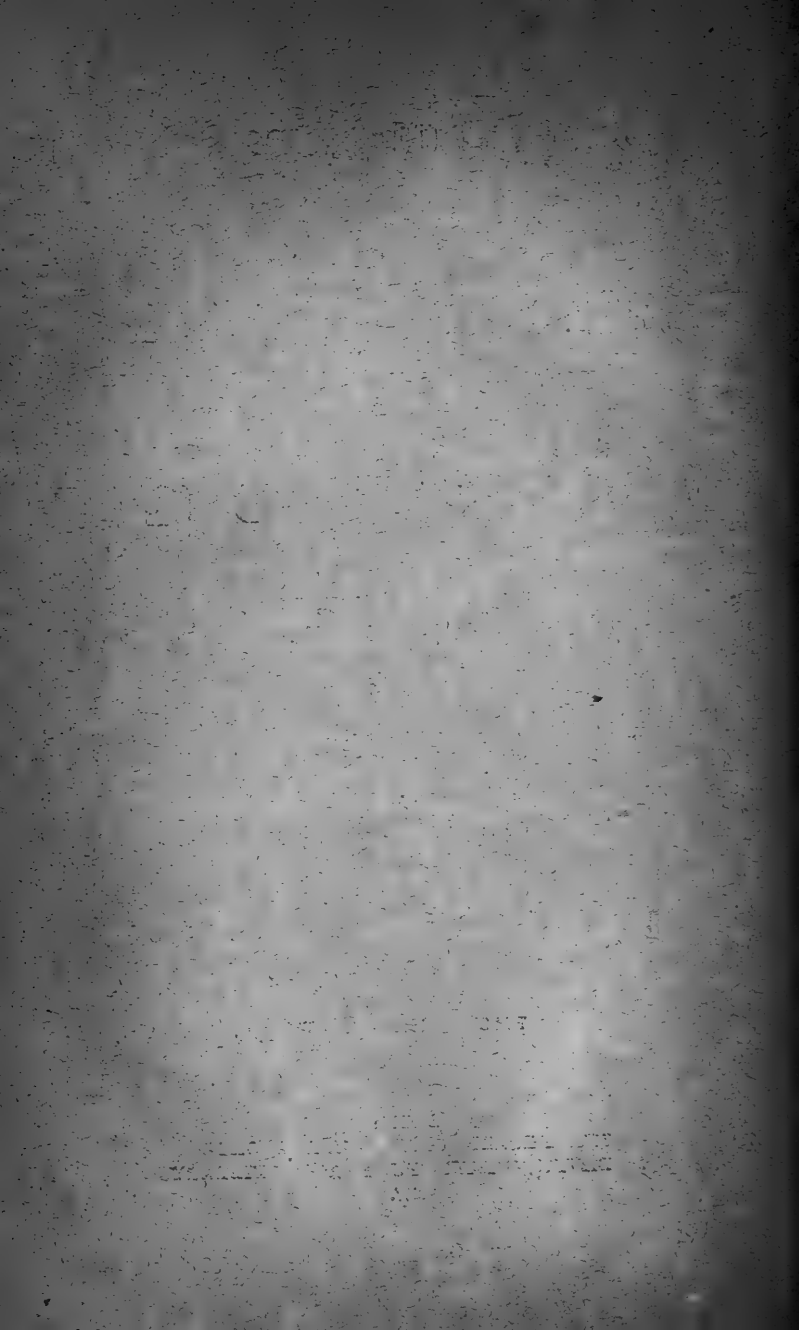
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*Notes on the Geology of Brent Knoll, in Somersetshire. By*  
 HORACE B. WOODWARD, F.G.S.,\* *of the Geological*  
*Survey of England and Wales.*

(Read March 10th, 1886.)

The conspicuous hill of Brent Knoll rises to a height of about 450 feet above the Alluvium of the Burnham Level between Highbridge and the Mendip Hills; its precise height above the sea-level is 457 feet. Some attention has been given to its Geological structure, but as it has been differently interpreted, a few remarks on the subject may be of interest. Thus the area occupied by the Romano-British Camp, was regarded by Conybeare and also by William Sanders as Inferior Oolite,† while on the Geological Survey Map (sheet 20) it was originally coloured as Marlstone or Middle Lias, the lower portions of the hill being regarded as Lower Lias. During the re-survey of the district in 1872, it fell to my lot to examine Brent Knoll, and in the Memoir subsequently published, a section to illustrate the structure of the hill was inserted.‡ This section represented the Knoll to be capped by a thin layer of the "Cephalopoda-bed" (below the Inferior Oolite), together with other portions of the Midford or Inferior Oolite Sands; and to be based on a platform composed of Upper, Middle, and Lower Lias.

No natural section was to be seen at the encampment, but there were loose blocks of sandy and ferruginous limestone which contained Ammonites; and although too imperfect for specific determination, the specimens were considered by Mr. Etheridge to belong to a type that characterizes the so-called "Cephalopoda-

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\* This paper is communicated by permission of the Director-General of the Geological Survey.

† Conybeare and Phillips' "Outlines of the Geology of England and Wales," pp. 255, 275; Sanders' "Map of the Bristol Coal Fields," 1862.

‡ "Geology of East Somerset," &c. (Geol. Survey), p. 116.

bed," which occurs at the top of the Midford Sands in Gloucestershire. So far as the divisions of the Lias were concerned, the identification of Upper Lias was satisfactorily proved by the presence of *Ammonites communis*, *A. bifrons*, &c., on the platform beneath the Knoll. Here pale earthy and rubbly limestones, (beds which characterize the lower part of the Upper Lias at Pennard Hill, and further south at Yeovil and Ilminster), are turned up in the ploughed fields and may be traced on the brow of the hill to the west of the Knoll.

The Marlstone rock-bed was probably present in an attenuated form, although at the time of my first visit I found only "one loose block on the hill which might be identified with this bed." At Pennard Hill its thickness is from 15 to 18 inches, and at Glastonbury Tor it is not much more.\*

The rarity of sections, however, rendered the interpretation of the Geology of Brent Knoll far from satisfactory, and I was glad to have the opportunity of revisiting it in July, 1885, on which occasion I had the advantage of being accompanied by Mr. Alfred Gillett, of Street; Mr. J. Edmund Clark, and Mr. Martin F. Woodward.

On approaching the foot of the hill from the Brent Knoll railway station, our attention was attracted by a spoil heap thrown up from a well-sinking. This proved to consist of blue micaceous Shale, and a search disclosed several specimens of *Ammonites margaritatus*, together with *Belemnites* and fragments of lignite.

This discovery leads to the conclusion that no Lower Lias is exposed at Brent Knoll, for the well was commenced but a few feet above the level of the Alluvium which encircles the hill, and it had been sunk to a depth of 15 or 20 feet, if not more.

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\* The thickness of "about 15 feet" assigned to the "Marlstone-rock," at Glastonbury Tor, by Dr. Wright, is I feel sure much exaggerated. See *Quart. Journ. Geol. Soc.*, vol. xvi., p. 34.

There are, moreover, certain beds exposed in a lane-cutting west of East Brent Church, that were described by my colleague, Mr. W. A. E. Ussher, as "hard and rather fine-grained light grey Limestone, with bluish-grey spots, containing *Ammonites*." These beds are interstratified with clay, and I formerly regarded them as Lower Lias,\* but they proved on re-examination to contain *Ammonites communis*, and thus to belong to the Upper Lias. This additional evidence confirms the view that no Lower Lias is exposed at Brent Knoll.

The upper sandy beds of the Middle Lias are not well exposed in this hill, but they form a comparatively steep scarp, surmounted by the Upper Lias. Nor are the Midford Sands shown in section, although portions of the beds are thrown out from many rabbit burrows. The thin capping of the so-called "Cephalopoda-bed," that had been inferred from the rubble and loose blocks of calcareous sandstone of which the walls of the Camp are formed was again examined and I was fortunate in finding a specimen of *Rhynchonella cynocephala* in one of the small exposures, in re-arranged material on the summit of the Knoll. Another and fragmentary specimen was also obtained from a loose block of calcareous sandstone by Mr. J. E. Clarke. Considering the nature of the ground, this is the most satisfactory evidence that could be obtained of the age of the beds forming the Knoll. Specimens of *Serpula* also occurred, and these prevail at the same horizon below the Inferior Oolite in the neighbourhood of Beaminster and Crewkerne.

It should, however, be mentioned that a variety of *Rhynchonella cynocephala* has been found by Mr. E. Witchell in the lower beds of the Inferior Oolite near Stroud,† so that the species has a higher range in the Cotteswold district than it is known to have in Dorsetshire.

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\* "Geology of East Somerset," &c., p. 116.

† "Geology of Stroud," 1882, p. 47.

The section of Brent Knoll would therefore be the following\* :—

Midford Sands	{ "Cephalopoda-bed" and Sands }	about 200 feet
Upper Lias ...	Clay and Stone ...	„ 40 „
Middle Lias	{ Rock bed and Micaceous Sands }	„ 80 „
	Micaceous Shales and Clays	„ 130 „

Hence the section published in the Geological Survey Memoir is incorrect, with respect to the Lower Lias, which may now be altered to Middle Lias.

#### SECTION OF BRENT KNOLL.

Scale three inches to one mile.



a. Cephalopoda bed.

c. Upper Lias.

e. Middle Lias Clays.

b. Midford Sands.

d. Middle Lias Sands.

Comparing Brent Knoll with Glastonbury Tor we find the same structure with the exception that no traces of hard beds at the top of the Midford Sands can there be recognized. The Tor is formed of these Sands, resting on a platform of Upper Lias Clay and Stone, beneath which come the Marlstone rock-bed, and the Middle Lias Sands, well shown in some of the deep road-cuttings. Micaceous clays and sandy Shales beneath the Middle Lias Sands, are opened up in three brickyards to the north-west of the Tor; and although I could find no organic remains in the beds I feel confident they belong to the same division as the basement beds of Brent Knoll, which contain *Ammonites margaritatus*.

The general sequence of beds forming the Middle Lias of this district is the following :—

3. Marlstone rock-bed with *A. spinatus*, *A. margaritatus*, &c.

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\* The estimates of the thickness of each division are based on the height of Brent Knoll.

2. Sands—not usually fossiliferous.

1. Micaceous Sandy Shales and Clays with *A. margaritatus*.

These beds may be traced from the Dorsetshire coast inland through the district north of Yeovil to Brent Knoll.\* Whether the junction of Middle and Lower Lias should be taken at the base of the beds with *A. margaritatus*, or still lower, is a question about which much difference of opinion has been expressed; but it is usual now to group the beds with *A. capricornus*, *A. Henleji*; *A. Jamesoni*, &c., wherever they occur, with the Lower Lias. The Middle Lias is well developed on the Dorsetshire coast, but it becomes much thinner towards the Mendip Hills.

The determination of Middle Lias at the base of Brent Knoll may be of some slight importance to those interested in the prospects of Coal on the south of the Mendips; at the Knoll itself a considerable thickness of Middle Lias, as well as the whole of the Lower Lias being present. The fault which stretches from the neighbourhood of Wanstrow,† to the south of Pilton, and brings the Lias north of Glastonbury against the Red Marls, is concealed beneath the Alluvium north of Meare, and its continuance in the neighbourhood of Brent Knoll cannot be indicated with any certainty. It is, however, evident that Brent Knoll, like Glastonbury Tor, forms part of a basin-shaped or synclinal structure in the rocks, and a greater thickness of Lias might be expected in the immediate neighbourhood of these hills than in the areas further away.

Concerning the origin of the hill itself, the denudation is probably due in part to subaërial and in part to estuarine agencies.

Knolls like Brent Knoll and Glastonbury Tor are met with in many other parts of the south-west of England, but nowhere

\* E. C. H. Day. *Quart. Journ. Geol. Soc.*, vol. xix. p. 278, and C. Moore, *Proc. Somerset Arch. Soc.*, vol. xiii., part 2, p. 119.

† The inlier marked as "Great Oolite" on the Geological Survey Map, at Wanstrow, is in reality Fuller's Earth.

else are they so conspicuous from the fact that at these localities they are further removed from the main mass of Oolites in the escarpment. Near Bridport, Colmer's Hill is a well-known Knoll of Midford Sands and many other outliers of the Sand and Inferior Oolite are met with in this neighbourhood. Further north again similar Knolls occur near Montacute and other places between Ilminster and Castle Cary. Those near South Cadbury indicate how the severance of outliers from the main mass may take place.

Subterranean drainage and erosion in the first instance may lead to the formation of underground channels in the impervious Lias Clays beneath the porous Midford Sands and the Limestones of the Inferior Oolite. The Limestones themselves may be in part wasted by chemical dissolution, and if channels are formed in subjacent strata, slight subsidences must take place here and there, and pave the way for the disconnection of portions of the main Limestones to form outliers. The subsequent more complete isolation of the severed masses, is due to the superficial and subterranean denudation by rain and streams. And in the case of Brent Knoll, as well as in that of Glastonbury Tor (to some extent), the influence of the estuarine waters that once spread over the Somersetshire levels, must have helped to complete the denudation. The preservation of both Brent Knoll and Glastonbury Tor, however, appears to be due to the basin-shaped arrangement of the strata, and this although slight, has exercised some influence on the agents of subaërial denudation.

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*Place-Names derived from Plants (in the Neighbourhood of Bath).*

By Rev. CANON ELLACOMBE.

(*Read March 16th, 1886.*)

I feel that I ought to apologise to the members of the Club for offering them a paper on such a hackneyed subject as Place and Plant-Names; but by limiting the question to the neighbour



hood of Bath, and so giving a local colouring, I hope my short paper may have an interest which it would not have otherwise.

The process of naming places by our early ancestors was a very simple one. Like all uncivilized people they chose out their settlement in the places best fitted for their mode of life, looking out for the necessary requirements of water, wood and shelter. Tacitus described it in his terse way (speaking of the Germans) "Colunt discreti ac diversi, ut fons, ut campus, ut nemus placuit—suam quisque domum spatio circumdat" \*—and having so squatted they named the place after the fons, campus or nemus—giving it one of the many names signifying stream, or wood, or meadow. But as the squattings increased in number it was necessary still further to distinguish them, and so they looked out for some distinctive natural feature which would mark out their special property, and among these natural features trees and plants would readily present themselves for the purpose of place-names.† It is these place-names from trees and plants which form my subject to-night—and I shall try and show not only that the trees and plants enter largely into place-names, but also that their use as place-names tells us something about the plants. I begin with the forest trees—and first with *The Oak*. We are fond of calling this grand tree the British Oak, and rightly so; there is no doubt whatever that it is a native tree, and it forms a part of some place-names. In its present form of *Oak* it is not much used in this part of the country. There is an Oakhill, near Bath, but I fancy that is a modern name, and there is an Oaksey, near Cirencester, which we, with a little stretch, can claim as a neighbour. But its older form of *ac*, which we retain in *acoru*, is also retained in many place-names. We have, in this neighbourhood, Iron Acton

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\* Germania, c. 16.

† Names so distinguished are of course not so old as the simpler forms—and many of them may be comparatively modern.

and Acton Turville. Many of you know those places, and would at once say that neither of them now are remarkable for abundance of Oaks, and there is no doubt, that not only in those places but throughout England, the Oak is becoming scarce, except where preserved in parks or such places. The reason is, as I suppose, that though the Oak ripens a very large quantity of fruit (in this respect being unlike the Elm which never ripens any in England), yet both the acorn and the young tree are searched for as food for so many animals, that you seldom find a colony of Oak seedlings except in sheltered and protected places.\* The Oak is seldom planted, as planters now look out for a rapid growing tree instead of one "*datura nepotibus umbram*"—and when cut down it dies, in that respect also being unlike the Elm, and Poplar, and some other trees, which when cut down often send up large colonies of saplings from the roots, which not only soon take the place of the parent tree, but largely extend its bounds.

*The Ash* is an undoubted native—and probably less than two hundred years ago it was the most abundant of the wild trees of England, and was probably as abundant in the south of England as it is still in the north. Its great abundance is shown by the many places named after it. In the last edition of Lewis' "Topographical Dictionary" there are no less than 122 places in which the Ash forms a distinct part of the name, and there are perhaps as many in which the word is more or less hidden, and of these 122 a large portion are in the south of England. In our neighbourhood we have Cold Ashton, Long Ashton, Steeple Ashton, Rood Ashton, Ashwick, and others; and we have the common family name of Nash. But now the Ash is not one of our most common trees, and the reason is that it has been pushed out of our hedgerows by the

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\* Tusser pointed this out long ago :—

"If cattle or coney may enter to crop,  
Young oak is in danger of losing his top."

*Elm.* This is not a native tree. Its very name (corrupted from *ulmus*) shows its foreign origin, and the fact that it never ripens its seed in England is another proof of the same. Yet it is now our commonest tree. In Evelyn's time Elm trees were not found in Shropshire and several other counties, and rarely any beyond Stamford.\* It was probably introduced by the Romans, and must at once have spread rapidly, for though Aubrey said that there were only three places in England named from the Elm, yet it would be easy to find more. In Somersetshire there are two places called Elm, and in my own parish is a family, of long standing, called Elms or Nelms. These are probably from the Elm, but I think it doubtful whether some other places such as Elmley, Elmworth, &c., may not have some other origin, because I find that one of the places so named is in the Isle of Sheppy, and I feel sure that there never could have been there such a growth of Elms as to give a name. The whole Isle is almost treeless. There is an Elm which is a true native, the Wych Elm, but it does not spread like the other Elm, and so is a much less common tree. I am not aware of any places named after the Wych, unless Wychnor, in Staffordshire, and Wychwood Forest may be so named; but if there was any place so named it would be difficult to distinguish it on the one hand from the common Wic, which we have in Wick, Bathwick, Swanswick, &c., and on the other from the Wich which marks the salt works.

There is a village under Lansdown called Beach, and it is always assumed that it is so named from the tree. It may be so, but there are no Beeches there now, and the soil is not that in which you would expect a natural growth of Beeches. The name is certainly an old one, it occurs in the old accounts of the manor as *Le Beche*, and I am inclined to look for the derivation of the name in another direction. The village lies under that remarkable acutely-pointed headland which we call Derby Point,

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\* *Sylva*, C. iv.

and I think it very probable that *le Beche*, is another form of *le Bec*, the beak, just as in other parts of the country such a headland would be called a *ness*.\*

There can be little doubt that the *Birch* gives the name to Berkley—its old name *Beorca-ley* shows this. The Birch is certainly not the tree of Berkley now, but we must recollect that when the name was given, the rising ground on which Berkley stands was a promontory or almost a peninsula jutting out from the Cotteswold into a vast impenetrable morass, the drainage of which has completely altered the vegetation, so that there may well have been Birches there in olden times, which have now given place to Elms and Oaks. Shakespeare describes the trees of Berkley as *Bolingbroke* and *Percy* saw them from *Stinchcombe Hill*, and as he may have often seen them from the same “wild high hills and rough uneven ways” that *Northumberland* complained of—

“There stands the castle, by yon tuft of trees.”†

but he does not tell us what the trees were.

And near Berkley there is another place named after a tree, and apparently now misnamed. This is *Alderly*, which must be named after the *Alders*, as many other places are. *Alderly* now is at a considerable elevation above the low ground in which we should look for *Alders*,‡ and so the name probably tells us something of the history of the place; that the first settlement was in the lower ground, as most early settlements were for the sake of water, but that it afterwards migrated to the higher ground, taking, however, with it its older name. The very same thing must have happened with *Marshfield*. Such a name could never have been given to that dry exposed hogs-back on which the present *Marshfield* stands, but it must point to an older

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\* Compare “High Beach,” in *Epping Forest*.

† *Ric* : II., A, 2. s. 3.

‡ *Crassisque paludibus alni nascuntur*—*Geo.* II., 110.

settlement in the lower ground adjoining some part of Box Brook, afterwards deserted for the higher ground. In my own parish is the hamlet of Oldland. The name is a puzzle, and one of the many suggestions I have received is that it is Alder-land. This is rendered rather probable by the fact that it is sometimes written Alde-land. But against it must be set the fact that there are other Oldlands, all like this in the neighbourhood of an ancient forest, and the name is said (but I cannot recollect the authority) to denote land recovered from the forest, and not subject to the laws of the forest manor.

The mention of Box Brook may at once take us to the *Box*. There is no doubt that the village of Box is not named from the tree. It is one of those numberless places which are named from the streams, and which appear in every direction under the different forms of Axe, Exe, Ix, Ox, Ux, with all sorts of different initials and terminals—the same word appears in the centre of Shockerwick in the same parish.\* But if Box is not named from the tree, we may almost (though not quite) certainly claim it for Boxwell. Many of you will know that remarkable valley sloping from the Cotteswold, near Dursley, covered with a wonderful growth of old Eox trees. Any who have not seen it may be recommended to visit it, for it is within easy reach of Bath, and it is one of the most remarkable woods I know.

The *Lime* or Lind may give its name to Lincombe, but though I have made some little search for the origin of the name, I have not been able to meet with any that would be decisive.

Before quite leaving the forest trees I would just mention that the reason more places are not named from the trees is that many of the most common trees are modern. The Plane has not been much more than 300 years in England. The Spanish Chestnut is older, but is a complete foreigner. The Horse Chestnut, now so common, is an eastern tree, unknown in England 200 years

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\* On the upper part of the same stream is *Okeford*.

ago. The Fir tree is a native, and gives its name to a few places, but not in these parts; and the Walnut, by its very name, is a foreigner.

I will now go to somewhat humbler trees. I am surprised that so few places are named from the Holly or Holm. It must once have been most abundant, and probably formed the chief underwood of Kingswood Forest. But I know of no place certainly named after it. There are plenty of Holmes, but they all mean Islands. There is, however, a Holcombe near Bath, which may have been Holmcombe, and if so, it must have been so named from the Holly—a valley could not have been named from an island. I am also surprised to find none named after the Hazel; for Evelyn says, “for the place they above all affect. . . . Where quarries of freestone lie beneath.” Yet, though we have abundance of freestone, I know of no other place named after the Hazel nearer than Haslebury, in Wiltshire, and Hasleton, near Cheltenham.

I know of no place near here named after the Elder, but I mention it because there is a family name, known to some of us, which may be traced to that tree, I mean the name of Ellacombe. The old form of Elder was Eller, or Ellern, and Eller-combe or Ellern-combe would very easily be written phonetically Ella-combe. Ferguson, however (a good authority on names), says that Ell or Elli is the old Norse form for the Alder.\* So I can take my choice between the Alder and the Elder.

I wish we could say that the different Hayes—Combehay, &c., were named after the Hawthorn, but I suppose they are simply “Hagas” (enclosed lands), the same word which afterwards became “Hedge.” It is true that the same word also forms the first syllable of Hawthorn, but we cannot stretch it further. We can, however, claim the Thorn as the chief component of Thornbury.

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\* Ferguson's “North Men,” p. 125.

Thorns naturally lead us to Gorse and Furze. There is a hill near Lansdown called Frizen Hill, now generally corrupted to Freezing Hill, and believed to be so named as being the coldest part of Cold Ashton, in which parish it lies. I was sorry to see this mistake perpetuated in two publications of great authority, the "Ordnance Survey" and the "Proceedings of the Bath Field Club"\*—for it is a mistake. Frizen, or Frysen, is merely the old form of furzen, and within the memory of man the hill was an open hill covered with Furze, and I have conversed with men who helped to grub up the furze that gave the name and enclose the land, and a lane leading from it is called Gorse Lane.

I know of no place near Bath named after fruits. In some parts the Apple has given a name to a few places, but not here. The nearest approach is such a name as Orchardleigh.

But we have places named from the Vine—not parishes, but fields. I believe there is no parish named from the Vine, but there are many places that have Vines and Vineyards. Bath is one, and the position of the Bath Vineyards, facing due south, with full protection behind and a warm brashy soil, must have been the best possible for the growth of the Vine. At Claverton there is another, and I have to thank Mr. Skrine, not only for showing me the old position, in some respects almost better than the Bath one, but also for giving me much interesting history connected with it. Vineyards have now gone from Bath, as they have from other parts of England; but I am sure that a search into the names of fields in many parishes round Bath would bring to light the former existence of many old Vineyards. It is the same with hops. The time was when it paid the farmer to grow his own hops, and in many parishes there are fields called Hop Gardens (there is one at Bitton), but the cultivation ceased to pay when it was cheaper to buy hops grown on more favourable soils.

Of more humble plants I can only name the nettle as giving

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\* Vol. iv., p. 290.

names to places. In Somersetshire we have a Nettlecombe, and there is a Nettlebridge near Radstock, and if it is really so named from the plant, it is an additional proof of the value attached to the nettle by our forefathers as the chief fibre plant. You will recollect in the churchwardens' accounts of St. Michael's, read to us by Mr. Pearson, one entry *pro urticis*, and the plant is often mentioned in the old cookery books as a good vegetable.

I know of no place named after flowers, strictly so called.\* Our ancestors had to look after something more materially useful than roses and gilly flowers, when they chose their settlements, (it required a more advanced state of civilisation to name an "habitation" after a "primrose.") But there is one place near Bath for which a flower derivation has been claimed; this is Claverton, and on this name I should like to speak a little more at length and so conclude. There are many places in England compounded of Claver, and it is quite possible that in some of these (as in Claverham, Clavermead), the word may mean Clover, of which the old form is Claver, thereby preserving its connection through the French *Clæffre* with the Latin *Clava*, a club, a connection which we now preserve by calling the trefoils on our cards clubs. [But in Claverton we are prevented from applying this derivation, because in the Saxon codex the name is certainly written Clât-ford-tun,† and on this name it has been decided, chiefly by Professor Earle, that Clât is the same as Clote, and that Clote means the Water Lily, and so the whole name means the village by the ford of the Water Lily. Professor Earle calls this "a pretty example." I entirely agree with the prettiness, but I venture to doubt its correctness, and for these reasons:—

Supposing that Clât could be converted into Clote (which is

\* Flax Bourton is so named, not from the Flax plant, but from having belonged to Flaxley Abbey—(Rutter).

† Charter of Wulfwarn, 694, and ic geaun Wulfmære mynum yldrad suna thæs landes cet Clatfordtune mid mete and mid mannum and mid eallre tilthe.



doubtful), there is absolute proof that Clote never meant the Water Lily in the days when Claverton first got its name. Clote always meant the bur or burdock and nothing else. On this point there is a complete consensus of all the old writers, beginning with the early vocabularies, through the early dictionaries, such as the Promptorium, the Catholicon and the dictionaries of Cotgrave and Palsgrave, through all the old Herbalists of the 16th and 17th centuries, down to our own day, in which the name has been almost lost. In all of these the Clote is *always* the Lappa, the bur or burdock, and there is not the slightest hint that the name was ever applied to the Water Lily. But about forty years ago Mr. Barnes stated in his Poems of Rural Life, that in Dorsetshire the Water Lily is now called the Clote. It may be so now occasionally, and the fact is curious as an instance where a lost name has survived and been transferred to another plant, but it is no proof as to any such ancient use of the word, and the loose way in which the English peasant names plants deprives the fact of any etymological value.\* But it was taken up by three different persons, all of good authority—first by Cockayne.† In an Anglo-Saxon Leechdom is a remedy against worms—“take dock or clote, such as would swim;” and Cockayne, following Barnes’ lead, thinks that “Clote that would swim,” may be the Water Lily. But I have no doubt that the “Clote that would swim” would be the Water Clote, *i.e.*, the water-bur, ditch-bur, or reed-bur,‡ especially as the medical qualities do not apply to

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\* “Throughout our travels in India we were struck with the undue reliance placed on native names of plants, and information of all kinds, and the pertinacity with which each linguist adhered to his own crotchet as to the application of terms to natural objects and their pronunciation. It is a very prevalent but erroneous impression, that savage and half-civilised people have an accurate knowledge of objects of natural history and a uniform nomenclature for them.”—Hooker, “Himalayan Journal,” II. 328—note.

† Cockayne II. 123. ‡ *Sparganium ramosum*.

the reputed qualities of the Water Lily, and Professor Skeat approves of this interpretation. The next was Halliwell. In his dictionary of Archaic words, he has—"Clote, the yellow Water Lily. Chaucer has Clote leaf, explained the leaf of the burdock, although the present meaning best suits the context\*—see Gerard, p. 674, and Cloten in Walter de Bibblesworth." Now having been taught to "verify your references," especially in the case of voluminous writers, I went to these two referred to with this result—Gerard calls the Clote the Bur, and gives no hint that the Water Lily was so named, but he says of the Water Lily that "it is good against the pilling away of the haire of the head," and that the *flowers* made into oil coole and refrigerate the temples," that is all Gerard says. Walter de Bibblesworth wrote a long poem in the French of his day, the 14th century, and in it is this†—

Sy vus trovet en toun verger  
 Ameroke e gletoner  
 Les aracez de un besagu  
 E choletz plantez en lour lu.

The poem has an English interlinear gloss and *gletoner* is translated Cloten, so the whole is—"If you find in your garden Mayweed or Cloten, dig them up with your fork, and plant marygolds in their place." I do not think this proves anything, except, perhaps, that the Cloten there spoken of *could* not have been the Water Lily.

The third person I spoke of is Professor Earle. He is a very great authority, so great that I could not venture to enter the lists against him myself. All I can do is to enter them by deputy, by sending against him another professor of equal or

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\* Chaucer's words are—

"A Clote-leaf he had under his hood  
 For swote, and for to keep his head from hete."  
 "Canon's Yeoman's Tale."

† Wright, p. 162.

greater weight. Professor Skeat, in his notes on Chaucer, refers to this theory of the Clote being the Water Lily, but soon dismisses it as of no value. He refers, however, to Gerard, and on my writing to him on the subject, he wrote as follows :—

“It is not I who refer to Gerard. I only say that *Halliwell* refers to Gerard ; and he gives the reference which I copy. I did not look it up, because I did not believe in it. As to Claverton, it is simply a fact that either that place, or some other place of like name, is spelt *Clatfordtūn* in a charter published by Kemble in his ‘Codex Diplomaticus.’ There is also an A.S. *Clatford* as a place-name, and still two parishes named CLATFORD. But it cannot well mean *Cloteford*, for the reason that if the A.S. word was *Clāt*, it would now be *Clote* ; but it is not ; therefore the A.S. word was *Clat* (with short *a*), and it did not mean *Clote*, but something else. Had it meant ‘Clote,’ your place would have been *Clôverton* with long *o*.”

Here I might well stop, but my inquiry into this one name has led me into so many pleasant paths that I should like to conclude the argument from my own researches. I now feel certain that Clat or Clote, in Claverton, never had any connection with the Water Lily for this reason, that the Water Lily did not grow there when the name was given. I feel certain that there were no wild Water Lilies, and very few, if any, cultivated ones in the South of England for many centuries after that date. There is a botanical reason for this. The plant is a northern one, and perhaps indigenous in Scotland, but it is of such a rapid growth, that if it had been long introduced, the still waters of our southern rivers would have been filled with it by this time. I can recollect the large pond at Warnley when I could pull or sail on it anywhere. A Water Lily has since then been introduced, and now the pond is completely choked with them. And that it was not known as a wild plant is proved by the early writers. The writers of the early Vocabularies found *Nymphæa* in Pliny, and so tried to translate it, but could make nothing of it ; and the early Herbalists of the 16th and 17th centuries all name it, but they all copy one from another, and none of them name any wild

habitat for it. If Turner or Gerard had ever found it, they would have said so—they are always fond of giving localities; Gerard so much so, that he was convicted on one occasion of planting a rare plant in one locality and then discovering it, and publishing the locality. In Ray's time it had reached Cambridgeshire, but the first notice that I can find of it south of the Trent is in Blackstone's "Specimen Botanicum," 1746. He names a few places round London, and among them Windsor Lake. This looks as if the plant might have been introduced from Scotland to please the Scottish King, James I., or he might have introduced it himself, for he was fond of introducing rarities. The whole of what is now Buckingham Palace and Gardens was planted by him with mulberries to encourage the silk trade.

But to my mind there is a still stronger proof that the plant was unknown in England, because with the exception of the Herbalists, the plant is entirely absent from English literature, either under its name of Water Lily or its other name of Water Rose. When we consider what a grand plant the Water Lily is, it seems impossible that it could have escaped the notice of all our writers, who yet notice so many of our wild plants. It is not named by Chaucer, Gower, or Spenser, nor by Shakespeare (who surely must have named it in the death of Ophelia had he ever seen it); nor by Drayton, who wrote a long account of rivers; nor by Vaughan, the Silurist, who had a special eye for all things that grew in or by rivers; nor by Herbert, Marvell, or Herrick. Not trusting my own research I applied to Dr. Murray, who is always most helpful, and he at once sent me all the slips that they had been able to collect, expressing at the same time his surprise at finding the plant unnamed except by the Herbalists.\* It is named once in a

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\* There is a passage in Walton's Angler which apparently proves the contrary:—"You are to cleanse your pond, if you intend either profit or pleasure, once every three or four years. . . . to kill the

Scotch Book, "The Complaynt of Scotland," 1549, but the plant is Scotch—the first English writer that names it is Byron, in 1818.\* From all this I conclude that Clote does not mean Water Lily, and that Claverton does not owe its name to that grand flower. If I were asked what the name does mean, I should say that I do not know—but in lack of a better derivation I should think that we might adopt the well-known rule of rejecting or paying no attention to initials (consonants), in names, and should say that Ulatfordtun is simply At. ford tun, the farm at the ford, which exactly describes the place. But this is a mere guess to be taken *quantum valeat*.

I have only in conclusion to say that I offer this paper to the Club not as an exhaustive account of the names of places in the neighbourhood, but as a slight sketch which others can fill in at their leisure.†

water weeds, as water lillies, candocks, reate, and bull-rushes that breed there."—c. xx. But this chapter was not in the first edition, and is confessedly not original, but a compiled translation from Dubravius and Lebault. The words of Lebault are:—"On si tu veux avoir proffit de son estang ou de la fosse, tu dois prendre soing à la curer de trois en trois ans oster les roseaux, ioncs, et larges fûelles que l'ò appelle *nymphée* de fleurs d'eau," &c. If the Water Lily was as abundant in the streams round London in Isaac Walton's time as it is now, it seems impossible that he could have overlooked them, both as a keen observer of natural objects and as an angler.

Since writing this I have found that Cowper's Poem on the Dog and the Water Lily was published in 1799.

† I have found in the "Synonoma Bartholomei," 1387, a strong confirmation of my opinion that the old writers did not confuse Clote and Water Lily, he says:—*Ungula caballina est duplex, videlicet terrestris quæ confert ptisicis et ethicis, et aquatica, cujus flos dicitur nenufar. Ungula caballina campestris, i. clote.*"

*Address to the Members of the Bath Field Club, in reference to the death of C. E. Broome, Esq., F.L.S. By Rev. L. BLOMEFIELD, M.A., F.L.S., F.G.S., &c., President.*

*(Read December 8th, 1886.)*

GENTLEMEN,

Before proceeding to any other subject, I am anxious to address you this afternoon in reference to the great loss our Club has sustained by the death of Mr. Broome, one of our original Members. I think some record of so earnest and hard working a naturalist should appear in our "Proceedings." With a view to this, I have briefly put together the chief particulars of his life, wishing afterwards to speak of him, as a friend personally known to myself over a long term of years, and as a Member of this Club.

Christopher Edmund Broome was born at Berkhamstead in 1812. His father, Christopher Broome, lived at White Hill, Berkhamstead, and was a lawyer by profession, and is said to have been "a strictly just and most excellent kind-hearted man." His mother was a Miss Seller, a niece of Lady Knightly, of Fawesley.

At the age of nine Broome went to a school at Dr. Jamieson's, at Kensington. This school, a few months after, being moved to Heston, near Hounslow, Broome went with it, and remained there till he was eighteen, in 1830.

It was in this year that his father died; two years after which he and his mother went to live at Chelsea, and it was from thence he went to be the pupil of a clergyman who held the curacy of Swaffham Prior, in Cambridgeshire, with whom he remained till he went up to the University. He was entered at Trinity Hall, Cambridge, October 23rd, 1832, the same college to which his tutor belonged, and took his degree in January, 1836. In April of that same year, he married Charlotte Horman, fourth daughter of the Rev. John Bush, incumbent of Chelsea Old Church.

A few months after his marriage he went to live at Rudloe Cottage, Rudloe Firs, near Box, a place probably known to some of the Members of this Club, though the house is now pulled down. Thence, in 1844, he moved, for nine months, to Wraxall Lodge, near Bristol, and thence again for a few years to Clifton, where he became very intimate with Thwaites, a botanist of high reputation and well known in the botanical world, and who was afterwards Curator of the Botanical Gardens in Ceylon. I suspect it was at this time that he began to give especial attention to the Fungi, as he is said "to have made, with Thwaites, many expeditions in the neighbourhood in search of truffles." It was in November, 1848, that Broome took up his abode at Elmhurst, near Bath, where he remained for the rest of his life.

I would now speak of my own acquaintance with Broome, who was the oldest friend I had—relatives apart. It arose out of the circumstance mentioned above, of his coming to be the pupil of a clergyman who was curate in the next parish to my own vicarage of Swaffham Bulbeck, in Cambridgeshire. I was intimate with the tutor, and I soon became intimate with the pupil, especially when I found him taking an interest in Natural History, for which he seemed to have a latent taste, only waiting to be evoked according as circumstances were more or less favourable. And circumstances certainly did favour him; for the tutor himself, under whom he was placed, was fond of collecting fossils and rare plants for his garden, independent of my own Natural History pursuits, which I had taken up many years before the pupil came.

Nor could any young naturalist have been placed in a richer or more attractive neighbourhood, in a Natural History point of view, than that in which Broome found himself. Newmarket Heath, with its wide expanse of unenclosed land, crossed by the Devil's Ditch, an earthwork of the Saxon age, running for seven miles, and only disturbed in places; this Ditch terminating at one extremity in the Woodlands, at the other in the Fens, the latter

reaching far and wide, even to Ely and beyond, as well as in other directions. This whole district not merely abounded in birds, insects, shells and plants, but in certain localities were to be found many rare species, of plants especially, seldom met with in other parts of England. I know nothing in Somerset, within easy reach from Bath, approaching to the Cambridgeshire Fens in this respect, except it be Shapwick Moor, as it was formerly, when Broome and myself twice visited it, and had a most successful day's botanising each time, but not as now, when little of the Moor remains, its chief rarities having in great measure disappeared with it.

Such was the rich neighbourhood in which Broome found himself situated, and of which he soon availed himself. He set about collecting insects, plants, and its other natural productions, and we frequently took walks together. In 1832, as stated above, he entered the University, where I often met him for a day's excursion, or visited him in his college rooms, and where also he became acquainted with Henslow, Professor of Botany at that time, and whose botanical excursions, with his class, I think he often joined. Darwin had taken his degree the January previous to Broome's entering the University in October, 1832, and I am not sure that the latter ever made the acquaintance of that distinguished naturalist, who, soon after graduating, left Cambridge to accompany Captain Fitzroy on the far-famed voyage of the *Beagle*.

After Broome left the University we still kept up our acquaintance, but we only met at intervals in London or elsewhere. His frequent change of residence caused an interruption of all companionship in Natural History excursions, though it left a place for occasional correspondence. It was not till after he had fixed his residence at Elmhurst, Batheaston, and myself had moved from Cambridgeshire and come to Bath, that we were able to associate together as formerly for field explorations.

And here I am led to speak of him in connection with the



origin of this Club, and the circumstances that led to it, which may not be known to all the Members, and which it may be of interest to put on record. Broome was one of the original Members of the Bath Field Club, no other remaining now except Mr. Scarth (Vice-President) and myself. But Broome was more than an original Member. I should not be far from the truth in saying—that he was a joint founder of it with myself. True I originated the idea, but the idea would never have been carried out but for Broome. It would never have received shape, but for the circumstance of the weekly walks, which he and I agreed to take for the investigation of the Natural History of Bath. Of these walks I proceed to speak.

When I first came to this neighbourhood I resided for a time at Southstoke, near Combe Down. Broome, having heard that I was there, took an early opportunity of walking across the Down and coming to see me, and we were both glad to renew an acquaintance which had been interrupted for some years previous. We then arranged that the most agreeable way of keeping up the acquaintance, having especial regard to the pursuits we had in common, would be to take weekly walks together in order to explore the Natural History of the Bath district. Thursday was the day fixed on, and the walks, weather permitting, were taken regularly. It was not long, however, before we were joined by friends; two others especially, both now deceased, joined us regularly—Captain Hewitt and Mr. Mackarness, the latter Father of the present Bishop of Oxford, who was then living at Bathford, not very far from Elmhurst. These gentlemen entered warmly into our project, and it was agreed that we should meet at each other's house in turn as a starting point, regard of course being had to the direction in which we were going and the spot we wished to visit.

Others also joined in the walks from time to time, until I thought things were ready for a move towards setting up a club similar to the Berwickshire, Tyneside and Cotteswold Field

Clubs, the only ones, I believe, then existing, though now abounding throughout the country. Accordingly I invited all who were favourable to the scheme to meet me on an appointed day at the Literary Institution, where, in the room now called the Lockey Room, after reading over for approval a few rules which I had drawn up, and which I thought would serve in the first instance, on the 18th of February, 1855, the "Bath Natural History and Antiquarian Field Club" took its beginning.

But to return to him of whom I desire to speak most on this occasion : Broome was naturally quiet and reserved, and did not show to advantage in public gatherings. But as a companion in a walk—a botanising excursion especially—none could excel him, none make himself more friendly and agreeable.

Broome had an uncommon sharp eye in looking after a plant known to grow in a particular locality, and which we were in search of. He seemed to have a sort of instinctive determination not to leave the place till one of us had found it, unless compelled by circumstances to do so, and the discovery of the first specimen rested much oftener with him than with myself. I remember only two instances in which neither of us had any success, and when we were forced to return home without the prize. In one of the cases we were led to think afterwards it was a mistake, and that the plant did not grow there at all ; in the other, that the plant had become extinct in that particular locality.

He was also clever in finding his way about in strange places. When at a loss about the road or in doubt as to where a particular path led, I always left the decision to him, feeling sure we should come right in the end.

It was mostly during our quiet walks alone that we carried on our botanical researches. The Club's regular excursions, though very pleasant in themselves, afford little opportunity for any steady work in Natural History. I remember once, our late much esteemed Member, Charles Moore, on its being remarked that he seldom walked with the Club, gave as a reason that there was

“no liberty of action.” Of course when a large party is wending its way, on foot or by rail, to some pre-arranged place or object of attraction, gentlemen can hardly be expected to make any long stand, whilst one stops to search for fossils in a particular stratum unexpectedly met with—another to look for some particular plant. Stationary work of this kind is best done at other times. Accordingly it was apart from the Club, on different occasions, that Broome and myself collected by degrees all the rarer plants growing in the Bath district, besides discovering several new ones not mentioned in Babington’s “*Flora Bathoniensis*.”\* Fine specimens of all of them are preserved in the Herbarium, in the Jenyns Library, at the Bath Literary Institution.

But Broome was not merely a local collector, he was a general botanist; he had been in Italy and some other parts of the Continent, where he had made himself acquainted with foreign plants, many specimens of which are preserved in his Herbarium. The particular department of botany, however, in which he worked hardest, and to which he had given his chief attention for a long term of years before his death, was that of Mycology, perhaps the most difficult class in the Cryptogamia, and one which very few botanists attempt to take up as a special pursuit. The “Proceedings” of our Club are enriched by several of his papers relating to the Fungi of the Bath district, and a collection of the same was placed by him many years back in the Duncan Local Museum.

In the study of this obscure and difficult tribe of plants, he was often associated with the Rev. M. J. Berkeley, celebrated for his works and papers on Mosses and Fungi, and who, as a Cryptogamist, stands as high as any name in this country or abroad. Berkeley, until his health failed, was a visitor at Elmhurst most

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\* In the supplement to the “*Flora Bathoniensis*,” published in 1839, Babington mentions Broome as one of the parties from whom he had derived much assistance in his work.

years, where I often met him. I had known him ever since he was at Cambridge, and even in his undergraduate days he began to take up the study of Mycology with ardour and success.

I have so slight an acquaintance myself with that branch of botany, that I am glad to be able to give the testimony of others as to what Broome did in this way, and the excellence of his work.

Broome has bequeathed his rich Collection of Fungi to the British Museum, and I am permitted to make an extract from a letter written by Mr. George Murray, an assistant curator in the botanical department of the Museum, to one of our Members, in which he speaks of Mr. Broome as follows:—"The great mass of his work is contained in the long series of 'Notices of British Fungi,' contributed by him and the Rev. M. J. Berkeley, to the *Annals and Magazine of Natural History*. The whole of it, from the earliest to the latest, is characterised by remarkable accuracy, the result of faithful, conscientious research, often involving far more labour than appears. A mere dry reference may contain the result of serious scientific labour, and in such matters as that, Mr. Broome took as great pains to be accurate beyond doubt as in far more showy researches so to speak. His modesty appeared in his work. No one but the Rev. Mr. Berkeley can know the full extent of it, but all students of the subject recognise his authority and trust it implicitly as of the highest order. . . . It is impossible to separate the two names, Berkeley and Broome, they are familiar to all workers in botany, as the very highest authority on British Mycology, and in the first rank of workers in this field throughout the world."

Thus far the letter. Besides working in the field and in his study, Broome did hard work in yet another way. He was a successful cultivator of plants, and did much in the garden with his own hands. His garden was always attractive—to botanists especially—from its containing many choice or rare plants not often met with in other gardens. Perhaps the most attractive

part of his grounds was the drive up to his house from the Bannerdown Road—the borders on each side of the carriage way displaying an assortment of shrubby and tall herbaceous plants, many seldom seen in gardens, and presenting in summer, when in full flower and foliage, a most ornamental drive, not very long, but such as I never saw elsewhere in this part of the country. I remember when it was part of a ploughed field. The wonderful transformation since effected was done under Broome's immediate direction, and much of it, I believe, was the work of his own hands.

In truth, Broome was a hard worker by habit and by rule. In summer he rose at six, occasionally at five, and worked in his garden till breakfast, after which he worked in his study, with his microscope at hand ready for immediate use, as wanted, till luncheon. Then in the afternoon, he was out for a botanising walk, if not called into Bath or elsewhere on some special business; and not unfrequently in summer, the whole day, between breakfast and a late dinner, was given up to some excursion or other, when he would walk long distances, taking little refreshment. He seemed to me, indeed, to eat and drink very sparingly at all times, and hardly what I should consider sufficient to meet the daily expenditure of strength and energy required for the work he did. For, lastly, it was in the evening, after dinner, that he took to his reading, especially botanical and other scientific periodicals, by which he kept himself abreast with the researches and discoveries of others in his own particular department. Engaged with his books in this way, he would often sit up, I have been told, till after midnight, sometimes till after the short hours had commenced.

No wonder that nature resented such an incessant strain upon her energies. Interruption of health, in some form or other, had more than once warned him to desist and spare himself a little, the warning being backed by the solicitation of friends, but it was to no purpose. In one case, when confined to the couch by

an affection of the knee joint, I went up to visit him in his room, where his table, spread with the usual books and papers and the microscope at hand, was drawn closely up, though he could do but little under the circumstances. I reasoned with him as to the necessity of his breaking off for a while from such occupations, and giving rest both to his mind and body. But he only said in reply, "If I am to lie by and do nothing, I may as well die at once."

And no doubt it was incessant work—over fatigue of both mind and body—that brought on the sudden attack that proved fatal. He had property in Essex, which he visited regularly at stated times every year, his head quarters in London being Wood's Hotel, Furnival's Inn. He was there the second week of last month. On the evening of Friday, November 12th, after a fatiguing day in Essex, in wet weather, he returned to his Hotel as usual. Soon after he had gone up to his room, he had a paralytic seizure, and became insensible. In this state he remained, his consciousness never returning, till the evening of the following Monday, the 15th, when at 11 p.m. he passed away. A sudden death to all outward appearance, but not sudden to himself—he was prepared for it. He had latterly hinted to one or two of his friends that he felt he should not be here long.

I conclude, gentlemen, with a few words suitable to the occasion, and suitable to ourselves.

The life and death alike of our much esteemed Member reads a lesson to us all—a short lesson, but a most important one—"Work to the full extent of your powers, but not to the injury of your health." Few Members of our Club, I imagine, need to be cautioned against working too hard for their health's sake, but there may be some to whom the first half of this advice might be given with advantage. When I look over the volumes of our "Proceedings," and compare the few names which stand as authors of the chief papers in them, with the hundred names or

more in the list of Members, I say to myself, where are the many? What are they doing to promote the objects of this Club? We can ill spare a man so active at home and abroad as our late Member. Will no one come forward and take his place? What may not a man do for science, if he be only active and willing, in these days of evolution, when the sciences have been so rolled together that he who works for one, in some degree works for all.

But I have one more thing to say respecting Broome. I stated above that he had bequeathed his collection of Fungi to the British Museum. I have now to add that he has bequeathed all his other collections of plants, along with the main part of his botanical library, consisting of about 340 volumes, to the Bath Royal Literary and Scientific Institution. When we consider this last bequest, in connection with the Jenyns Library of Natural History, and the Herbarium of British plants, already in the Institution, I conceive that hardly any place in England, outside London and the Universities, Kew of course excepted, will henceforth be more favourably circumstanced than Bath for the study of botany. May there be at least one, if not more, of the Members of our Club desirous of availing himself of these resources, which promise so much assistance and success to those who take up this subject in good earnest.

But whether botanists or not, whatever be our work in the study or the field, may we all copy often the indomitable zeal and industry of our deceased friend. Let us take for our motto that which was the guiding star of his whole life—"Work while it is day."

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*Traces of the Saxon period in Bath and the Neighbourhood.* By  
Rev. Prebendary EARLE, Professor of Anglo-Saxon.

(*Read December 8th, 1886.*)

The Rev. Prebendary EARLE said, before I begin my subject I think I must say a word or two, in echo of the very kind and interesting remarks which our President has made upon Mr.

Broome. A great deal of what he said I was able to follow in my mind, and by recalling my own experience to go over the same ground. Many a time have I enjoyed a walk with Mr. Broome himself, or with some member of his family, up that drive of which Mr. Blomefield has spoken, and I remember perfectly well the circumstances of its making—how it contributed to the pleasure which Mr. Broome had in it, that it was a son of his who had been to the Colonies and had come home who engineered it and planned it for him. I have often gone round Mr. Broome's garden with him; I have been with him to Bitton, and spent a day or half a day among Mr. Ellacombe's remarkable collection of trees and plants; for Mr. Ellacombe is very fond of bringing home and domesticating rare and wild English plants which are to be found in his garden, as well as many exotics. It is fresh in my memory that I went up more than once to Mr. Broome's room when he was confined to his sofa, and as Mr. Blomefield has already told you, he was always at his table with his work before him. I remember that summer extremely well. He had been with his son to the Alps on a walking tour, and keeping pace with the activity of the young man, had done too much, and so he was for some months confined to his house by a stiffening in the knee. I am sure that I shall be expressing the sentiments of many when I say that Mr. Blomefield, in the way in which he has brought his friend and our friend before our minds in this memoir, has touched a very deep chord in our feelings and carried us back to many very pleasant reminiscences, though now tinged with sorrow and regret. And we cannot but rejoice that our President, among his many high acquirements and rich accomplishments, adds to it that power of appreciating the value of his friends, which is one of the most amiable and admirable qualities, and is thereby able to do justice to his friend, though Mr. Broome is not the only one of whom he could speak. He has indeed already spoken of some of his acquaintances. I have had the pleasure of reading a



biography by him upon Yarrell, the Ornithologist; and I think there is another great name in natural history, one whom he has this afternoon mentioned, of whom he could give a sketch, as well as, or perhaps better than any other man living, I mean the great Naturalist Darwin. All the best and chiefest traces that I possess of the life and character of Darwin I owe to conversation with my valued friend, Mr. Blomefield. It is among the treasures of my memory that I have had the pleasure of Mr. Blomefield's acquaintance. When I first came here in the year 1857, Mr. Blomefield was residing at Swainswick, and from that time to this I have always been able to feel that I had in him a friend. But if I were to go on as far as my feelings would let me upon this subject I should never come to the "traces of the Saxon period," and I hope I have not said more than is right on an occasion which might be allowed, I suppose, to stir up one's feelings a little in the pilgrimage of this life.

The subject of the "traces of the Saxon period in Bath and the neighbouring," I fear, may seem a very distant subject. One might say it is eight hundred years ago, speaking roundly; yes, it is more than eight hundred years ago since the Saxon period was brought, or supposed to have been brought to a close by the Conquest; and then from the time of its close till it began, we must reckon back a period of 500 years. From the middle of the sixth to the middle of the eleventh century is what we call the Saxon period. It seems a long time ago, but it really is so only in the arithmetical way of calculation in the sound of figures; it is not long ago for anyone who has cultivated a consciousness of his relationship to the national life. We have had, as I may say, but three stages in our life. We have had the first Colonists' stage, when we laid out the country and occupied the fields, and built farm houses and fenced lands, and instituted agriculture, and had one more struggle in repelling the Danes, when to a very great extent we received them as additional Colonists to our country.

So the first 600 years is but a chapter in our life passed. It is an agricultural chapter, and if you want to go back into the Saxon period you have only to walk out into the lanes and by-ways of our remote villages and there you may find all you want for essentials in the Saxon period. Since that time we have had two great periods; we have had the period in which we formed our municipalities, and then we have had since that the period of our great manufactures and our Colonies, and these second and third periods have tended to shut out from our view that great and important Saxon period which is after all the solid basis of our national history. Now Bath is a spot in which one might be naturally led to ask whether there are any remains of this period. There are many reasons why one should look to Bath as one of a very small number of spots in which you might expect to find traces of the Saxon period, other places which might rank with it, but hardly above it, would be such as Canterbury, or York, or Winchester for various historical reasons. I feel that there are very few places that a student acquainted with Saxon periods and literature, on coming to England from a foreign country to try to see what he could see in England, would be more likely to visit with curiosity than the neighbourhood of Bath. For consider, it was first of all a Roman city, and so was one of those places which was attacked by the Saxons very early. It was destroyed by the Saxons in the year 577 after the battle of Dyrham, as recorded in the Chronicle; but it was not occupied by the Saxons, they were not fond of city life. They destroyed cities because cities contained populations that were hostile to them and they could not live peaceably by them. This city of Bath must have laid for 100 to 200 years in a state of desolation—a vast city of stones and buildings, but without inhabitants—and the proofs of this are very various, and have been remarked upon independently by different observers and discoverers. That period was even the subject of a record in the shape of an ancient poem preserved in the Exeter book—

the "Codex Exoniensis"—a volume of the Saxon period which is the one remaining volume of Bishop Leofric's library that still lies in his cathedral. In that volume there is a poem which describes a city in ruins—splendid ruins—with a pool of water of natural heat in the centre, and which appears to me to indicate no place in this country except Bath, and in that opinion I have received the confirmation of very many important authorities. So far for literature. I am only touching on the literature as indicating what means we have to expect that the neighbourhood of Bath should be one that might probably preserve objects of the Saxon period. We have a considerable number of documents relating to Bath, documents of various dates during the Saxon period, and these documents tell of two things—the transfer of land and the manumission of slaves. In these documents we have mention of Widcombe, Lyncombe, Northstoke, Priston, Farmborough, Corston, Weston, Hampton and Freshford. In short, an American or New Zealander, or any visitor who had studied our early literature, might very well come and ask what there was to be seen in the neighbourhood of Bath; what visible and tangible objects remained in existence in the neighbourhood of Bath. Let me first mention one or two things that have been here, but have been removed. There are lying in Cambridge in the Parker library, that famous library which Archbishop Matthew Parker bequeathed to his college, Benet College, now called Corpus Christi, two important books that were formerly the property of the Abbey of Bath; one is a volume of Gospels, in the fly leaves of which were written the manumissions of slaves; and there is also a volume entirely devoted to documents relating to landed property, mostly of the property of the Monastery of Bath, but also partly of the Monastery of Abingdon, which I can only account for by supposing that this book was transcribed after the Conquest. I think that after the Conquest, when religious houses were very anxious to multiply the proofs of their property, they

interchanged with one another the compliment of writing entries of documents in each other's book, by way of multiplying the security of the copy. At any rate there are a number of entries in the Bath book relating to Abingdon, and I cannot conceive any other explanation of them. Among other things that may be mentioned as being found in distant places are the coins. There were a great number of coins struck in Bath from the time of Athelstan in 925, up to the period of Edward the Confessor. I think there must have been more than one monetarius who was licensed to strike coins in Bath. At any rate there are a great number of coins in existence of the Saxon period that have the name of Bath on them, but I am sorry to say there is not one preserved in the place itself. I asked Mr. Russell, at the Royal Institution, the question this morning, and he said they had none. The place where I made the acquaintance of these coins was at Stockholm.

I had the pleasure many years ago of looking over the great collection of Saxon coins in the museum at Stockholm, and the memory of it was revived in a recent conversation with Mr. Arthur Evans, who told me that his father had just come back from Stockholm, where he had bought from the Trustees of the Museum there a large number of coins. Mr. Evans, who is well-known as an authority in numismatics, especially British and Saxon, had bought a very large number of Saxon coins, which were superfluous duplicates in the Stockholm collection. While Saxon coins do exist in the world in very large numbers, and while Bath has its place among the limited number of cities in which they were struck, it is remarkable that they are all gone from their native place. There is not one to be found in our cases here in the Bath Museum.

I have spoken of the Monastery. We all know that the present Abbey Church represents it. Of the Saxon building we have nothing left, but there are some solid traces of the

Norman edifice which was built by John de Villula upon the site previously occupied by the Saxon building ; considerable remains will be found by those who know where to look for them. Of the Saxon building there are none, but in this book at Cambridge which I have mentioned there is information about the Saxon Church. It is incidentally mentioned that the church is of unusually beautiful architecture—*mira fabrica*—a wonderful fabric, and such it might naturally be. It was built in a place in which stone was in abundance without quarrying. There were all the materials of the Roman city to build a church with, so that at a time when stone churches were extremely rare in our country there was a beautiful stone church at the Abbey of Bath. Of that church we have no part of the architecture remaining, but I think I can point to certain fragments which are connected with its history. There are in the Institution two fragments of two different Saxon crosses ; the cross was an object which the Saxons particularly decorated and ornamented, in fact we are rather beginning in some of our tomb-stone crosses to copy the decoration of the Saxon crosses. There are two pieces of the heads of two different Saxon crosses in the Institution here, and they both have been figured by Mr. Poole in his “ Old Crosses of Somerset.” Then there is among the excavations from the Roman baths a piece of the upper part of the shaft of a Saxon cross, ornamented with a triquetrous interlacing pattern which is quite unmistakable. It belongs to no other period at all unless it may possibly be a specimen of the interlacing work of British crosses. But I believe it is Saxon. There is also the basement of a Saxon pillar, probably one of the pillars of the church which was part of this handsome building I have referred to. These are the chief ecclesiastical remains that I have been able to see in Bath, but at Bitton (Mr. Ellacombe says, I have not myself verified it) there is over the chancel arch—which is Norman—higher up in the wall and surrounding the Norman arch, visible traces of a previous

Saxon chancel arch ; at Limpley Stoke there is a very remarkable Saxon doorway on the south side of the church. It is a sight that visitors to the church may easily miss, as they may visit the church and go away and not see it. If they do not walk all round they will not see it because all the architectural featurings of Limpley Stoke Church, contrary to the usual plan of a church, is on the north side. It is by the door on the north side that the church is entered, and almost all the windows are on the north side, so that the south side appears to be a blank wall. But if you take the trouble to walk round the church, you will see a most perfect bit of Saxon architecture ; an old doorway in its place perfectly complete. There are the jambs of the door and the arch of rude timber, like stone-work, but in perfect condition. Mr. Forss who showed it to us (I was led thither by my friend Mr. Skrine) was himself under the impression that it was a door that was brought from the Manor House close by, indeed in the next field. That this door had an intimate relation with the Manor House, is manifest, in so far as it was through this doorway that the people of the Manor House would pass in and out. In this sense it was the door of the Manor House, but that it had a more material connection with that house is not at all likely. It is not like anything in a private house, and there it is where it should be, directly opposite the north door. It was usual for a church of that period to consist of one long room, one long parallelogram crossed by two doors opposite to each other. Limpley Stoke Church has both these doors in evidence, but the south door is walled up, and the north door is in use. It is worth anyone's while to walk there to see it. But when we speak of church architecture, there is in this neighbourhood an example, such as exists nowhere else ; a unique example of a Saxon Church that has been discovered in our own day, and which was brought out and cleared from the incumbrances of the adjoining buildings mainly by the activity of Mr. Jones, who was then the vicar. He

laboured at it day after day, till it became to him an object of affection ; he worked hard at getting the money to pay for the expense of clearing it, and it has added a very great ornament to this whole district. To persons that have a taste for historical knowledge it is an object that is worth going a very long distance to see. When we compare it with our historical records—the only historical records which we can bring to bear upon it—we are led to think not only that it belongs to the Saxon period—that is quite certain, a look at it for anyone with a practised eye is enough for that—but when we go into the records we find it probable that it belongs not only to the Saxon period, but hundreds of years back in the Saxon period. It is quite probable that it is the very little church—the “Ecclesiola”—stated by William of Malmesbury, to have been built by Bishop Aldhelm at Bradford. Now Bishop Aldhelm died in the year 709 ; and while on the one hand the pushing it back to so high an antiquity seems to render it more difficult to accept, on the other hand there are evidences of very high probability. In the first two centuries of our English Christianity there was a nobility about their architecture it did not afterwards exceed. We do not realise to how great an extent the fortunes and the improvements, and even the minds of the people were crippled in the years of the Danish visitations. The people were impoverished. They were driven back into ruined barbarism, so that to say that a Saxon church was built in the year 700 is not really harder to believe than to say it was built in the year 900, or even so hard. It is certainly harder to strain our convictions to the point of believing that it should have existed so long, but that it was built in 700 is in itself more likely than that it was built in 900 or 950. Now for the chancel arch of that church, there is in the wall above, high up, what I suppose is the most perfect example of sculpture of the Saxon period existing. The Saxons never, at their best, arrived at a perfection of sculpture to be compared to that of the Greeks ; that we understand perfectly well. It is something

that appeals not to our æsthetic feelings and imaginations for its beauty of outline, but something that appeals to us as Englishmen, something which we may look at with the same indulgence and tenderness of feeling as we look at the drawings of our own children, and in that point of view Saxon sculpture is intensely interesting. There is found up in that wall what I think may be taken as a specimen of the palmy period, an example of early Saxon sculpture, because in a later period they had lost something of their artistic ability. By the way, let me pause a moment to illustrate what I mean about the difference in the later period. It is in the early period that we have the best works of art, not in the late period. By the early period I mean the period before the ninth century, a period in which our national existence was imperilled, out of which we were drawn by the heroism of Alfred, and this was the achievement which makes him a great national hero. Well, before that time, art had gained a higher perfection than it ever gained afterwards up to the time of the Conquest. One little example. Of the whole series of Anglo-Saxon coins during that 500 years the most beautiful as works of art are the denarii of King Offa. King Offa died in the year 793, and the most perfect works of art in the Saxon period are his coins. That is an illustration of what I mean. The early period is the period of the best Saxon art, and the later period is a period of recovery from an enormous shock.

The sculpture to which I have referred represents two angels, which we may suppose are in a flying or soaring position, almost horizontal in their figures, and evidently looking towards some object, inasmuch as they are looking, as it were, to one another; but in all probability there was the head of the cross between them, and perhaps the head of the Lord himself, and these angels must have been, as it were, worshipping, waiting, tending or serving the crucified one. That is probably the meaning of the composition of which they are the relics. There is another piece of Saxon sculpture of which, however, I am



not able to say anything as to date (I should rather be disposed to attribute it to a later period) to be seen at Bristol in the Chapter House, dug up when some repairs were being done in the Cathedral there. It is really the slab of a stone coffin, and upon it there is represented the figure of a man, apparently Christ (as far as I can recollect, I have not seen it for a great number of years), delivering a soul, represented by a little figure, out of the mouth of the Dragon. This stone is now in the vestry within the Chapter. You go through the Chapter House to a door at one corner of the room and into the vestry, and there this stone is walled up and presents itself as a picture over the fire-place. Another kind of Saxon remains which exist in this country very numerous are the earthen banks made by the Saxons. Now there are earthen banks which it may be doubted whether they were made by the Saxons or not. The Wansdyke may be a Saxon earth work, or it may not, I cannot pretend to say, but there are certain earth works of which there is no doubt that they are Saxon, and these are the earth works which represent the ground plan of the old Saxon gentleman's house, the Thane's house, the house of the landlord, the man of property. I think that there is probably one of these mounds at Englishcombe. I do not speak of a bit of Wansdyke, which runs through Englishcombe, but I speak of a couple of concentric circles which are to be seen near the village of Englishcombe. I think they are the remains of a fortified house. The first and chief idea of fortification, (perhaps the feature of Saxon times that possesses most durability), was to make an earthen bank.

Around the group of buildings of which a noble residence consisted, was carried a bank and ditch, and at a point in this enceinte a conical mound was raised, of comparatively high elevation, with a flat top, on which was erected the watch-tower which constituted the citadel of the domestic fortress; I am persuaded there are relics of many such still capable of being

traced if they were looked for, in the neighbourhood of ancient churches and manor houses. Before castles were built of stone, the strength of the defence lay in the advantage which the bank gave to the defenders, and in the hindrance it caused to the besiegers when they would set the citadel on fire.

You may see an illustration of this in the Bayeaux tapestry. The best extant figure of a wooden fortress, pitched on a conical and moated mound, is to be seen in that part of the Bayeaux tapestry which represents the assault on Dinan. Now these mounds exist in two forms, that which I have already mentioned of the fortifications of a domestic house, and also in the other form of the fortifications of a city. There is a very large one at Oxford near the station. There is one at Tamworth, and one at Canterbury. I think there is one, too, at Leicester. The most perfect example that I have ever seen of the fortifications of a domestic house is to be seen at a village called Laughton, about eight miles from Sheffield. The field in which it is placed is called, I think, the Castle Field. There is another very good example, only partly preserved, in Northamptonshire at Earl's Barton, close to the churchyard. Mr. Clark, in a work of his published some years ago, gave some ground plans of various places in which he had observed these remains of Saxon houses, and when once they are ascertained and recognised they are exceedingly interesting, as illustrating the life of our forefathers.

Turning now to the churches of the neighbourhood, I have no doubt that Charlecombe was a very old church, as it is reputed to be. Before the Norman church was built there was, no doubt, a Saxon church there, as there was at Swanswick and a great many other villages about here. The churches about Bath are very generally Norman churches, or churches that bear traces of having been Norman churches. Their original form is in some instances much obscured. At Twerton, for instance, the church has been subject to many changes, and the only extant evidence

of its Norman history is a well-preserved doorway which originally stood on the south side, but which in the extension of the area of the church has been unavoidably removed to the north side.

John de Villula, in building the Norman Abbey, drew a large number of Norman masons here, who were ready to be employed in similar works in the neighbourhood. Of all these Norman Churches which were then built, I have always looked upon Englishcombe Church as being the most perfect specimen, indeed I always fancy that Englishcombe Church was intended to be a kind of miniature picture of the Norman Abbey. However, to return to Charlecombe, there is something at Charlecombe Church I should like to know a little more about. The yew tree in the churchyard there is said to be older than the church. Now that is a very interesting saying, for if we could really verify it as a genuine tradition in any one place that the yew tree is older than the church, this would be a matter of historical value. I am strongly of opinion that the yew trees did not go to the churches, but that the churches came to the yew trees. The yew trees did not arrive upon the spot first, they went there in attendance upon the cross. The first thing that was erected, speaking generally, in our country, was the cross. I do not say the cross instead of the church, the cross was the church, and our word church, whatever people may tell you about its being derived from *κυριακόν* is simply an anglicism of the Latin word *crucem*.

When I say that in our own country at the first the cross was the church, I mean that the people assembled around the cross, they received the sacraments at the cross, and they were baptized at the cross. But the question is what the yew trees had to do with it? When we travel through our country and see the yew trees in our churchyards, we cannot divest ourselves of the idea that there is some very considerable reason, hitherto inadequately explained, why there are yew trees so constantly in the churchyards, being sometimes hundreds of years old, for the

yew trees in our churchyards are among the highest antiquities in the vegetable world. Some people have said that yew trees are poisonous to cattle, and they were planted in churchyards in order that farmers might not turn their cattle into them. Well, that does not satisfy me, and I do not suppose that it satisfies many members of the Club. Another reason was that the branches of the yew trees made good bows, and that at the time when our artillery consisted chiefly of bows and arrows, it was a matter of public interest that yew trees should be cultivated, and so they were planted in the churchyards. I think the national interest would hardly have been dependent upon such a provision as that. Yet another way of explaining it is that the yew tree succeeded to the cypresses of the classical period as symbols of mourning.

All this seems to me to be exceedingly fanciful, and does not bite into the marrow of the case, but one hint I got from Bishop Hobhouse, and I was very glad, when as I was preparing these remarks and turning over old memoranda, to come upon the very date when Bishop Hobhouse communicated the idea to me. His idea was that they were planted for the shelter and protection of the worshippers around the cross when as yet they had no roof over their heads. I felt at once that this touched the truth, and ever since that time I have continually looked and searched for evidence with the purpose of ascertaining whether the yew trees were in the churchyards before the churches were built. From the localities in which they are generally found, namely, on the south side of the chancel, and the east or west side of the south door, it would seem that they were about and around the spot upon which the cross stood.

The cross usually stood upon the south side of the line now occupied by the church and most generally somewhere about the middle of that line, and the fact that these trees are found on one side or the other of that spot shows that there was probably a ring of yew trees round the cross, the best possible protection

that could be devised for people too poor to build a church, and worshipping in the open air. And let me add one word more. Not only was this word Church made in this island ; but it reflects in a remarkable manner the condition and circumstances of our people in the first age of our national Christianity. Before this time there never had been in Christendom but one word of general acceptance to express the idea which that word expresses. We, the English nation, made a second. To the old word "Ecclesia" we added an equivalent, a new word, Church. And we not only used this word ourselves, but we propagated it. We carried it across seas to our kindred who were still heathen, and we converted them and brought them into the Church. And this is the true explanation why the German and the Scandinavian nations use the same word as we do, and speak not of the Ecclesia but of the Church.

We stand in Christendom on a pinnacle in this respect, that when Christianity seemed to have grown old, to be worn out, when no extension had taken place for generations in the area of Christendom, then it was that our people embraced Christianity, and embraced it with such ardour and passion as caused them to become in the second generation missionaries, to convert the people in the old Mother Country, and to found Churches calling them naturally by the new name which reflected the circumstances of their own conversion, and the manner of their earliest Christian ceremonial.

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*Letters Illustrating the Battles of Claverton and Lansdown.* By  
H. D. SKRINE, M.A.

(Read January 11th, 1887.)

Some years ago I read a Paper to this Club giving an account of the Skirmish at Claverton during the Civil War. My main object was to elicit information on the subject, as the only historical records which I had then the opportunity of consulting

were the brief notice of the engagement in Clarendon's History of the Rebellion, the entry in the Claverton Register, the account in Collinson, and last, but in my opinion most important—that given in the Rushworth Historical Collections—I had not seen Mr. Emmanuel Green's description of the Battle of Lansdown in which this skirmish was noticed. In the course of last summer I was able to consult some MSS. in the Bodleian Library, part of the Clarendon Papers (documents sent to Lord Clarendon as materials to enable him to write his history). These were two letters, one by Lord Hopton, then Sir Ralph Hopton, the other by Colonel Slingsby, both of whom held commands in the Royal army. These letters give a very clear, graphic and consistent account of what took place; and a knowledge of the ground and acquaintance with the roads, both ancient and modern, as given in maps in my possession, lead me to conclude that we have in these documents the true history of what actually did take place. In many important particulars both my own and Mr. Green's account require correction. My information had led me to suppose that Waller was in position on the Warleigh side of the river from which he had attacked Claverton Manor House, then in the possession of the Royalists, and that, being repulsed, Waller retired along the Warleigh valley to Batheaston and Bath. Mr. Green was of opinion that Waller occupied both sides of the river and that the Royalists had been first encountered at Monkton Combe and that the defeated Parliamentarians withdrew through Batheaston to Bath and Lansdown Hill. He also thought that there had been a previous skirmish at Claverton when three Parliamentary and one Royalist soldier were slain and buried in Claverton churchyard. There is certainly a discrepancy in the dates here, but I cannot believe there was more than one battle at this period in this valley of the Avon. The date of the burial of these soldiers is stated in the Register to be the 30th June, 1643, whereas the battle described in the following letters was fought, according to the Mercurius Aulicus, on the 3rd of July

that year. The true explanation of the discrepancy of the dates probably is, that the letters were written and the entry in the Register made, some time after the event. Humphrey Chambers, the Rector of Claverton, was a member of the Assembly of Divines and was probably in London at the time, and as there is evidence to show that the bodies were buried without coffins\* it may be conjectured that the funeral may have been hasty and "without benefit of clergy." It appears by these letters that Waller, having heard that the Royal army coming from the west had reached Bradford, had taken post with all his forces on Claverton Down; and having thrown a bridge across the Avon at Warleigh ferry, and built a redoubt to protect the bridge and the ford there, had sent a force of horse and foot and artillery across the river to occupy *Monkton Farleigh Down*—so as to be prepared to meet the enemy on whichever side of the river he might select to march. As a matter of fact, the Marquis of Hertford and Prince Maurice, who commanded the Royalists, marched by the road on the right bank of the river, which was identical as far as Farley Wick with the present high road from Bradford to Bath. Near the point of junction of this road with that leading to Warleigh lane, and about half a mile from Farleigh Down on the way to Bradford at the foot of a hill, was a small wood which was grubbed about 30 years ago. In this wood Major Davet,† who commanded the Parliamentary force on Farleigh Down, placed some of his infantry

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\* Collinson states that these soldiers were buried under the west wall of the church. There is at present no room west of the church to bury, but previous to the building the new north aisle there was a space for burial, and in digging a deep grave there early in the century some bones were found which apparently had been buried without coffins, and these were removed to the other side of the church, where tradition now is that these victims of civil war were finally interred.

† Rushworth's account.





ground in the ffoote of the Hill, and so in the morning he advanced strong Partyes of Horse; vpon their out guards of Horse, which being then strong and well comāded by Major Lower, he held them vp till the whole Army drew forth, which then in good order both Horse and ffoote advanced towards the Enimy.

The Cornish ffoote in an hower or two beate the Enimy out of their Ambuscade, and then both ffoote and Horse advanced vpon their maine-body on the topp of Munckton-farley hill, where they durst not to stande them and so they had the chace of them as farr as Bathe-Easton. In which chace and not before they discovered Sr Wm. Waller with his maine Body on the other side of the water on the topp of Claverton-downe with his Bridge and his worke before mentioned. Herevpon Prince Maurice turn'd the maine of the force of ffoote to gaine that pass which he did just as it was night, and so Sr Wm. Waller in the darke retreated into Bathe. By this time many of the Horse in pursuite of that part of the Enimy that fledd the other way had passed into the ffields vnder Lansdowne close by Bathe, where about 12 at night it was considered by the officers there present, whereof the principle were the E. of Carnarvon, Lo-Mohun and Sr Ralph Hopton and Sr Nicholas Slañing, whither they should that night drawe to the topp of Lansdowne or not, and it was considered that they were there but a part of the Army, and that the rest of the Army being surprized by the night, after that dayes chace might not be in very good posture to receive concurrent orders; So they resolu'd to drawe back that night within Bath-Easton-bridge, and to advise with the Generall to quarter the Army in the best order they could, with a resolution to drawe out the next morning verie early to try if they could prevente the Enimy of that high ground of advantage, which the next morning early they endeavoured with a little more heate then was altogether expedient, for moveing verie early with all their Horse, ffoote, Cañon and Baggage towards

Lansdowne, by that time they came to the foote of the hill, the Enimy, by the advantage of his neernes to it, was possest of the ground, and themselves with the whole Army, especially the Carriages which were most troublesome, engaged in a ffield just vnder them, out of which there were verie inconvenient wayes to retreat, to advance noe possibility, and to stay there least of all, for the Enimye's Cañon played into them, and they had noe meanes to requite them. So about one in the afternoone the chiefe Co mānders resolved of a retreat towards Marsfield, and co mitted the order of it to Sr Ralph Hopton, who drawing vp the Army in the best order he could to face the Enimy, first sent of the Cañon and Carriages with convenient guards by the 2 narrow lanes that went from thence towards Marsfield, and presently after sent 1000 Muskettiers to line the hedges vpon the entrance of both those wayes, then he sent off the Army in parts, remayninge onely to hold vp the Enimy with a strong forlorne hope of Horse with which at last he marched off without any loss and drew a strong party of the Enimye's Horse within the Ambuscade of Muskettiers, which haveing tasted they quickly retired. And so the Army came that night safe to Marsfield sending out their Parties of Horse everie way to secure their Quarters.

The next morning earlie Sr Wm. Waller drew out his whole Army over Lansdowne to that ende which lookes towards Marsfield and there vpon the verie point of the hill over the high way suddenly raysed breast workes with faggots and earth, and sent downe strong partyes of Horse into the field towards Marsfield, where they lighted vpon a party of Horse and beate them in. This roused the Army at Marsfield and so about 8 that morning being the 13th of July, 1643, all drew forth, and within verie short time a light skirmish was engaged with dragoones in the hedges on eache side; But the chiefe Co mānders of the King's Army considering that the continuing of that kinde of fight would be to little effect, but might onely waste

theire Amunition (whereof they had not plenty) drew off and retreated in Batalio towards theire Quarter to Marsfield, which the other Army perceiving tooke the courage to sende downe great partyes of arm'd Horse and Dragoones to charge them both in reare and flancke. Those that came vpon the reare vsed most dilligence and haveing left theire dragoones in the ende of the Lane towards the field charged verie gallantly, and rowted two Bodyes of theire Horse, whereof the last was, by Prince Maurice his comānd to Sr Ralph Hopton winged with Cornish-muskettiers, who poore men (though the Horse were rowted betweene them) kept theire ground and preserv'd themselves till the E. of Carvarvons Regiment of Horse was drawn vp to them. In the meane time Sr. Nicholas Slanning was comāded with two or three hundred Muskettiers to fall vpon the reserue of dragoones behinde them, which he performed verie gallantly and beate them off; And at the same time the Earle of Carvarvon with his Regiment and the forementioned Muskettiers charged the Enimyes Horse and totally rowted them. Presently after this appeared two great Bodyes of the Enimyes Horse advancing towards theire flanck, which indured a good charge of two bodyes of the Kings Horse and some volleys of Muskettiers before they brake, but at last were rowted and chased. And then the whole Army in the best order they could in that broad way that leads to Lansdowne advanced towards the Enemy sending out as they wente strong partyes of Muskettiers on eache hand to seconde one another to endeavour vnder the Couvert of the inclosed grounds to gaine the flanck of the Enemy on the topp of the Hill, which they at last did, But the Pikes and the Horse with the rest of the Muskettiers that advanced vp the broad way as the space would beare had much to doe by reason of the disadvantage of the grounde, the Enimye's ffoote and Batteryes being vnder couvert of theire breast-workes, and theire Horse ready to charge vpon the verie browe of the Hill, where the Kings forces were five times

charg'd and beaten back with disorder. There was Sr Bevil Grenvile slayne in the head of his Pikes, and Major Lower in the head of a Partye of Horse, and Sr Nicholas Slanings Horse kild vnder him with a greate shott, and the whole body of Horse soe discomforted that of 2000 there did not stand aboue 600. Yett at last they recovered the hill, and the Enimye drew back about demi-culverin-shott, within a stone wall, but there stood in reasonable good order, and eache part played vpon the other with their Ordnance, but neither advanced being both soundly batter'd. So the night came on, and all things grew quiett, where Prince Maurice and Sr Ralph Hopton remayning in the heads of the Troopes all that night, aboute one of the clocke heard an advancing of Horse and ffoote, but without drum or trumpet and they presently received a smart vollye from the Enimye's Muskettiers, which was answered with the like, but being verie darke noe more was done and all things grew quiett againe. So after an howers silence the chiefe Coṁanders before mentioned rightly iudgeing that this might be the Enimye's parting blowe, gave a coṁon souldier a rewarde to creepe softly towards the place where the Enimye stode to bring certaine notice whether they were retreated or no, who found them gone. By this time it was towards breake of daye, and in the morning the Coṁanders founde themselves possess of the field and of the dead, and of 3 or 400 of the Enimye's Armes, and 9 or 10 barrells of their powder, And so about 9 in the morning they retired with the Army to Marsfield, where they rested the next day, principally by reason of Sr Ralph Hopton, he having bin in the begining of the battell shott through the Arme and in the ende of it blown vp with Gun-powder, and so was verie vnfit to be removed the next daye."

*By Col. Slingsby. Events of the West, "After Stratton field to taking of Bristol." Clarendon MSS., 1738. (3).*

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Then does the kings Army mooue first and marches to Bradford\* within fower miles of Bathe : the next morning our skoutts brought vs word that the Enemy was drawne into the field horse and ffoote in the midle way betwixt our quarters ; wee draw out presently and marche towards the place, and finds them but a party and fixed vpon a ground of greate aduantage, yett from thence (though with a very hott dispute) they were remou'd with the losse of two small pieces, and neare 100 men. Wee possessing this ground discouer'd the body of the Enemy drawne vp in batalia on the other side the Riuer and about two miles of ; thus had the shifting Rebell deluded vs one day with a party, hoping to make vs weary with dancing about him, or else to fight where hee pleas'd : vpon this wee were once resolu'd to marche directly vp to Lansdowne hill, but afterwardes (considering the night approaching, the narrow and craggy passage vp the hill, with the aduantage theire horse might take vpon our Reare, who would bee more bold and troublesome hauing a good Towne for a retreat soe neare them) wee lay all night in the bottome close by the ffoote of the hill.

The next morning when day appear'd our Enemy did the like vpon the hill, who as with iudgement obseru'd our motion and discern'd our intention soe with greate industry and care

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\* Mercurius Aulicus . . . the seven and twentieth weeke p. 356. It was advertised this day, that Prince Maurice hearing of a Partee which Waller had sent out to obtaine a Passe over Bradford-bridge, not farre from Bath, sent out an answerable strenght tto deprive them of it. Who did their work so valiantly like men of courage that they did not onley gain that Passe for the Princes use, but killed neare an hundred of the Rebels, and drave the residue into Bath.

labour'd all night both to preuent vs, and to serue himselfe of such an advantage: and indeede that Generall of the Rebels was the best shifter and chooser of ground when hee was not Master of the field that I euer saw; wch are greate abilityes in a Souldier.

Vpon this south side of Lansdowne hee shewes vs his whole body; that day wee spent in looking vpon one another; the Enemy veiw'd our whole Army as it stood rang'd in the valley whose number could not then bee disguis'd, soe that it appear'd too big to invite him downe to fight: towards night wee marchd of the feild towards Marsfeild, vpon our remouall a lusty party of the Enemys horse falls on our Reare, who att first bred a litle trouble, but were att last repulsed with losse and shame:

That night wee lay att Marsfeild and next day fought Lansdowne batle the Rebels being then drawne vp vpon the North side of the hill."

*After the Rebels are drawn out on North side of the Hill. Col. Slingsby's relation of the battle of Lansdown, July 5th, and that of Roundway, July 13th. Clarendon MSS., 1738. (2).*

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The night before the battaile att Launslowne the kings Army quarter'd att Marsfeild; in the morning betimes Waller sent a strong party of horse towards our head quarter, who beate in all our horse guards, and alarum'd all our quarters: wee instantly drew into the feild and marched two miles towards Launslowne where wee could see the Rebels Army drawne vp vpon the top of the hill, he stood vpon a piece of ground almost inaccessible. In the brow of the hill hee had raised brestworkes in w<sup>ch</sup> his Cannon and greate store of small shott was placed; on either flank hee was strenghtned with a thicke wood w<sup>ch</sup> stood vpon the declining of the hill, in w<sup>ch</sup> hee had putt store of muskeiteires; on his reare hee had a faire plaine where stood rang'd

his reserves of horse and ffootte; some bodyes of horse with musketeires hee bestow'd vpon some other places of the hill, where hee thought there was any accesse; thus fortyfied stood the foxe gazing at vs when our whole Army was rang'd in order of battle vpon the large Corne feild neare Tughill. In this posture wee continued about two houres; nothing passing but loose skirmishes vpon Tughill, betwixt a party of our vantgard and a party of horse and dragoones of the enemys sent downe the hill for that purpose. The kings Army found that the Rebells would not bee drawne to fight but vpon extreame aduantages; and therefore faced about and marched towardes our quarter in order as wee had stood w<sup>ch</sup> the ground would admit of, being a continuing plaine large feild all the way to Marsfeild; when wee had marched neare a mile the whole strength of Wallers horse and dragoones descends the hill, and falls vpon our Reare; wee faced about againe and aduanced vpon them endeatoring to regaine our ground where wee were before rangd: w<sup>ch</sup> wee gott with muche difcultye and hazard, our horse receiving some dangerous foiles; soe that had not our ffootte bin excellent wee had certainly suffer'd there: the rebells horse not enduring our charges of horse and volleys of small shott that fell vpon them from our approaching bodyes of ffootte, they retir'd themselues out of that feild; but left all their dragoons vpon the walls and hedges vpon the farre end of feild the neare Tughill from whence our ffoote beate them suddenly. The enemys horse being now forest into the laine that leades ouer Tughill to Lansdowne, were obseru'd to be in some disorder by reason of the narrow and ill passage. Prince Maurice therefore takes all our horse and wings them on both sides the laine within the hedges with small shott, and soe smartly fell vpon them, that some run in greate disorder; but it seemes they had (like prouident souldiers) placed their best horse in the Reare who being compeld, turnes about and fights desperately, and their giues our horse another foile with the death of Major Lower, Major James and many others: but

our horse being still assisted by the ffootte, att last beate them downe Tughill, where in the bottome they were cruelly gall'd by our ffootte that then drew vp thicke vpon Tughill.

Now did our ffootte beleine noe men their equals, and were soe apt to vndertake anything, that the hill vpon wch the Rebels stood well fortyfied litle without muskett shott (from whence they raked vs with their Cannon) could not deterre them; for they desir'd to fall on and cry'd lett vs fetch those Cannon. Order was presently given to attempt the hill with horse and ffootte: greate partys of Muskeiteires was sent out of either of our wings to fall into those woodes w<sup>ch</sup> flanked the Enemye, and in w<sup>ch</sup> they had lodg'd stoare of small shott for their defence, the horse were to passe vpp the high way, but were att first repulsed; Sr Beuill Grenville then stood on the head of his Regiment vpon Tughill, who aduanced presently putting all his shott vpon his left hand within a wall, and cary'd with him horse on his right hand the ground being best there for horse, and hee himselfe lead vp his pikes in the middle: hee gain'd with muche gallantry the brow of the hill receiving all their small shott and Cannon from their brest worke, and three charges of horse, two of wch hee stood; but in the third fell with him many of his men: yett had his appearing vpon the ground soe disorder'd the Enemy, his owne muskeiteires firing fast vpon their horse, that they could not stay vpon the ground longer; the Rebels ffootte tooke example by their horse and quitt their brestworks retyring behind a long stone wall that runs acrosse the downe; our ffootte leps into their brestworks; our horse draws vp vpon their ground: our two wings that were sent to fall into the two woodes had done their businesse and were vpon the hill assoone as the rest.

The Enemy (obseruing our ffront to enlarge it selfe vpon the hill, and our Cannon appearing there likewise) began to suspect himself, and drew his whole strength behind that wall, wch hee lined well with muskeiteires, and in seuerall places broke down



breaches very broade that his horse might charge if there were occasion, w<sup>ch</sup> breaches were guarded by his Cannon and bodyes of Pikes.

Thus stood the two Armys taking breath looking vpon each other, our Cannon on both sides playing without ceasing till it was darke, Leges and Armes flying apace the two Armys being within muskett shott: After it was darke there was great silence on both sides, att wch time our right wing of shott gott mucbe nearer there army lodging themselues amongst the many litle pitts betwixt the wall and the wood from whence wee gald them cruelly.

About 11 of ye clock wee receiu'd a very greate volley of small shott but not mixt with Cannon by which some of vs iudg'd that hee was retreating, and gaue this att his expiring; but the generall apprehension through our Army was that the Enemy had intention to trye a pushe in the night for there ground, wch they had soe dishonorably lost; for wee were then seated like a heauy stone vpon the very brow of the hill, wch with one lustye charge might well haue bin rowl'd to the bottome.

It was not long before wee knew certainly that they were gone. att there departure they left all there light matches upon the wall and whole bodyes of Pikes standing upright in order within the wall as if men had held them: wee were glad they were gone for if they had not I know who had within an hower; but indeede had our horse bin as good as the Enemys the rebels had never gone of the feild unruin'd. We kept the ffeild till it was day light and then plundered it, and sent severall partys of horse seueral waies, att whose retourne we were inform'd that the Enemy was in Bathe: at eight of the clocke we marched of towards Marsfeild.\* Upon Tughill one of our ammunicon waggons tooke fyer, blew up many men and hurt many; especially

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\* End of Bath, Lansdown.

my Lord Hopton, Major Sheldane dyed the next day and was much lamented: this disaster encourag'd the Rebels and discourag'd vs. Our horse were bad before but now worse, our foote drooped for their Lord whom they lou'd, and that they had not powder left to defend him, for as I remember we had then but nine barrells left: that night wee quarter'd att Marsfeild being Thursday, the same night the enemy drawes out of Bathe up to Lansdowne againe; the next morning being friday we marched to Chippenham, the same night the Enemy steps into our quarters att Marsfeild, and now the Country seeing him following vs begins to disert vs; soe that wee could gett neither meale nor intelligence, two necessary things for an Army: wee lay att Chipenham two nights, but were on Sunday earely ffrighted from thence by the Enemys neare approche; wee marched to the Deuizes.

*Further Notes on the Claverton Skirmish.* By H. D. SKRINE, M.A.

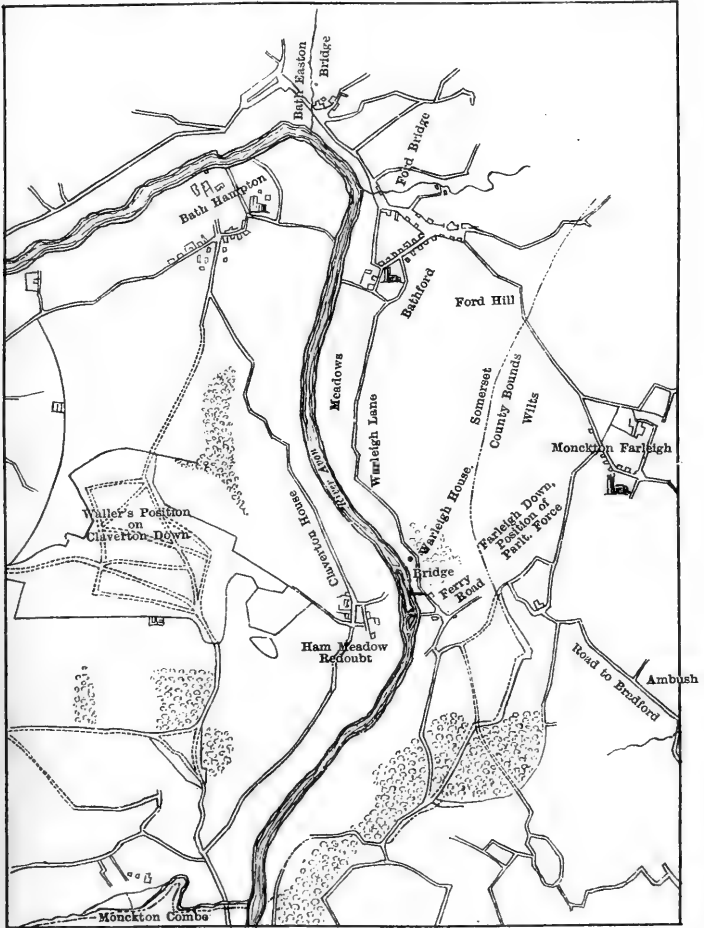
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An old map shows very distinctly the road I suppose the Royal Army to have taken, and you will see that at the date of that map the road joined the present ford road below the Dry Arch. The maps do not show how far Monkton Farleigh Down extended towards Bradford, but I think it can hardly have been farther than the ford road. That road would be the line of communication between Davet and Waller, and down it must have been the pursuit of the defeated Parliamentarians; though some may have scattered over the precipitous and craggy common towards Bathford and Bath.

I do not think the line of march I have pointed out can be disputed; but it may be well to note that strategical reasons would be very strongly in favour of its being chosen by the Marquis of Hertford and Prince Maurice. It was the most direct, the shortest, and in every respect, from the open country it traversed, the most suited to the march of an army; and there

MAP ILLUSTRATING BATTLES OF MONCKTON FARLEIGH  
AND CLAVERTON.

REDUCED FROM THORPE'S MAP OF BATH AND ENVIRONS, 1742.



SCALE— $\frac{1}{2}$  in. to the Mile.



was but one little piece of "walled wood ground" where an ambush could have been laid. Near the spot just named, still is to be seen by the side of the high road a deep hollow ditch at one side, evidently the old road which must have been rather like a Devonshire lane. The other road through Turley, Winsley and Conkwell would have presented more physical obstacles and have also been farther; and besides, the armies would have been in sight of each other long before they reached Warleigh Woods, or the line of Monkton Farleigh Down. That they should have marched on the left bank of the river may be dismissed for still stronger reasons. It would have been the wrong side for their purpose of keeping between Waller under fire; and at Westwood, Freshford, Limpley Stoke and Monkton Combe were defiles which might have been defended easily, as the road most of the way follows the valley of the Avon with steep hills on both sides. The circumstances mentioned in the letters, that "in the *chase and not before* the Royalists perceived Waller's army drawn up on Claverton Down" exactly tallies with the site of the battle as described by Lord Hopton; as until the position at Monkton Farleigh was won, the rise of the ground would prevent the Royalists from seeing the Claverton Down.

Rushworth giving the authorized Parliamentary account of this battle says "that the Royal Army having come within two miles of Fourd Hill, Waller sent *Major Davet* to secure the pass at Fourd Bridge." Fourd Hill means Bathford Hill. Fourd Bridge existed at that time, but the real pass was at Warleigh where was a bridge at the time, and this could be best secured by occupying the southern end of Fourd Hill—*i.e.*, Monkton Farleigh Down and Warleigh Hill. Warleigh would have been naturally named as the locality, but was probably not known to writers, though Ford or Bathford was well known, and Warleigh is only a part of the Manor of Ford. In making the attack on Claverton Redoubt, cannon no doubt would have been employed to support the attack, and this accounts for the cannon balls found at Claverton.

*Note on the Ham Hill Stone.* By HORACE B. WOODWARD, F.G.S.,\*  
of the Geological Survey of England and Wales.

(Read February 9th, 1887.)

The celebrated building-stone of Ham Hill, near Yeovil, offers but little attraction to the collector of fossils, for he may hammer away in the quarries all day long, without obtaining any palæontological reward; but the stone is not without geological interest, for it differs considerably from the ordinary beds of the Inferior Oolite, and its precise position in that series has been a subject of some discussion.

The ordinary beds of the Inferior Oolite comprise an upper division of marly, oolitic, and iron-shot limestones; and a lower division of sands (known as the Midford Sands) with impersistent bands and large concretionary masses of calcareous sandstone. The Ham Hill stone is mainly composed of sand and comminuted shells. In considering its relation to other divisions of the series, we must, of course, remember that however persistent the ordinary or characteristic features of a formation may be in our country, such features after all are but local portions of the original formation; and with regard to marine deposits, were the full record of each period preserved and open to our inspection, it would no doubt exhibit as much diversity as do the sea-bottoms at the present day.

In the case of the Ham Hill stone, we picture a shoal of shifting sands and broken shells, such as may be found in many areas of the English Channel or the German Ocean; and we are thankful, while searching for fossils, to recognise even the fragment of a *Pecten* or an *Oyster*. After contemplating the rock and endeavouring to picture the conditions under which it was

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\* Communicated by permission of the Director General of the Geological Survey

formed, it is but natural to inquire into its precise position in the Inferior Oolite series, and to ascertain what others have said upon the subject. Unfortunately a study of the literature is likely at first to create a feeling of perplexity, for those who have written about the Inferior Oolite of the Yeovil district, have not agreed in the correlation of its members with those in other parts of the West of England; nevertheless, by the aid of personal observation, we may extract the truth from the several Geological papers, and ultimately restore comfort to our minds.

Mr. Charles Moore (to whose papers we naturally turn for information on the Lias and Oolites of Somersetshire) has given the best account of the strata at Ham Hill; but he did not enter into the question of their exact equivalents, as his object was simply to show the intimate connection between the so-called Midford Sands and the limestones of the Inferior Oolite, in opposition to the view of Dr. Wright that the sands should be grouped with the Upper Lias.\* On the Geological Survey Map the Ham Hill stone is coloured the same as the Inferior Oolite Limestone, but Mr. Bristow, who originally surveyed the area, has expressed the opinion that the stone is the equivalent of the upper part of the Midford, or Inferior Oolite Sands, which contain thin and interrupted beds of limestone.† This is the true view of the case, and Prof. Buckman claimed to have been the first to point it out.‡ Thus layers of stone like Ham Hill stone appear in the Sands in the railway cuttings near Yeovil Junction, and in some of the deep road-cuttings or "hollow-ways" of Babylon Hill. Lately Mr. W. H. Hudleston has drawn particular attention to one of these layers opened up in a pit at Stoford, west of Yeovil Junction. This shelly-layer yielded *Trigonia angulata*, *Tancredia*, *Ammonites (Harpoceras) Moorei*,

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\* Moore, Proc. Somerset Arch. Soc., vol. xiii.

† Damon's Geology of Weymouth, &c., 1884, p. 219.

‡ Proc. Somerset Arch. Soc., vol. xx., p. 162.

and *A. radians*.\* These shelly limestones may be traced in places to the south and south-west of Yeovil, and there is a large quarry in stone similar to that of Ham Hill, at North Perrot, east of Crewkerne.

Although the Ham Hill stone is, as a rule, devoid of recognizable fossils, I have obtained several specimens of *Rhynchonella cynocephala* in the beds exposed on the eastern side of the outlier, in a quarry about half-a-mile south-west of Montacute Church and this discovery has since been confirmed by the Rev. H. H. Winwood. This fossil corroborates the stratigraphical evidence that the Ham Hill stone belongs to the upper part of the Midford or Inferior Oolite Sands. † While Professor Buckman recognized the true position of the Ham Hill stone in reference to the Inferior Oolite series of the neighbourhood, he was not justified in grouping the upper part of the Sands at Yeovil with the lower part of the Inferior Oolite limestone of the Cotteswold Hills. His son, Mr. S. S. Buckman, has pointed out that although the limestones of Dorset are comparatively thin, yet palæontologically they represent the whole of the Inferior Oolite limestones of Cheltenham, and yield the same succession of Ammonite-zones; a succession confirmed by the more recent observations of Mr. Hudleston. Hence the Sands below the Inferior Oolite limestone in Dorsetshire, Somersetshire and Gloucestershire are approximately the same, and the term Midford Sands (given to them by John Phillips) is applicable to all these areas.

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\* Proc. Geol. Assoc., vol. ix., p. 190.

† As mentioned in my Notes on Brent Knoll, a variety of *Rhynchonella cynocephala* occurs at a higher horizon in the Cotteswold Hills.



*Further Results of Meteorological Observations made at the Bath Royal Literary and Scientific Institution. By the Rev. LEONARD BLOMEFIELD, M.A., F.L.S., F.G.S., &c., President.*

(*Read February, 18th, 1887.*)

In a former paper read to this Club in November, 1875, and published in our "Proceedings,"\* I stated the Results of Meteorological Observations made at the Bath Royal Literary and Scientific Institution, during ten years commencing with March, 1865, and ending with February, 1875. I stated under what circumstances these observations had been taken in hand, as also what had been done previously, or written by others, in reference to the subject of the Bath climate. This was followed by a description of the structure erected in the Institution Gardens for the reception of the instruments employed, the nature and character of the instruments themselves and the way in which they were fixed. As the instruments remain unaltered in character and position, it is unnecessary to repeat here what was then said on this part of the subject.

Neither is it necessary to say anything further respecting the situation of Bath and its surrounding hills, or as to any other of its features; nor to speak of other places, some in the immediate neighbourhood, others in the far distance, east and west, of which as compared with Bath in the matter of climate, I gave some account in my first paper.

My main object at present is to annex the results of ten years further observations of the Thermometer and Rain-gauge to those of the decades preceding. This will cover a period of twenty years, commencing with January, 1866, and ending with Dec., 1885. I also give the results of eleven years' observations of the Barometer. Very little was said about this instrument in my first paper, from the circumstance of there being no barometer

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\* Vol. III., p 205,

in the possession of the Institution at that time with which any trustworthy observations could be made. At the same time I stated that a much better instrument had recently been acquired, "a Fortin's Barometer made by Casella," with which observations were commenced on the 1st of January, 1875; and I now proceed, in the first instance, to give the results of eleven years' observations, 1875-85, both years inclusive.

It will be seen, on inspecting the accompanying tables, that the mean height of the Barometer at the Bath Literary Institution on an average of eleven years is 29.976 inches. This differs scarcely more than three hundredths of an inch from the result of ten years' measurement at the same Institution with the *old* instrument, spoken of in my former paper,\* and set at 29.944 inches. It also differs but very little (only .012 inches) from the mean height of the Barometer at Exeter, determined by Dr. Shapter,† on an average of twelve years, to be 29.988 inches. The observations I made formerly at Swaffham Bulbeck, in Cambridgeshire, continued for nineteen years, gave a mean of 29.885 inches. Other observations made at the Cambridge Observatory for ten years gave a result of 29.906 inches.‡ Combining these results we shall not be much in error, if we consider the mean height of the Barometer in the southern half of England as about 29.950 inches.

In table 2 are given the greatest and lowest heights of the Barometer in each month of each year from 1875 to 1885. All these observations, like those in the first table, have been corrected for temperature and height above the sea. On inspection they will be found to possess several features of interest.

The highest of all the Barometric observations registered is 30.978 inches, which occurred on January 18th, 1882. The

\* See the Club's "Proceedings," vol. iii., p. 211.

† Climate of South Devon, p. 24.

‡ Observations in Meteorology, p. 139.

TABLE I.—Showing the Mean Monthly and Yearly Heights of Barometer, 1875-1885.

(Corrected to temperature 32° and Sea level.)

YEARS.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	Yearly Means
1875	29·946	30·084	30·189	30·094	30·037	29·934	29·987	30·072	30·058	29·770	30·028	30·129	30·027
1876	30·305	29·843	29·616	29·881	30·181	30·015	30·101	29·957	29·915	29·930	29·882	29·481	29·926
1877	29·827	29·983	29·800	29·775	29·899	30·020	29·953	29·887	30·096	30·067	29·715	30·106	29·927
1878	30·219	30·301	30·056	29·839	29·792	29·954	30·076	29·767	30·030	29·808	29·826	29·779	29·954
1879	30·049	29·557	30·020	29·710	30·023	29·800	29·822	29·846	29·999	30·191	30·276	30·348	29·971
1880	30·410	29·813	30·130	29·895	30·155	29·951	29·912	30·031	30·012	29·930	29·998	29·969	30·017
1881	29·952	29·861	29·936	29·966	30·133	30·007	30·037	29·871	30·015	30·033	29·948	30·027	29·982
1882	30·367	30·255	30·061	29·790	30·058	29·937	29·884	29·958	29·902	29·850	29·777	29·694	29·962
1883	29·938	30·072	29·924	30·040	30·000	29·991	29·891	30·073	29·830	30·015	29·850	30·236	29·995
1884	30·070	29·908	29·955	29·852	30·030	30·076	29·971	30·037	30·039	30·132	30·206	29·912	30·015
1885	29·911	29·697	30·117	29·825	29·828	30·072	30·209	30·010	29·918	29·758	29·916	30·275	29·961
Monthly Means	30·091	29·943	29·982	29·879	30·012	29·978	29·985	29·955	29·983	29·953	29·947	29·996	29·976



TABLE II.—Greatest and Lowest Heights of Barometer in each Month of each Year 1875-1889.

MAXIMA.

YEARS,	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.	OCT.	NOV.	DEC.
1875	30·654	30·565	30 639	30·604	30·449	30 267	30·377	30·377	30·331	30·488	30·273	30·519

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TABLE II.—Greatest and Lowest Heights of Barometer in each Month of each Year 1875-1885.

## MAXIMA.

YEARS.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.	OCT.	NOV.	DEC.
1875	<b>30.654</b>	30.565	30.629	30.604	30.449	30.267	30.377	30.377	30.321	30.488	30.273	30.519
1876	<b>30.694</b>	30.328	30.142	30.539	30.485	30.259	30.436	30.350	30.407	30.343	30.345	30.320
1877	30.638	30.336	30.411	30.270	30.461	30.511	30.356	30.201	30.416	<b>30.741</b>	30.461	30.689
1878	<b>30.713</b>	30.600	30.681	30.230	30.179	30.205	30.388	30.310	30.287	30.394	30.470	30.370
1879	30.426	30.166	30.587	30.268	30.537	30.167	30.184	30.110	30.491	30.570	30.663	<b>30.787</b>
1880	<b>30.729</b>	30.510	30.491	30.459	30.512	30.265	30.224	30.329	30.630	30.448	30.443	30.672
1881	30.638	30.308	30.604	30.285	<b>30.685</b>	30.294	30.341	30.354	30.415	30.563	30.440	30.656
1882	<b>30.978</b>	30.782	30.676	30.372	30.506	30.303	30.449	30.372	30.430	30.534	30.185	30.172
1883	30.618	<b>30.884</b>	30.723	30.669	30.405	30.365	30.225	30.329	30.284	30.564	30.330	30.636
1884	30.664	30.521	30.248	30.132	30.444	30.337	30.215	30.254	30.395	<b>30.716</b>	30.550	30.323
1885	30.451	30.191	30.626	30.231	30.178	30.404	30.427	30.354	30.344	30.215	30.384	<b>30.654</b>

## MINIMA.

YEARS.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1875	29.224	29.316	29.604	29.247	29.540	29.436	29.541	29.776	29.752	29.193	<b>28.940</b>	29.637
1876	29.659	29.183	28.709	28.862	29.695	29.761	29.974	29.204	29.366	29.235	29.243	<b>28.337</b>
1877	28.849	29.410	28.864	29.115	29.235	29.262	29.284	29.399	29.610	29.243	<b>28.744</b>	29.327
1878	29.550	<b>28.805</b>	29.307	29.238	29.310	29.498	29.745	29.428	29.522	29.189	29.441	29.311
1879	29.475	<b>28.841</b>	29.505	28.865	29.570	29.508	29.444	29.512	29.527	29.459	29.639	29.599
1880	30.016	<b>28.767</b>	29.396	29.300	29.743	29.582	29.511	29.246	29.232	28.888	29.156	29.305
1881	28.877	29.048	29.257	29.815	29.614	29.537	29.468	29.461	29.428	29.199	<b>28.585</b>	29.044
1882	29.332	29.053	29.023	<b>28.850</b>	29.414	29.500	29.359	29.394	29.301	29.016	29.329	29.163
1883	29.086	<b>28.840</b>	29.312	29.238	29.555	29.768	29.562	29.664	29.298	29.371	29.011	29.683
1884	<b>28.615</b>	29.391	29.262	29.466	29.449	29.606	29.645	29.723	29.593	29.371	29.779	29.177
1885	<b>28.959</b>	29.078	29.396	29.236	29.348	29.577	29.884	29.637	29.551	29.041	29.273	29.564

lowest is 28·337 inches on December 4th, 1876. The range consequently during the whole eleven years is 2·641, or rather more than two inches and six-tenths. The above extremes have been exceeded in other places on former occasions. Dr. Shapter's extreme maximum at Exeter is 30·98, or very nearly 31 inches, observed in January, 1825; his extreme minimum 28·13, observed in December, 1821.

I doubt whether the former, the extreme maximum at Exeter, has ever been exceeded; but with regard to the extreme minimum, there are a few unquestionable cases on record, in which the Barometer has fallen considerably below 28 inches. Howard mentions a reading of 27·83 inches at Tottenham, on December, 25th, 1821,\* a day on which there was a very remarkable depression of the Barometer over a great part of the kingdom, noticed at Greenwich and Cambridge and several other places.† Perhaps the greatest falls on record were two of more recent occurrence, in one of which the Barometer, at Barrow-in-Furness, on December 8th, 1886, fell to 27·410 inches; in the other at Ochtertyre, Perthshire, on January 26th, 1884, when it fell to 27·333 inches.‡

Belville remarks that the great depression of the Barometer in December, 1821, above mentioned, occurred after "a heavy rain of some hours' duration, with the wind S.E." He speaks also of a great depression (28·21 inches) that occurred "at the close of the great frost of 1814, which in like manner was preceded by a stormy wind from S.E. and much rain."

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\* "Climate of London," vol. iii., p. 69.

† Belville's Manual of the Barometer, pp. 19, 20.

‡ See "Nature," vol. xxxv., p. 157; where it is added as remarkable—"that these two low Barometers, hitherto the lowest observed by man any where on the land surfaces of the globe after being reduced to sea-level, should have occurred in the British Islands, and within three years of each other."

Judging from my own experience, derived from observations during a long term of years, I should say that sudden thaws, after frosts of some continuance—and yet more after frosts of long continuance—are the occasions *generally* on which occur the greatest depressions of the Barometer; and, what is more, that the greatest elevations also, as well as lowest, mostly occur in winter. This makes it of interest to notice how far this is the case in the table of maxima and minima during the eleven years 1875—1885. It will be seen on inspection that the *maxima* occurred five times in January, twice in December, twice in October, once in February and once in May. The *minima* occurred four times in February, three times in November, twice in January, once in December and once in April. Perhaps this will appear plainer when set out as under, allotting the three usual months to each season:—

	SPRING.	SUMMER.	AUTUMN	WINTER.
Maximum...	1	0	2	8
Minimum ...	1	0	3	7
	2	0	5	15

Thus, not only are the greatest elevations and depressions clearly in excess in winter; but with the two exceptions of one high elevation in May and one depression in April, there are no extremes one way or the other to be found between the months of February and October.

The *mean* height of the Barometer for each season on an average of eleven years, which it may be useful to record, is as follows:—

Spring	...	...	...	29.958
Summer	...	...	...	29.973
Autumn	...	...	...	29.961
Winter	...	...	...	30.010



## TEMPERATURE.

From the subject of Barometrical observations I pass on to consider that of Thermometrical observations. I went so fully into the subject of temperature, considered generally, in my former paper on the Bath Climate, that it is hardly necessary to do more here than to combine the results of ten years' further observations with those of the first decade. The period, therefore, now to be considered is one of 20 years, commencing with 1866 and ending with 1885 ; and there is the less occasion, also, for going much into detail from the results varying but little in the two cases. I shall confine myself chiefly to a statement of results as regards the mean temperature of the whole term of years and the temperature of the seasons.

The mean temperature of the first nine years will be found in my former paper. The mean temperatures of each of the eleven last years is as follows :—

YEARS.	MEAN TEMP.	YEARS.	MEAN TEMP.
1875 ... ..	50·5	1881 ... ..	49·5
1876 ... ..	51·5	1882 ... ..	50·9
1877 ... ..	50·8	1883 ... ..	50·4
1878 ... ..	50·7	1884 ... ..	51·7
1879 ... ..	47·5	1885 ... ..	50·2
1880 ... ..	50·2	Mean ... ..	50·4

The mean temperature of the whole series of twenty years is exactly the same as that of the first ten, which in my former paper is set at 50°·5. The variation also between the two decades, taken separately, does not amount to one-tenth of a degree ; so we may fairly consider the mean temperature of Bath, at least in the lower part of the town, to have been determined with tolerable correctness.

The year of highest mean temperature in the whole series is 1868, when the mean rose to 52°. The year of lowest mean

temperature is 1879, when the mean fell to  $47^{\circ}\cdot5$ , three degrees below the average, and following the severest winter in the series—that of 1878-79.

Fourteen out of the twenty years had a mean temperature of  $50^{\circ}$  or upwards; the remaining six had a mean below  $50^{\circ}$ .

With regard to the seasons, next to be considered, the following table shows the mean temperature of each season, as deduced from twenty years' observations, together with the highest and lowest means observed in each season—also the range:—

SEASONS.	MEAN.	HIGHEST.	LOWEST.	RANGE.
Spring ...	48·4	51·2	45·8	5·4
Summer ...	60·3	63·5	58·1	5·4
Autumn ...	50·7	52·3	48·5	3·8
Winter ...	41·4	46·3	36·4	9·9

The warmest spring, and the hottest summer, in the series occurred both in the same year, 1868, which year had also the highest mean temperature of all the years. Of the summer of this year (1868) I gave a detailed account to the Field Club shortly afterwards,\* and I need say nothing further about it here. No such hot summer has occurred since in Bath. The nearest approach to it was the summer of 1876; but the spring preceding that summer was nearly  $4^{\circ}$  lower than the spring of 1868.

Looking to the summers generally it appears that the mean temperature of that season was above  $60^{\circ}$  in sixteen out of the twenty years, the four exceptions being 1879, and the three consecutive summers of 1881, 1882 and 1883. In 1879 the mean temperature of the summer was scarcely above  $58^{\circ}$ ; it was a notoriously wet and cold year throughout, of which also I gave a full account to the Field Club in a paper published in their Proceedings.†

\* Proceedings of Bath Field Club, vol. i., No. 3, p. 43.

† Id. vol. iv., No. 3, p. 209.

With respect to the *range* of mean temperature in the several seasons, it is worth noticing that while the ranges of Spring and Summer are identically the same, the Autumn range, or difference between the highest and lowest mean temperatures, amounts to nearly  $4^{\circ}$ ,—while in the winter season this difference is greatly augmented, being nearly double that of any of the others. Whether this is the case in other places I know not, but it shows the great uncertainty of character that attaches to the Winter season in Bath, and the matter seems to call for closer investigation. For which purpose I annex a Table showing the mean Winter temperature of each of the twenty years to which this paper relates—

WINTER.	MEAN TEMP.	WINTER.	MEAN TEMP.
1866-7	42·7	1876-7	46·1
1867-8	40·8	1877-8	42·8
1868-9	46·3	1878-9	36·4
1869-70	38·9	1879-80	37·5
1870-1	38·0	1880-1	39·0
1871-2	42·6	1881-2	43·0
1872-3	41·1	1882-3	43·6
1873-4	42·1	1883-4	44·8
1874-5	39·0	1884-5	43·4
1875-6	41·2	1885-6	38·1

Analysing the results of the above Table, it will be found that the coldest winter in the whole series of years was that of 1878-9, when the mean temperature fell to  $36^{\circ}4$ ; the next coldest being the winter following, that of 1879-80, scarcely more than one degree higher than its predecessor, being  $37^{\circ}5$ . The two coldest winters, therefore, in the whole series were two *consecutive* winters.

The mildest winter in the series was that of 1868-9, following the very hot summer of 1868, the mean temperature of that winter being as high as  $46^{\circ}3$ , or ten degrees higher than that of

the coldest spoken of above. The next mildest winter in the series was that of 1876-7, its mean temperature being  $46^{\circ}\cdot 1$ , or scarcely less than that of 1868-9.

It may be further remarked—and this perhaps is the result of chiefest importance,—that thirteen out of the twenty winters had a mean temperature above  $40^{\circ}$ , while there were but seven in which the mean temperature did not rise to  $40^{\circ}$ , the former being to the latter in a ratio of nearly two to one, so that, perhaps, we should not be very wide of the truth in coming to the conclusion that, though Bath winters are more variable than the other seasons, they are as a *rule* mild.

I might add that the great range of the mean temperature of the winter season in Bath, exceeding that of any of the other seasons, is in keeping with the circumstance spoken of above, when treating of the Barometer, viz., that the greatest elevations, as well as the lowest depressions, of that instrument for the most part occur in winter; for from this it follows that the *range* of th *Barometer* is, as a rule, also greater in winter than in the other seasons. I now pass to the subject of

#### RAINFALL.

In the annexed table are given the results of rainfall measurements during the last ten years. Combining these with the measurements of the preceding decade, 1866—1875, given for the most part\* in Table I. in my former paper on the climate of Bath, the results of the whole twenty years may be summed up as follows :—

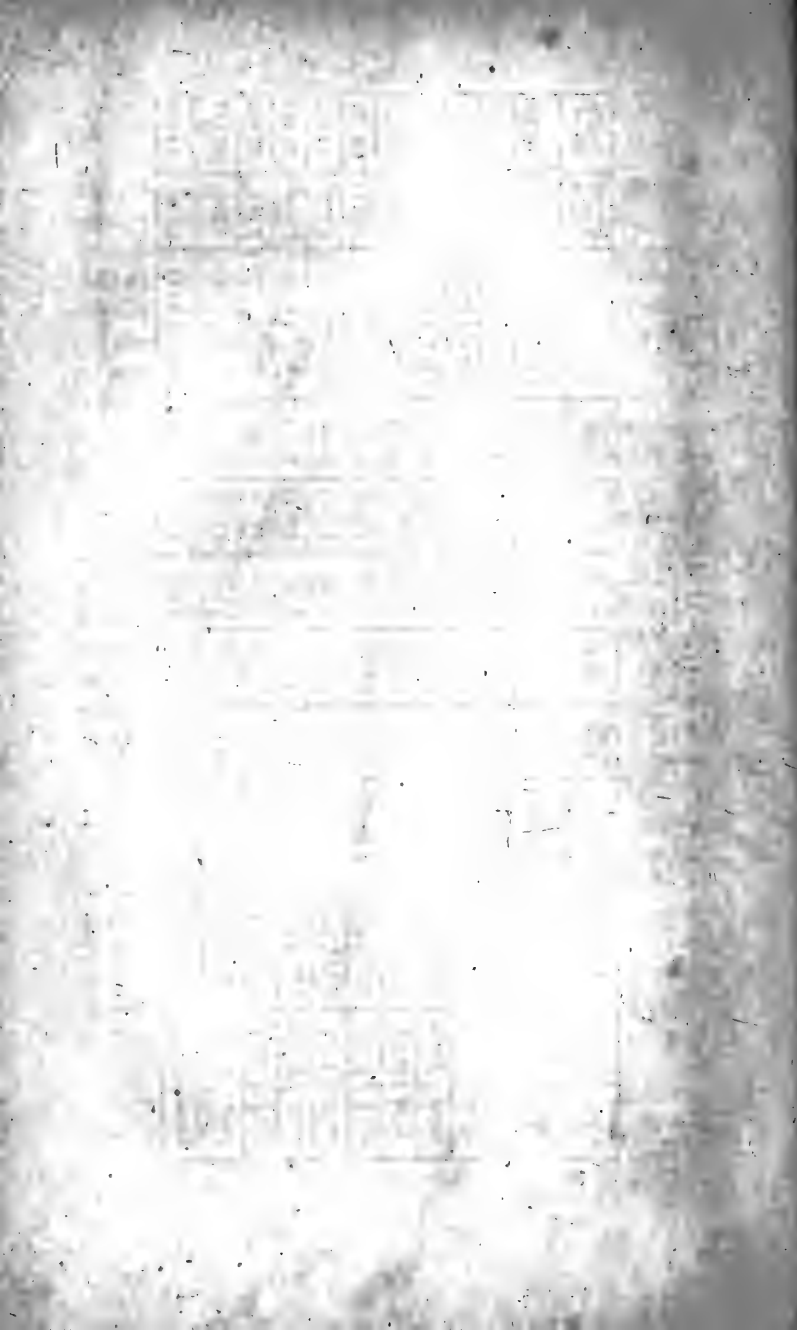
The mean Rainfall (mean of 20 years) is 32·064 inches. I

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\* The above reservation has reference to the circumstance of the first and last years in that Table being incomplete years. The results now to appear are those derived from the measurements of 20 complete years 1866—1885.

*Rainfall in each Month in each Year of the decade commencing with 1876,  
and terminating with 1885.*

YEARS.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	Yearly Sums.
1876	1·915	3·467	4·352	3·200	0·378	0·493	1·018	3·902	4·802	1·292	3·794	6·350	34·953
1877	4·415	1·585	2·486	2·812	3·077	0·987	3·531	3·792	3·165	1·954	6·109	1·658	35·571
1878	1·656	1·516	1·575	2·213	7·060	4·150	1·539	5·775	1·893	5·424	3·155	1·839	37·795
1879	3·678	4·069	0·830	2·858	2·809	6·668	3·693	5·222	3·018	1·114	0·447	1·218	35·624
1880	0·511	3·420	1·954	1·530	0·726	1·632	3·499	0·821	4·553	4·564	2·777	3·819	29·806
1881	2·008	4·060	1·815	0·527	1·881	2·785	2·236	4·223	1·695	1·993	4·011	3·871	31·105
1882	1·671	2·124	2·005	4·376	1·752	4·727	5·917	4·057	2·556	4·800	4·434	3·872	42·294
1883	3·262	3·670	0·889	0·811	1·037	3·744	3·355	1·261	4·210	2·962	3·168	0·786	29·155
1884	3·702	1·375	2·424	0·910	1·370	3·816	3·695	1·883	1·851	0·856	1·520	3·215	26·617
1885	2·745	3·605	1·055	2·440	3·167	1·020	0·210	3·040	4·740	4·534	5·028	1·235	32·819
Means	2·556	2·889	1·938	2·167	2·325	3·002	2·869	3·397	3·248	2·948	3·444	2·786	33·573



spoke in my first paper of the necessity for rain measurements being continued for a long term of years "in order to determine the true average fall at any particular place," and this necessity is clearly shown in the present instance. The average Rainfall in the Institution Gardens, as determined by ten years measurement, is set in my former paper at 29·986, or allowing for errors at 30 inches. Now—at the end of 20 years, it is found to be 32·064inc., or more than two inches in excess of the ten years measurement.

But this is not the only striking circumstance in the comparison of the two decades. It may further be observed that the excess of rainfall is almost entirely confined to the latter decade, so that in a general way the first decade may be called a dry one, and the latter a wet one. In the first decade there are only three very wet years, or in which the rainfall amounted to more than 30 inches. In the second there were *seven* such years, the fall in 1882 being more than 42 inches. This last year was the wettest of the whole twenty; and not only that, but in no other year did the rainfall attain even to 40 inches.

Other wet years were 1866, 1872, and the five consecutive years 1875—1879, in all which years the rainfall was between 34·953 inches and 37·795 inches.

Thus, in consequence of most of the wet years occurring in the second decade, the two decades are very unequal in respect of rainfall; the mean yearly fall in the first decade (1866—75) being 30·504 inches, that of the second (1876—85) being 33·573; the difference between the two being 3·069 inches.

The *driest year* in the whole series was 1870, when the rainfall did not exceed *21 inches*. The only other very dry year was 1873, when the rainfall as measured, was 24·890 *inches*.

Passing on to the consideration of the seasons. The following table represents the mean, maximum and minimum rainfall in each of the four seasons as the result of twenty years' measurement :—

	MEAN.	MAXIMUM.	MINIMUM.
Spring ...	6 056	10 848	2 737
Summer ...	7 633	15 583	2 592
Autumn ...	10 008	14 302	4 227
Winter ...	8 785	13 388	4 830

It appears from this that, as a rule, Autumn is the wettest season, and Spring the driest season in Bath. In the Rainfall Table, deduced from the first decade, as given in my former paper, the *Winter* season is shown to be the wettest; but there is not very much difference between the autumn and winter falls in either table, and either season might prove to be the wettest in any particular year.

Taking the seasons separately in reference to their extreme character of wet and dry, it may be worth recording that the greatest spring rainfall (10 848 inches) occurred in 1878, the least spring rainfall (2 737 inches) in 1883.

The wettest summer (rainfall, 15 583 inches) occurred in 1879; the summer of 1882 (rainfall, 14 701 inches) being nearly as wet; the driest summer in the series (rainfall, 2 592 inches) occurred in 1870.

The greatest autumn rainfall (14 302 inches) occurred in 1885; the least autumn rainfall (4 227 inches) occurred in 1884. Hence the driest autumn in twenty years was succeeded by the wettest.

The wettest winter in the series was 1869, rainfall amounting to 13 388 inches. The driest winter was that of 1878, rainfall being 4 830 inches. It is worth noting that 1878 was one of the *five consecutive wet years* spoken of above; but the heavy falls were in the spring, summer and autumn months, especially in the month of May.

In reference to wet and dry months, it may be observed,



Autumn as a rule being the wettest season, that there is not much difference between the rainfall of September and that of October ; and this confirms a remark I made in my former paper, that "on an average, one of the two months of September and October is, comparatively speaking, a wet one, and the other a dry one. But which is to be wet and which dry is an even chance looking merely to results."

The highest mean monthly fall in the results of twenty years is that of January ; and it will be seen again on referring to my former paper, that this same month presented the highest mean fall in the first decade. January, therefore, may well stand as on an average, the wettest month in the year in Bath ; though September and October (or one of those months in any single year) may make a near approach to it.

The absolutely wettest month during the whole twenty years was May, 1878, when the fall amounted to 7·060 inches ; a remarkable circumstance, May and April being the two months, in which the *mean* rainfall (nearly the same in each case) is lower than in any other months of the year. In only five instances besides the above did it amount to so much as six inches.

The absolutely driest month in the whole series was July, 1885, when the fall was 0·210 inches. There was no month absolutely without rain.

This leaves little more to be said on the present occasion. I have nothing further to state with respect to the temperature, rainfall and humidity, of Bath compared with other places, beyond what I stated in my former paper. Nor need I add anything to what was therein said respecting the general conditions of the Bath climate. I believe the results given in that paper are as a whole correct. Of course the longer the term of years for which the observations are continued, the more trustworthy they become ; while there are anomalous states of weather, in one or other of its aspects, sure to recur from time to time during long periods, which it is of interest to record ;

while also they not unfrequently serve to correct former views as to the causes that combine to bring about the very variable states of weather characteristic of the English climate.

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*Summary of Proceedings for the year 1886-87.*

MR. PRESIDENT AND GENTLEMEN,—

The thirty-first anniversary of the Club was held at the Royal Literary and Scientific Institution, on Thursday, 18th February, when after the usual routine business had been transacted, the subject of the preservation of the recently uncovered Roman remains was brought to the notice of the members by the Committee. The injury caused by their exposure to the vicissitudes of the weather having been insisted on, a memorial to that effect was adopted for presentation to the Mayor and Corporation suggesting that some protection should be given to the whole, either by enclosure beneath a suitable roof or covering, or at least that the recently discovered "Altar" stone and other more delicate and easily moveable portions of sculpture should be placed without delay in the Museum, or elsewhere as may be deemed advisable. This Memorial having been signed on behalf of the Committee by the President, Vice-President and officers of the Club was duly sent to the proper authorities, and courteously acknowledged by the Architect of the works on behalf of the Baths Committee, with thanks for the suggestion, which should receive every consideration. With regard to the sculpture he stated, that the stones lately uncovered had been partially protected, but that as to the temporary roof over the whole, advocated by himself, the Committee considered it unnecessary, unless the Corporation were willing to erect one of a permanent character, which could not be undertaken before the removal of the Poor Law Offices.

Seventeen members having been brought together by a *three-lined Whip*, the dinner, which had fallen through the year before, was held at the Grand Pump Room Hotel in the evening, the vice-president, the Rev. Preb. Scarth, in the chair.

After the usual loyal toasts, Mr. SKRINE, who was called upon to give the health of the president the Rev. L. Blomefield, said it was a duty as well as a pleasure to propose such a toast to them. From the very commencement of the Club's life, now some thirty years ago, until the present time, it might well be said of him *tu es Patronus, tu es Parens*. Ever ready to lead the way and encourage the research of any interesting object of natural history in our neighbourhood, he had earned our respect and regard by the vigorous exercise of his intellect. If not able, through physical weakness, to be with the Club in their excursions and walks, yet his mind showed no lack of its former strength, witness his recent admirable paper on the \**Bournemouth Firs*," and the numerous contributions to our "Proceedings." Let, then, his unceasing energy excite us never to rest on our oars, but to work on and do our very best to distribute valuable information on the subjects which concern the Club, and with which we may be familiar. Without putting himself forward, but showing that modesty which becomes a great mind, it may be truly said of him, *nihil tetigit quod non ornavit*. Before sitting down he must also give the health of the Vice-President, so well known for his antiquarian lore, and so ready at all times to come forward and support and promote the objects of the Club. He was glad to see him among them that evening so vigorous and well. For nearly 30 years he had been connected with the Club, may he be so for 30 years more!

Mr. SCARTH, in returning thanks, spoke of the advantage of such clubs, and said that this one had taken up a portion of work much needed in the neighbourhood.

After some more appropriate remarks, the health of the Treasurer and Secretary was proposed, and Mr. Scarth made some remarks on the recently discovered "Altar" stone, and stated that his interpretation of the figures differed somewhat from that of Mr. Sayce (*vide* Vol. vi., No. 1, p. 81).

The Rev. J. B. Medley, the Rector of Orchardleigh, being the only one able to be present of those gentlemen from whom the Club had received hospitality and assistance during their excursions, facetiously returned thanks for his health in the character of the country mouse visiting the town mouse.

#### AFTERNOON MEETINGS.

The attendance at these meetings has been encouraging, the small room at the Institution on some occasions being so inconveniently crowded as to induce the Club to migrate on one afternoon to Christ Church Hall; an experiment not entirely satisfactory owing to its size and imperfect acoustic properties when only partly filled.

The afternoon of Wednesday, March 10th, was given up to Geology and Botany; the first paper was from Mr. HORACE B. WOODWARD, of the Geological Survey, on the "Geology of Brent Knoll" (*vide* p. 125). Owing to the absence of sections, the structure of that remarkable hill, rising some 400ft. from the alluvial flats of the Burnham level, has always been somewhat doubtful, especially as regards its lower portion. Hitherto the sequence of the beds has been, Inferior Oolite on the top, Midford Sands next, then Upper Lias, followed by Middle Lias and Lower Lias at the base. From recent discoveries made by Mr. Woodward in 1885, he has now found out from fossil evidence that the Lower Lias has no existence at the base of the hill; but that the basal portion consists of Middle Lias Clays. His paper then went on to show the bearing of this thickness of the Lias upon the coal question to the south of the Mendips, and concluded

with a description of the agencies at work in the formation of such outlying conical hills as Glastonbury Tor, and the one in question. Mr. Woodward was unfortunately prevented from being present himself, but was enabled, by the kind permission of the Director General of the Geological Survey, to forward the paper for the Club.

Mr. McMURTRIE said these notes were an important addition to our knowledge of local geology, and the Survey deserved great credit for so readily acknowledging an error they had formerly made in mapping this knoll—a readiness which had not been conspicuous on former occasions when the work of amateur geologists did not exactly accord with their views. As regards the prospects of coal, of course this discovery of the thickness of the Liassic beds at this point did not affect the question as to the existence of coal south of the Mendips, but merely as to the depth at which it might be won. Bearing in mind too that the Lias thinned out near the Polden Hills, and that the New Red Sandstone came in there, the depth might not after all be so great. Moreover, a sinking for coal would be made nearer the Mendips. Mr. Skrine (who was in the chair) proposed a vote of thanks to Mr. Woodward for having given the Club the benefit of his notes.

Canon ELLACOMBE then read a short paper on "Place Names derived from Plants (in the neighbourhood of Bath)," stating that the process of naming places by our early ancestors was a very simple one, for like all uncivilised people they chose out their settlements in the places best fitted for their requirements, where the necessaries of life, water, wood and shelter could be most easily procured; and naming their places from some distinctive natural feature, those of trees and plants would readily present themselves for the purpose of place-names. It was then his endeavour to show that trees and plants enter largely into place-names, and that the latter also tell us something about plants. Taking forest trees first, how many places derive

their name from the British oak, ash, elm, beech, birch, alder, box, &c. ? He knew of no places near Bath, however, derived from flowers or fruit ; but from more humble plants, *e.g.*, the nettle, several instances were given. Claverton, near Bath, was supposed by a high authority to have derived its name from the water lily, and was originally written Clât-ford-tun, or the town at the ford of the *clote* or lily. This derivation, though extremely pretty, he thought was incorrect, for *clote* he considered to be the water-bur, ditch-bur, or reed-bur, and not the water lily. This view as regards Claverton was not acceptable to Mr. Skrine, who contended earnestly for the more flowery and poetical derivation, and had not failed to fortify himself with the following letter from Professor Earle, who maintained the correctness of his former view of the connection of Claverton and water lily by reference to some learned authorities :—

“The argument for the Water Lily claims no higher a rank than probability, and it is of the nature of such arguments to be in some degree matter of opinion. My opinion is strong in favour of the connection of Claverton with the Water Lily.

Our early authorities are Glossaries of Latin and English, ranging from the 8th to the 12th century. In these we find the word *clate* representing various Latin names of plants, Blitum, Tubera, Blitum vel Lappa, Amorfolia, Philantropium, Cliton, all, so far as we can gather (for the identity of these plants is obscure), large leaved plants. The name of all these which we have most confidence in recognising is Lappa, which is our Burdock, and the fruit of which is still called clotbur, where I have no doubt *clot* is the old *clate*. But the Glossaries contain another entry besides all the above, *viz.*, *Oxylapation* “*aneo cyunes clate,*” *i.e.*, one sort of *clote*; thus informing us that *clate* was used very freely for a large diversity of plants, and that all the above Latin names are not a variety of names for the same or nearly the same plant, but rather for so many different plants.

The name of *clate* being then used with so much latitude, we may claim it for the Water Lily without denying it to the Burdock. And as one part of the evidence in favour of the Burdock consists in the

modern name of its fruit, so the fact, stated by Barnes, that the Water Lilies of the Stour are called *clotes*, must be held good evidence for an ancient connection between *clate* and Water Lily. For as on the one hand we cannot regard our Glossaries as a complete record of the case of *clate*, so on the other we must remember that the old English of the Saxon period is now best represented by the dialect of Dorset. The Saxon form of Claverton is Clat-ford-tūn, and there is a Clatford in Hants near Andover, where the *clat* is preserved in its early form. Does not the association in these instances of *clate* with water speak in favour of a water plant with big leaves? And does not the natural fact which you mention of the habitat of Water Lilies in the Avon at Claverton lend added force to this presumption?

I think these are the chief points of the argument; but you know in twilight men interpret objects diversely, and if Ellacombe likes his idea better, he has a right to prefer it. One thing, however, I think is quite out of court, and that is the Clover."

Notwithstanding this letter, Mr. Ellacombe, in reply, said that his opinion had not been in the least shaken, and he thought that the absence of the water lily from old writers, and the fact that it was unknown in England till within the last 100 years, were strong arguments in his favour.

The Rev. S. SHAW exhibited a plaster cast of an inscription found on the N.E. buttress of his tower during the recent alterations at Twerton. The tower's date was about the 13th or 14th century, and the inscription was probably not earlier than the 15th. The inscription was a complete puzzle to antiquaries and he sought a solution from those present.

On Wednesday, Dec. 8th, there was a large attendance of members and their friends on the occasion of the President opening the winter session with an obituary notice of their late distinguished mycologist. Regretting that age and its attendant infirmities had prevented him from taking that chair for a long time past, he said that he was extremely anxious to come before them that afternoon in consequence of the great

loss their Society had sustained by the death of Mr. Christopher Edmund Broome. He desired to speak of him as an acquaintance who had been his friend for a large number of years, and more particularly to speak of him in reference to his connection with that club. Mr. Broome was the oldest friend he had, relatives excepted, and he supposed he had known him for nearer 60 than 50 years, their acquaintance taking its origin from the circumstance of his going, when he was a quite a young man, to be pupil to a clergyman who was curate of the parish adjoining his own parish in Cambridgeshire. Then he went to Cambridge University and graduated in 1836, but after leaving the University they only fell in with each other at intervals. After a time he took up his residence at Elmhurst, Batheaston, where he was living when he (the speaker) first came to Bath, in 1850, and where he resided until his death. Mr. Broome was one of the original members of the Bath Field Club, of whom none remained now except the vice-president and the speaker. But Mr. Broome was more than an original member, and he would not be far from the truth in saying that he was the joint founder with himself. It was true he originated the idea, but if it had not been for Mr. Broome it would never have received its ultimate shape. Mr. Blomefield then described the origin of the Field Club, and spoke of Mr. Broome's great activity in research, and all matters connected with natural history, and especially botany; also of his rare and valuable collections. He described his great energy and capacity for work, and attributed his death to incessant labour and over fatigue of both mind and body. The death of their much esteemed member read a lesson for all of them, a sharp lesson, but a most important one—to work to the full extent of their energies, but not to the injury of their health. Few members of their Club, he imagined, needed to be cautioned not to work too hard, and he felt there were not a few to whom the first half of this advice would be given with difficulty. They could ill spare one so active at home and



abroad, as their late member—would anyone come forward and take his place? He asked them to take for their motto, that which was the guiding star of the whole life of their departed member—"Work while it is day." The President then read extracts from the will of the deceased, which he had received from the hon. secretary of the Royal Literary and Scientific Institution, bequeathing to that Institution all his books (on the fly page of which he had written his initials, "C.E.B."), consisting of works on a number of sciences, which were enumerated, and his herbarium; and also stating that if the bequest of his fungi made to the British Museum was not accepted, it should be given to the Institution. This, however, had been accepted.

The Rev. Prebendary SCARTH also expressed his sincere sorrow at the loss they had sustained, and thanked the President for the excellent memoir which he had placed before them. He further spoke of his personal friendship with Mr. Broome.

The PRESIDENT then called upon the Rev. Prebendary EARLE to read a paper on the "Traces of the Saxon period in Bath and the neighbourhood." Before doing so, the Prebendary also said a few words with reference to the remarks of the President upon the late Mr. Broome, and added that he was sure he would be expressing the sentiments of many when he said that Mr. Blomefield's memoir of his friend had touched a very deep chord in their feelings. He then passed on to his subject (*vide* p. 153).

The third meeting was held at the Institution, on Wednesday, January 12th, 1887, when, in the absence of Mr. Skrine, the Secretary read certain "Letters illustrating the Battles of Claverton and Lansdown," one written by Lord Hopton (then Sir Ralph), the other by Col. Slingsby, both Royalists (*vide* p. 167). In the discussion which followed, Mr. GREEN said he had always felt sorry that Mr. Skrine had made a former contribution on this subject, as printed in 1878, without having read, or without

having noted, the account of the Battle of Lansdown as printed in 1875. He had, however, perhaps better not remark further on this. The letter now read to them was not new, as he had used it very much, practically embodied it, in his Lansdown paper, and duly gave the reference to it, where it could be found. Perhaps, again, a notice of this and a comparison should have now been made. The whole of these MSS. had just then been arranged, and he thought he was the first who had referred to them. It seemed that Mr. Skrine, from his minute knowledge of the roads about Claverton, had detected that the Royalists could not have been at Monkton Combe as stated; and looking up this reference had found the place therein written Monkton Farleigh. The relation of this march from Frome was epitomised, being introductory, not as giving full particulars, but merely to bring both forces to Lansdown. The object in view was the Battle on Lansdown. Writing at the time full of Somerset, the more familiar name of Monkton Combe had been substituted and passed unnoticed; it was evidently wrong, as it placed both forces on that side of the river. But it was a slip, a clerical error, not an error affecting any statement or fact. The paragraph now as it stood, was meaningless and obscure; *Farleigh* not *Combe* was clearly intended, as by substituting *Farleigh* for *Combe* all became clear and the account read on correctly. The narrative of the Lansdown fight was taken from his full manuscript of the Civil War as relating to the whole county, and probably a reference to this would show the name written *Farleigh*\*. The Royalists passing round by Bradford bridge were met at Monkton Farleigh by Waller's advanced guard which he had passed over the "ford" below Claverton, his main body being drawn up on Claverton Down. Beaten back and losing the

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\* The Secretary has since been informed by Mr. Green that on referring again to his original MS. of the Lansdown fight he finds therein—"Monkton *Farleigh* and not Monkton *Coombe*."

ford, he then retreated his whole force down the hill and through Bath to Lansdown. The Royalists keeping the opposite side of the river passed on as related, and rested that night within Batheaston bridge. He was glad to have the oversight corrected, although no great harm had been done.

The fourth afternoon meeting was held at the Institution on Wednesday, Feb. 9th, when the "Note on the Ham Hill Stone," contributed by Mr. Horace B. Woodward, of the Geological Survey, was read by the Secretary. The object of the communication was to define the position of that celebrated building stone in the Inferior Oolite series, the conclusion being that the Ham Hill stone belongs to the upper part of the Midford or Inferior Oolite sands. Mr. MCMURTRIE, in the discussion which followed, stated that he was not prepared to come to any definite conclusion as to the exact position of the stone in the Inferior Oolite series, as his attention had not been especially directed to those beds. Hitherto the information respecting them afforded by the Geological Survey was very meagre, and he congratulated the Club on hearing this contribution to the subject from one so well qualified to deal with it as was Mr. Woodward, who had worked so much in our neighbourhood. He reminded the members what a different aspect these beds put on in different parts of the country, comparing their facies on the north of the Mendips with that on the south, where they were more largely developed and so different in appearance—instancing their thin representatives in the neighbourhood of Frome and Mells, resting upon the Carboniferous Limestones; and their thickness at Doultling and Ham Hill, both of which places were so celebrated for their building stone. The CHAIRMAN, in giving the thanks of the members to the author of the paper, stated that everyone must be interested in this stone, who had seen how much it had been used in our churches for decorative and other purposes, and how durable it was. As to his own church he stated that there was a tradition that the

stone for the tower came from a quarry near Langridge and not far from Battlefields.

The SECRETARY having been asked for his view respecting Mr. Woodward's "Note," stated that he was not prepared in any way to criticise it. The brachiopod—*Rhynchonella cynocephala*—which the writer said he had found in a small section on the right hand side of the road, on the last rise before coming to the main quarries, had subsequently been found there by himself on two occasions, one being during the excursion of the Club to Ham Hill last year; and unless the identification of strata by their fossil contents was an exploded theory, the discovery of this peculiar shell (of which specimens were shown) certainly fixed these beds as coming in somewhere at the base of the Inferior Oolite series. Alluding to the chairman's remark about the locality whence the Oolite for the Tower of Bitton Church came from, he asked for some definite information as to the quarries whence the Bath Abbey was hewn; Mr. Chas. Moore had informed him that the now disused quarry (called Shepherd's) on the right of the Entry Hill road supplied the material. Some sections on the black board illustrated the position of the Ham Hill Stone as compared with the Inferior Oolite beds at Leckhampton Hill; and a block of the hard nodular bed at the base of the workable "Gray beds" at Ham Hill, resting immediately upon the Yellow "Brim Sands" was exhibited. The Secretary reminding the members that a very large block of this stone had just been brought to the surface when they visited the quarries in September last; Mr. Trask, the owner, who was then present, stating that it was rather an uncommon thing to see this bed exposed, and promising to send a specimen to the Bath Museum. This he has since kindly done.

## EXCURSIONS.

*Sherborne Abbey and Park, May 4th.* The Club was most fortunate in having so fine a day for the first excursion of the season to Sherborne. Tuesday was simply a perfect May day, and as the members, comfortably "located" in a saloon carriage, ascended the slope of the Mendips and found themselves on the watershed at Maesbury, looking over the Somerset moors, with a bright sun and a clear sky everywhere around them, they thought that the "merry month of May" was after all not merely a tradition of the past, but a bright possession of the present. Glastonbury Tor, to those unfamiliar with the curious freaks of denudation, stood out like a huge conical tumulus on the horizon, appearing and disappearing as the train swept down the winding descent to Shepton Mallet, and the Polden hills were seen, a faint blue bank in the distance. The trees were hardly yet in full leafage, and the grass, owing to the cold nights and late season, was very scanty of growth; but, notwithstanding this, the rich, rolling Somerset meadows through which the train passed to Templecombe looked as only Somerset meadows can look—verdantly luxuriant. At Sherborne the members were met at the station by the vicar, the Rev. W. H. Lyon and his son, and were at once conducted by the south porch of the Abbey to the King's School. Here one of the masters, the Rev. A. Wood, showed them over the school whilst the vicar attended the mid-day service in the Abbey. From the schoolroom, erected within the last eight years, containing an organ at one end for concerts (music being one of the fine arts much cultivated at this school), all the various portions of the buildings were visited in detail. The boys' studies—once the cells of the Benedictine monks, whose monastery formerly stood on the north side of the Abbey, and has now been appropriated for the use of the school; the crypt—with its Norman piers; the old schoolroom—built 1670, with the statue of King Edward VI. at its east end, transferred from a

more ancient schoolroom to its present site, well known to old Sherborne boys, as they "capped" the image of royalty—better known, perhaps, than the Latin lines beneath:—

En ! tibi, Flos juvenum, Britonum Decus, Inclytus orbis  
 Splendor, Appolinei Deliciæque chori,  
 Gymnasium hic pueris statuit, gratumque Minervæ  
 Ut gratis discant—discito—gratis eris.

Outside and over the gateway leading to the court in which this hall stands, the following two Latin lines record the foundation of the school:—

Edvardi impensis patet hic Schola Publica Sexti,  
 Grammaticæ cupidis, nobile Regis opus.

From the hall up to the sick chambers curiously built amid the stone groining of what was the Lady Chapel, thence to the admirably fitted up library, the ancient Guesten hall, and through the chapel to the museum on the opposite side of the road. Formerly belonging to a silk factory, this well lighted room contains a very good collection of the characteristic fossils of the neighbourhood, principally from the Inferior Oolite, and has evidently had more attention bestowed on its contents than most school museums. Mr. Wood briefly indicated from a geological section of the neighbourhood the formations recently traversed in descending order from the Oxford Clay and Cornbrash at Templecombe to the Forest Marble, Fuller's Earth, Fuller's Earth Rock, and Inferior Oolite on which Sherborne is built; the only peculiarity being that the Great Oolite so thick at Bath had thinned out in this direction altogether, and was probably represented by the Forest Marble. The Secretary supplemented Mr. Wood's remarks with a few words as to the formations successively passed over on the morning's journey. Leaving the Lower Lias of the Bath valley they had passed through the Upper Lias in the cutting below Devonshire buildings, the Sands of the Midford tunnel, on to the Inferior Oolite beyond, over the

anticlinal of the Mendips, with the Mountain Limestone dipping successively north and south, until they reached the levels on the other side, and once more came upon the Lias. He then drew especial attention to the series of Ammonites from the Sands and the Inferior Oolite; alluded to the researches of the late Professor Buckman, so ably continued by his son, which had done so much to clear up the vexed question as to the true horizon of the Sands, and he ventured to think that their researches went far to establish the fact that these Midford or Yeovil Sands put on a *facies* more Oolitic than Liassic. Having thanked Mr. Wood for his kindness in showing them over the famous school, the members entered the Abbey at the west end under the guidance of the vicar. Before doing so the remains of an old doorway on the north side of the present one were pointed out as containing traces of Saxon work, and attention was called to the picturesque effect of the painted window at the east end as seen through the open portal. The contrast from the glare outside to the subdued light of the interior of this noble Abbey was most restful to the eye. The richness of the carving in pannelled pier and vaulted tracery, and the soft blending of the whole in one harmonious warm tint, due to the quality of the far celebrated Ham Hill stone, renders this interior probably unequalled in beauty. The vicar, notwithstanding the sad affliction in the almost total loss of his eyesight, was an excellent expositor of all the architectural details. Recently he has had the gratification of taking a prominent part in the restoration of the tower, and pointed out some Norman pier work on the north wall of the lantern, recently brought to light. Scarcely any portion now remains to be restored; almost everything has been done through the liberality of the Digby family that was necessary. There still, however, remains the anomaly of the Lady Chapel being used as a sick ward to be done away with, and then this Abbey will be even more perfect than it is now. A visit was paid to the belfry, containing a peal of eight bells. The tenor, called "Great Tom," the gift of Cardinal

Wolsey, and the smallest of the seven brought from Tournay and presented to various cathedrals in England, bears the inscription ;

By Wolsey's gift I measure time for all ;  
To mirth, to grief, to church I serve to call.

The bell rung on the alarm of fire, and from its shape giving out a peculiar sound, has the following inscription :

Lord, quench this furious flame !  
Arise ! run ! help ! put out the same.

The panoramic view from the top of the tower, of the park, town and surrounding neighbourhood, was much enjoyed by the few who were energetic enough to make the ascent. A cordial vote of thanks was given to the vicar for his able guidance, the members parting with him at the south porch and turning their steps to the park. The lake looked its best in the bright sunshine, dotted here and there with swans sailing out from beneath the shade of the fine overhanging trees. Having inspected the outside of the house built in the shape of the letter "H," the cross part of which is said to have been erected by Walter Raleigh, and the architectural features of which have not much to attract attention, they wandered on to Walter Raleigh's seat and tree (an elm), the traditional scene of the pipe and flagon of beer anecdote—and finally found themselves admitted, by the civility of the gardener, to the precincts of the old castle, Bishop Rogers' once famous fortress, now a picturesque ruin, with here and there traces of the once rich Norman mouldings in column and window tracery, characteristic of his period. Several of the members now returned to Bath by an early train, whilst others remained to dine at the Digby Hotel.

*Southerndown and Ewenny Priory, June 8th, 1886.*—The members (14 in number) who met at the G.W.R. station on Tuesday, June 8th for this excursion were much indebted to Mr. T. Graham for the arrangements he had made with the company, whereby they were enabled to break their journey at



Cardiff or elsewhere. Leaving Bath by the 10.18 train, and not finding much to interest them during the earlier portion of the morning, in spite of the well known custom of the Club to avoid politics, the burning question of the day "Home Rule" unavoidably cropped up, and a surprising unanimity prevailed with the representatives of both sides of political thought in the satisfaction felt by the news of the Government defeat by a majority of 30. At the Patchway station, however, interest was concentrated upon the great works in progress there in connection with the Severn Tunnel; the deep cuttings at the sides made for the double line of rail revealing fine sections of Lower Lias and Keuper Marls. Just beyond the station, and before approaching the entrance to the new Patchway tunnel, a thin section of the Rhætic Bone Bed has been exposed lying on the Light Green Marls. And the "tips" from the blastings in the tunnel show many interesting specimens of Millstone grit (containing curious spherical concretions similar to those found in the Lias near Bitton whilst making the line there, but in this case siliceous) of Limestone and a coarse and fine Conglomerate. Though goods trains have passed through the Severn Tunnel from the other side the passenger traffic is not yet in working order. Passengers, who are sadly inconvenienced by the present break at New Passage, anxiously look forward to the completion of this great undertaking which has already cost about two millions of money. Arriving at Cardiff about 1.30 the members were met by Dr. Vachell, President of the Cardiff Naturalists' Society, and Mr. Gavey, the Secretary, and at once conducted to the Angel Hotel, whence, after lunch generously provided and most thoroughly appreciated and an ascent to the roof to see the fine view thence of the town and neighbourhood, they went to the Museum and Free Library close at hand. The principal object being to see the Rhætic and other fossils from the neighbourhood, time did not admit of more than a cursory glance at the rest of its contents. At half-past three a start was made for Llandaff, not

before cordial thanks were returned by our Vice-President, the Rev. Preb. Scarth, on behalf of the Club to the representatives of the Cardiff Naturalists' Society for the hospitality and courtesy shown to the members, and a cordial wish that they would give the Bath Field Club an opportunity of returning their civility, and of showing them some of the objects of interest in their own city. Under the guidance of Mr. Storrie, the able and intelligent Curator of the Museum, some of the party proceeded on foot to Llandaff, whilst the rest preferred the more easy, if less dignified, method of riding on a 'bus. On looking back after crossing the fine bridge over the Taff, the Marquis of Bute's castellated residence was seen standing out clearly defined in all the minute details of its architecture and gilding against the back ground of a black thunder cloud. A slight detour was made from the main road through the Sofia gardens, the out-lying district of Canton passed through, and a path to the right led through pleasant fields to Llandaff, distant about a mile and a half. Before crossing the last stile a lovely view of the Cathedral was seen, framed as it were in the limbs of a venerable ash tree, which must have seen 200 winters at least; the crocketed spire on its S.W. tower and the Perpendicular pinnacles of the N.W. standing most picturesquely out of the surrounding foliage. Entering by the north porch and passing in to the nave, the simplicity and unity of the interior was the first and most noticeable feature before the various details unfolded themselves; then the eye was attracted by a curious and most unhappy series of horizontal graduated pipes projecting over the stalls from the organ, like long and short post horns held by some invisible hands; then passing on to the colours of the 41st Welsh Fusileers finally rested with pleasure on the view of the Lady Chapel seen through the fine Norman arch at the east end of the choir. Mr. Prichard, the Architect and restorer, being prevented from meeting the members through illness, they were severally indebted to Mr. Storrie, the Verger, and a "Sketch

of Llandaff Cathedral by John Taylor," for particulars of the structure ; from these various sources of information it was gleaned that the present building was mainly the work of Bishop Urban, about 1120, whose work may be recognised in the N. and S. doorways and the choir arch and some portions of the external walls. The pillars of the nave and choir and the W. front are later, about 1220 ; the Lady Chapel is still later in date, and the Chapter House on the S. is advanced Early English, square with a central pillar. The tower on the N.W. was built by Jasper, Earl of Pembroke, 1485, and is similar in its overhanging pinnacles to that of St. Stephen's, Bristol, and to the one at Cardiff. The S.W. tower has been recently re-erected, and the whole of the careful restorations, completed in 1869 under the skilful hands of Messrs. Prichard and Seddon, give general satisfaction. There are many monuments, amongst them two are worthy of special mention, the one at E. end of N. aisle, an altar tomb with a knight in armour, said to be that of Sir David Matthew standard bearer to Edward IV. at the battle of Towton, 1461, and murdered by a Turbervill ; and another at the N.E. of the nave to Sir William Matthew and Janet his wife, two fine alabaster figures, 1528—1530. The wood-work of the stalls, cedar wood inlaid with oak, box and lignum vitæ, are very beautiful. As afternoon service was just about to commence, the members passed by the well, the water of which was level with the floor, outside round by the cross erected to the memory of Dean Conybeare and ascended the table land immediately N. of the Cathedral, and wended their way through Fairwater to Ely station, about one mile distant ; here the train was taken for Bridgend, and after a drive of five miles the barren uplands of Southerndown were reached, and the Marine Hotel and some neighbouring houses received the members for Tuesday night.

*Wednesday, June 9th.* — Some of the younger and more enthusiastic members rose early on Wednesday morning and found their way to the beach in spite of the stone walls which

run down in all directions seawards—small proprietary rights sadly interfering thereby with the roaming instincts of the free Briton. Looking upwards from the yellow sands a very fine section of Lower Lias beds about 250ft. in height are seen from summit to base. The horizontal reefs extend to low water mark, the lowest of them being a blue coarsish crystalline limestone, its outer surface roughened with angular and sub-angular pebbles of Chert and Mountain Limestone. Fossils seemed scarce in these lower reefs, but blocks with impressions of *Ammonites Bucklandi* were scattered about under the cliff, probably fallen from higher beds above. The strata were nearly horizontal with perhaps a slight dip landwards. After an early breakfast a start was made at 9 a.m. for Sutton, Mr. Storrie, who had come all the way from Cardiff, kindly acting as guide through the day. Following the cliff road by the farmhouse of West, before descending to the sea level a halt was called at a road section on the left, where the Sutton stone was first seen and many characteristic fossils were found on the heaps of weathered blocks lying about, e.g. *Pecten Pollux*; *Ostrea multicostrata*; *Cardinia Suttonensis* (Tawney), &c., &c. Passing still further downwards another section on the right just above some houses was visited, it was here that the Sutton stone was originally quarried for building purposes. Standing on one of the "tips," now grass grown, the Secretary gave a short description of the geology of the district, and the discoveries made here by their late lamented brother geologist, Charles Moore. "They were standing (he said) on that remarkable formation called the "Sutton stone," so named from the locality where it was first worked—the question was, to what particular position in geological sequence these beds belonged—were they representatives of the Rhætic series? a view once held by a very able geologist, now passed away to the majority, (his friend E. B. Tawney), but a view which he, the Secretary, knew had been given up at the latter period of his life—or were they representatives of the Lower Lias—the *Ammonites*

*angulatus* zone? The latter was the view held by Charles Moore; than whom no one could be better able to form an opinion. The Rhaetic theory had recently been resuscitated by Messrs. Tomes and Lucy based principally on coral evidence. A re-examination of the geology of this district was therefore necessary, and this excursion had been planned with this object. A great alteration had taken place in the lithological character of these beds,—as could be readily seen by comparing the specimens before them with the Lias through which they had passed on their journey yesterday—this rendered their correlation so difficult. Those however familiar with the Secondary rocks in the Mendip area must be struck with the practical identity of these beds with those at Shepton Mallet, both as to their appearance and fossil contents—the latter were admittedly Lower Lias. Indeed whenever the Liassic beds rested uncomformably on the Carboniferous Limestone this alteration (as Charles Moore had pointed out) has taken place. Similar conditions prevailed in this district, on looking seawards the members would perceive the reefs of Carboniferous Limestone with the Sutton stone resting uncomformably upon them, the high range of hills at their back were a like formation and throughout this neighbourhood those beds resting on these Palaeozoic rocks were much changed in structure. What caused this was still an open question, the evidence of igneous rocks in close proximity could not be adduced as a reason here, as it had been across the water—however the fact of their alteration remains, so that the fossil contents of these beds were the only safe guide to their place in the geological series—members had an opportunity of winning their spurs.”

The carriages being rejoined below they drove past the mouth of the Ogmore and on to Ogmore Castle, a picturesque ruin of which not much beyond the old keep and a portion of the outer walls remain, situated on the river Ewenny crossed here by stepping stones. The view of the yellow sand hills at the back across the Ogmore framed in one of the old windows was most picturesque. A

two-mile drive landed the party at Ewenny Priory. Colonel Turbevill, notwithstanding the early hour of arrival, was ready to receive the members and to show them over the Priory Church and grounds. Entering by the S. door into the chancel it was at once seen that no ordinary hand had been busy with the restoration of this perfect specimen of early Norman work. The Presbytery or chancel is simply perfect and one of the purest specimens of Norman work in S. Wales. The floor has been recently covered with encaustic tiles, modern reproductions of the various coats of arms belonging to the noble families of which traces have from time to time been discovered, the three-light Norman window at the E. end has been opened and various other restorations recently carried out. From Colonel Turbevill's description and from the account of the Priory by Mr. Freeman in the *Archæologica Cambrensis*, 1857, the following history was gathered :—

It was originally a Norman fortress built by William de Londres, one of the twelve knights who with Fitz Hamon invaded Glamorgan and who built Ogmores Castle. In 1141 it was added as a cell to the Abbey of St. Peter at Glo'ster. The Priory belonged to the Benedictines and after the dissolution passed to the Carne family and afterwards by marriage to the Turbevills. Freeman considers the Priory Church highly remarkable on several grounds, and to be one of the best specimens of a fortified ecclesiastical building—the union of Castle and Monastery in the same structure—and that it exists very nearly as it was originally built. The Church was cruciform with central tower very massive—when perfect there was a nave with N. aisle—N. and S. transepts, latter only now remaining with eastern vaulted chapels now destroyed, and presbytery. The nave originally formed and now forms the parish Church, the choir, the presbytery and their appendages formed the church of the Priory. The vaulting of the Presbytery, Freeman writes, is one of the rare instances of Romanesque on so large a scale in England. Over the two

western bays is a barrel vault, the third and eastern has groined cellular vaulting—the S. transept has three round-headed lights at the S. end, an arcade of seven arches approached by a stone newel staircase in the S.W. corner leading to the tower belfry, and contains the supposed tomb of the founder, on which is a floriated cross with the following inscription round it :—

“ Ici gist Morice de Londres le fondateur,  
Dieu lui rend on labour Am.”

Several other incised slabs of later date are let into the floor at the S. end. Entering the nave through the S. arched doorway lately opened out, the massive Norman cylindrical piers, with plain impostes on the N. side instructive characteristics of English Norman (as Freeman writes) were pointed out, also the fine oval Norman font at the W. end, and the 18th century plain tablet to a local blacksmith in the S. wall adjoining with the following appropriate inscription :—

“ Underneath  
“ Lieth the body of David William,  
“ of this Parish, who died the 16th of  
“ March, 1742, aged 57.  
“ My sledge and hammers lie decay'd,  
“ My fires extinct, my force allay'd ;  
“ My vice is in the dust confin'd,  
“ My coal is spent, my irons gone ;  
“ My nails are drove, my work is done.”

Passing through the N. door to the outside the remains of the N. transept were seen, also the foundations of two of the chapels E. of that transept. The domestic buildings of the Priory were on the S. side and remained nearly perfect till about the beginning of the present century. A large portion of the enclosing wall remains with two gateways ; on passing out of the S. door a broken slab with the following portion of an inscription has lately been discovered :—

Hic jacet . . . . . De Lon. . . . .

Evidently the cover of a tomb to one of the De Londres. Colonel Turburvill having most hospitably invited the members to lunch, the spare time was occupied in wandering through the grounds and following the course of the ancient walls; the curious dovecot in the E. wall, the S.W. gateway, the kitchen garden enclosed on three sides by the old ramparts and the N. gateway were the chief objects of interest. The Secretary likewise in company with Mr. Storrie took a few of the members more especially interested in the subject to see a geological section about a mile distant on the Brocastle road, an account of the result of this visit is appended :—

*Brocastle Section.*—In a paper recently read by Mr. Lucy before the Cotteswold Naturalists' Field Club, and published in their Proceedings for 1884-1885 (p. 257), an attempt is there made to revive Mr. Tawney's theory of the Rhætic age of the Sutton stone Conglomerate, and to show that Charles Moore was in error in supposing it to be of Lower Lias age, and had mistaken one bed for another. In his paper on Abnormal Secondary Deposits (Quarterly Journal Geological Society, Vol. xxiii., p. 521), a section is there given at Brocastle, with a description of "a deposit of Conglomerate" found there resting on the Mountain Limestone immediately under the soil, the Liassic character of which he brought forward abundant evidence to prove. At p. 257 of Mr. Lucy's paper—with a view of rebutting this evidence of the Liassic age of the Conglomerate—a statement is made that "it was clear (to the writer's mind) that it was merely a large mass of drift"—whatever this may mean. It was then to ascertain the accuracy of this view that the visit was made. About a mile from the Priory on the S. road to Brocastle, just at the top of a slight rise, and nearly opposite a road section on the right-hand, a gate on the left led into a field at the top corner of which, close to the hedge bounding the road on the S., Moore's section was found. There could not be any doubt of this, as the Secretary had the original map used by that Geologist on which the spot was marked. The quarry having long been disused was of course much grown over; but the E. side revealed the section sought for. There immediately under the turf were loose blocks of bluish



Conglomerate full of cavities on the exterior, with encrinital plates attached and apparently bored by *lithodomi*, some two or three inches thick ; these were followed on the slope to the N. by thicker beds of whitish fine grained blocks, having precisely the character of the fine grained Sutton stone, and containing Lower Lias fossils ; one of the first blocks, about 1ft. long and 2in thick, revealing when broken open good specimens of *Ostrea liassica* *Avicula decussata* and a perfect tooth of *Acrodus nobilis* ; so far for the fossil contents. Mr. Lucy, however, apparently does not dispute the fact of this deposit containing a Lower Lias fauna ; but of its similarity in stratigraphical position with the beds at Sutton. In the opinion of the Geologists present and also that of Mr. Storrie, who is well acquainted with these beds, the similarity of these deposits with the Sutton stone could hardly be doubted ; and the "drift" theory of Mr. Lucy, whatever that might mean, did not hold good. Charles Moore's views in this respect were not proved erroneous, and the legitimate, though at the same time hazardous, attempt to overthrow observations made by cautious authorities had not as yet proved successful.

Prebendary SCARTH having after lunch thanked the courteous host and hostess for their hospitality and the instructive morning the members had passed under their guidance, the intervening distance to Bridgend was soon traversed, and the 3.5 p.m. train received them just in time before the break up of the fine weather which had so much enhanced the pleasure of the excursion.

*Excursion to Chepstow and Tintern Abbey, Tuesday, July 13th, 1886.*—Memories of pleasant places and things need refreshing sometimes, hence though the Club had previously, in 1864, visited Chepstow and Tintern, many who had recently become members were anxious to see those far-famed places for the first time, and the others were not adverse to revisit those architectural gems ever revealing something new to wonder at and admire at every fresh visit. The G.W.R. arrangements necessitated an early start from Bath and the 8.5 a.m. train for Portskewet received some twenty members. On the way they were joined by

Mr. Charles Richardson, the acting engineer of the Severn Tunnel works. That costly undertaking of driving a tunnel five miles long—two-and-a-quarter beneath the water and two-and-a-quarter on land—though now so far finished as to have admitted the passage of a goods train, yet is not in sufficient working order for passenger traffic. The unfortunate bursting out of a land spring on the Portskewet side having more than once impeded progress, and now requiring the pumping up of 15 million gallons of water every 24 hours; a drain which report states has considerably affected the neighbouring springs, and must also affect the finances, notwithstanding the contemplated saving of £12,000 per annum, by the doing away with the present water traffic. Let us hope, however, that this like other difficulties will be successfully met by engineering skill! After having duly noted the velocity of the Severn currents causing a perceptible irregularity in the level of the water which in some places seemed to be flowing down hill near the "Shoots," the *trajectus* at all times unpleasant and especially so at low tide was accomplished, and nothing particular occurred worthy of record before arriving at Chepstow, except the pretty peeps of the Wye seen through the intervening masses of rock as the train wound its way along the right bank. On alighting of course the first object was the Castle so picturesquely perched on its inaccessible crag, rising 130 feet in a sheer perpendicular wall of Mountain Limestone from the river which washes its base. Ascending a grassy slope and passing under the eastern gateway with its grooves for portcullis flanked on either hand by round towers of Edwardian date, late 13th century, the first of the four courts was entered. On the right was the Banqueting hall, the tracery in its windows looking on to the court indicating early Decorated work, *temp.* Edward II. Pantry and buttery are shown at the E. end of this hall and a flight of stone steps leads to the kitchen. The groining over the steps is particularly good, also that of the vaulted subterranean store chamber beneath, with its opening to the Wye and its iron ring

in the floor to which the rope of the boats bringing provisions to the inmates was attached from below. Proceeding to the left side of the first court, the tower where Henry Marten, one of the judges of King Charles I., was interned and died, was next inspected. The moulding of the upper part, supposed to be the chapel, shows the ball flower and is of early English date, the windows facing the court are much later. Ascending the spiral staircase, the battlements were followed to the fine hall at the upper end of the first court, supposed once to have been a chapel. The windows are fine specimens of Decorated work. On the inside face of the south and west walls, above the holes where the flooring joists were inserted, there are several apparently Norman arches possibly some of the original work of Fitz Osborn, the Norman, who is said to have been the original founder of the Castle in the 11th century. At the upper end of the hall are remains of some Early English work, probably of a screen which separated a portion from the rest and made it into a chapel. Passing outside this hall, on the river side, a steep ascent led into another courtyard approached by an outer gate. Having returned to the first courtyard and enjoyed the shade of a magnificent walnut tree for a space, the members passed out through the east entrance and followed the deep ditch on the S., noting by the way at the bottom of "Marten's" tower the peculiar strengthening of the base which seemed to rest on an inverted arch of hewn stone, the sides forming the angles of the tower and gradually dying away in the masonry above. A coach and break met the members at the top of the moat on the Tintern road, and after a pleasant and breezy drive through Piercefield Park they commenced the ascent of the Windcliff by an easy path through the woods at the back of Moss Cottage. The far-famed view was seen to advantage. The windings of the Wye through its tree-clad inland cliffs, the distant islands of the Steep and Flat Holmes, the Cotteswold hills across the expanse of the Severn on the horizon, and Chepstow and its Castle almost hidden in the midst

of the surrounding deep foliage at their feet, were the prominent features in a view rarely excelled in beauty. A descent through the woods was then made, and after paying the usual toll at the Cottage, the conveyances, which had been sent round to meet the members, were re-mounted and after a drive of two miles the much needed lunch, prepared at the Beaufort Arms, was thought highly necessary before the further prosecution of antiquarian research. To those entering the western portal of the Abbey for the first time the view of the exquisite interior seems unrivalled; wall, pier, window and tracery seem so little injured by time that one almost fancies the roof is only waiting to be erected to restore the whole to its former state of chaste beauty, even the large bosses at the intersection of the groining are there ready to be raised into place—but perhaps its present state of ruined preservation is better for pilgrims. Founded in 1131 by Walter de Clare, a Norman baron and relative of William the Conqueror, but little, if anything, remains of that early date; all the chief architectural features of the present building date from the 13th century. Roger de Bigod, Earl of Norfolk, to whom the de Clare estates descended by marriage, commenced it in 1269; and 1287 saw it finished for divine service. After the dissolution in 1537, the monastic buildings and estates fell to the share of the Earl of Worcester and through him to his descendant the present Duke of Beaufort. The interior illustrates the typical arrangements of the Cistercians. The nave which was given up to the lay brethren has on its south side the remains of the stone screens which shut out the lay brothers from the monks, and was entered by a door-way still existing in the N.W. corner. All the monastic offices are on the N. side; the Chapter House with its encaustic flooring recently uncovered, the Guest House, Refectory and elegant vaulted pulpit on its west side for the reader, the buttery, kitchen, dormitories, and the Cloister Garth. At the south side of the Garth, near the richly Decorated north doorway to the nave, are two tombstones on one of which the in-

scription "Johannes de Lynns;" and on the other "Jacet Henricus de Lancaut . . . Abbas de Voto," can be plainly read. The Cloisters themselves have disappeared, but the well proportioned windows of the N. aisle, dwarfed purposely for the admission of the lean-to roof beneath, indicate the line where these originally ran. Situation and architectural details both combine to make these ruins some of the most picturesque in England. Passing out again beneath the beautifully proportioned west window with its nearly perfect Decorated tracery, a last look was given at the fine west front with the remains of its Galilee, and then the modern procession of lay brethren wound their way reluctantly back to those less interesting but most useful conveyances, the coach and break, which took them on to the station at Tintern Parva, a mile distant, whence the train was taken for Chepstow. The lovely peeps of rock, wood and river, as the train winds its way to Chepstow, are unsurpassed even by the hitherto celebrated drive by the coach road. The beauty of the scenery was much enhanced, too, by the freshness which the recent rains had effected on the foliage after the long drought of the past June, and everything conspired to render this a most pleasant and successful archaeological excursion.

*Ham Hill and Montacute, Tuesday September 14th, 1886.*—Those who were present at a former excursion to Montacute on 10th October, 1865, may recollect that owing to the bad weather and other *contretemps* the day did not leave pleasant memories in its wake. Neither the house nor the quarries were seen to advantage. Such remarks, however, could not be recorded of this the fourth and last excursion of the season. A glorious summer's day and courteous civility combined to make this certainly one of the pleasantest and most instructive of the series. Owing to the length of the programme an early start for Yeovil by G.W.R. was necessary, and at 10.45 twenty members and their friends, comfortably packed away in two breaks supplied by the landlord of the "Three Choughs," left the Pen Mill

station for Ham Hill. Pleasant was the drive in the balmy morning air by upland and deep cut hedge-embowered lane, with distant peeps of church tower, and stately mansion house embosomed in luxuriant foliage, the church of Odcombe conspicuous on the right, and the fine Queen Anne façade of Brympton in the vale below. Agreeable, too, was the shade from the long avenue of Scotch firs on either side of the road; though perhaps not planted by the original makers of the camp, yet planted many years ago by a former owner of Montacute (?) with excellent taste, and seemingly rejoicing in the rich nature of the Inferior Oolite Sands capping the elevated ground on which they grow. At a sharp rise of the ground leading to the outer defence of the camp, the members left the breaks and walked up the road cut through the steep vallum on the E. At a small quarry on the right hand, immediately on passing into the camp, the Secretary called a halt, and pointing to a particular ferruginous band about six feet from the top of the section, suggested that a search should there be made for a small and characteristic shell. Crowbar and hammer having been plied, many specimens more or less perfect were soon found of the *Rhynconella cynocephala*, a brachiopod marking a certain horizon in the Pisolitic beds of the Inferior Oolite of the Cotteswold hills. Proceeding onwards from the corner, "too hot" in some respects for the comfort of many, the more airy plateau of the hill was reached, and a short detour to the left led to the quarries so widely celebrated for their building stone. Fortunately the owner, Mr. Trask, was there, and from him the following facts were elicited. The deep quarries have only been opened in the present century; the one above which they were standing, some 90ft. from the top soil to the bottom of the working, only during the last 30 years. The stone had been known and utilized for centuries, the original makers of the camp were acquainted with it, as the use of it in the S. and W. ramparts plainly showed. The Romans certainly used it, and the architects from the Norman period down to the

present day, as so many of the churches bear witness. The problem was, how with the bad roads of former days they were enabled to convey the material so far. As to the details of the section he referred to the late Mr. Charles Moore's description, which is given below in ascending order :—

	Feet. Inches.
Inferior Oolite ; Yellow " Brim Sands " with occasional concretionary boulders of Sandstone ... ..	80
Bottom bed—hard Nodular bed, not worked ... ..	1 4
Gray bed ... ..	2
Ditto ... ..	2 6
Ditto ... ..	2
Ditto ... ..	1 8
The " Yellow beds " closely bedded, varying from 2ft. to 1ft. 6in. ... ..	50
" Ochre "—consisting of Yellow sands, sometimes passing into Sandstone... ..	30

The " Gray beds " yield the best weathering stone, and are separated from the " Yellow beds " by a band about 1ft. thick containing many pellets of iron ore (Somerset Archæological and Natural History Society, vol. xiii. 1865-6). Mr. Trask told us that in working back the quarries many hut circles had been destroyed containing skulls, burnt earth and pebbles. During the morning an example of one of these " finds " was shown by a workman, consisting of round water worn flint pebbles, a broken implement, probably portion of a polished celt made of some hard blue stone (? igneous), and some bones of domestic animals, sheep, &c. The flint pebbles looked like sling stones. The Secretary thanked Mr. Trask for his information, and said he would supplement his remarks by calling their attention to the numerous fissures and joints running at cross angles to the beds, facilitating the removal of the large blocks from their parent bedding. Having accompanied Professor Boyd Dawkins to these quarries a few weeks ago, he could give them the substance of the latter's remarks on these beds. Being

composed of comminuted shells, the Professor stated that in his opinion these beds owed their formation to shallow water and were probably laid down at a depth not exceeding 150 fathoms. There was once a time when a walk could have been made from this hill, without descending any very deep valleys, to Glastonbury Torr ; but owing to the enormous wearing down that had gone on in comparatively recent times the intervening rock had been removed by the action of the sea, rain, river, frosts and carbonic acid until the hill stood out boldly as at present, a monument of past denudation. The geological part of the day's programme having been finished, a traverse was made to the S.W. entrance of the camp and the vallum followed to a projecting spur, whence a magnificent view of the distant Quantocks with the intervening rich lowlands and numerous church towers scattered about was obtained. At this point extra strength has been given to the camp by a series of outworks defending the entrance in this direction in a manner which even military authorities of the present day would acknowledge as well and skilfully carried out. The Secretary, here again referring to the great authorities on these camps, said that this was one of the largest in England, being 210 acres in area and three miles round ; and that such strongholds as these, of which there are numerous examples on all our neighbouring hills, were made by the Neolithic people, the Non-Aryans who preceeded the Celts, and by whom the polished stone weapons were made. They were a military people, and wherever there was a weak point to protect it was always defended on scientific principles, such as would guide defenders in the present day. The reasons why these camps were situated on rising ground was due to the fact that in those early days the country was divided into small communities, and when the latter took to fighting among themselves—and the country was “up” either from domestic feuds or from foreign invasion—these upland enclosures served as places of refuge to which they drove their cattle and in which they lived till the



clouds rolled by. Generally water was to be had close at hand or could be temporarily obtained from the rainfall or dew ponds, as in Wiltshire. These camps were in existence when the Romans came, and were of course adapted and occupied by them as good strategical points. Continuing along the W. side, the contour of the ground was seen to have been much altered by the ancient quarrying; the Romans and others seem to have gradually worked the stone back from the W. face, throwing up the "tips" as they went eastward and in some places obliterating the ancient vallum. The heat of the sun taxing the powers of some of the members a cross cut over the broken-up ground was made to the N.E. side, and the much needed lunch, brought in the breaks, having refreshed them for the remaining portion of the day's work, the "Frying Pan" was the next object. This, an undoubted portion of Roman adaptation, is situated at the N.E. point of the hill, and was probably originally an amphitheatre; the scene of Roman military agitation, as in latter days it has been utilized by arch agitators of the bucolic stamp. Many unfinished Roman swords, coins chiefly of the Antonine period, one 50 years later, and fibulæ have been found; also a curious row of holed stones existed close at hand *in situ*, but during the last ten years these have nearly all disappeared. One still remains much broken away, but what their use was is doubtful. Some think they were used for the purpose of tethering horses. The hill having been both geologically and archæological examined, it now remained to make a steep and rapid descent to the church of Stoke-sub-Hamdon below, where the Vicar, the Rev. W. J. Rowland, was kindly ready to receive the members in his churchyard and point out the peculiarities of his most interesting church. Proceeding first of all round the outside, attention was directed to some Early English work on the N. wall of the nave, the meaning of which it was not easy to understand. Over this, on the same side, was a good specimen of an Early Norman narrow-lighted window, with grotesque carving in

the headstone forming the arch, at the W. end a fine Decorated window, on the S. Norman and Early English windows side by side. The S. doorway, originally Norman, had been altered to admit of the insertion over it of a later window. The S. side of the chancel caused some discussion. Mr. Talbot considered that the curious Norman corbel table was in its original position, that the masonry of the walls was Norman work as was evidently that of the end buttresses; and that the windows were Early English and Early Decorated, but altered on the north side of the chancel in the 15th century. Entering the church by the N. porch the tympanum of the doorway, originally blocked up by masonry and discovered as the Vicar told us in 1857, created much interest. The subject—in the centre a tree with three birds in the branches; an archer, half beast half man, on the left, turning backwards shooting at a lion, with “Sagittarius” roughly cut below; a lamb on the right with a cross on back; beneath, a lion with head turned to right and tongue out as if wounded, with “Leo” cut in like rude characters—gave rise to many curious explanations (*vide* Mr. Talbot's “Notes” below). Inside, the following facts were gleaned from the Vicar. Originally a Norman church with chancel and nave, subsequent alterations had made it cruciform. The chancel arch, a very fine specimen of Norman work, had probably been altered, the square abaci apparently being older than the capitals below, a heavy roll runs completely round the soffit, a peculiarity. The tower instead of being at the W. end, as was usual, is over the N. transept, the stand for the hour glass on right of pulpit was a relic of olden times. The S. transept was a beautiful specimen of Early Decorated work, and the “squints” were also noticeable. In short but few churches in Somerset, so noted for its churches, equal this in interest, as it is an example of nearly every style from Early Norman down to our own times.

Mr. Talbot's notes on the church being of value are here appended:—

*Notes on Stoke-sub-Hamdon Church. By C. H. TALBOT.*

This church is very picturesque and of great interest, owing to the

successive alterations it has undergone, and the work of different periods remaining. It is a cruciform, aisleless building, with a tower over the north transept and a north porch. The walls of the nave and chancel are Norman; those of the nave having been raised probably in the fourteenth century. The original Norman north doorway of the nave remains, though somewhat concealed in the upper part by the fourteenth century porch which has been built against it. This doorway has a solid tympanum, with curious and interesting carving; in the centre is a tree, with three birds in its branches; on the right, an *Agnus Dei*; and below, on the left, a *Sagittarius*; and, on the right, a lion, identified by an apparently contemporary inscription underneath—"Sagittarius . . . Leo." The suggestion, in this and other cases, that the *Sagittarius* had reference to King Stephen, appears to me fanciful; as also the notion that the carvings typify St. Michael and the devil; though the *Sagittarius* is certainly represented as shooting at the lion, they may simply be two of the signs of the zodiac. There are the remains of a corresponding Norman doorway on the south side of the nave, but it has lost its arch and tympanum owing to the insertion of a later window over it; so that we cannot tell whether more signs of the zodiac were carved upon it. There are the remains of two small original windows in the north and south walls of the nave, and one in the south wall of the chancel. The chancel walls retain very interesting original corbel tables. The chancel arch is a Norman one restored. Above it, on the side next the nave, is a defaced carved string course, apparently Norman, which would be parallel to the original flat ceiling if the usual Norman arrangement existed.

On the south side of the chancel, near the east end, is a double lancet window of the thirteenth century, under one arch internally; to the west of this, a lancet of the fourteenth century; and, to the west of that again, a low side window, of the same date, with a plain cusped head. It is obvious that the latter window may have been exactly similar in the head, and have been reduced to the lancet form by cutting away the cusps, but it is not absolutely certain.

Exactly the same arrangement seems to have prevailed on the north side of the chancel, as is shown by the original arches of the windows remaining internally; but externally they have been remodelled in

the fifteenth century. The east window is an interesting specimen of Perpendicular. Buttresses were added to the side walls of the chancel, apparently at the same time.

The north transept and tower over it are of the thirteenth century, with the exception of the north window, which was inserted in the fifteenth century. The lower storey has groined vaulting, and there is a projection on the east side, which may perhaps act as an abutment to the chancel arch ; but, no doubt, served to enlarge the transept and to contain an altar internally. All this is of the thirteenth century. In front of this eastern recess is placed a stone screen of the fifteenth century, which formerly occupied a different position in the church.

The south transept has ranges of windows in the side walls, of early fourteenth century character, so close together that their splays meet, forming an angle, and the whole has much the effect of a continuous arcade internally. The south window is of a later type, fully developed fourteenth century work. There is, in the south wall, a well preserved male effigy in a canopied recess of the same date ; and piscinas across the S.E. angles in the transept and chancel. The nave has several good windows inserted in the fourteenth century ; particularly the west window, under which is a late fifteenth century doorway. A bracket, affixed to the east splay of one of the windows, on the south side of the nave, probably carried a statue. The font is Norman.

The north porch, added in the fourteenth century, is of two stories with a groined vault to the basement, and a ribbed vault, apparently a true stone roof, to the upper chamber. Close to this porch, by which it is partly concealed, in the outer wall of the nave is a feature of the thirteenth century, not very easy to understand, consisting of tabling crowned with Early English foliage. A similar, but perfect, example is said to occur elsewhere. Internally there are remains of early painting on the splays of the Norman windows, and also remains of painting on the wall, over the chancel arch—two censuring angels ; probably, the figure of our Lord was formerly in the centre.

On the north side of the chancel there is a male effigy, under a canopy, which may be of the time of Elizabeth, or, as some think, later. The arms, on the monument, show that it commemorates a member of the Strode family, as the same arms occur on a later tablet of that family against the east wall of the chancel.

In the churchyard is an altar tomb, apparently of the fifteenth century, probably removed from the church.

There are a number of houses near the church, mostly of late date, but preserving the ancient traditional character, well preserved and but little altered.

After thanking the Vicar for his information a short drive took the members to the W. entrance of Montacute house, where a cordial reception from Mr. and Mrs. W. R. Phelps enabled them to see both the exterior and inside of their noble mansion. Passing beneath "and yours my friends" into the hall, they issued "through the wide-opening gate," where "none come too early, none return too late," on to the courtyard opposite the W. entrance. Attention was here directed to the grand Elizabethan façade with its so called nine worthies writ in stone—Hector, son of Priam, Alexander the Great and Julius Cæsar, three Gentiles; Joshua, David and Judas Maccabæus, three Jews; Arthur the King, Charlemagne and Godfrey de Bouillon, three Christians. Beneath the windows, of which there are said to be 365, a number equal to days in the year, were round hollows—what was their use? Mr. Talbot thought they were for statues originally; the round chimneys too, were they a part of the original structure, or a later introduction? Longleat had similar ones, these the last authority thought were not original. Was John of Padua the architect, or who? Records are silent; but the founder of this noble house all know was Sir Edward Phelps, Knt., Queen's Sergeant to Elizabeth between 1580 and 1601; and in possession of that family it has been ever since. The eastern façade has had a subsequent addition made to it, the centre portion between the two wings having been brought from the house of the Horsey's, Clifton, May Bank, and inserted here; "J. H." or "C. H." and the crest of the Horsey family, a horse's head, being recognised in the 15th century carving over the porch and elsewhere. The members then entered the hall, in which at the N. end is a curious plaster relief of the pratice called

“Skimmerton riding,” of which the following is a description :—

“Riding the Skimmity.”

“On the left-hand of the bas-relief a man is seen stooping over a beer barrel, in one arm he is holding a baby which has evidently been entrusted to his charge by his absent wife. In the meantime he has been drinking the beer, and apparently in a state of intoxication is about to draw more, as the hand of his other arm is extended towards the tap, and a cup to receive it stands underneath. But the wife returns, and finding him in this condition rates him soundly ; then while an altercation ensues between them, and she is whacking him with an old shoe, a third person, supposed to be the school-master from a scroll of paper in his hand, overhears the quarrel and reports it to the village. Then follows the procession composed of men and women, most of whom are carrying an effigy of the delinquent on a pole and proclaiming the matrimonial scandal to the surrounding crowd.”

NOTE.—The term “skimmerton” is supposed to be derived from the “skimmers” and ladles which the person riding carries in his hand and with which he was sometimes belaboured. The Rev. J. B. Medley, Rector of Orchardleigh, informed the Secretary that during his curacy at Shepton Beauchamp he once saw (1854) this old use of “Skimmerton riding.”

From the hall the members ascended the stone staircase to the long gallery, one of the most striking features of the house ; supposed once to have been the library it extends the whole length of the building and has a good oriel window at either end. A refreshing cup of tea was awaiting their descent to the hall, and after thanking their host and hostess for their courtesy the breaks were remounted, and a pleasant ride through the park brought them to Yeovil in time for the 6.23 p.m. train to Bath after a most enjoyable day.

The bye-excursion to *Dundry*, fixed for May 18th—postponed owing to the rain—came off on October 12th. There were only five or six members who ventured in spite of a somewhat unpromising morning to take part in it, and on leaving the Bristol station had a most unpleasant trudge through muddy

roads and blinding rain to the top of the hill. The derivation of the word—whether from the Saxon *Dagian*, to dawn or spreadlight, according to Bishop Clifford, the Tower of the Church being on the site of an ancient beacon, or “Dawn tree”; or whether from two words *Dun* and *Draegh*, signifying “a hill of oaks,” according to Collinson—was discussed by the way; the chief conclusion arrived at, however, was that it was not *done dry*. As it was impossible to enjoy any view, or to visit the celebrated quarries; after some needed refreshments were taken at a friendly Hostelry, the Church was hastily inspected, with its “Dole stone” and fine cross in the Churchyard, and a rapid descent made to Bristol.

The other bye-excursions, to West Harptree and Winchester, were not carried out; but the long deferred one, to visit the little Saxon Church at Bradford, on the invitation of Mr. Adye, the architect at present engaged in the needful structural repairs, was made on Tuesday, December 14th. Owing to the heavy rainfall in the early morning only about six members were present. These were met by Mr. Shum at the Bradford station, and had some of the interesting features of that picturesque and foreign looking town pointed out to them. Before crossing the bridge, the house in which Lord Westbury was born, and the residence, nearly opposite, of the inventor of the Shrapnell shell, were passed, and the strongly built and curious little chapel on the south side of the bridge, overhanging the water, claimed more than a mere passing look. At the *Ecclesiola*, Mr. Adye met the party, and pointed out the various repairs to walls and roof, which had elicited the commendation of Mr. Freeman, and therefore must needs be historically and architecturally correct. Since the last visit of the club much has been done, the precincts of the chapel have been cleared from the tumble-down cumbrous sheds before built against the south wall and hiding its features; the roof has been repaired and made watertight, and the walls, which were in a

dangerous state and consisted of an outer and inner facing of masonry with the space between hollow, have been filled in with Portland cement, thus binding the whole together in a solid mass. The small round arches have been repaired and completed wherever it was necessary for structural reasons to do so, and wherever there was sufficient "springing" left to carry on the design. On clearing away the structure abutting against the south side, the foundations of a south porch were found; and the pitch of a high roof, corresponding with the height of the wall, plainly indicated on the outside; an interesting point, thus showing that the south porch was a *fac simile* as to height and dimensions of the existing north porch. Two solid buttresses have been carried up, resting upon the base of the east and west walls of this porch, thus marking the site, and acting as a support to the main wall on that side; though in the opinion of the architect such support was not needed. Of course it is a question about which the different schools of thought may readily dispute, whether this present ugly masonry should remain breaking the harmony of the south side; or whether the porch should be restored (hateful word to some!) and the walls and roofs added. Entering through the arched doorway into the nave, the great height of the building at once arrested attention; and when the eye became accustomed to the dim light, the irregularity of the details, the descent instead of ascent into the chancel by a step, the bulging look of the walls, which might have been original and intended to be out of "plumb line;" the curious "rundlet," or reed-like ornamentation round the chancel arch—the only ornament in the chapel save the two angels high up in the chancel wall, about which Professor Earle discoursed to the Club at their last meeting (*Vide* p. 162),—all came out at last into prominence. The chancel appears to have been lit by one deeply-splayed window, high up in the south wall, and the length of the whole building, corresponded with the height of the walls, 25 feet. Passing through the north



porch, the outside details were inspected, which are equally interesting with those in the interior. The arched panelling, all round under the eaves, evidently cut out of the masonry; the flat pilasters, "stepped" now on one side of the base, now on the other, here and there on both sides; the irregularity of the string courses and the general idiosyncrasy of the structural details were remarkable. The west front has three windows pierced in it, and on the inside beneath them it is stated that they were not found there originally; here, perhaps, utilitarian purposes were a sufficient reason for breaking the otherwise plain western wall face. Having thoroughly seen this most instructive building the parish church adjoining was visited; and thus in a very small space were seen illustrations of church architecture, from the eighth century (so some suppose) down through all the ages to the present nineteenth century garter-like bands with which some fanciful hand has girt the westernmost pillars of the north aisle. Having thanked Mr. Adye for his guidance, the party, taken in hand by Mr. Shum, were shown the priest's chapel on Tory hill, admired the beautiful view o'er woodland and vale below flecked with storm clouds and sunshine, and descended to the beautifully situated manor house of Belcombe Brook, and were there most hospitably entertained by Mr. Shum.

Amongst the walks that to Claverton Down, at the invitation of Mr. Skrine, to examine the Camp and excavations lately made there by him, may be recorded. The meeting place was Sham Castle, on October 26th. About twenty members were present. The day was fair, cold and bracing, and so nipping and eager was the wind on that airy height that the party were fain to crowd under the lee of the Sham Castle, which some must have wished to have formed a little more real defence against the elements. Here Mr. Skrine read his paper (*Vide* p. 236), which was listened to with attention, and the whole party then ascended to the ramparts of the Camp, noting several longitudinal mounds, considered

by Mr. Scarth to have been barrows. They struck the line of the ramparts at the stile leading on to the Down and followed it round to the Rifle Butts, where the ancient road through the Camp had its exit towards the north, and where is still the cart track. The line of the road curving through the Camp was then followed, Mr. Skrine pointing out the lines of the enclosures which bordered it. The rampart on the south was then observed, dividing a field belonging to Major Allen from the Down, with a wall on the top of the bank as in prehistoric times. Several of the enclosures were then pointed out with a reference to the map of the Camp, and the party entered a field of Mr. Skrine's, in which he is carrying on some excavations. The building here had been partially cleared, showing a solid wall 6ft. thick and about 3ft. 4in. in height. A small piece of pottery (apparently Roman) and a piece of worked flint like a sling stone had been found on the spot. The members then were guided to Gainsborough's Kitchen, a romantic dell in a rocky lane leading down to a spring, the course of which is the boundary of the manor; and then through the wood to Claverton Manor by a charming road overlooking the Avon valley. At Claverton the Club were entertained at luncheon by Mr. Skrine in the picture gallery, after which, on Colonel Chandler's motion, a hearty vote of thanks was given to Mr. Skrine for his paper and hospitality.

*Hampton Camp.*—The ancient camp on Hampton Down which I have asked you to explore with me to-day, is by all learned archaeologists considered to have been constructed by the Belgæ, the invaders and conquerors of South Britain, about 200 years B.C.

It was their most important fortress in this part of the country, and was closely connected with their famous Boundary-Earthwork called the Wansdyke. It is very strong by situation, for it crowns a steep and wooded hill about 700 feet above the sea, and 600 at least above the valley of the Avon which it commands. It overlooks a considerable expanse of country, and was within sight of numerous hill forts on the line of the Wansdyke. It was then of considerable strategic importance to the Belgæ, and was surrounded by an embank-

ment and ditch still to be clearly traced on three sides, north, west and south. On the east the quarries have destroyed the line of the ramparts, but probably as the hill on that side seems to have been scarped and is very precipitous, its ramparts may not have had so much attention. It is most likely that a wall stood on the top of the bank, stone being plentiful and near the surface. The old road which passed through the settlement from south to north and which was part of the ancient Fosse Road from Seaton to Lincoln is still distinctly traceable.

The interior area of the camp is about 74 acres, and it is divided into a number of parcels of land of unequal size by low longitudinal ridges or banks. These are the remains of substantial walls or high banks, that served to separate the hut dwellings, and the homesteads or yards of the cattle, belonging to the inhabitants; and also perhaps enclosed gardens and fields of arable. The number and size of these enclosures show that this was a permanent settlement or town, and not merely a military post, or refuge for the neighbouring villages in time of war. The cattle would be stabled or yarded at night by their owners to protect them from wild beasts, or robbers; and would be led out to pasture by day in the woods and on the adjacent downs, under the charge of their herdsmen.

Sir Richard Colt Hoare says that he has repeatedly met with similar foundations of enclosures on and near the Wiltshire Downs, and that he had invariably found they were indications of a British village. The situation of Hampton Down also corresponds with the description by Cæsar of an "oppidum" of the Britons. He says "the Britons call a town a place with a tangled wood round it and fortified with a rampart and ditch." Inside this, as Strabo tells us, they would build their huts and collect their cattle, but not with a view to remaining there long. As, however, Hampton Down was on the frontier, it was no doubt always occupied by a garrison, and was a permanent settlement. I am indebted to Mr. Spackman for the assistance of a map of the camp which he made by direction of Mr. Scarth, more than 30 years ago, and which I have had reduced. It gives all or nearly all the enclosures within the camp, some 34 in number, and some outside; and a recent measurement directed by myself has verified the lines as on the whole very accurate. No excavation has been made of these lines; but some hut circles have been explored by Mr. Scarth. And I

have discovered enclosures of a similar kind to them within the camp in a field of mine called Bushy Norwood, on the south side of the camp, where I am now carrying on some excavations to which I shall invite your attention.

It has, I think, been shown that we have here a considerable camp, occupying an important military position in pre-historic times.

What traces there may be of Roman occupation I am not prepared to say, a small fragment of pottery being all I have found by excavation; but it is certain that this must have been one of the forts garrisoned by Ostorius on the Avon and Severn rivers when he marched against the Silures in South Wales. Mr. Scarth found traces of a Roman camp on what was Claverton Down; but the plough has probably obliterated it. We are, however, on the present occasion dealing with its occupation by the Belgæ as their frontier fortress. Now who were the Belgæ? This is a question which has puzzled a good many antiquaries; but it is fairly solved by the researches of the late Dr. Guest, given to the world in a posthumous work of his "*Origines Celticæ*."

He says, "the Belgæ were a powerful and aggressive people, but from what quarter they had intruded themselves into the seats where we find them settled is a difficult question to answer. Cæsar says that the country of Gaul was parcelled out among three great tribes—*Belgæ*, *Celtæ* and *Aquitani*—and he makes the Seine and the Marne the Southern boundary of the *Belgæ*. The basin of the Rhone and Saone with Toulouse the capital was called 'Provincia' by the Romans ('Provence' now), and this was occupied by the *Volcæ*—another reading of *Bolcæ* or *Belcæ* the V and B being interchangeable letters. These *Volcæ* were traced also to Ancyra in Asia Minor, whither the Belgæ under Brennus some centuries before had passed from Byzantium. Jerome says, the people of Ancyra spoke the same language as those of Toulouse. Identity of language in this case means identity of race." These *Volcæ* were also called *Tectosages*; the meaning of which, says Guest, is the wayfaring men who wore cloaks of skins, *i.e.*, shepherds or herdsmen; and curiously enough the Scythians who drove some of these same Belgæ from the basin of the Danube over into Asia, were also called *Belcæ* or *Tectosages*. The name being a collective term for their occupation as herdsmen, Dr. Guest pursues the matter by an argument from etymology.

Fir-Bolg, the Irish or Gaelic form of the name Belgæ, means the men of the Bolg tribe. Fir, plural of *Fear-Men* (or say it was an Irish form of the Latin *Vir* which would be pronounced *Fear*) the meaning is the same. He thinks that the Roman *Bubulcus* comes from Bolg, or *Builc*, again a Gaelic form of the word, and hederives it from the Sanscrit Palah, or Palakah, protector; Go-Palah, or Palakah, being cow-herd; Greek Βου-πολος, Latin *Bu-Bulc-us*. Supposing this conjecture to be correct, the name admirably fits the character and occupation of the Belgæ who invaded Britain 200 years before the Christian era. And what does Cæsar tell us of them? Cæsar says that the southern coasts of Britain were occupied by these tribes, who had crossed over from Belgium for the purposes of plunder and war, and who had finally settled there and begun to cultivate the land. Dr. Guest follows up this by saying that they probably landed near Christ Church, in Hampshire; and thus possessed themselves of the fine grazing lands on the banks of the Stour and Avon; and that they fixed their first boundary line by a Dyke—called Bokerley Dyke and Combe Bank—which included Cranborne Chase and part of the new Forest. They next pushed on beyond Old Sarum and Amesbury to the Downs of Hants and South Wiltshire. Their third line was the Wansdyke, which has been traced from the Berkshire Downs through Savernake Forest to near Portbury Lane and the Bristol Channel. It is plainly visible near Warleigh on the opposite side of the Avon. The ditch in every instance faces the N. to keep back the British tribes, of whose land they had taken possession. There were numerous forts along the Wansdyke, many of which must have been within sight of Hampton Down; English Combe, Maes Knoll, Dundry and Stantonbury camp on the W., or Bathford Hill, which appears to have been scarped, though no certain traces of a camp have, so far as I am aware, been discovered. Many of the forts on the Marlborough Down from Roundway eastwards would also be in communication, and the Wansdyke itself was utilised by the Romans as their own road to Marlborough.

These observations will, I think, have shown the strategic importance of the Hampton Camp. It was the great frontier fortress settlement of the Belgæ; and, as observed before, no doubt permanently occupied by them. Now assuming Dr. Guest's conjecture to be correct as to their name and origin, we shall see that their migrations may have

been dictated by the necessity of their occupation. They had out-grown their own lands in Gaul, or possibly had been driven out by an inundation of the sea, and sought fresh grazing and arable lands in the fertile vallies of Southern Britain, where the Downs afforded dry and safe situations for their fortified settlements ; many of these had no doubt been occupied by the British tribes who had preceded them, but were further strengthened by these men who possessed iron and bronze tools unknown to the early settlers of the stone age. It would also become necessary to mark out in some definite manner the limits of their conquests, both to keep their own cattle in and to exclude those of the neighbouring tribes from their grazing grounds.

That their migration and conquest of South Britain may be thus explained is no mere theory, but is in accordance with what may be called the laws of Nature.

In the primitive times it was undoubtedly the case that the owners of cattle had to move their quarters frequently, their herds and flocks having out-grown the pastures. Abraham and Lot had "exceeding many flocks and herds," and separated in consequence. And cattle, if short of food, would certainly move, whether with or without their master's leave, and draw them after them "to fresh fields and pastures new."

An illustration of this may be drawn from the ranches in N.W. America ; where, when prairie fires or overstocking has laid the pastures bare, the herds rush tumultuously down on the homesteads and wreck them in order to get at the hay and provender stored within. We find the Belgic tribes had before Cæsar's time occupied the greater part of Southern Britain, and were his sturdy antagonists in war.

Dr. Guest considers that the Wansdyke was merely a boundary fence, and argues that it could not be defended in time of war ; but it must be borne in mind that the hedge, that most probably surmounted the bank, would be a very valid obstruction, and one that was certainly made use of as such by the Romans in that famous dyke constructed by Drusus from the Rhine to the Danube, a distance of 300 miles, to repress the incursions of the German tribes. It is called the Pfahl-Graben, or the hedge-bank and ditch, and is still clearly traceable from near Coblenz to Ratisbon. This was like the Wansdyke, guarded at intervals of a few miles by forts garrisoned by Roman soldiers ; one

of these, the *Saal-Burg*, near Homburg, has been carefully explored, and the foundations of all the usual buildings in a Roman camp are visible. When first discovered little more was to be seen than raised mounds, such as we have on Hampton Down. The hedges had grown into trees and thickets, and formed a thick barrier in many places; and the idea was, that if an enemy came through in one place he would have a difficulty in finding again the hole through which he had entered the territory, and might be cut off in his retreat by the garrison of the adjacent forts, which were all within signal notice of each other.

It seems to me that the Wansdyke, with its numerous forts along the line, may have suggested to the Romans the means of fortifying their positions on the Rhine and Danube; and also afterwards, the walls in the North of England to curb the Scots.

The Belgæ were far in advance of the ancient Britons in civilisation and knowledge of husbandry. Whereas the British tribes were wont to burn the straw, and to store the ears of corn, which they cut from the stalks, in holes in the earth, the Belgæ built barns and threshed their corn and stored it therein. But though nearly as much civilised as their neighbours on the continent (says Mr. Elton in his *origins of English History*) they were simpler in their habits. They had not learned to build regular towns, though their kinsmen in Gaul had founded cities with streets and market places. What they called a town or *dunum*, was still no more than a refuge in time of war, a stockade on a hill-top. Their villages were built of beehive huts with roofs of fern or thatch. But their farms were laid out in large fields without enclosures, except when fences were necessary to separate the arable from the pasture. Such enclosures can, I think, be shown on Hampton Down, and must have been more than walls of huts and yards, for some are several acres in extent. It may be that further excavations may show more clearly the nature of this Belgic settlement and the character of its ancient inhabitants, but the main facts above related are, I think, reliable. A building on my side of the camp, the foundations of which are now being cleared, appears to have been erected for some peculiar object and to be of a public nature. It is of an oval shape, and the walls are at least 6ft. thick. The length 93ft., breadth 50ft. It seems to be connected with what looks like an exterior defensive

wall of the settlement on the hither side of the camp. Mr. Scarth finds on the N. side remains of a temple and several barrows, which will probably attract the attention of the Club. On the whole I think the camp deserves very full and serious exploration, and ought to be included in the ancient monuments protected by the Act of Parliament.

The weekly walks have been kept up, but the Secretary has not received any Notes respecting them, and concludes that bodily exercise, unaccompanied with any particular strain upon the mind by way of observation, was the chief object. As he is not always able to join in these walks himself, he wishes members would from time to time send him some result of their meetings, *e.g.*, the time of the flowering of plants, the first appearance of migratory birds, and other events connected with natural history ; any notices connected with the geology of the district, such as the opening of new sections and quarries in the rocks, the occurrence of landslips, so constantly going on around our hills of more or less magnitude, and lastly the state of preservation of our monuments both ancient and modern. In connection with this last subject a communication was received in the summer from the authorities of the Somerset Archæological and Natural History Society, requesting to have a report upon any Ancient Monuments in our neighbourhood which it was desirable to place under Government protection. In accordance with this request a report was made and sent to the secretaries upon the remains of the Wansdyke at Englishcombe and Claverton Down ; also of the Cromlechs opposite Tracey Park, near Castle Combe, and in Orchardleigh Park. It is right to mention here, in connection with the preservation of ancient remains, that the so called altar-stone, of so much archæological interest, having again been brought out from its temporary shelter and exposed to the destructive action of the weather, it was found necessary to call the attention of the Mayor and Corporation to a former presentation from the Club on this



subject. Owing also to a statement made at one of the Quarterly Meetings of the danger lest some of the interesting Roman work lately uncovered at the Baths should be interfered with and obscured by the new buildings in process, your Secretary was empowered to present the following memorial to the Town Council :—“The Committee of the Bath Natural History and Antiquarian Field Club having been credibly informed that a wall has lately been built intersecting some of the Roman work recently uncovered, respectfully beg the Mayor and Corporation to make such structural arrangements in the new work as that any destruction or concealment of the Roman work by plaster or otherwise may be avoided, in order that the public may have free access to, and free inspection of, the valuable system of Baths prevailing at the Roman period. This was presented by your Secretary on Tuesday, November 23rd.

*The Inscribed Leaden Tablet found in the Roman Bath.*

As every reading and every notice of this Table must be of importance and of value to local archæologists, a record of such notices may well find a place in our Proceedings. Two new readings, which will accordingly be acceptable, having recently appeared, they are here, with the kind permission of the authors, produced.

But just lately, in the volume of the Archæological Association for 1886, Mr. W. de Gray Birch, F.S.A., after remarking that the characters on the tablet appear to be a mixture of cursive and rustic letters, assigns the date to a period ranging from the second to the fifth century after Christ. Mr. Birch considers that the reading should be from left to right as usual, but that every word is written or inscribed in reversed order of the letters, a manner quite unique. All other readers have begun at the right-hand side of the first line, and so on each line consecutively from right to left ; but that the reading should be from left to right is clear, as the last line starts from the left and finishes half way across towards the right.

A fac-simile of the tablet given in the Berlin *Hermes*, Vol. xv., March, 1881, shows the inscription clearer than a photograph, and Mr. Birch thus reads the text as :—

QIHIM . MAIBLIV TIVALOG
VI . CIS TAVQIL OMOC AVQA
ELAT . . . . . VVQMAE TI VA
VL . . . . . ANNIVLEVSVEREPV
SXESVN AIRFASVNIREV
ESSILATSVGASVNAITI
MOC SVNAINIMSVTAC
LLINAMREG ANIVOI

No contractions are used except Q for qui. As the whole of the fourth word could not be got into the first line, it was finished on the second, and so with the third, fourth, fifth, sixth and seventh lines which all begin with end parts of words from the lines above them. The reversed mode of writing is supposed to recommend itself to the avenging deity.

By this reading the inscription becomes clear and we get an intelligible piece of tragedy. It works out as :—

Q(ui) MIHI VILBIAM JUGOLAVIT (= jugulavit) SIC LIQUAT (=liquatur)  
 COM<sup>o</sup> (=Comodo, quomodo) AQUA. TALE  
 VU (enus) Q(ui or quæ) CUM (sa)LVAVIT  
 (est or fuit) VELVINNA EXSUPEREUS  
 AFRI(C)ANUS SEVERINUS AGUSTALIS  
 COMITIANUS MINIANUS CATUS GERMANILLA  
 JOVINA

“Mihi” is considered to refer to Germanilla Jovina.

In the *Journal* no translation is given, but Mr. Birch has kindly favoured us—his own version being so desirable—and gives the following ;

May he who cut Vilbia's throat for me melt away like water. It is (or was) Velvinna who cured her of such a wound. Exsupereus

Africanus, Severinus, Augustalis, Comitianus, Minianus, Catus, Germanilla Jovina. These names may possibly be those of witnesses; and lastly comes Germanilla Jovina as the lady whose servant had been so nearly murdered.

In a previous volume of the Archæological Association, that for 1885, Mr. Thos. Morgan, F.S.A., has given an account of his reading, and by his kind permission the following extracts are made. After remarking that three tablets have been found, only this one having been described in print, he reads the inscription, taking the words from right to left, as :—

COLAVIT. VILBIA. M(iniana) MIHI Q(ue)  
 AQUA. COM. CLI(ens) QV(in) T(u)S. E(git) c(ommentariensis)  
 VEL [R] (atiocinator) IV  
 AVITE. AMVL(ius) E(t). AEL(ius) (vel) AEL(ianus)  
 EXPERIVS VELVINNAI(tem) L(avit) V̄  
 GVERINVS. AERIANVS. EX  
 ITIANVS. AGVSTALIS. s(evir)  
 CATVS MINIANVS. COM  
 JOVINA. GERMANILL(a)

Translated thus :—Vilbia Miniana, in company (with Jovina the little sister), bathed in the water four times; and when Quintus my client, ancestrally named Amulius and Ælius or Ælianus, acted as secretary or accountant. Experius Velvinna also bathed five times; Guerinus Ærianus Exitianus member of the Augustal College; as also Catus Minianus, with Jovina the little sister.

The only conjectural emendations made are, the setting out Amulius in full in the third line, and the substitution of V for X the fourth letter from the end, in the fifth line. The reading thus seems to be the testimonial of a family party who went to take the baths, viz. :—Catus Minianus the pater-familias, with his wife or daughter Vilbia, and a little sister Jovina, and their attendants. The words on the tablet are easily read because the position only of the letters is reversed; the letters are written in the right way. This could not therefore have been a tablet for stamping or printing. Professor Zangemeister, of Heidelberg, requires an I instead of E in line two, then Mr. Morgan could read *Ivit* (for *egit*); or if the E be allowed to remain. then *E Commentariis* might be preferred as relating to Avite

Aurelius et Ælius in the third line. *Egit Commentariensis* is not common in inscriptions, though good Latin. The A at the end of the second line forming the first syllable of *Aqua* is considered too faint to do duty as a letter ; omitting it the words would be *mihique quacum cliens Quintus*, which makes the sense more explicit, and the sentence would run :—Vilbia Miniana in company (of the little sister Jovina), bathed four times (*quater*), with whom (*quacum*) my client Quintus went as secretary, &c. The IV in the second line wants the dash over it to mark it as a numeral, though this may have disappeared with age ; if consequently this IV must be read as two letters, then E CIV might stand for *e civibus* if Quintus were entitled to citizenship ; or IV might mean IVIT if the reading E COMMENTARIUS be adopted.

The investigation of the circulation, quality, and quantity of underground waters being one of the subjects about which our Society, as one of the corresponding Societies of the British Association, was requested to acquire information, an application was made to the Baths Committee with a view to ascertain whether any scientific observations had been carried on for a series of years to determine the temperature and volume of the Hot Springs. In reply to this your Secretary was informed that the experiments as to the temperature, which appear to have been carried on merely during the last two years, have been conducted at the expense of a private physician in London. It is very much to be regretted that accurate and scientific observations, in connection with a subject so vastly important to the welfare of the city and general public as the variableness or otherwise of the flow, temperature, and mineral contents of these Hot Springs, should not be systematically made. One other subject may be briefly mentioned, the Club having offered to assist the Mayor in his reception of the Colonial visitors on September 8th and 9th, your Secretary was placed on the Reception Committee, and was in attendance at the Museum of the Royal Literary and Scientific Institution during their visit on the latter day, and briefly pointed out to them the valuable contents of the Moore Geological collection.

The finances of the Club continue in a fairly prosperous position, for though the yearly expenditure exceeds the receipts by £4. 0s. 7d., the Treasurer was able to meet the deficiency by the balance in hand from past years. The increased expenses arising mainly in the Printing items, the Committee have been instructed to consider the question of possible reduction in this quarter.

In conclusion, the past year has been rather an eventful one in the death annals of the Club, three old members whose presence used to be so familiar have passed away; the Rev. A. G. How, General Mulcaster; and C. E. Broome, Esq.; the latter's absence cannot easily be replaced; another \* (star) has fallen out of our list, two only now remain, let his and their example encourage us to work while time is ours!

H. H. WINWOOD,

*Hon. Secretary.*

*Presented*  
25 FEB 1888

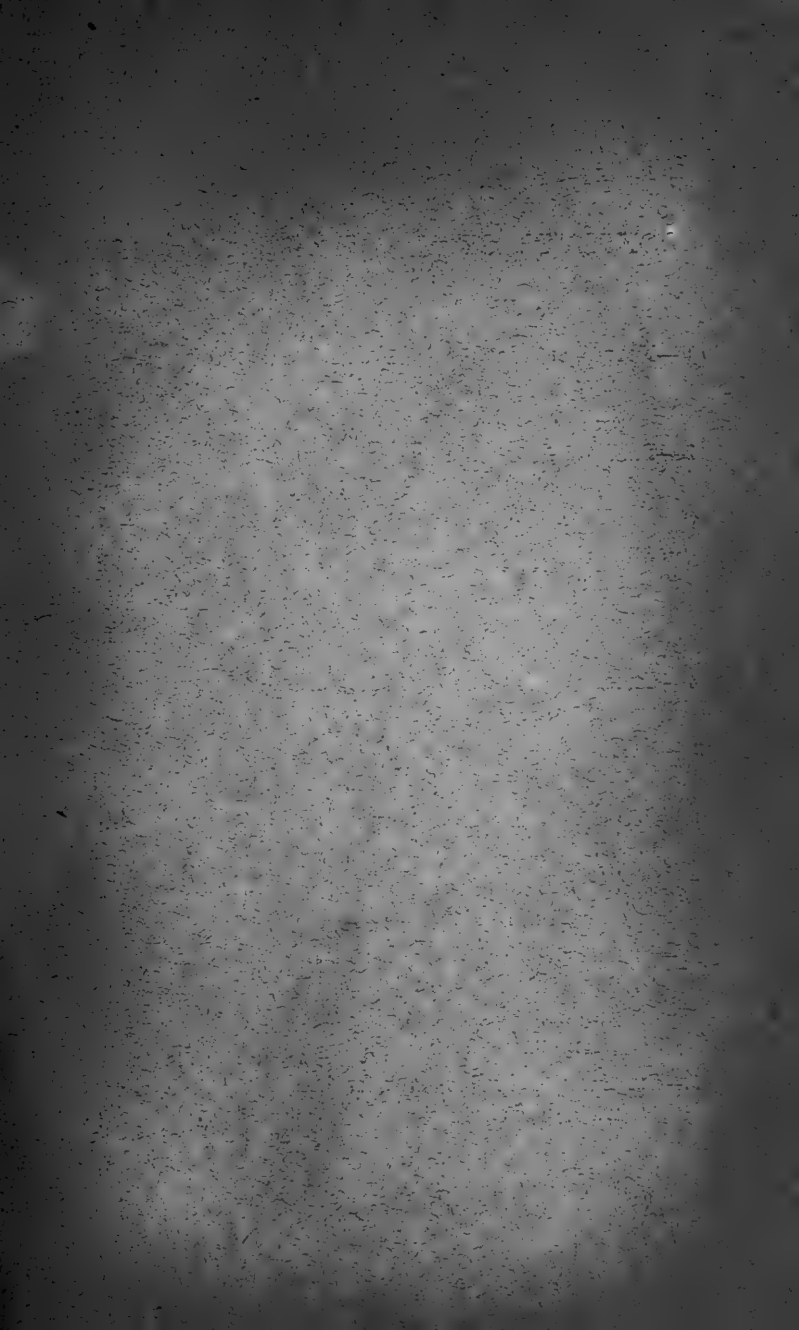


### CORRIGENDA.

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Page 200, tenth line from bottom, for "aneo" read "anes."

Page 201, sixth line from top, before England insert "*the S. of.*"



# CONTENTS OF NO. II., VOL. VI., 1887.

	PAGE.
1.—NOTES ON THE GEOLOGY OF BRENT KNOLL, IN SOMERSETSHIRE, BY HORACE B. WOODWARD, F.G.S. ... ..	125
2.—PLACE-NAMES DERIVED FROM PLANTS (IN THE NEIGHBOURHOOD OF BATH), BY REV. CANON ELLACOMBE ... ..	130
3.—ADDRESS TO THE MEMBERS OF THE BATH FIELD CLUB, IN REFERENCE TO THE DEATH OF C. E. BROOME, ESQ., F.L.S., BY REV. L. BLOMEFIELD, M.A., F.L.S., F.G.S., &c. ... ..	144
4.—TRACES OF THE SAXON PERIOD IN BATH AND THE NEIGHBOURHOOD, BY REV. PREBENDARY EARLE	153
5.—LETTERS ILLUSTRATING THE BATTLES OF CLAVERTON AND LANSDOWN, BY H. D. SKRINE, M.A. ...	167
6.—FURTHER NOTES ON THE CLAVERTON SKIRMISH, BY H. D. SKRINE, M.A. ... ..	180
7.—NOTES ON THE HAM HILL STONE, BY HORACE B. WOODWARD, F.G.S. ... ..	182
8.—FURTHER RESULTS OF METEOROLOGICAL OBSERVATIONS MADE AT THE BATH ROYAL LITERARY AND SCIENTIFIC INSTITUTION, BY REV. LEONARD BLOMEFIELD, M.A., F.L.S., F.G.S., &c. ...	185
9.—SUMMARY OF PROCEEDINGS FOR THE YEAR 1886-87, BY THE SECRETARY ... ..	195



8 JUN. 92

# PROCEEDINGS

BY THE

## BATH NATURAL HISTORY

AND

## ANTIQUARIAN FIELD CLUB.

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NO. 3, VOL. VI.

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1888.

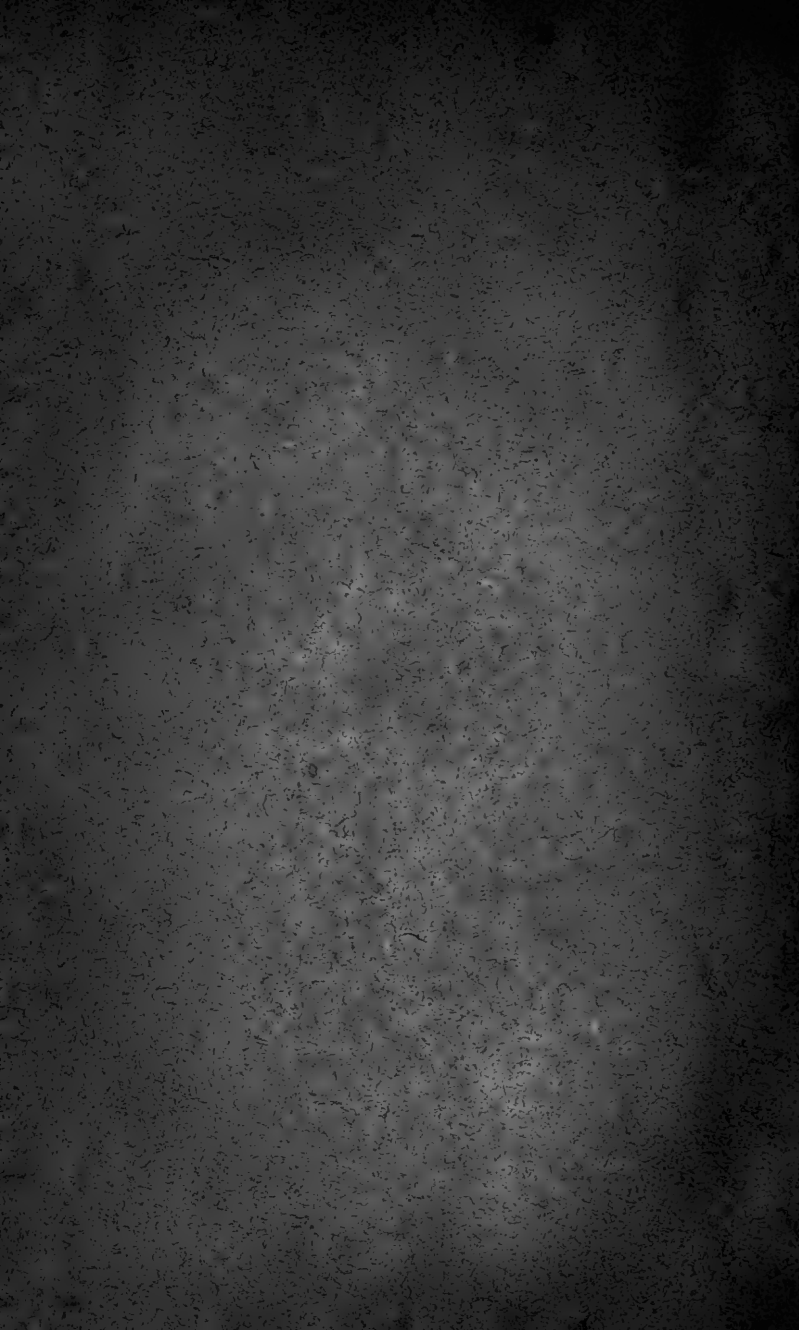


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1888.



*On some Ostracoda from the Fullers-earth Oolite and Bradford Clay.*

By Professor T. RUPERT JONES, F.R.S., F.G.S., and

C. DAVIES SHERBORN, Esq., F.G.S.

(Read November 16th, 1887.)

[Plates i.—v.]

*Introduction.*—In a short paper on Jurassic Microzoa in the *Geological Magazine* for June, 1886 (pp. 271—274), we referred in detail to each of the hand-specimens courteously supplied to us a few weeks previously by the Rev. H. H. Winwood, F.G.S., and H. B. Woodward, Esq., F.G.S., of the Geological Survey. Amongst them were examples of the Fullers-earth Clays, from Midford, containing Ostracoda. These minute bivalved Entomostracan Crustacea are the subject of the present memoir.

The Ostracodes were obtained from the blue and yellow clays of the Fullers-earth Oolite, as exposed in the sections at Midford, near Bath.\* One of the two blue clays is directly under the Great Oolite. Not far beneath is a yellow Fullers-earth Clay; and this rests upon the second bed of blue clay. Very few Microzoa (not 10 per cent.) were found in the yellow bed.

The Rev. H. H. Winwood has also sent us a small piece of the Fullers-earth Rock,† from near Bath, as it contained some Ostracodes. These are rather obscure on account of their embedment in the matrix, but are evidently a *Bairdia* and a *Cytherella*, and are probably of the same species as some of those from the clays.

Several specimens from the base of the Fullers-earth Oolite, near the Cotteswolds (see p. 256), have been courteously sub-

\* The Clays at Midford are mentioned in H. B. Woodward's "Geology of England and Wales," 2nd edition, 1887, p. 297.

† Mentioned in H. B. Woodward's "Geol. England and Wales," 2nd edition, p. 295.

mitted for our examination by Mr. E. A. Walford, F.G.S. They are figured in the fifth plate issued herewith.

One piece of the Bradford Clay from Bradford (*Geol. Mag.*, 1886, p. 273) has yielded a few specimens which are also treated of here.

A bibliographic list of works treating of the Jurassic Ostracoda (omitting those of the Lias and the Purbeck beds) is given in the *Quart. Journ. Geol. Soc.*, vol. xl., p. 776. To this list may be added the paper on the species obtained from the boring at Richmond, Surrey, described in the same volume, and M. O. Terquem's memoir on the Ostracodes from the Inferior Oolite\* of the Department of the Moselle, in France (*Mém. Soc. Géol., France, sér. 3, vol. iv.*, 1885). The latter is elaborate and fully illustrated; but we are not satisfied with all the generic determinations, and the drawings in some instances leave much to be desired. Another such memoir by M. Terquem treats of the Ostracoda of the Inferior Oolite near Warsaw, 1886.

The figures on the five plates illustrating this present memoir give the valves with the anterior extremities upwards; the dorsal and ventral margins being on the *right* and *left hand*, as the case may be. Of course, this position is not in accordance with the natural habit of the animal when swimming; but it is a convenient arrangement in plates, and often adopted. Hence the *height* of the valves (from the *ventral* to the *dorsal* margin) is occasionally referred to in the text as the (apparent) *breadth*.

In every case the specimen has been mounted on a "Beck's revolving disc," and drawn under the camera; and thus the *several views* that we have given of *each* individual type of a species have an assured correctness.

The Ostracodous Genera mentioned in our note in the *Geological Magazine*, June, 1886, have been more accurately determined in

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\* One figure, p. 100, pl. xviii., fig. 1; seems to approach our *C. pentagonalis*, p. 261.

the present memoir. Their characters have been defined chiefly in the works of Sars and Brady. We need offer no remarks except on *Cytheridea*. In this genus the hinge is constructed as described by Jones (*Monogr. Tertiary Entom., Pal. Soc.*, 1856, p. 41) and Brady (*Trans. Zool. Soc.*, vol. v., 1866, p. 369), and has the following characters:—Hinge-margin of the right valve marked with a series of small tubercles, which are received into corresponding depressions of the opposite (left) valve. These tubercles or crenulations are mostly disposed in two terminal groups, and the intervening portion of the valve-margin either is plain, or may be marked by minute tubercles on the left, and corresponding fossæ on the right valve. G. S. B., *l.c.*

The continuance of the crenulation along the dorsal edge occurs in *Cyprideis*, Jones (*Monogr. Tert. Entom.*, p. 21); and, if worthy of being noticed as a distinctive feature, this name might have been retained as subgeneric, were it not that *Cytheridea perforata* and *C. Sorbyana* (*Monogr. Tert. Entom.*, pp. 40 and 44) have it also. Moreover, *Cythere lutea*, Müller, is figured by G. S. Brady as having this hinge-structure in the *Trans. Linn. Soc.*, vol. xxvi., pl. xxviii., fig. 5 *b*, and a simple Cytheridean form of hinge in *Trans. Zool. Soc.*, vol. v., pl. lviii., figs. 13 *c, d*. This shows that merely by the hingement the tests of *Cytheridea*, *Cyprideis*, and *Cythere* cannot be always clearly separated; but, for the sake of convenience in Palæontology, we must use some special terms for the forms having the different kinds of hinges, as they are among the few leading characters that we have at command. Thus those forms having hinges with crenulated teeth and edges are referred to *Cytheridea*, whilst those having the bar and furrow, with teeth (rarely crenulated) at the angles, belong to *Cythere*.\*

We may also notice that the allied *Cytheropteron* and *Loxoconcha* have sometimes crenulations on or near their hinges.

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\* This kind of hinge is definitely described and figured in the *Monogr. Tert. Entom.*, 1856, p. 23, pl. iii.; and in the *Challenge Report*, 1880, p. 62.

## DESCRIPTION OF THE SPECIES.

[*In Zoological arrangement.*]1. BYTHOCYPRIS WINWOODIANA, *sp. n.*Pl. v., figs. 1 *a, b, c.*

Reniform, nearly symmetrical, sub-convex, smooth; left valve overlapping the right on the ventral margin. Edge view, lanceolate; end view, compressed ovate.

Named after the Rev. H. H. Winwood, M.A., F.G.S., who courteously favoured us with some of the material from Midford. One specimen; Blue Fullers-earth Clay, Midford.

2. MACROCYPRIS HORATIANA, *sp. n.*Pl. v., figs. 2 *a, b, c.*

Subreniform, elongate, narrower behind than in front, with a flattening at the antero-dorsal margin. Not very convex; surface perfectly smooth; edge view, lanceolate; end view, narrow-ovate.

Named after Mr. Horace B. Woodward, F.G.S., to whom we are indebted for some of the fossil material from Midford.

This species is near *M. decora*, G. S. Brady, *Challenger Report*, p. 44, pl. 1, fig. 3, but it is shorter, blunter, and less arcuate.

Five examples; Blue Fullers-earth Clay, Midford.

3. MACROCYPRIS TERRÆ-FULLONICÆ,\* *sp. n.*Pl. v., figs. 3 *a, b, c.*

Subreniform, posterior end narrower than the anterior. Ventral margin nearly straight. Well-curved on the dorsal margin. Surface smooth. Edge view, lanceolate; end view, broadly ovate.

Four examples; Blue Fullers-earth Clay, Midford.

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\* Of the Fullers-earth.

## 4. BAIRDIA JUDDIANA, Jones.

*Quart. Journ. Geol. Soc.*, vol. xl., 1884, p. 767, pl. xxxiv., fig. 18.

One perfect example of this boldly characterized *Bairdia* occurs in the Blue Fullers-earth Clay at Midford. It is well known to us as occurring in the Lias, and from the Richmond boring.

## 5. BAIRDIA TRIGONALIS, Jones.

*Quart. Journ. Geol. Soc.*, vol. xl., 1884, p. 767, pl. xxxiv., fig. 19.

Two valves of this species occur in the Blue Fullers-earth Clay, Midford.

6. BAIRDIA FULLONICA, *sp. n.*

Pl. v., figs. 4 *a*, *b*, *c*.

Of the usual subdeltoid outline, evenly convex, smooth, and delicately punctate. We do not, however, know any form yet figured that exactly matches these specimens from the Fullers-earth Oolite. Edge view, lanceolate; end view, sharp-oval.

Two examples; Blue Fullers-earth Clay, Midford.

7. Three examples of *Bairdia*, more nearly approaching to *B. Hilda* (*Quart. Journ. Geol. Soc.*, vol. xl., 1884, p. 771, pl. xxxiv., fig. 20) than to others, occur in the Blue Fullers-earth Clay of Midford; also a single valve of a *Bairdia* very near to the smaller valve of *B. Jurassica* (*loc. cit.*, fig. 22.)

8. CYTHERE SPHÆRULATA, *sp. n.*

Pl. i., figs. 6 *a*, *b*, *c*.

Broadly sub-oblong and convex, with the antero-dorsal border very oblique, and the posterior end well rounded. Surface ornamented with minute tubercles arranged in curved lines, resembling strings of beads, and becoming straighter, but confused in the dorsal region. Edge view, long-ovate; end view, sub-cordate or broadly ovate, with flat base.

One specimen; Yellow Fullers-earth Clay,\* Midford.

The dorsal view (not figured) of this perfect specimen shows the anterior hinge-tubercles usual in *Cythere*, and the dorsal depression (as in *Monogr. Tert. Entom., Pal. Soc.*, pl. iii., fig. 2 c), hence we are inclined to refer this specimen to *Cythere*.

9. *CY THERE* (?) *SPECIOSA*, *sp. n.*

Pl. ii., figs. 10 a, b, c.

Carapace convex and smooth, sinuous on the dorsal margin, the anterior hinge being prominent. The ventral margin is elegantly outlined with an oblique curve. Anterior end nearly semi-circular; posterior narrower, with a sharp curve, and distinct rim. Edge view, sub-sagittate; end view (like that of pl. ii., fig. 8), ovate and compressed dorsally, this depression showing on the front half of the carapace, behind the anterior hinge.

One specimen (unfortunately lost since the drawing was made); Blue Fullers-earth Clay, Midford.

10. *CY THERE* *CORROSA*, *sp. n.*

Pl. ii., figs. 12 a, b, c.

A short, sub-oblong form, neatly rounded behind, and obliquely rounded in front, with the dorsal slope meeting the prominent anterior hinge, and forming a shoulder, hence the dorsal edge shows features strongly suggestive of a *Cythere*. Surface with a rugose, sub-concentric reticulation. Edge view, ovate, slightly compressed at the anterior third; end view, subcordate.

One specimen; Blue Fullers-earth Clay, Midford.

11. *CY THERE* *OSCILLUM*,† *sp. n.*

Pl. iii., figs. 8 a, b, c.

Sub-oval; angularly curved and rimmed in front; angulate with a flattened extremity behind. Ventral margin partly

\* See *Geol. Mag.*, June, 1886, p. 272.

† A little mask.



straight; dorsal margin convex. Hinge consisting of strongly developed, crenulated processes at the angles, separated by a furrow, and with corresponding depressions and ridge or bar in the opposite valve; thus differing in the character of hingement from many of the associated Cytheridean forms.

Surface smooth and convex, but strongly impressed by broad sunken areas along the ventral region, and by more irregular impressions in the dorsal region, there remaining a central, rounded but broken ridge.

One specimen; Blue Fullers-earth Clay, Midford.

12. *CYTHERE JUGLANDICA*, Jones, var. MAJOR, nov.

Pl. iv., figs. 2 a, b.

This form is like *C. juglandica* (*Quart. Journ. Geol. Soc.*, vol. xl., 1884, p. 766, pl. xxxiv., figs. 36 and 37), from the Richmond boring, in all its essentials, but is much broader (higher).

One specimen from the Bradford Clay, Bradford.\*

13. *CYTHERE JUGLANDICA*, Jones, var. MINOR, nov.

Pl. iv., figs. 3 a, b, c.

This also approximates in all essential features to *C. juglandica* too nearly to allow of any specific distinction. The ventral ridging is much stronger in this specimen than in either the type or the var. *major*; but, as this only represents the longitudinal ridges of the meshes in an exaggerated form, the departure from the type is but slight.

One specimen; Blue Fullers-earth Clay, Midford.

14. *CYTHERE WALFORDIANA*, sp. n.

Pl. v., figs. 9 a, b, c.

Mr. Walford's specimens were from the Fullers-earth Oolite in a cutting on the Banbury-and-Cheltenham Railway, about

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\* *Geol. Mag.*, June, 1886, p. 273.

midway between Notgrove and Bourton-on-the-Water, east of the Harford-road Bridge, in Gloucestershire and within the Cotteswolds region. The section has been described by Mr. Walford in the *Quart. Journ. Geol. Soc.*, vol. xxxix., 1873, p. 225; and the Ostracoda were obtained by washing the nodules there described as occurring at the base of the Fullers-earth Blue Clay.

*C. Walfordiana* is represented by one valve of the usual sub-oblong form of this class of *Cythere*. Rather larger than the majority of the specimens from Midford. The anterior hinge is distinct; and near it are two oblique transverse furrows on the valve, with a triangular swelling between them, having its apex directed forwards. The anterior margin is thickly rimmed; and a coarse reticulation covers the valves.

We name this species after Mr. E. A. Walford, F.G.S., through whose kindness we are enabled to catalogue several new forms of Ostracoda from the above-mentioned clay found between Notgrove and Bourton.

15. *CYHERE TRAPEZIOIDES*, *sp. n.*

Pl. v., figs. 10 *a, b, c.*

Convex, oblong, with the front hinge strongly expressed. Obliquely rounded at the ends, and nearly trapezoidal. Posterior extremity suddenly compressed to a flat narrow rim. An irregular wrinkling of the surface is observable on some parts of the valve. The tubules perforating the test, in the subconcentric pits, falsely appear, in some lights, under the microscope as projecting spines, a condition observable in other Ostracoda.

From the base of the Fullers-earth Oolite between Notgrove and Bourton. In Mr. E. A. Walford's collection.

16. *CYHEREIS FULLONICA*,\* *sp. n.*

Pl. iv., figs. 13 *a, b, c.*

This little form is of considerable interest, as it is the first or

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\* Having reference to the Fullers-earth.

oldest known of those allies of *Cythere* which have been divided off as *Cythereis* on account of their quadrate angular features. The smooth test bears, in addition to the characteristic posterior angles, the central tubercle usual in this genus, also a curved lumpy ridge along the ventral region, and a smaller interrupted ridge in the antero-dorsal region.

Two specimens from the Blue Fullers-earth Clay, Midford.

17. *CYTHEREIS WALFORDIANA*, *sp. n.*

Pl. v., figs. 12 *a, b, c.*

This is near to *C. fullonica* (pl. iv., fig. 13), but the surface is somewhat differently sculptured. The anterior ridge is stronger and more continuous, and ends sharply over the hinge; the dorsal ridge is not quite so acute posteriorly; the ventral ridge is somewhat weaker; and there are two small longitudinal ridges on the posterior third of the valve. These last are slightly curved, and one of them bears a small smooth tubercle.

One specimen from the base of the Fullers-earth Oolite between Notgrove and Bourton. Collected by Mr. E. A. Walford, F.G.S., after whom the species is named.

18. *CYThERIDEA ÆQUABILIS*, *sp. n.*

Pl. i., figs. 1 *a, b, c.*

Oblong, with symmetrically rounded and equally compressed ends; the latter feature giving a truly lanceolate edge-view, longer than broad, and diminishing each way from the middle. The hinge-line (seen to the left in figure 1 *a*) is straight, with feeble angles, thus associating this form with similar *Cytherideæ* (figs. 3 and 4), which have this character definitely though weakly marked.

Surface smooth, very convex, especially in the ventral region; end view, broadly ovate.

At first sight this species is something like *Cythere* (?) *tenella*, (*Quart. Journ. Geol. Soc.*, vol. xl., 1884, pl. xxxiv., fig. 24); but the present specimen is much larger and more symmetrical.

It has also some resemblance to Terquem's *Pontocypris subdeltoidea*, *Mém. Soc. Géol. France, sér. 3, vol. iv., 1885, p. 14, pl. ii., fig. 1*, as far as the side view is concerned; but there is no real alliance.

One specimen; Yellow Fullers-earth Clay, Midford.

19. CYTHERIDEA PUNCTIPUTEOLATA, *sp. n.*

Pl. i., figs. 4, a, b, c.

This form resembles pl. i., fig. 2, in outline, but is longer and narrower, more convex in the middle, and more compressed anteriorly. Surface finely punctate, and marked with upwards of 40 larger pits scattered about. Edge view, acute-ovate, compressed anteriorly; end view, almost circular. Hingement differs from that of pl. i., fig. 2, by not clearly showing crenulations on the teeth at the angles; but on this point we are not well satisfied.

One specimen; Blue Fullers-earth Clay, Midford.

20. CYTHERIDEA TERRE-FULLONICÆ, *sp. n.*

*Cytheridea perforata*, Terquem (*non* Roemer). *Mém. Soc. Géol. France, sér. 3, vol. iv., 1885, p. 28, pl. iv., fig. 8.*

Pl. i., figs. 5 a, b, c.

Broad-oblong, ends rounded, the anterior somewhat compressed and rather broader than the posterior, which is slightly rimmed.

Surface coarsely reticulate, with large and irregularly rounded, shallow meshes. Hingement as in pl. i., fig. 2. End view, ovate.

*Cytheridea spinulosa*, G. S. Brady, *Challenger Report*, 1880, pl. xxxiii., fig. 6, is probably allied to this form. The name *perforata*, having been used by Roemer, we refer M. Terquem's species to the form under notice.

Four specimens from the Blue, and two from the Yellow Fullers-earth Clay, Midford. One valve, from the base of the Fullers-earth Oolite, between Notgrove and Bourton, is in Mr. E. A. Walford's collection.

21. CYTHERIDEA WINWOODIANA, *sp. n.*Pl. i., figs. 2 *a, b, c, d.*

Smooth, sub-oblong in outline; anterior hinge sub-angulate, as commonly seen in these forms of Ostracoda. Edge view, narrow-lanceolate, blunted anteriorly; end view, sub-ovate, the valves not being very convex. Hinge consists of a crenulated tooth at each end of a shallow groove in one valve, and corresponding pitted depressions at the extremities of a delicate ridge in the other. This hingement is common to the greater number of Ostracoda here to be described, and has therefore been figured only in a few cases (pl. iii., fig. 11; pl. iv., fig. 9).

*Cytheridea Winwoodiana* is comparable with *Cytheridea sub-perforata*, Jones (*Quart. Journ. Geol. Soc.*, vol. xl., 1884, pl. xxxiv., fig. 26); but the anterior extremity is less contracted and less oblique, while the posterior is more fully rounded.

Named after the Rev. H. H. Winwood, M.A., F.G.S., by whose kindness we received some of the material from which these Ostracoda are here described.

Two examples from the Yellow Fullers-earth Clay, Midford.

22. CYTHERIDEA COARCTATA, *sp. n.*Pl. i., figs. 3 *a, b, c.*

A narrow, convex, approximately oblong form, with oblique ends, making it somewhat subrhomboidal. Surface smooth, marked with a few scattered small pits. Edge view, long-ovate, compressed at the middle; end view, acute-ovate. A form perhaps allied to this is the *Cytheropsis obliquepunctata*, Terquem (*Mém. Soc. Géol., France, ser. 3, tome iv.*, 1885, p. 23, pl. iii., fig. 13).

One specimen; Blue Fullers-earth Clay, Midford.

23. CYTHERIDEA PUTEOLATA, *sp. n.*Pl. i., figs. 7 *a, b, c.*

Also a sub-oblong *Cytheridea*, having the ventral and dorsal

margins nearly parallel ; very convex, especially in the posterior third. A slight transverse depression occurs near the middle, in front of which can be seen the lucid spots of the muscle-mark, visible externally. These apparently consist of a row of four, and there are probably one or two more in front of them. Surface smooth, with a few very faint ridges in the ventral region, and ornamented with scattered shallow pits. Hingement as in pl. i., fig. 2.

Three examples ; Blue Fullers-earth Clay, Midford.

24. *CYTHERIDEA RETORRIDA*,\* *sp. n.*

Pl. i., figs. 8 *a, b, c.*

If compared with pl. i., fig. 5, this form is seen to be less symmetrical, smaller, and narrower. The dorsal margin also is much straighter, and the hinge-line is more defined. The posterior and anterior ends are unequally and obliquely rounded, and the ventral margin is much incurved. Edge view, narrow acute-ovate, falling in sharply at the base; end view, ovate. Ornament somewhat similar to that of pl. i., fig. 5; the carapace has a dried up, parched, or withered appearance.

One specimen ; Yellow Fullers-earth Clay, Midford.

25. *CYTHERIDEA PARALLELA*, *sp. n.*

Pl. i., figs. 9 *a, b, c.*

Sub-oblong, with ends obliquely rounded, especially on the postero-ventral margin. Hinge-line long and distinct. Valves very convex ; the left valve overlapping the right in the posterior region, smooth, and ornamented with some shallow, scattered pits. Edge view, almost lanceolate, the greatest fullness in the posterior third ; end view, almost circular.

Four or five examples from the Blue Fullers-earth Clay, Midford.

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\* Parched.

26. CYTHERIDEA SEDATA,\* *sp. n.*Pl. i., figs. 10 *a, b, c.*

Perfectly smooth and unornamented; much like some of the foregoing sub-oblong forms in general outline, but less convex. Anterior end broadly rounded and compressed; posterior end more convex, and obliquely rounded, curving to join an incurve on the ventral margin. Edge view, narrow-ovate; end view, compressed-ovate.

One specimen from the Blue, and one from the Yellow Fullers-earth Clay, Midford.

27. CYTHERIDEA EMINULA,† *sp. n.*Pl. i., figs. 11 *a, b, c.*

In general outline this approaches *Cythere Blakeana*, Jones (*Quart. Journ. Geol. Soc.*, vol. xl., 1884, pl. xxxiv., fig. 34), but it differs from it in ornamentation considerably, having a few scattered pits instead of a coarse reticulation. Edge view, sharply ovate, apiculate posteriorly; end view, ovate. Hingement like that of pl. i., fig. 2.

Two examples; Blue Fullers-earth Clay, Midford.

28. CYTHERIDEA SUBEMINULA, *sp. n.*Pl. v., figs. 8 *a, b, c.*

A form nearly allied to *C. eminula* (pl. i., fig. 11), but squarer, flatter, and more swollen behind. The surface also differs from that of *C. eminula*, in being quite smooth.

One specimen from the base of the Fullers-earth Oolite, between Notgrove and Bourton. In Mr. E. A. Walford's collection.

29. CYTHERIDEA PENTAGONALIS, *sp. n.*Pl. ii., figs. 1 *a, b, c.*

The dorsal margin of this species has a distinct, but short and

\* Quiet or calm.

† Rising slightly.

slightly incurved hinge-line; the anterior margin slopes with a long curve round to the straight ventral edge, while the posterior margin has two slopes—one ventral, and one meeting the hinge-line. These five border-lines give a pentagonal aspect to the valve. In the edge view the convexity of the valve is nearly equal, making an acute-oval; the end view is ovate, somewhat compressed dorsally. Surface smooth, with small scattered pits. Hingement as in pl. i., fig. 2.

One specimen; Yellow Fullers-earth Clay, Midford.

30. *CYTHERIDEA SUGILLATA*, \* *sp. n.*

Pl. ii., figs. 2 *a, b, c.*

Obovate in outline, almost semicircular anteriorly, more convex posteriorly; the three free margins have a broad and strong rim, that on the ventral margin very nearly hidden by the convexity of the valve. Surface smooth, but raised into irregular wales, weals, or broken rolls in the dorsal region, and into a loosely-reticulate ridge in the ventral region; the weals run together posteriorly, but their junction anteriorly is defined by a small tubercle. Hingement as in pl. i., fig. 2.

Two examples; Blue Fullers-earth Clay, Midford.

31. *CYTHERIDEA REFECTA*, *sp. n.*

Pl. ii., figs. 3 *a, b.*

A sub-oval *Cytheridea*, rounded at the ends, broadest posteriorly; nearly straight on the ventral margin, somewhat sinuous dorsally, with the anterior hinge-joint marked by a small tubercle. Surface somewhat depressed and irregularly undulate, as if it had been crushed and repaired—this feature, however, appears to be natural. Edge view, a narrow acute-oval; end view (not drawn), acute-oval, compressed, and sinuous.

Two or three examples; Blue Fullers-earth Clay, Midford.

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\* Beaten, with weals or wales.



32. CYTHERIDEA VULSA,\* *sp. n.*Pl. ii., figs. 4 *a*, *b*.

Sub-oblong, rounded in front, obliquely rounded behind, straight on the ventral and dorsal margins. Hinge-line long and distinct, terminating anteriorly with a faint tubercle. Surface irregularly convex, depressed and sulcate in the dorsal region, and raised along the ventral region, as if forcibly pinched up. The general appearance, looking at the carapace with the dorsal margin uppermost, is that of a partially melted wax seal, hanging in a curved lump away from the upper margin, and showing a furrow at the top.

One specimen from the Blue Fullers-earth Clay, Midford; another specimen of this form has been sent to us by Mr. E. A. Walford, F.G.S., from the base of the Fullers-earth Oolite between Notgrove and Bourton.

33. CYTHERIDEA HORATIANA, *sp. n.*Pl. ii., figs. 5 *a*, *b*.

This large, smooth, and somewhat oval form, has a short hinge-line in the middle of an arched dorsal margin, with a strong shoulder. The ventral margin is nearly straight, but sinuous, owing to a slight median convexity. The ends are rounded, rather narrow; the anterior largest, but more compressed than the posterior. The lucid spots of the muscle-mark, seen through the shell, are arranged in a group much the same as in other *Cytherideæ*. Hingement the same as in pl. i., fig. 2. There is some fine punctation on the surface of the posterior sixth of the carapace, but it is not shown in the figure.

We name this species after Mr. Horace B. Woodward, F.G.S., to whom we are indebted for some of the material from which these forms were obtained.

Three examples; Blue Fullers-earth Clay, Midford.

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\* Pulled out, or pinched up.

34. CYTHERIDEA OBOVATA, *sp. n.*

Pl. ii., figs. 6 a, b, c.

Smooth and very convex; obovate, the anterior being broader than the posterior; nearly symmetrical, but the dorsal margin is more rounded than the ventral. Edge view, long oval; end view, ovate. A slight notch (not shown in the figure) marks the junction of the anterior and the ventral margins. The hinge-ment in the specimen from which our figures are taken is beautifully perfect, and consists of two crenulated ridges, running side by side and gradually dying away in the middle third of the hinge-line. This is precisely the same feature as seen in *Cytheridea pinguis*, Jones, *Monogr. Tert. Entom., Pal. Soc.*, 1856, p. 43, pl. ii., figs. 4 e, 4 f.

Two or three examples; Yellow Fullers-earth Clay, Midford.

The side view of this form seems to have a close resemblance to that of Terquem's *Bairdia affinis* (*op. cit.* p. 8, pl. i., fig. 1); but there is no real affinity between the two.

35. CYTHERIDEA SPINIGYRATA, *sp. n.*

Pl. ii., figs. 7 a, b, c.

Near *Cythere drupacea*, Jones (*Quart. Journ. Geol. Soc.*, vol. xl., 1884, p. 772, pl. xxxiv., fig. 30), but the posterior end is much broader, and the ornament is more distinctly gyrate, with prickles instead of pits. It is also denticulate on the front margin.

Swollen in posterior ventral region. Hinge-line distinct, and longer than in *C. drupacea*. Hingement, that of pl. i., fig. 2. Edge-view, long-ovate; end view, ovate.

One specimen only; Blue Fullers-earth Clay, Midford.

36. CYTHERIDEA SPINIFASTIGIATA, *sp. n.*

Pl. ii., figs. 8 a, b, c.

This belongs to the same group as the last. It is much swollen in the ventral region, the swelling hiding the incurved margin.

The small notches seen at the anterior hinge are probably due to fracture. Ornament consisting of delicate longitudinal ridges, bearing short, sharp spines. Hingement, as in pl. i., fig. 2.

One specimen; Blue Fullers-earth Clay, Midford.

37. CYTHERIDEA SUBTRIGONA, *sp. n.*

Pl. ii., figs. 9 *a, b, c.*

This form differs from *Cytheridea obovata*, pl. ii., fig. 6, in having a narrower anterior, and a broader posterior margin; and in being somewhat angular at the shoulder or front end of the hinge-line. The edge and end views are less convex than those of *C. obovata*. Hingement, the same as pl. i., fig. 2.

Terquem's *Cytheridea fabacea* (*op. cit.* p. 27, pl. iv., fig. 4) is allied to the form here figured and described.

Three or four examples; Blue Fullers-earth Clay, Midford.

38. CYTHERIDEA POLITULA, *sp. n.*

Pl. v., figs. 7 *a, b, c.*

Small, sub-triangular, smooth, and sparsely pitted. *Cytheridea perforata* of the Tertiary and Cretaceous formations is allied to this form. The tubules at the base of the pits appear falsely as spinules, in some lights, under the microscope.

One specimen from the base of the Fullers-earth Oolite between Notgrove and Bourton. In Mr. Walford's collection.

39. CYTHERIDEA BLAKEANA, *Jones.*

Pl. ii., figs. 11 *a, b, c.*

*Cythere Blakeana*, Jones, *Quart. Journ. Geol. Soc.*, vol. xl., 1884, p. 772, pl. xxxiv., figs. 34, 35.

This appears to be the same as *Cythere Blakeana* from the Richmond boring. Although slightly narrower posteriorly, it agrees in the hingement (as in pl. i., fig. 2) and other important

features. In outline *C. Blakeana* has some alliance with the recent *Cythere impluta*, Brady (*Challenger Report*, 1880, p. 76, pl. xvi., fig. 3), but this latter has a fuller ventral margin, and a more sharply marked outline.

Two examples ; Blue Fullers-earth Clay, Midford.

40. CYTHERIDEA RENOIDES, *sp. n.*

Pl. iii., figs. 1 *a*, *b*, *c*.

Subreniform, smooth, but pitted with large, shallow, scattered holes. Ventral margin slightly incurved ; dorsal margin convex, but with a distinct hinge-line. Ends rounded, the posterior narrowest. Edge view, bluntly lanceolate ; end view, broad-ovate. Hingement, like that of pl. i., fig. 2.

G. S. Brady's figure of *Cytheridea papillosa*, Bosquet (*Trans. Zool. Soc.*, vol. v., 1866, pl. lviii., fig. 8), is almost identical in outline with our figure, but it is broader (higher) than Bosquet's species ; and neither of the two agrees with ours in the surface ornaments and end view.

Four examples from the Blue, and one from the Yellow Fullers-earth Clay, Midford.

41. CYTHERIDEA PULVINAR,\* *sp. n.*

Pl. iii., figs. 2 *a*, *b*, *c*.

A large and sub-oblong form, both ends broadly rimmed ; semicircular in front, angular behind, and having both the ventral and the dorsal margin sinuous and swollen. Surface smooth ; transversely undulate to a slight degree, and marked with large shallow scattered pits. Edge view, lanceolate, with pinched ends ; end view, ovate, with blunt ends. Hingement, as in pl. i., fig. 2.

Three specimens , Blue Fullers-earth Clay, Midford.

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\* A pillow.

42. CYTHERIDEA DOLABRA,\* *sp. n.*Pl. iii., figs. 3 *a, b, c.*

Dorsal margin straight in the middle, strongly sloping towards each end from the hinge-angles; the posterior slope incurved like that of a *Bairdia*. Ventral margin rounded before and behind, and incurved in the middle. Surface smooth, but marked with scattered pits, as in the two foregoing species. Edge view, long acute-ovate; end view, acute-ovate. Hingement, as in pl. i., fig. 2.

Reuss' *C. notata* (*Haidinger's Nat. Abth.*, vol. iii., 1850, pl. ix., fig. 16), approaches this form; but Reuss' species has a strong antero-ventral notch, and a curved transverse mid-dorsal ridge, dying out towards the antero-ventral region.

Four examples; Blue Fullers-earth Clay, Midford.

43. CYTHERIDEA TRANSVERSIPLICATA, *sp. n.*Pl. iii., figs. 4 *a, b, c.*

Broadly curved anteriorly, angulate behind. Dorsal margin almost straight, but slightly projecting at the anterior hinge. Ventral margin sinuous, being incurved in the middle. The valve has somewhat the outline of the sole of a human foot. Surface smooth, but with numerous small transverse undulations (well seen in the edge view), and marked all over with large, irregular, shallow pits. Edge view, bluntly lanceolate, with wrinkled outline; end view, oval. Hingement, the same as pl. i., fig. 2.

One specimen; Blue Fullers-earth Clay, Midford.

44. CYTHERIDEA EGREGIA, *sp. n.*Pl. iii., figs. 5 *a, b, c.*

Nearly allied to the last, but broader, more oblique anteriorly, and rather less angular behind. Surface bearing faint cross

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\* An axe.

wrinkles or undulations; not pitted; with a few limited flattened areas in the anterior and posterior regions. Hingement, as in pl. i., fig. 2.

One specimen; Yellow Fullers-earth Clay, Midford.

45. *CYTHERIDEA VISCERALIS*,\* *sp. n.*

Pl. iii., figs. 6 *a, b, c.*

Oblong with oblique ends, subrhomboidal; truncate in front, angular behind. Surface punctate, swollen into irregular lumps, and having a short depression in the antero-ventral region, and a flattened area along the postero-ventral border.

One specimen; Blue Fullers-earth Clay, Midford. In Mr. Walford's collection, there is a specimen from the base of the Fullers-earth Oolite between Notgrove and Bourton, which we regard as an immature specimen of this form. It differs from the figured individual in being smaller, and in having the postero-ventral swelling more prominent; thus giving the valves a more triangularly sagittate edge view.

46. *CYTHERIDEA STRIBLITA*,† *sp. n.*

Pl. iii., figs. 7 *a, b, c.*

Sub-oblong, with rounded anterior margin, and angular posterior margin; sloping on the postero-dorsal margin, and flattened at its extremity. Surface smooth, with a few pits; irregularly swollen, and partially crossed by a sulcus, it looks like a dough cake. The hingement is as in pl. i., fig. 2.

Two specimens; Blue Fullers-earth Clay, Midford

47. *CYTHERIDEA IGNOBILIS*, *sp. n.*

Pl. iii., figs. 9 *a, b, c.*

Neatly sub-oblong, convex; rounded in front, straight at

\* Like bowels.

† A twisted cake.

upper and lower margins, and bluntly angular behind. This simple form is covered with minute puncta, amongst which are sparsely scattered a few pits. Edge view, sub-lanceolate; end view, acute-ovate. Hingement, as in pl. i., fig. 2.

Two specimens; Blue Fullers-earth Clay, Midford.

48. CYTHERIDEA VENTROSA, *sp. n.*

Pl. iii., figs. 10 *a, b, c.*

Obovate, but angular and lipped behind, and rather narrowed anteriorly. Convex and quite smooth. Edge view, sharp-oval; end view, ovate. Hingement, like that of pl. i., fig. 2.

One specimen; Blue Fullers-earth Clay, Midford.

49. CYTHERIDEA PURA, *sp. n.*

Pl. iii., figs. 11 *a, b, c, d.*

A delicate and simple form, much like a common type of *Cythere*, having a curved dorsal margin, rounded anterior, angular posterior, and swollen ventral margin, defined at each end by a slight depression. Altogether, sub-oval, smooth, and convex. Hingement, as in pl. i., fig. 2. In some respects allied to *Cythere virginea*, Jones (*Monogr. Cretaceous Entom., Palæontographical Society*, 1848, p. 12, pl. i., fig. 2*n*). If magnified 75 diameters, the surface has the appearance of hammered metal.

One specimen; Blue Fullers-earth Clay, Midford.

50. CYTHERIDEA LIMACIFORMIS,\* *sp. n.*

Pl. iii., figs. 12 *a, b, c.*

Ovate-oblong, very convex; hinge-line distinct; ventral region swollen; posterior end somewhat angular and lipped. There are some faint ridges parallel with the ventral margin, not well shown in the figure. Hingement, like that of pl. i., fig. 2.

One specimen; Blue Fullers-earth Clay, Midford.

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\* Like a slug (resting).

51. CYTHERIDEA TRAPEZOIDALIS, *Terquem.*Pl. iv., figs. 1 *a, b.*

*Mém. Soc. Géol., France*, ser. 3, vol. iv., 1885, p. 31, pl. iv., figs. 20 *a, b, c.*

Straight on the dorsal margin, angular behind, with the postero-ventral slope reaching into the middle of the ventral margin, giving to the latter an obtuse angle. Both anterior and posterior margins are lipped. Surface moderately convex, smooth, but sparsely pitted; and with two or three shallow transverse sulci in the dorsal region. Hinge-line very long.

Terquem's figures are not quite equal among themselves, but, taking the average, we think that they are not unlike the form here figured and described.

One specimen; Blue Fullers-earth Clay, Midford.

52. CYTHERIDEA PERSICA,\* *sp. n.*

Pl. iv., fig. 4.

Roughly obovate, much resembling a coarsely marked peach-stone, rounded in front, angular behind, and lipped at each extremity. A strong longitudinal keel is developed on the ventral margin of the valve, and this is repeated, with less intensity, by the raised ridges of the concentric reticulation on that region.

Edge view (not drawn), compressed ovate, with apiculate ends. Hingement, like that of pl. i., fig. 2.

One specimen; Blue Fullers-earth Clay, Midford.

53. CYTHERIDEA BICARINATA, *sp. n.*Pl. iv., figs. 5 *a, b, c.*

Sub-obovate, obliquely rounded in front, angular and lipped behind. Dorsal margin oblique, with a straight hinge-line, which is tuberculate externally. The ventral region bears two

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\* With reference to the stone of a peach.



ridges, one of which overhangs and hides the margin. The surface is more strongly reticulate than shown in the figure; it has a low tubercle on the anterior third, and a limited impression on the posterior region, near the dorsal border. Edge view, bluntly sub-sagittate; end view, sub-quadrate.

Four examples; Blue Fullers-earth Clay, Midford.

54. *CYTHERIDEA OSTREATA*,\* *sp. n.*  
Pl. iv., figs. 6 *a*, *b*, *c*.

A large and sub-oblong *Cytheridea*, obliquely rounded in front, contracted and irregularly angular behind. Dorsal margin straight; anterior hinge-angle prominent, hinder hinge-angle hidden by a coarse, irregular growth of shelly matter. Surface reticulate, with irregular meshes, looking like oyster-spat. Two strong ridges runs along the ventral region, the upper of which turns upwards, and runs parallel with the two ends of the valve for some distance. Hingement, as in pl. i., fig. 2.

One specimen; Yellow Fullers-earth Clay, Midford.

55. *CYTHERIDEA RUGIFERA*, *sp. n.*  
Pl. v., figs. 11 *a*, *b*, *c*.

Oblong, obliquely rounded in front, rounded and deeply rimmed behind. Upper and lower margins slightly incurved. Surface rugulose (not well shown in the figure), with numerous small, shallow, irregular depressions. A slight curved ridge rises above and behind the front hinge.

From the base of the Fullers-earth Oolite between Notgrove and Bourton. In Mr. E. A. Walford's collection.

56. *CYTHERIDEA ACUTIPPLICATA*, *n. sp.*

Pl. iv., figs. 7 *a*, *b*; 8 *a*, *b*, *c*.

Obovate, being broader (higher) anteriorly than posteriorly.

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\* Scabby, as if covered with small oyster shells.

Surface marked with sharp longitudinal ridges. There are two very closely allied forms of this species. In fig. 7 the anterior margin is thickened and pitted, and the ridges, instead of occupying the middle of the valve (as in fig. 8), occupy the posterior half: fig. 7 has also a longer valve, and the dorsal region differs from that of fig. 8, in not being compressed. Hingement, as in pl. i., fig. 2.

Two specimens of fig. 7 from the Blue Fullers-earth Clay; and one specimen of fig. 8 from the Blue, and one from the Yellow Fullers-earth Clay of Midford.

57. CYTHERIDEA CRATICULA,\* *sp. n.*

Pl. iv., figs. 9 *a, b, c*, and 10 *a, b, c*.

These two specimens appear to us to belong to one form, fig. 9 being weaker in its details, and narrower in the posterior region than fig. 10. Taking the latter (fig. 10) as the type, we may describe it as having an oblong carapace, with an angular posterior margin. The surface bears several longitudinal ridges, more or less curved, coarsely reticulate in the interspaces, the meshes passing up on the sides of the largest ridges, making them fenestrate. We consider fig. 9 rather as a weak variety, than as an immature form of fig. 10. Hingement, as in pl. i., fig. 2.

Of fig. 9, one specimen from the Yellow Fullers-earth Clay; of fig. 10, two specimens from the Blue Fullers-earth Clay, Midford.

58. CYTHERIDEA BRADIANA, *Jones*.

Pl. iv., figs. 11 *a, b, c*.

*Cythere Bradiana*, Jones, *Quart. Journ. Geol. Soc.*, vol. xl., 1884, p. 772, pl. xxxiv., figs. 38 *a, b*.

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\* A gridiron

We see no reason for separating this form from that figured under the name of *C. Bradiana*, from the Richmond boring. Hingement, like that of pl. i., fig. 2.

This character of ornament, ridges with intermediate rows of pits, is figured also in *Cythere Jurinei*, Münster, by G. S. Brady, *Trans. Zool. Soc.*, vol. v., 1866, p. 372, pl. lix., fig. 1.

Five examples from the Blue Fullers-earth Clay, Midford.

59. CYTHERIDEA FULGURATA, *sp. n.*

Pl. iv., figs. 12 *a, b, c.*

Sub-obovate, convex, with straight but oblique dorsal and ventral margins; rounded and lipped in front, and angular, broadly lipped, and depressed behind. Surface smooth, and bearing two longitudinal, slightly curved ridges in the ventral region, and several minor oblique ridges, irregular, but radiating from the middle of the dorsal, towards the ventral region. Hingement, as in pl. i., fig. 2.

Four examples from the Blue Fullers-earth Clay, Midford; and two or three examples from the Bradford Clay, Bradford.

60. CYTHERIDEA EXIMIA, *sp. n.*

Pl. v., figs. 5 *a, b, c.*

Oblong, with obliquely rounded ends; straight dorsal, and slightly sinuous ventral margin. Both extremities have a depressed rim. Surface very convex, especially in the posterior region; finely punctate, and also pitted with scattered shallow pits. Edge view, lanceolate. End view, broadly ovate, almost circular. The hingement is the same as in pl. i., fig. 2.

One specimen; Yellow Fullers-earth Clay, Midford.

61. CYTHERELLA FULLONICA, *sp. n.*Pl. i., figs. 12 *a, b, c.*

Sub-oblong, compressed, with a faint median sulcus, slightly incurved on the ventral, and somewhat angular on the dorsal margin, symmetrically rounded anteriorly; contracted posteriorly. Surface smooth, muscle-mark unusually distinct, in the ordinary shallow depression.

This approaches *C. pulchra*, G. S. Brady (*Trans. Zool. Soc.*, vol. v., 1866, p. 361, pl. lvii., fig. 5), in general appearance, but its ventral incurve is more marked, and the postero-dorsal margin has a stronger angle and slope. The dorsal process is analogous to that seen in *C. dromadaria*, G. S. Brady (*Challenger Report*, 1880, p. 173, pl. xliii., fig. 6), but is very rare in *Cytherella*. *C. Leopolitana*, Reuss (*Denkschr. k. Ak. Wiss., Wien*, vol. vii., 1854, p. 140, pl. xxvii, fig. 4), has projections on both upper and lower margins.

Four examples from the Blue, and four from the Yellow Fullers-earth Clay, Midford. We have also seen three similar valves, but with the dorsal process obsolete or nearly so, in the small collection of Ostracoda sent to us by Mr. E. A. Walford, and collected at the base of the Fullers-earth Oolite between Notgrove and Bourton.

62. CYTHERELLA CATENULATA, *sp. n.*Pl. v., figs. 6 *a, b, c.*

This *Cytherella*, of the usual oblong outline, with rounded ends and slightly incurved ventral region, has an irregularly wavy surface, very clearly seen in the edge view. The surface is ornamented with a neatly regular concentric reticulation, the elongated meshes of which assume a chain-like appearance.

Nine examples from the Blue, and one from the Yellow Fullers-earth Clay, Midford. We have also received one specimen from the base of the Fullers-earth Oolite between Notgrove and Bourton, from Mr. E. A. Walford, F.G.S.

TABLE OF THE FOSSIL OSTRACODA FROM THE FULLERS-  
EARTH OOLITE AND THE BRADFORD CLAY.

[Zoologically arranged.]

	MIDFORD.		Base of F.E. Oolite.	Bradford Clay.
	Blue Clay.	Yellow Clay.		
1 <i>Bythocypris</i> <i>Winwoodiana</i> , <i>n.</i> ...	...	X		
2 <i>Macrocypis</i> <i>Horatiana</i> , <i>n.</i> ...	...	X		
3 ——— <i>terræ-fullonicæ</i> , <i>n.</i> ...	...	X		
4 <i>Bairdia</i> <i>Juddiana</i> , <i>J.</i> ...	...	X		
5 ——— <i>trigonalis</i> , <i>J.</i> ...	...	X		
6 ——— <i>fullonica</i> , <i>n.</i> ...	...	X		
7 ——— 2 <i>spp.</i> ...	...	X		
8 <i>Cythere</i> <i>sphærulata</i> , <i>n.</i> ...	...	—	X	
9 ———? <i>speciosa</i> , <i>n.</i> ...	...	X		
10 ——— <i>corrosa</i> , <i>n.</i> ...	...	X		
11 ——— <i>oscillum</i> , <i>n.</i> ...	...	X		
12 ——— <i>juglandica</i> , <i>J. var. major</i> , <i>n.</i>	...	—	—	X
13 ——— <i>var. minor</i> , <i>n.</i> ...	...	X		
14 ——— <i>Walfordiana</i> . <i>n.</i> ...	...	—	—	X
15 ——— <i>trapezioides</i> , <i>n.</i> ...	...	—	—	X
16 <i>Cythereis</i> <i>fullonica</i> , <i>n.</i> ...	...	X		
17 ——— <i>Walfordiana</i> , <i>n.</i> ...	...	—	—	X
18 <i>Cytheridea</i> <i>æquabilis</i> , <i>n.</i> ...	...	—	X	
19 ——— <i>punctiputeolata</i> , <i>n.</i> ...	...	X		
20 ——— <i>terræ-fullonicæ</i> , <i>n.</i> ...	...	X	X	
21 ——— <i>Winwoodiana</i> , <i>n.</i> ...	...	—	X	
22 ——— <i>coarctata</i> , <i>n.</i> ...	...	X		
23 ——— <i>puteolata</i> , <i>n.</i> ...	...	X		
24 ——— <i>retorrida</i> , <i>n.</i> ...	...	—	X	
25 ——— <i>parallela</i> , ...	...	X		
26 ——— <i>sedata</i> , <i>n.</i> ...	...	X	X	
27 ——— <i>eminula</i> , <i>n.</i> ...	...	X		
28 ——— <i>subeminula</i> , <i>n.</i> ...	...	—	—	X
29 ——— <i>pentagonalis</i> , <i>n.</i> ...	...	—	X	
30 ——— <i>sugillata</i> , <i>n.</i> ...	...	X		

		MIDFORD.		Base of	Bradford
		Blue	Yellow	F.E.	Clay.
		Clay.	Clay.	Oolite.	
31	refecta, <i>n.</i>	...	X		
32	vulsa, <i>n.</i> ...	...	X	—	X
33	Horatiana, <i>n.</i>	...	X		
34	obovata, <i>n.</i>	...	—	X	
35	spinigyrata, <i>n.</i>	...	X		
36	spinifastigiata, <i>n.</i>	...	X		
37	subtrigona, <i>n.</i>	...	X		
38	politula, <i>n.</i>	...	—	—	X
39	Blakeana, <i>J.</i>	...	X		
40	renoides, <i>n.</i>	...	X	X	
41	pulvinar, <i>n.</i>	...	X		
42	dolabra, <i>n.</i>	...	X		
43	transversiplicata, <i>n.</i>	...	X		
44	egregia, <i>n.</i>	...	—	X	
45	visceralis, <i>n.</i>	...	X	—	—
46	striblita, <i>n.</i>	...	X		X
47	ignobilis, <i>n.</i>	...	X		
48	ventrosa <i>n.</i> ...	...	X		
49	pura, <i>n.</i> ...	...	X		
50	limaciformis, <i>n.</i>	...	X		
51	trapezoidalis, <i>Terquem</i>	...	X		
52	persica, <i>n.</i> ...	...	X		
53	bicarinata, <i>n.</i>	...	X		
54	ostreata, <i>n.</i>	...	—	X	
55	rugifera, <i>n.</i>	..	—	—	X
56	acutiplicata, <i>n.</i>	...	X	X	
57	craticula, <i>n.</i>	...	X	X	
58	Bradiana, <i>J.</i>	...	X		
59	fulgurata, <i>n.</i>	...	X	—	—
60	eximia, <i>n.</i>	...	—	X	
61	<i>Cytherella fullonica, n</i>	...	X	X	X
62	catenulata, <i>n.</i>	...	X	X	X.

## EXPLANATION OF THE PLATES.

*N.B.* All the Figures are magnified 50 diameters.

- Plate i., Figs. 1 *a, b, c.* *Cytheridea æquabilis, sp. n.*  
 " " 2 *a, b, c, d.* *Cytheridea Winwoodiana, sp. n.*  
 " " 3 *a, b, c.* *Cytheridea coarctata, sp. n.*  
 " " 4 *a, b, c.* *Cytheridea punctiputeolata, sp. n.*  
 " " 5 *a, b, c.* *Cytheridea terræ-fullonicæ, sp. n.*  
 " " 6 *a, b, c.* *Cythere sphærulata, sp. n.*  
 " " 7 *a, b, c.* *Cytheridea puteolata, sp. n.*  
 " " 8 *a, b, c.* *Cytheridea retorrída, sp. n.*  
 " " 9 *a, b, c.* *Cytheridea parallela, sp. n.*  
 " " 10 *a, b, c.* *Cytheridea sedata, sp. n.*  
 " " 11 *a, b, c.* *Cytheridea eminula, sp. n.*  
 " " 12 *a, b, c.* *Cytherella fullonica, sp. n.*
- Plate ii., Figs. 1 *a, b, c.* *Cytheridea pentagonalis, sp. n.*  
 " " 2 *a, b, c.* *Cytheridea sugillata, sp. n.*  
 " " 3 *a, b.* *Cytheridea resecta, sp. n.*  
 " " 4 *a, b.* *Cytheridea vulsa, sp. n.*  
 " " 5 *a, b, c.* *Cytheridea Horatiana, sp. n.*  
 " " 6 *a, b, c.* *Cytheridea obovata, sp. n.*  
 " " 7 *a, b, c.* *Cytheridea spinigyrata, sp. n.*  
 " " 8 *a, b, c.* *Cytheridea spinifastigiata, sp. n.*  
 " " 9 *a, b, c.* *Cytheridea subtrigona, sp. n.*  
 " " 10 *a, b, c.* *Cythere ? speciosa, sp. n.*  
 " " 11 *a, b, c, d.* *Cytheridea Blakeana, Jones.*  
 " " 12 *a, b, c.* *Cythere corrosa, sp. n.*
- Plate iii., Figs. 1 *a, b.* *Cytheridea renoides, sp. n.*  
 " " 2 *a, b.* *Cytheridea pulvinar, sp. n.*  
 " " 3 *a, b, c.* *Cytheridea dolabra, sp. n.*  
 " " 4 *a, b, c.* *Cytheridea transversiplicata, sp. n.*  
 " " 5 *a, b, c.* *Cytheridea egregia, sp. n.*  
 " " 6 *a, b, c.* *Cytheridea visceralis, sp. n.*  
 " " 7 *a, b, c.* *Cytheridea stríblita, sp. n.*  
 " " 8 *a, b, c.* *Cythere oscillum, sp. n.*  
 " " 9 *a, b, c.* *Cytheridea ignobilis, sp. n.*

- „ „ 10 *a, b, c.* *Cytheridea ventrosa, sp. n.*  
 „ „ 11 *a, b, c.* *Cytheridea pura, sp. n.*  
 „ „ 12 *a, b, c.* *Cytheridea linaciformis, sp. n.*  
 Plate iv., Figs. 1 *a, b, c.* *Cytheridea trapezoidalis, Terquem*  
 „ „ 2 *a, b, c.* *Cythere juglandica, Jones, var. major, nov.*  
 „ „ 3 *a, b, c.* *Cythere juglandica, Jones, var. minor, nov.*  
 „ Fig. 4 *Cytheridea persica, sp. n.*  
 „ Figs. 5 *a, b, c.* *Cytheridea bicarinata, sp. n.*  
 „ „ 6 *a, b, c.* *Cytheridea ostreata, sp. n.*  
 „ „ 7 *a, b;* and 8 *a, b, c.* *Cytheridea acutiplicata, sp. n.*  
 „ „ 9 *a, b, c;* and 10 *a, b, c.* *Cytheridea craticula, sp. n.*  
 „ „ 11 *a, b, c.* *Cytheridea Bradiana, Jones.*  
 „ „ 12 *a, b, c.* *Cytheridea fulgurata, sp. n.*  
 „ „ 13 *a, b, c.* *Cythereis fullonica, sp. n.*  
 Plate v., Figs. 1 *a, b, c.* *Bythocypris Winwoodiana, sp. n.*  
 „ „ 2 *a, b, c.* *Macrocypris Horatiana, sp. n.*  
 „ „ 3 *a, b, c.* *Macrocypris terræ-fullonicæ, sp. n.*  
 „ „ 4 *a, b, c.* *Bairdia fullonica, sp. n.*  
 „ „ 5 *a, b, c.* *Cytheridea eximia, sp. n.*  
 „ „ 6 *a, b, c.* *Cytherella catenulata, sp. n.*  
 „ „ 7 *a, b, c.* *Cytheridea politula, sp. n.*  
 „ „ 8 *a, b, c.* *Cytheridea subeminula, sp. n.*  
 „ „ 9 *a, b, c.* *Cythere Walfordiana, sp. n.*  
 „ „ 10 *a, b, c.* *Cythere trapezioides, sp. n.*  
 „ „ 11 *a, b, c.* *Cytheridea rugifera, sp. n.*  
 „ „ 12 *a, b, c.* *Cythereis Walfordiana, sp. n.*

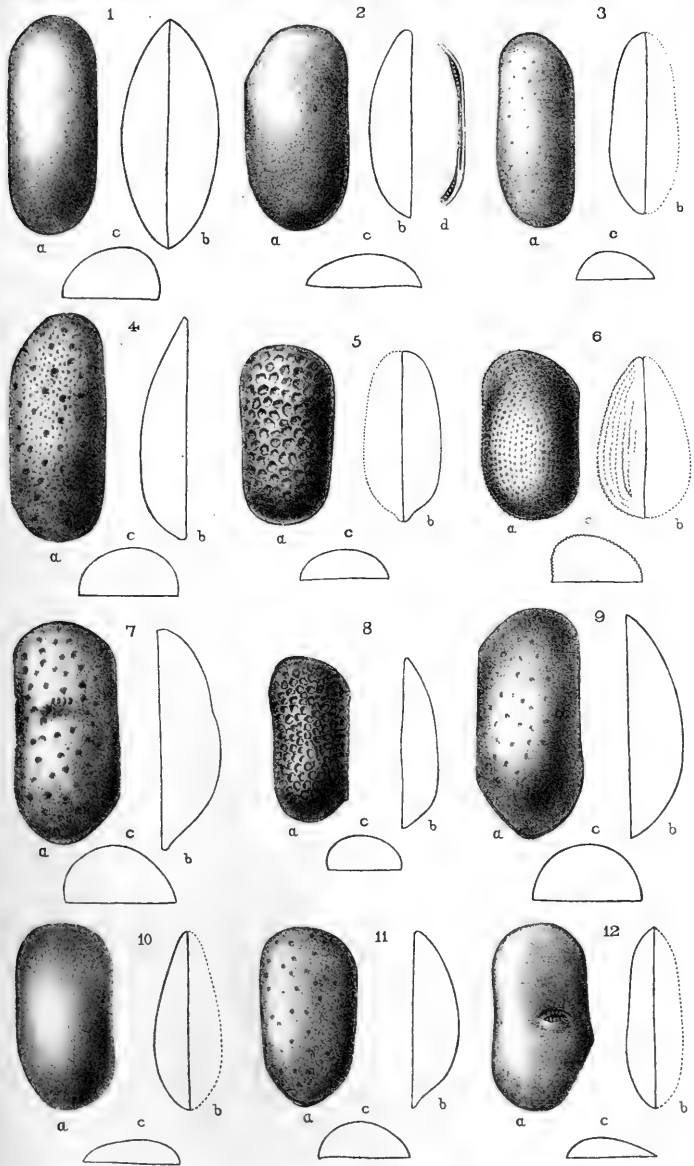
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*Landslips and Subsidences.* By W. PUMPHREY, Esq.

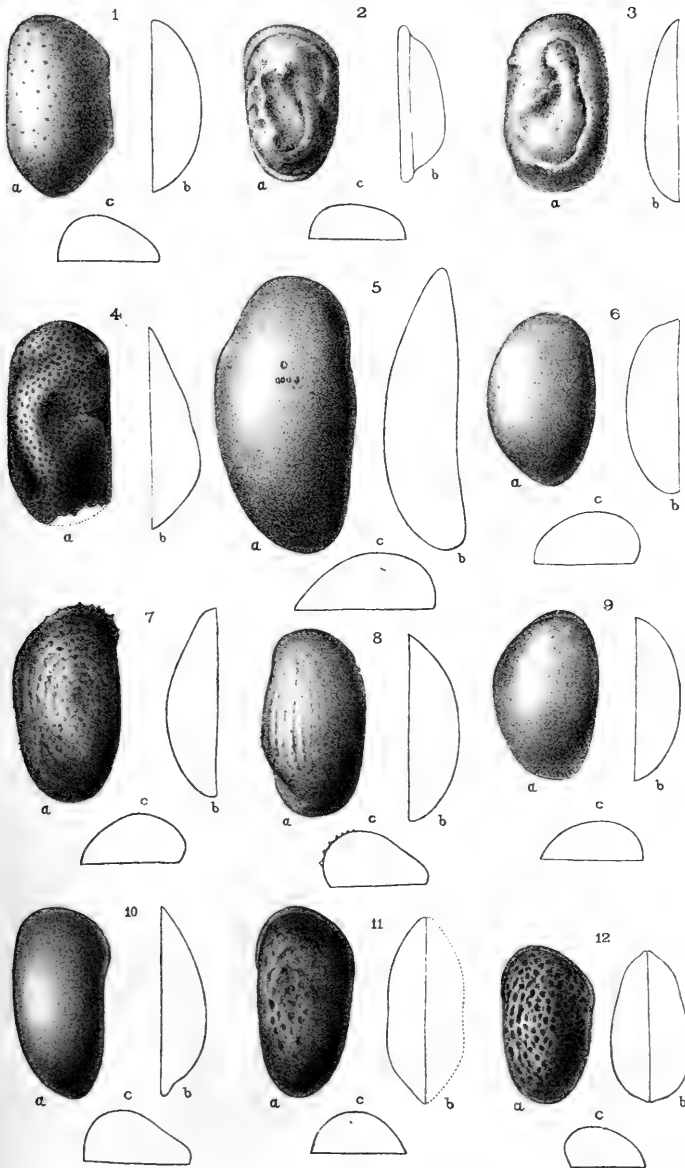
(Read 16th November, 1887.)

My excuse for taking up your time on the present occasion must be that having been accidentally very near the scene of the disaster at Zug, on July 5th, I became considerably interested in the affair, and possibly am inclined to attach too great importance to it.







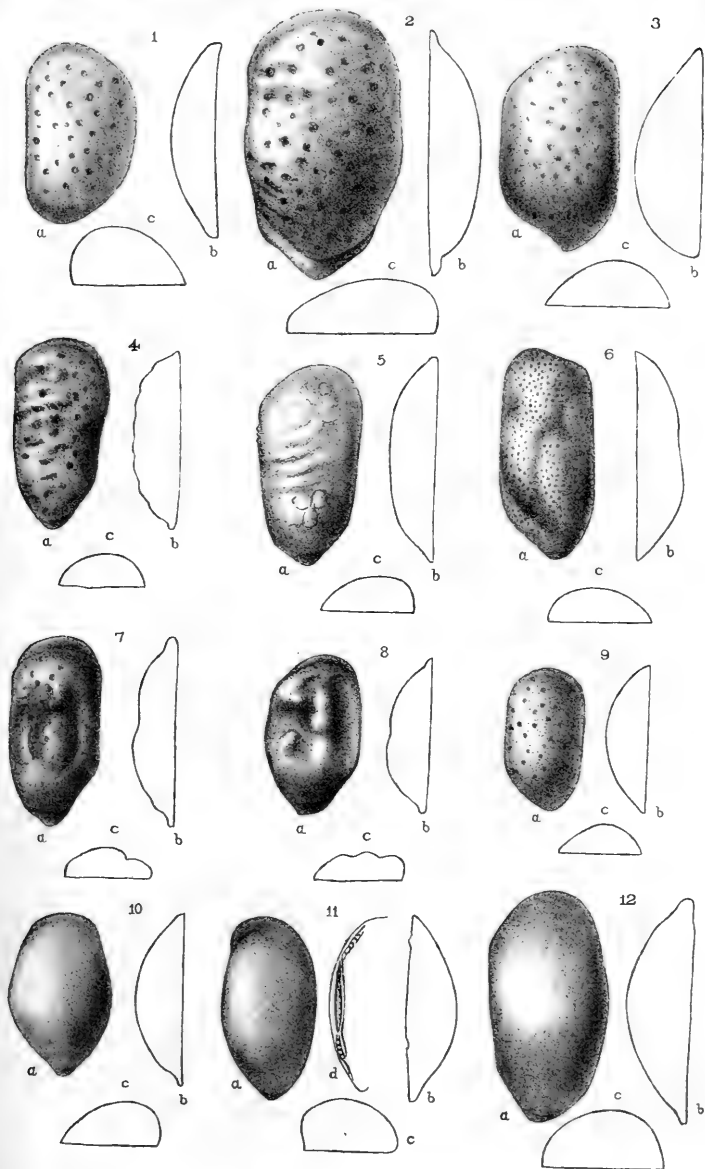


C.D.S & G.W. del.

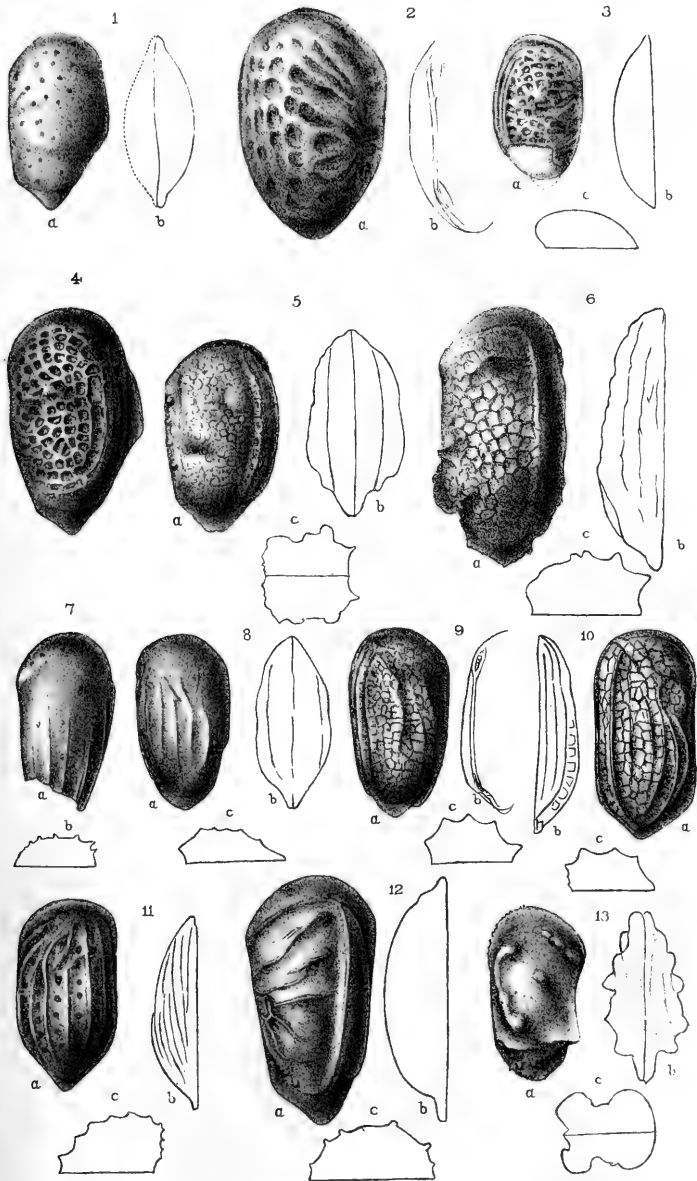
Geo. West & Sons lith et imp.

OSTRACODA OF THE FULLERS-EARTH OOLITE.





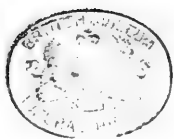




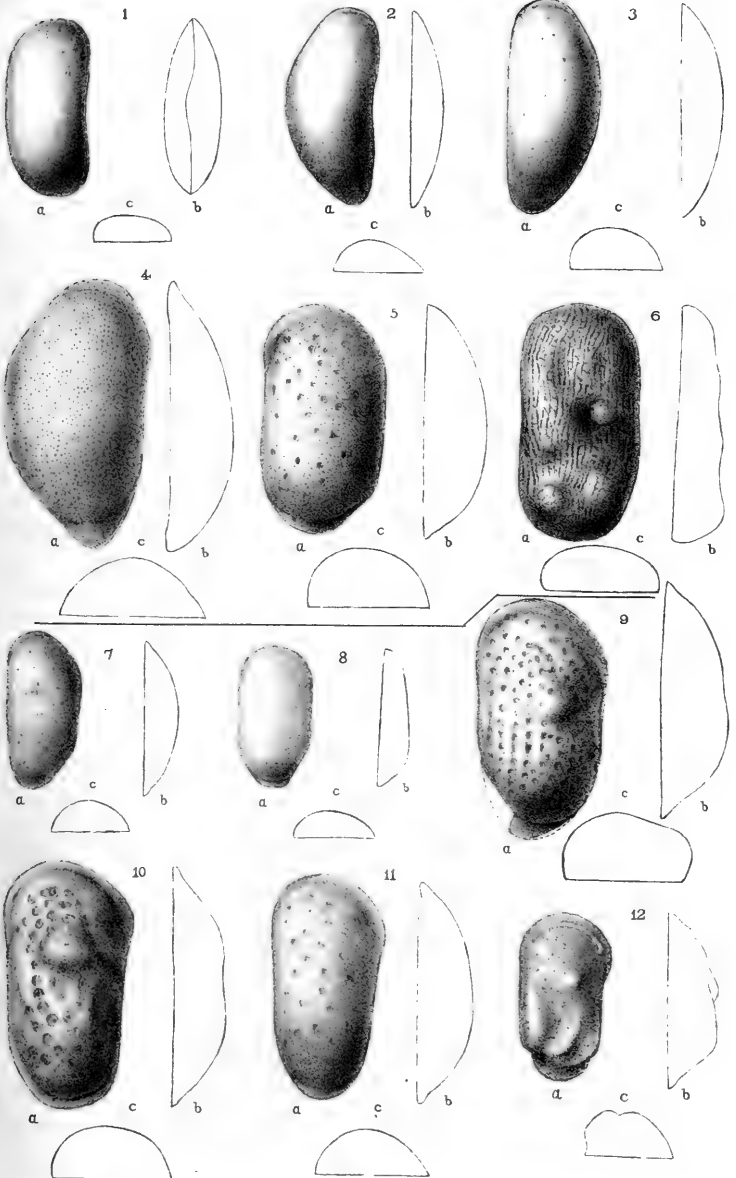
C.D.S & G.W. del.

Geo. West & Sons lith. et imp.

OSTRACODA OF THE FULLERS EARTH OOLITE.







C.D.S.&G.W.del.

Geo West & Sons, lith et imp.

OSTRACODA OF THE FULLERS-EARTH OOLITE.



Before referring to the event of July it may be well to glance at the general contour of the surrounding country. The Lake of Zug, which has an elevation above the sea of 1,368 feet, and a depth of about 1,300 feet, is at its upper and southern end hemmed in by the Rigi and the Rossberg, which are separated by the low pass, by means of which the St. Gothard railway is enabled to avoid some of the engineering difficulties that the bizarre outline of the Lake of Lucerne presented. From this low pass and from the northern slopes of the Rigi, and from the western slopes of the Rossberg a series of small streams send down their waters to the Lake, but the quantity is not large. The greater part comes from the northern slopes of the Rossberg, and after passing through the Egeri See, takes a northerly direction till it passes the hills that bound the Lake of Zug on the east, when turning to the west and then to the south-west it falls into the Lake very near its outlet. In the latter part of its course it traverses a very level tract of country, the result apparently of fluvial detritus.

The Rigi and the Rossberg have not contributed largely towards the filling up the Lake of Zug—the alluvial tract at the head of the Lake being of small extent. But they have given us some striking examples of landslips on a large scale. They are both mainly composed of beds of conglomerate (Nagelfluh) consisting of calcareous and silicious pebbles cemented together by a calcareous infiltration, which has bound the whole into a concrete mass, so firm that very often the compacted pebbles will break across rather than quit the mass. These beds of conglomerate are separated by beds of sand and clay, and anything that seriously disturbs these beds has a tendency to alter the relation in which they stand towards each other. Hence changes have taken place from time to time, and within the last hundred years two very notable events of this kind have happened. In 1795 there issued from below some of the upper strata of the Rigi, a vast outflow of mud, which, like a stream of lava, rolled down the mountain side, spreading ruin and desolation in its course. It is

said to have taken fourteen days in reaching the Lake of Lucerne. This of course gave ample time for escape, and we believe that no lives were lost, though the destruction of property was very great.

There is also evidence in the piled-up masses of conglomerate which form what is called the Felsenthor, that at some period of which we have no record, a berg-fall, similar in kind to that which we are about to notice took place on the Rigi.

The summer of 1808 had been very wet and we may assume had loosened the intervening beds of clay and sand, or at least had rendered them so slippery that the superincumbent strata which rested on them at a considerable angle slid forward, and the crest of the mountain was precipitated into the valley below. The mass that fell was about 1,000 feet in length and 100 feet in thickness and of unknown breadth. Such a mass descending from a height of between 3,000 and 4,000 feet pressed forward with irresistible force, bearing down everything that was in its course, overwhelming villages—filling up about one third of the Lake of Lowerz and doing untold damage to life and property. The masses of rock now fill the valley on the eastern side of the low col on which the village of Goldan stands, and many of them rest on the slopes of the Rigi about four miles from the spot whence they began their descent. Though it is now nearly 80 years since the disaster occurred (Sept. 5th, 1808), the crest of the Rossberg, as seen from the Rigi, appears entirely barren, and the course of the falling rock is clearly evident all down the mountain side.

In both these cases the exciting cause appears to have been the same—an excessive fall of rain rendered the beds of clay &c., soft or slippery. In the first case the clay and sand were squeezed out by the pressure of strata whose angle of inclination was not sufficient to cause them to slide down; in the second the angle of inclination determined the fall of the mass—the substratum became so altered in its condition as no longer to give the support that had hitherto sustained the rock in its place.

However disastrous these berg-falls may be they are too common among the Alps to excite any great attention, except when of very exceptional extent, as in the case just mentioned ; but when a large tract of land that looks like solid ground, with substantial houses built on it and covered with orchards and gardens sinks down and become part of an adjoining lake we are more likely to feel and express great surprise. Thus all Switzerland was taken by surprise when on July 5th of the present year the telegraph flashed over the whole country, the intelligence that a portion of the little town of Zug had disappeared below the surface of its lake ; the thing seemed utterly unlikely and the news was received with much incredulity—nevertheless it was true. The town of Zug is situated at the north-eastern corner of the lake, at a point where the hills that have formed the eastern rampart of the lake, continuing onward in northerly direction leave its shore, which now consists of a dead level plain. Through this level plain the principal affluent of the lake finds its way, having in all probability been the agent in producing the level plain through which it now flows. Two or three smaller streams also fall into the lake near Zug. The greater part of the town lies on the gentle slop of the hills—but a long suburb extends along that margin of the lake, which I have spoken of as part of the level alluvial plain. It was in this suburb that the disaster occurred. I have noticed a peculiarity in the Lake of Zug and possibly some connection may exist between these repeated subsidences and this peculiarity. The river, Lorze, the principal feeder of the lake, falls into it at a point not more than a kilometer and a half (rather under a mile) in a direct line from the place where the waters of the lake have their outlet.

Whatever may have been the causes, either predisposing or exciting, the facts are these:—About mid-day, July 5th, some of the houses that formed part of the suburb I have mentioned suddenly sank down, and later in the afternoon other houses, amounting in all to about thirty, were swallowed up, and where but a few

hours before, stood a substantial hotel—new built and not yet opened for guests—a street of substantial houses, orchards and gardens, there was nothing but mud and water, floating wreck. Though some notice of what might happen was given by cracks in some of the houses and in the quay that was in course of construction, yet the actual fall was so sudden that about thirty persons were either drowned or crushed to death in the ruins. I was staying for a few days at Lucerne, distant about 18 miles, so accompanied by my brother we went over on the afternoon of the 6th to see for ourselves the extent of the disaster; but we were able to see but very little. We found the usually quiet town full of an excited crowd, and all the approaches to the scene guarded by the Federal soldiers, who would not allow any person to go near, as it was considered quite unsafe. We were therefore obliged to return to Lucerne with little definite information; but with a knowledge that rumour had not exaggerated the extent of the disaster.

The Rev. E. Hill, who visited the spot about two weeks after, when the excitement had calmed down and it was possible to investigate the causes, &c., read a paper at the meeting of the British Association, at Manchester, on the subject. He stated that it had been proved that the first 10 or 12 feet of the soil consisted of alluvial detritus—and below this there was an unknown depth of soft oozy stuff. It would seem that the accumulation of buildings on a soil of this kind had ultimately produced a state of unstable equilibrium, and anything that tended either to increase the superincumbent pressure or remove in ever so slight a degree the support from below would destroy that equilibrium. It is worth notice that similar calamities have happened very near the same spot. In 1435 a similiar subsidence took place accompanied, it is said, by a loss of 160 lives—and again about 100 years since something very similar occurred. In both these cases there appears to have been some connection with a sudden reduction of the level of the waters of the lake. It is

assumed that the subsidence is due to an outflow towards the deeper parts of the lake of this oozy substratum—that under ordinary circumstances the waters of the lake give to this ooze sufficient support to maintain it in its normal position. But if by any means that support were withdrawn, or the superincumbent pressure increased, the equilibrium would cease to be maintained, the oozy matter would be pressed outward and the upper crust would be broken up. In the present case there had been no lowering of the level of the water—but a considerable amount of pile driving had been going on which very possibly had disturbed the superficial arrangement of the soil below the surface of the water—and the gradual accumulation of buildings on the surface had gone on adding from time to time to the weight that pressed more and more heavily on the soft matter below. If this be the explanation of the event it comes to very much the same as in the cases of the Rigi and the Rossberg, viz., superincumbent pressure and withdrawal of supports. The moving bogs of Ireland appear to be phenomena of an analogous kind.

To come still nearer home, we have a series of subsidences taking place in Cheshire and Worcestershire in consequence of the abstraction of the salt. In Cheshire these are in some places altering the face of the country, producing depressions of the surface, that fill up with water, forming large pools, where only a few years ago was dry ground. Almost any person who passes along the railway through Droitwich must have noticed how the retaining walls of the railway are fissured by the sinking of the ground.

Similar operations have been going on on a large scale in limestone districts—water charged with carbonic acid, percolating through beds of limestone, dissolves it, making caverns and galleries—and these from time to time fall in, forming cliffs and ravines. The gorge in the cliffs at Cheddar is assigned by many geologists to this cause.

But at our own doors we have a neat little landslip and we find it a rather troublesome neighbour. So far as I have been

able to ascertain the cause of the movement at Hedgemoad is this—it presents no feature widely different from other landslips—certain beds of clay are super-saturated with water, they become softened at their planes of contact, superincumbent pressure causes them to slide over each other, the upper bed being the one most liable to move. In the ground of the Hydropathic Establishment at Limpley Stoke, they have lately constructed a new tennis lawn, which required that soil should be cut away from the upper side and transferred to the lower; in doing this they cut through two thin beds of clay, the support to these beds being now removed the upper has begun to slide over the lower, bringing the soil down on to the new level.

What is the remedy for such things? Clearly the first thing appears to get rid of all superfluous water—and thus to keep the adjacent beds in a condition to exert as much friction on each other as possible—and secondly to reduce the superincumbent pressure.

As regards Hedgemoad, we have had long continued warnings—and if at an unexpected moment some great catastrophe should happen we cannot plead that we have not had notice. Such an event is not probable, but there is no saying what might be the effect of a very wet season and a very stormy time.

Doubtless there are many other forms that landslips and subsidences may take, but these are enough for my present purpose, which had chiefly reference to the Zug disaster. I see a notice from Geneva, in last week's papers, in which it is stated that nearly the whole of the northern shore of the lake of Zug has become unsafe, and that it has been deserted by all the inhabitants. It would be interesting to know how far inland the danger is supposed to extend. The Railway station is not far away and may have to be removed.

The plans on the table are copies from one issued at Zurich directly after the subsidence, and the photos are copies of photographs of taken on the 6th of July.



*The Destruction of the two Churches of St. Mary in Bath.* By  
AUSTIN J. KING.

(Read December 14th, 1888.)

There were at one time three churches in Bath dedicated to the Blessed Virgin. One of these was Saint Mary *extra muros*, otherwise called St. Mary by the Southgate. This Church is, I think, intended to be shown on the earliest map of Bath, which formed the subject of an interesting lecture in this room by Mr. E. Green. I say intended, because the situation given to it is almost certainly wrong namely on the north instead of the south side of the Avon.

I am inclined to think that it was near to the south side of the Old Bridge, but it must not be confused with the little Chapel of St. Lawrence built on the centre pier of the bridge.

Warner speaks (p. 123) of this Church being a Rectory but it is clear from the document he cites as his authority that it is the Church of St. Mary *intra muros* which was intended.

The words are "ecclesie beate marie infra portam acquil."

Leland does not mention this Church on the occasion of his visit in 1530. It is probable therefore that it was only an oratory.

The two other Churches dedicated to the Blessed Virgin were Saint Mary *de Stalles* or "*Sancta Maria de Stabulis*" more commonly called Stalls Church and Saint Mary *intra muros* or *Sancta Maria intra portam Borealem*.

And first as to Stalls Church. It has been suggested that the original name of the Church was "*Sancta Maria in Stabulo*" (our Lady of the Stable), and that it was intended to honour the Blessed Virgin by reference to the stable where Christ was born.

This derivation is ingenious, but I think inaccurate. In the earliest deeds in our Record room, dated 1218, a district "the Stalls of Bath" is mentioned, and I am inclined to believe that it was so called, as being a sort of rough place where temporary

booths and sheds were put up. The word used in the conveyances as denoting the tenement is "Selda."

The Church was situate at what was called "Bear Corner," that is at the junction of Stalls Street with Cheap Street. The Bear Inn stood of course just opposite at the bottom of what is now Union Street. The churchyard adjoined, and probably lay in common with the open space to the west of the Abbey. The Abbey Church was what its name implied, and was only resorted to by the citizens on special days. Stalls Church stood, as regards the Abbey, in the same position and for the same purposes as did the Church of St. Margaret at Westminster, the Church which overshadowed it.

Stalls was a Vicarage, the Rectory having been vested in the Prior and Monks in 1263. To the Vicarage was appendant the Chapelry of Widcombe. In 1322 the relations between the Vicar and Rectors were put upon a definite footing, the tithes were apportioned, and it was ordered that the Vicar should be resident, that there should be a priest at Widcombe, and that the Rectors should be charged with the repairs of the Chancel.

This Church was the official one of the city, and one of the aisles was set apart for the Mayor and Corporation, and went under the name of the Mayor's aisle. The seats in this aisle were repaired from time to time at the expense of the Chamber.

Numerous gifts and benefactions were made to the Church. In 1326 Benedict de Stoke gave a pound of wax yearly for a taper to be lighted on the Feast of the Assumption of the Blessed Virgin and fourpence for four masses yearly for the repose of his soul, and charged the necessary annual payments on a house of his in Stalls Street. In 1403 Sybil Pochon gave her best veil (*manutergium*) to Stalls Church, a sum of money to the Vicar to say masses for her soul and to the image of St. Catherine de Stalls her best silk robe (*unum flamiolum meum optimum de serico*).

St. Catherine was a favourite saint in Bath. This appears not

only from the references to her in the Ruber Codex Bathon at Longleat, but from the ancient oath taken by apprentices on taking up their freedom. This runs—

“I schal buxom and obedyent be to the mayr of Bathe and to al hys successowrys and Y schal mentayne me to no lordschyp for hynderans of eny burges of Bathe Nether Y schal nozth plete wyth no burges of Bathe but on the mayr courte yf hit so be that the mayr wyll do me ryght or may do ryght Seynt Katern day Y schall kepe holy day yerely and. Seynt Katern Chapell and the brigge help to mentayne and to susteyn by my power. All other custumys and fredumys that langit to the foresayde fredum Y schal well and truly kepe and mentayne on my behalf selme God and halydom.”

Notwithstanding that the Rectory of Stalls was vested in the Prior and Monks, the Vicar of Stalls sided with the Citizens in a memorable dispute with the Monks, temp. Henry V., as to the right of ringing church bells. The inquisition is set out by Warner (Appendix xli.) The ancient custom contended for by the Monks was at this time (1421) distinctly recognized, namely that none of the City Churches should ring their bells in the morning before the Abbey bells, nor after the Curfew (*ignitigium*) had sounded from the Abbey tower in the evening. Certain exceptions were allowed; Christmas, the Epiphany, the feasts of the dedication of the Churches and of the patron saints of the Churches and of St. Catherine, St. Nicholas and All Saints. On other feasts the City Churches were to summon to Matins with one bell only.

The participation of the Rector of St. Mary *intra muros*, in this dispute is the only early recorded fact I have been able to find concerning this Church. It was a Rectory, and the advowson was vested in the Prior and Monks. The parish attached to it must have been a very small one, and it is a little difficult to conjecture what district it covered. The parish of St. Michael

extended to the city walls, and so did the parish of Walcot, and Stalls parish pressed hard upon the intervening district from the other side.

The Church was situate just within the Northgate, and across what is now the junction of Bridge Street with High Street. It must have been very ancient because we read of its repair by Fitz Jocelin in 1190. In the reign of Edward VI. the charitable property annexed to Stalls Church for lights to burn before statues, anniversary masses and doles, was stated to be £2 16s. 4d. per annum, and that annexed to St. Mary's *intra muros*, to be £4 0s. 2d. It is clear, however, that these returns were false, and it is probable that both these Churches had considerable property belonging to them, much as was proved to be the case with regard to the Church of St. Michael *extra muros*.

At the Dissolution the monastic property in Bath was granted to a speculator, Humphrey Colles. Colles sold to Mathew Colthurst, and the property descended from him to Edmund Colthurst. Colthurst thus became possessed of, of course, the Abbey Church, and the Rectory of St. Mary *intra muros*, and St. Mary *de Stalls* and the advowson of the other parish Churches.

The citizens agreed with Colthurst for the acquisition of this Church property. The royal licence was required to the conveyance, and in a "remembrance" to Lord Burleigh the citizens thus stated their views:—

"And that whereas there are 3 little Churches decayed within the said city, that the parishes thereof may be annexed to the great Church by the assent of the Ordinary there and that your lordships orators may have the advowson thereof by grant of the Queen."

The licence asked for was given on the 21st November, 1572. It was not, however, for 10 years that the scheme could be even partially carried out. There were several reasons. In the first place there was an Incumbent of Stalls, one Henry Adams. This ecclesiastic had in 1571 been presented by Sir

Walter Daveys, to whom Prior Holwaye had granted the "next presentation." Adams did not die until 1577, and even then there was an obstacle in the person of Gilbert Berkley, the Bishop of the Diocese, whose consent was required. The Bishop died in 1581, and during the vacancy of the See a Dr. Aubrey was Vicar Capitular. Aubrey was a pensioner of the Bath municipality, and received some relatively handsome presents for his complaisance in consenting to the spoliation. The order for consolidation of the parishes was made in April, 1583. The order recites that the "ruinated church" belonging to the Priory had been re-edified, except the south aisle, and then orders that the Church of Stalls and the Chapel of Widcombe should be annexed "for the increase of Divine worship and the preaching of the word of God to the said great ruinated Church. The Abbey Church is then erected into a Parish Church "to which as to their Parish Church all and singular the inhabitants of the said late parishes should be obliged always to come to and to no other place to hear Divine service and to receive the Sacraments." The order permits the use of other Churches until the repair of the south aisle of the Abbey.

Thus what had been for centuries the parish of St. Mary de Stalls became the parish of SS. Peter and Paul, the Abbey having been dedicated to those Saints.

The inhabitants of Widcombe were prompt in the action which they took. They applied for a sequestration of the living and obtained an order to that effect and a Mr. Gaye was appointed to serve the Chapel. There was consternation amongst the citizens; and by intriguing and bribing, and probably also by promises to the men of Widcombe, they got the sequestration removed.

The parishioners of St. Michael's *extra muros* and St. James were probably equally active, and to their remonstrances we owe it that these two city Churches were not desecrated and destroyed. The little Church of St. Michael *intra muros* was annexed to St

John's Hospital ; the two Churches of St. Mary were abandoned to their fate.

We have certain data from which we can approximately fix the dates of their secularization.

The Church of Stalls was used as the official city Church until 1593, for in that year we find the Chamberlain making a payment for "twoe mattes for the maior his seate in Stalles Church." Probably Stalls Church was soon afterwards given up as a place of worship for in 1600-1 the partial restoration of the Abbey Church was finished, and money was expended by the Chamberlain in fitting that Church with wainscoting and benches. Writing in 1608 Sir John Harrington says "The tower, the choir and two aisles are already finished by Mr. Billett, executor of the worthy Lord Treasurer Burleigh."

Probably the transfer from Stalls to the Abbey was in about 1606, for in that year we read in the Council Book :—

"Agreed upon the 25th march, 1606, by the mayor, parson and parishioners of Stalls concerning burials in the great church vault. That any of the degree of a Knight which shall be buried there shall pay for the breaking the ground, 20/-, and 6/8 for ringing the great bell, and others 6/8 for breaking the ground and 2/6 for ringing the bell, and every child 2/- for breaking the earth."

The following entry in the Chamberlain's account in 1609 is somewhat obscure :—

"Paid for the Abbey Bell and Stalls ...	£20	10	0
Paid for the Clipp of the Bell...	£1	10	4"

but I am inclined to think it refers to the recasting of a bell, probably the "Inket" or Inquest Bell formerly in Stalls Church, and setting it in the Abbey tower.

In 1616 the Corporation took possession of Stalls Churchyard and granted each other leases at nominal rents ; the site of the Churchyard can be traced from the block of houses now standing.

From this date we do not hear of Stalls Church being employed for any ecclesiastical purposes, although the parish retained for many years its ancient name.

A reference to the valuable collection of Bath maps made by the late Mr. Russell may here be interesting.

The map of the city erroneously attributed by Wood to Dr. Jones, dated in 1572, and Speed's map, issued in 1610, both show Stalls Church. Gilmore's map, under date 1694, shows a blank where a part of the Church stood, and later maps show the site of the Church. Strachey's Map of Somerset, published in 1732, shows the corner where the Church stood by a cross, and the reference "St. Mary de Scalys, now dwelling-houses."

These maps are so manifestly copied from each other, and contain so many obvious mistakes, that they are not at all reliable as evidence of dates.

Strachey's statement as to the conversion of the Church into dwelling-houses is no doubt correct, for in 1632 we find leases granted of houses described as "in the Church." During the Civil Wars the Church was used as a military prison and hospital.

In 1656 we read in the Council book :—

"Whereas the Tower of the Church of Stalles in this City is now much fallen into decay and cannot be repaired. Whether the said tower shall be taken down so far as the roof of the said Church or so far as need required or not, the profit to be employed to the use of the Abbey Church, and the churchwardens of the said Abbey Church to undertake the care and oversight thereof."

This resolution was carried, and three aldermen were elected to oversee the work and take the churchwardens accounts.

In 1659 the Church itself fell down, for we read :—

"Whereas Stalls Church within the said City is fallen down, and the materials, by a formal order, appointed to be employed to and for the use of the Church of St.

Peter and Paul within the same City, the question is who shall be appointed to dispose of the said materials to the use aforesaid, both to make, sale thereof, and to employ the money made thereof to the use of the said Church of St. Peter and Paul."

It curiously happens that we can trace the exact destination of the money received from the sale of the materials of this old civic Church. The sum realized was £100; and in 1663, when the Citizens were making a present to Charles II., under circumstances which I have detailed elsewhere,\* it was mentioned in the Council minutes that there was this sum in hand "belonging to Stalls Church," and it was accordingly appropriated to the gift.

And now I return to the Church of St. Mary *intra muros*.

The last date on which we have evidence of its use for Ecclesiastical purpose is 1588, and probably its desecration occurred very shortly afterwards.

But the building was not destroyed. The Grammar School (founded by Edward VI. out of a portion of the much larger property formerly devoted to educational purposes), was held in some rooms over the Westgate. This school was moved into the nave of St. Mary's Church, and we can fix the date with substantial accuracy.

In 1589, we find the Chamberlain paying—

"To Thomas Gardener and Thomas Hibbett, masons, for byldinge up the chancell at the Schole hous 1/- more to a Free-mason for making a window in the poining end 9/-"

From this date then the nave was used as a school, and there are many quaint and curious records connected with the master and his teaching. These however relate rather to the history of the "Grammar School."

The tower of St. Mary's Church was used as a gaol. I have

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\* "Cavaliers and Round-heads : a Chapter in the History of Bath."



not been able to fix the date at which this user commenced, for there was, of course, always a gaol for the city, and there is no record of the change from an older building to this one.

Wood writes :—

“The City Prison so nearly appertaining to her Court of Justice that structure is the very tower of St. Mary’s Church . . . but no sooner had Queen Elizabeth consolidated the Churches of the City into one cure . . . than they looking upon this house of God no more as a house of Prayer turned the tower of it into a den for thieves.”

The gaol in the tower of the Church must not be confused with the Bridewell or house of correction in the lane of that name. This was built in 1632, partly by subscriptions, partly out of the proceeds of a special rate. The entry concerning this latter is :—

“Whereas Mr. Chambers hath possession of a barn, stable and backride, which is agreed shall be converted to a house of correction, what he think fit to give him freely to quit the possession without any rule £5 to give him.”

The Church was used for the purposes of the Grammar School until about 1760, when the present building in Broad Street was erected. A map of 1750 shows St. Mary’s Church, and refers to it as St. Mary’s Church now the free school, and another similar map, published in 1760, contains the same reference to the Church but shows also the building in Broad Street.

Wood tells us that he completed the design for the Broad Street schoolhouse in 1742.

The destruction of St. Mary’s Church, was, however, to be thorough. In 1773 Mr. William Pulteney framed the design of opening up the Bathwick estate by building what is now Pulteney Bridge. St. Mary’s Church stood in the way of this improvement, and he purchased it from the Corporation. No

money passed, but certain springs of water on Castle Down were conveyed to the City, and the family house in Grove Street was made over for use as a gaol.

We cannot now even accurately fix the spot on which this ancient Church stood.

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*A Bath Poll Tax, 2, Richard II. By E. GREEN, F.S.A.*

(Read 11th January, 1888).

In my last communication I brought before you the first known map of our City, endeavouring generally at the same time to work out its picture from the earliest records; but as those notes applied entirely to the plan then produced and the surrounding walls, it remains next to fill the enclosure with a population,—with the living and moving makers of history. Of our later times in this respect we know much, but of the early days we know almost nothing. The documents now offered will it is hoped,—as a first instalment,—help to throw some light on several obscure points, such as the number of inhabitants and their local status, or occupations, or wealth, subjects of no mean interest, only to be worked out from the class of record here either quoted or transcribed.

There is also the question of Christian and Surname; from what origin or under what influence did they arise; the extent to which Surnames had become general and whether derived from merely personal peculiarities, or from places, or from occupations. English names derived from places do not imply territorial possessions, as so many hastily assume, but on the contrary, they are marks simply of residence or a birth of the lowliest, in fact but for such local designation there was no other name. The early Law proceedings are full of such instances when the witnesses are only given as John of this place or of another. The names of territorial influence, for the most part Norman, were given to,

not taken from, the places to which they are attached, and often in addition to the English name already existing.

The first document which may be noted is of great interest as being the earliest of the class extant as specially relating to Bath, and although not so full in details as a later one will well serve the purpose of comparison. It is a Nonæ Roll of the year 1340, 14 Edward III., to be found in our Public Record Office, relating to a subsidy or tax made for two years for the good keeping of the Realm and for assisting the King in his wars, granting in Counties the ninth fleece and the ninth sheaf, and in Cities and Boroughs the ninth part of all moveable goods and chattels. It was to be levied by lawful and reasonable means, the valuation being made by inquisition upon the oath of the parishioners. Two assessors were appointed for Bath, in this case they were Adam le Muleward and William Cubboll, who made a return of the following names and the amount paid by each for the first of the two years for which the tax lasted:—

Richard le Deyare	...	iijs.	Thomas Berughogg	...	xvj <i>d.</i>
Adam de Doynton	...	xij <i>d.</i>	Nicholas le Fysshare	...	xij <i>d.</i>
Henry le Webbe	...	vjs.	Henry de Sulbury	...	iijs.
John Gourlmay	...	ijs.	John Payn	...	iijs.
William le Hoper	...	xvii <i>d.</i>	John de Heottlegh	...	xij <i>d.</i>
Walter le Carpenter	...	ijs.	William Spray	...	iijs.
Isabell de Kary	...	iijs.	John Baytyn	...	ijs.
Joan Cooke	...	ijs.	Peter de Lewas	...	iijs.
Adam Knevet	...	v <i>d.</i>	William le Porter	...	iijs.
Thomas le Touker	...	v <i>d.</i>	William Bouche	...	xij <i>d.</i>
Robert le Porter	...	xij <i>d.</i>	John Corteyns	...	iijs.
Ralph le Deyare	...	ijs.	Elias Gower...	...	xij <i>d.</i>
Nicholas de Deyare	...	iiij <i>d.</i>	John Freman	...	xij <i>d.</i>
Henry Hurel	...	xxs.	Walter Saundres	...	xij <i>d.</i>
Barto de Deyare	...	viijs.	Roger la Tannere	...	ijs.
Adam le Boy	...	iijs.	Ralph le Taylour	...	vi <i>d.</i>
William á dieux	...	ijs.	John de Mersfeld	...	iijs.
Richard le Boy	...	iijs.	William Gay...	...	xvii <i>d.</i>

Richard le Webbe ...	iijs.	John de Boldebury ..	xijd.
Gilbert le Webbe ...	ijs.	Thomas Stoke ...	vjd.
Richard Shakesho ...	xijd.	William Clement ...	xxd.
John Coventree ...	xvjd.	John Hoirys... ..	ijs.
Adam le Barber ...	vjd.	Adam Whiteson ...	vjd.
Peter de Marsfeld ...	iijs.	Thomas Fovel ...	iijs.
Richard Beone ...	xijd.	Giles de Cheyppenham	xviijd.
John atte Tame ...	vs.	William Symond ...	ijs.
John Berughogg ...	ijs.	Elias la Spicer ...	vs.
William Hindeman ...	xijd.	John de Sambourn ...	vs.
Nicholas Basse ...	iijs.	Robert le Deyare ...	iijs. vjd.
Ralph atte Tame ...	ijs.	Walter atte Brugge ...	xijd.
William Swayne ...	xviijd.	Julian de Wyke ...	xijd.
John Baron ...	xijd.	Robert le Deyare ...	ijs. vjd.
John de Alynton ...	ixs.	Henry Rossel ...	ijs.
Walter le Lindraper ...	ijs.	William de Kemyngton	iijs.
William Cubboll ...	ixs.	Thomas Buryman ..	xijd.
John Allyn ...	ijs.	John de Budeston ...	ijs.
William de Sarum ...	ijs.	Eustach de Button ...	ijs.
John Wodelond ...	ijs.	William de Wyke ...	ijs.
Robert de Natton ...	ixs.	John Rolf ... ..	ijs.
John Croknutte ...	ijs.	John Nywman ...	ijs.
Roger Sutor... ..	xijd.	John de Farleigh ...	ijs.
Reginald Nony ...	iijs.	Henry Burel ...	xd.
John Castell... ..	iijs.	Adam Storch ...	xijd.
John de Durcot ...	iijs.	Ralph le Hoper ...	iijd.
John Tryg ... ..	xviijd.	Nicholas le Chaloner ...	xijd.
John le Rydelar ...	ijs.	Agnes le Zork ...	xijd.
John Cole ... ..	xijd.	Stephen de Pryssheton	xijd.
John Deverel ...	iijs.	Roger de Roding ...	xijd.
John Gyvelegh ...	iijs.	Thomas le Mason ...	iis.
Robert Pluco ...	vjs.	Alexander le Deyare	xiijs. iiijd.
William Orlegh ...	ijs.	Richard le Vyn gour ...	vijs. vjd.
Thomas Gourlemey ...	iijs.		
Henry le Mareschal ...	ijs.		
John atte Brome ...	vjd.		
		Total ...	<u>xiiijli. xs. jd.</u>

Thus the substantial men of Bath in 1340 having personalty warranting taxation numbered 106, and their payment amounting to £14 10s. 1d. as a ninth, gives the total gross value of the assessment as £130 10s. 9d.

In a collection of a 20th in 1 Ed. III., the totals only being returned—Bath produced £8 4s. 7d.; Wells at the same time paying £10 0s. 6d. As another point of local interest one example may be given of the entire Hundred of Bath Forum. In 12 Ed. IV. in payment of a 15th and 10th, the return was from:—

Claverton ... ..	cv̄s.	Wyke Abbatisse	xxvjs. viij̄d.
Hampton ... ..	iiij̄li.	Eston ... ..	iiij̄li.
Aumarle Chamfiour ...	iiij̄li. xs.	Wallecote ... ..	xxiiij̄s.
Calueston ... ..	iiij̄li.	Weston ... ..	ls.
Northstoke .. ..	xxxiijs.	Lynecombe ... ..	lxij̄s.
Langrigge ... ..	vs. iiij̄d.	Charlcombe ... ..	xlvijs.
Swayneswyke and		Ford ... ..	lxij̄s.
Ferschford ... ..	xls. xd.	Wollegh ... ..	xxvjs. viij̄d.
Southstoke ... ..	xxxs.	Combe ... ..	... xxxs. xd.

Analysing the names in the Nonæ Roll it will be observed how many use the de or le—the de being prefixed to names of places the le to occupations, atte appears only three times. In some cases the prefix has been either dropped or perhaps never existed. There are seven bearing the name of le Deyare, but shown as not necessarily of one family as there are two Roberts. There are three Webbe, a le Toker, and le Fisher, and others such as Lindraper, Mareschal, Sutor and Spicer, which speak for themselves; then there is the name of Swayne so constant in early Bath deeds.

The taxation of the clerics was distinct, as they claimed to be, and were taxed separately, and when possible not at all. This part of the subject being very difficult must be avoided, but an example which seems fairly clear may be used as well for itself as also for a further illustration of early name giving. In 1377, 51 Edward III., in a list of the names of all the religious persons.

in the Deanery of Bath, there is found first John Berwykes, Prior of the Cathedral Church of Bath, and following him come fifteen brothers, all paying uniformly twelvecence. The names of the brothers are—John Bradlegh, William Tonar, John Brok, William de Welles, John de Ciceter, Michael de Combe, Nicholas Vinor, John Kyneton, John Rockbourne, Henry Godeley, John Preston, John Ploute, Thomas Bampton, Philip de Pekelynych, Nicholas Huse and John Milverton. Besides these there were John Astwykes, master of St. John's Hospital and Brothers Peter Harding, John Dunstarr, John Briwton and John Wedmor, and then Edward, without other name, master of the house of St. Mary Magdalen. The Dean, the Vicars of St. James, St. Michael, St. Mary, and Stalles, all paid uniformly twelvecence. The inferior clergy paid fourpence.

The modes adopted for taxation in these days are not easily understood. The plans met with are called fifteenths, and presently fifteenths and tenths. The fifteenth at first was laid upon goods only, as granted in 18 Edward I., but later this seems to have included lands also. Two assessors were appointed for every County and City, and they in turn appointed a jury of twelve,—in the Counties a jury in every Hundred,—and these returned their valuation of every man's personal estate, and levied thereon the fifteenth of such value. When the tax fell upon land also, a valuation was made in 1344, 18 Edward III., of all the cities and towns in England and returned into the Exchequer, and this became then the fixed guide, the amount due upon any fifteenth or tenth being always the same, and known exactly. A Subsidy was another form of taxing. This was laid upon every individual's estate either real or personal, and consequently varied in the amount produced. In time these forms generally became known by the one name of Subsidy. There was also another plan occasionally met with, the following being an example for Bath. It is entitled the account of John Natton, John Gregory and William Cook collectors of a tenth and half a

tenth of all moveable goods from the Laity of the City of Bath, as warranted by Letters Patent dated the fourth of March in the aforesaid third year. As the year said to be aforesaid is nowhere given, the date of the document is uncertain, but from internal indications it is attributed to the third year of Richard II. The totals only are given, viz. :—

For the 10th	...	...	£13	6	8
For the half-a-tenth	...	...	6	13	4
Total			£20	0	0

It will be noted here that the expression a tenth and half-a-tenth did not mean a fifteenth, about  $6\frac{1}{2}$  per cent. or a total of £8 17s. 9 $\frac{1}{4}$ d., as without help it might have done, but it actually meant 15 per cent. or a total of £20. The gross value here of the city in 1380 is—£133 6s. 8d., against the same in 1340—£130 10s. 9d. There was yet another plan of taxation called exactly a Poll Tax. Although a little out of chronological order, the result of one of the year 1381, 4, Richard II., may be shortly mentioned. It is entitled—"A View of the Account of John Gregory, John Natton and Robert Wattes, collectors of the Poll Tax of xijd. in the City of Bath on all aged xv. years, true mendicants excepted." Payment appears to have been prompt, as the warrant or order being dated in December, two-thirds of the assessment were paid at Hilary, and the other third at Pentecost. The totals only are given, and in this document only the first payment, viz.—£9 14s. 8d. for the two parts of £14 12s.—the Subsidy from two hundred and ninety-two persons, men and women of the city.

The preceding notes so far will aid towards a comparison with the next and last example, one for the second year of King Richard II., the one specially intended for notice, and the one of the fullest and greatest interest. It is a Subsidy granted on the accession of Richard in the form of a Poll Tax on the Laity. The rates were graduated and ranged from ten marks for a Duke

down to fourpence for the "general," not being really mendicants. Married couples paid at a single rate. The Roll here transcribed consists of three consecutive membranes duly indented, and by good fortune the counter indenture or duplicate also exists, or, on account of the decay of the ink, without such duplicate the names could not have been read. The business of deciphering has been certainly most troublesome and fatiguing, and notwithstanding often examination and every care it is more than possible that some names may bear a different reading. The occupations however, perhaps the chief point, will be found correct. The document is not only of extreme interest as giving full names of persons and their occupations, but it also by a happy chance gives the names of the streets in which they lived, so that we have presumably a complete Directory for the city in the year 1379. It will be seen that the Mayor begins, an early notice of one, perhaps the earliest actually named.

## CITY OF BATH.

Indenture made the fourth day of June, in the second year of King Richard the Second after the conquest, between John Gregory, John Natton and Robert Compe, assessors of the Subsidy of (iiij.) pence, for the lord the King on the one part, and Robert Wattes, Richard Ford, John Swayne and John Cherde, collectors of the same on the other part, from all the men and women of the age of xvj. years, true mendicants excepted.

John Natton, Maior, — (xs).

## SOWTHEYATE STRET.

John Balle ...	...	tanner	...	...	ijs.
William Webbe ...	...	laborar	...	...	iiij <i>d.</i>
William Zawoher ...	...	laborar	...	...	iiij <i>d.</i>
Felicia Launder ...	...	filator	...	...	iiij <i>d.</i>
Walter Thesher ...	...	laborar	...	..	iiij <i>d.</i>
John Growe ...	...	laborar	...	...	iiij <i>d.</i>
John Bowby ...	...	laborar	...	...	iiij <i>d.</i>
John Hosteler ...	...	laborar	...	...	iiij <i>d.</i>



John Coxler ...	...	laborar	...	...	iiij <i>d.</i>
William Y — dene	...	laborar	...	...	iiij <i>d.</i>
Philip Bryan ...	...	folator	...	...	v <i>d.</i>
Stephen Growe	...	( <i>illegible</i> )	...	...	v <i>d.</i>
Robert Baker	...	( <i>illegible</i> )	...	...	ijs.
John Fanna ...	...	( <i>illegible</i> )	...	...	iiij <i>d.</i>
Ellen Sims ...	...	( <i>illegible</i> )	...	...	iiij <i>d.</i>
John Fletcher	...	laborar	...	...	iiij <i>d.</i>
John Feyror ...	...	laborar	...	...	iiij <i>d.</i>
Harri Wreg ...	...	laborar	...	...	iiij <i>d.</i>

Total :—xixs. viij*d.*

BYNBURI STRETE.

Richard Port ...	...	cissor	...	...	v <i>d.</i>
Richard Legge	...	laborar	...	...	iiij <i>d.</i>
John Beyon ...	...	laborar	...	...	iiij <i>d.</i>
Andrew Trotebosse	...	laborar	...	...	iiij <i>d.</i>
Robert Schoylocke	...	laborar	...	...	iiij <i>d.</i>
Richard Farley	...	laborar	...	...	iiij <i>d.</i>
John Nappesford	...	laboror	...	...	iiij <i>d.</i>
William Redheffed	...	laborar	...	...	iiij <i>d.</i>
William Bedistone	...	laborar	...	...	iiij <i>d.</i>

Total :—iij*s.* ij*d.*

BY YE BATHE STRETE.

John Popp ...	...	laborar	...	...	iiij <i>d.</i>
Robert Porch	...	laborar	...	...	iiij <i>d.</i>
John Taylor ...	..	laborar	...	...	iiij <i>d.</i>
Alan Cissor ...	...	laborar	...	...	iiij <i>d.</i>
Robert Waterman	...	laborar	...	...	iiij <i>d.</i>
John Warbey	...	laborar	...	...	iiij <i>d.</i>
John Eston ...	...	laborar	...	...	iiij <i>d.</i>
John Mulwerton	...	laborar	...	...	iiij <i>d.</i>
John Pochon ...	...	laborar	...	...	iiij <i>d.</i>
Richard Lockyer	...	laborar	...	...	iiij <i>d.</i>
John Porke ...	...	laborar	...	...	iiij <i>d.</i>
John Howard	...	laborar	...	...	iiij <i>d.</i>
Walter Hasilwod	...	laborar	...	...	iiij <i>d.</i>

Total :—iiij*s.* iiij*d.*

## STALLE STRETE.

John Lacoekes	...	carnifex	...	...	xijd.
Thomas Norhorne	...	carnifex	...	...	vjd.
Agnes Porter ...	...	filator	...	...	iiijd.
John Norhamton	...	laborar	...	...	iiijd.
John Tame ...	...	artificer	...	...	vjd.
Roger Chepman	...	pedeler	...	...	ijs.
Christiana Caunton	...	filator	...	...	iiijd.
Robert Cauersam	...	pedeler	...	...	vjd.
John Monemewye	...	laborar	...	...	iiijd.
Walter Wek ...	...	faber	...	...	vjd.
John, serviens to the said Walter	...		...	...	iiijd.
Roger Gewe ...	...	skynner	...	...	xijd.
Philip, serviens to the said Roger	...		...	...	iiijd.
John Stone ...	...	laborar	...	...	iiijd.
John Streyle ...	...	soutor	...	...	xijd.
		laborar	...	...	iiijd.
		cissor	...	...	vjd.
Richard Swetys	...	cissor	...	...	vjd.
John Fyssher	...	artificer	...	...	vjd.
John Seymour	...	faber	...	...	vjd.
John, serviens to the said John	...		...	...	iiijd.
Joan Forester	...	filator	...	...	iiijd.
Richard Andrewe	...	laborar	...	...	iiijd.
Thomas Porter	...	laborar	...	...	iiijd.
John Teyntyghulle	...	laborar	...	...	iiijd.
Herri Touker	...	folator	...	...	vjd.
John Panter ...	...	laborar	...	...	iiijd.
Edward Hopere	...	laborar	...	...	iiijd.
William Parson	...	laborar	...	...	iiijd.
John Mytteford	...	skynner	...	...	vjd.
Alice Pigeley ...	...	braciator	...	...	xijd.
Joan, serviens to the said Alice	...		...	...	iiijd.
William Carpenter	...	laborar	...	...	iiijd.
William, serviens to the said William	...		...	...	iiijd.
William Hulle ..	...	cissor	...	...	xijd.
William Rolphe	...	folator	...	...	iiijd.

John Castell ...	laborar	...	...	iiijd.
John Druhed...	artificer	...	...	xijd.
Morgery, serviens to the said John		...	...	iiijd.
Thomas Durant	laborar	...	...	iiijd.
Richard Baysse	cissor	...	...	xijd.
John Scottfisher	(nil)	...	...	xijd.
John Hawkyn	cissor	...	...	vjd.
Agnes, serviens to the said John Scottfisher		...	...	iiijd.
Thomas Bedull	braciator	...	...	xijd.
Agnes, serviens to the said Thomas		...	...	iiijd.
John Fadur ...	folator	...	...	iiijd.
Roger Vookes	laborar	...	...	iiijd.
John Mycham	laborar	...	...	iiijd.
Nicholas Burynton	artificer	...	...	xijd.
John Bobichon	braciator	...	...	xijd.
John, serviens to the said John		...	...	iiijd.
William Caulestocke	laborar	...	...	iiijd.
Robert Pistor...	artificer	...	...	xijd.
Nicholas, serviens to the said Robert		...	...	iiijd.
Richard Bedulle	textor	...	...	ijs.
William, serviens to the said Richard		...	...	iiijd.
Herri Jolifphe	braciator	...	...	xijd.
William Payne	laborar	...	...	iiijd.
Richard Chepman	pedeler	...	...	xijd.
John Cherd ...	laborar	...	...	iiijd.
Richard Browne	laborar	...	...	iiijd.
William Cooke	pety marchand	...	...	iijs. iiijd.
John, serviens to the said William		...	...	iiijd.
Matilda, serviens to the said William		...	...	iiijd.
Agnes, daughter of the said William		...	...	iiijd.
John Schete ...	pedeler	...	...	vjd.
William Chaumberleyn	laborar	...	...	iiijd.
Roger, serviens to the Prior of Bath		...	...	iiijd.
William, serviens to John Brocke		...	...	iiijd.
Richard Cooke, serviens to the Prior of Bath		...	...	iiijd.
Nicholas, serviens to the said Prior		...	...	iiijd.
Thomas, serviens to the said Prior		...	...	iiijd.
Walter Palfreyman ...	(nil)	...	...	iiijd.

Thomas Plomer, jun ...	(nil) ...	... iij <i>d.</i>
Richard, serviens to the baker of the Prior of Bath ...		... iij <i>d.</i>
John Waderleder ...	laborar ...	... iij <i>d.</i>
Total: --xliijs. iij <i>d.</i>		

## WESTYATE STRETE.

John Morekek ...	laborar ...	... iij <i>d.</i>
Richard Bromilbe ...	laborar ...	... iij <i>d.</i>
John Sarne ...	textor ...	... ijs.
John Homfrey ...	laborar ...	... iij <i>d.</i>
Christiana Homfrey ...	filator ...	... iij <i>d.</i>
John Goffe ...	laborar ...	... iij <i>d.</i>
Thomas Mountwalle ...	(nil) ...	... iij <i>d.</i>
Thomas, serviens to John Cerne ...		... iij <i>d.</i>
Robert Greywod ...	laborar ...	... iij <i>d.</i>
John Atteberwe ...	laborar ...	... iij <i>d.</i>
Nicholas Speragroue ...	sutor ...	... xij <i>d.</i>
Herri v ynour ...	sutor ...	... xij <i>d.</i>
John Freyne ...	laborar ...	... iij <i>d.</i>
John Baytn ...	laborar ...	... iij <i>d.</i>
Stephen Corior ...	laborar ...	... iij <i>d.</i>
Thomas Payerd ...	laborar ...	... iij <i>d.</i>
Walter Deyher ...	laborar ...	... iij <i>d.</i>
Walter Souter ...	laborar ...	... iij <i>d.</i>
Total: --ixs.		

## SOWTER STRET.

Richard Vitull ...	pedeler ...	... xij <i>d.</i>
William Hedeman ...	laborar ...	... iij <i>d.</i>
John Chaperwe ...	pedeler ...	... xij <i>d.</i>
John Clacton ...	faber ...	... xij <i>d.</i>
Thomas Swayne ...	hosteler ...	... ijs.
Robert Coppe ...	pedeller ...	... xij <i>d.</i>
Agnes Carter ...	filator ...	... iij <i>d.</i>
John Barbor ...	artificer ...	... v <i>d.</i>
Robert Brent ...	hosteler ...	... ijs.
Joan Lokyngton ...	filator ...	... iij <i>d.</i>
Walter Mirkely ...	laborar ...	... iij <i>d.</i>
Margery Sowthstok ...	braciator ...	... xij <i>d.</i>

John Bregwater	...	laborar	...	...	iiij <i>d.</i>
Geoffrey Nynnan	...	laborar	...	...	iiij <i>d.</i>
Edithe, serviens to the said Goeffery	...		...	...	iiij <i>d.</i>
John Donne	...	cissor	...	...	xij <i>d.</i>
Robert Waccus	...	pety marchant	...	...	ijs.
Thomas Berwehog	...	laborar	...	...	iiij <i>d.</i>
Robert Cherchward	...	pedeler	...	...	ijs.
Thomas Poffe	...	laborar	...	...	iiij <i>d.</i>
Alice, serviens to Robert Cherchward	...		...	...	iiij <i>d.</i>
Peter Heneley	...	artificer	...	...	vjd.
Robert Spyrelackes	...	soutor	...	...	xij <i>d.</i>
Thomas Brockword	...	pedeler	...	...	vjd.
John Keynshym	...	laborar	...	...	iiij <i>d.</i>
William Cropp	...	laborar	...	...	iiij <i>d.</i>
Joan Swayne	...	filator	...	...	iiij <i>d.</i>
Nicholas Swayne	...	laborar	...	...	iiij <i>d.</i>
Alice, serviens to Richard Vitull	...		...	...	iiij <i>d.</i>
John, serviens to Robert Waccus	...		...	...	iiij <i>d.</i>
Joan, serviens to the said Robert	...		...	...	iiij <i>d.</i>
William Bath	...	laborar	...	...	iiij <i>d.</i>
John, servaunt to Thomas Swayne	...		...	...	iiij <i>d.</i>
John, servaunt to John Barbor	...		...	...	iiij <i>d.</i>
Thomas, servaunt to Hugh Coteler	...		...	...	iiij <i>d.</i>
Walter, servaunt to the said John Clacton	...		...	...	iiij <i>d.</i>
Aylmer Flemyng	...	artificer	...	...	vjd.
John Tybowode	...	laborar	...	...	iiij <i>d.</i>

Total :—xxvs.

## NORYATE STRET.

Stephen Brigman	...	laborar	...	...	iiij <i>d.</i>
John Compe	...	pety marchant	...	...	vs.
Xpine Loffe	...	filator	...	...	iiij <i>d.</i>
John Carnyfex	...	carnifex	...	...	vjd.
William Chestburie	...	laborar	...	...	iiij <i>d.</i>
Herri Aurifaber	...	(nil)	...	...	xij <i>d.</i>
Roger Skynner	...	artificer	...	...	vjd.
Stephen Dernned	...	cissor	...	...	vjd.
Thomas Carewyle	...	soutor	...	...	xij <i>d.</i>

Robert Waspour	...	artificer	...	...	ijs.
John Wyche	...	laborar	...	...	iiij <i>d.</i>
Phillip Bichewe	...	artificer	...	...	xij <i>d.</i>
Thomas Saundrus	...	pedeler	...	...	vj <i>d.</i>
Sewale Fraunces	...	artificer	...	...	ijs.
John Kynt	...	braciator	...	...	xij <i>d.</i>
William Cissor	...	laborar	...	...	iiij <i>d.</i>
Thomas Hopere	...	laborar	...	...	iiij <i>d.</i>
Alice, servaunt to Sewale Frauncis	...		...	...	iiij <i>d.</i>
Robert Bentley	...	pedeler	...	...	xij <i>d.</i>
William Aurifaber	..	( <i>nil</i> )	...	...	xij <i>d.</i>
Vylbo, servaunt to the said William	...		...	...	iiij <i>d.</i>
Richard de Forde	...	artificer	...	...	vs.
Margery, servaunt to the said Richard	...		...	...	iiij <i>d.</i>
Xpine Bynald	...	filator	...	...	iiij <i>d.</i>
Edmund Teylerd	...	laborar	...	...	iiij <i>d.</i>
William Peyntor	...	artificer	...	...	vj <i>d.</i>
John Heyward	...	artificer	...	...	xij <i>d.</i>
Robert, servaunt to the said John	...		...	...	iiij <i>d.</i>
Walter Meynard	...	laborar	...	...	iiij <i>d.</i>
John Benet	...	artificer	...	...	vj <i>d.</i>
Henry Barbor	...	laborar	...	...	iiij <i>d.</i>
Hugh Coteler	...	artificer	...	...	vj <i>d.</i>
John Colurbre	...	laborar	...	...	iiij <i>d.</i>
John Gowher	...	laborar	...	...	iiij <i>d.</i>
William Cherward	...	artificer	...	...	xij <i>d.</i>
Thomas, servaunt to John Compe	...		...	...	iiij <i>d.</i>
John, servaunt to William Chestiburie	...		...	...	iiij <i>d.</i>
Henry, famulus to the said William	...		...	...	iiij <i>d.</i>
John, famulus to Stephen Derved	...		...	...	iiij <i>d.</i>
Agnes, servaunt to Philip Bichewe	...		...	...	iiij <i>d.</i>
John Wyte	...	faber	...	...	vj <i>d.</i>
Richard, servaunt to the said John	...		...	...	iiij <i>d.</i>
Total:—xxiijs. iiij <i>d.</i>					

## BRADE STRET.

Thomas Saltford	...	laborar	...	...	iiij <i>d.</i>
William Deyher	..	laborar	...	...	iiij <i>d.</i>

Deodonay (Belde)	...	soutor	...	...	xijd.
Margery, serviens to the said Deodonay	...		...	...	iiijd.
Richard Carter	...	folator	...	...	vjd.
Richard Hoper	...	artificer	...	...	vjd.
John Broun	...	laborar	...	...	iiijd.
Walter Webbe	...	artificer	...	...	ijs.
Laurence, famulus to the said Walter	...		...	...	iiijd.
Robert, famulus to the said Walter	...		...	...	iiijd.
Joan, serviens to the said Walter	...		...	...	iiijd.
Iwan Glover	...	laborar	...	...	iiijd.
John Gregorye	...	(nil)	...	vjs.	viiijd.
John, famulus to the said John	...		...	...	iiijd.
Isolda, serviens to the said John	..		...	...	iiijd.
Alice, serviens to the said John	...		...	...	iiijd.
John Lacy	...	laborar	...	...	iiijd.
Agnes, serviens to the said John	...		...	...	iiijd.
Alexander, famulus to John Natton	...		...	...	iiijd.
Morgery, serviens to the said John	...		...	...	iiijd.
John Garrard	...	laborar	...	...	iiijd.
Walter, serviens to the said John Gregory	...		...	...	iiijd.
Thomas Plomcr	...	artificer	...	...	xijd.
John Fadur	...	artificer	...	...	vjd.
Herri Workman	...	laborar	...	...	iiijd.
Joan Wysdom	...	filator	...	...	iiijd.
Richard Folator	...	(nil)	...	...	vjd.
Stephen, famulus to the said Richard	...		...	...	iiijd.
Richard, famulus to the said Peter Cissor	...		...	...	iiijd.
Philip Follator	...	(nil)	...	...	vjd.
John, famulus to the said Philip	...		...	...	iiijd.
John Wysdome	...	laborar	...	...	iiijd.
William Burrell	...	laborar	...	...	iiijd.
Isack Irysse	...	artificer	...	...	iiijd.
John, famulus to the said Isack	...		...	...	iiijd.
Peter Cissor	...	(nil)	...	...	vjd.
John Banestre	...	laborar	...	...	iiijd.
Herre Kente	...	laborar	...	...	iiijd.
John Salpe	...	laborar	...	...	iiijd.
William Kymton	...	laborar	...	...	iiijd.

John Duke ... ..	laborar	...	...	iiij <i>d.</i>
John, son of John Brown	...	...	...	iiij <i>d.</i>
Thomas Kymton ...	artificer	...	...	v <i>d.</i>
John Honybrige ...	textor	...	...	i <i>s.</i>
William Rowse ...	artificer	...	...	v <i>d.</i>
John Faber ... ..	( <i>nil</i> )	...	...	v <i>d.</i>
Henry Colnette ...	laborar	...	...	iiij <i>d.</i>
Total :—xxvii <i>s.</i> i <i>d.</i>				

## WALCOTE STRET.

William Deyher ...	artificer	...	...	v <i>d.</i>
Agnes, serviens to the said William	...	...	...	iiij <i>d.</i>
Thomas Barbor ...	artificer	...	...	i <i>s.</i>
William, famulus to the said Thomas	...	...	...	v <i>d.</i>
Roger, famulus to the said Thomas	...	...	...	iiij <i>d.</i>
Robert, famulus to the said Thomas	...	...	...	iiij <i>d.</i>
Thomas Webbe ...	( <i>nil</i> )	...	...	v <i>d.</i>
John, serviens to the said Thomas...	...	...	...	iiij <i>d.</i>
John Smalcombe ...	artificer	...	...	v <i>d.</i>
John Cornewalle ...	follator	...	...	v <i>d.</i>
Richard Balleard ...	artificer	...	...	v <i>d.</i>
Ralph Scerfhe... ..	laborar	...	...	iiij <i>d.</i>
John Harneham ...	laborar	...	...	iiij <i>d.</i>
John, famulus to Richard Ballard ...	...	...	...	iiij <i>d.</i>
William Momeray ...	laborar	...	...	iiij <i>d.</i>
John Gregory... ..	webbe artificer	...	...	v <i>d.</i>
William Teylour ...	artificer	...	...	v <i>d.</i>
William Workman ...	laborar	...	...	iiij <i>d.</i>
Robert Heyward ...	laborar	...	...	iiij <i>d.</i>
Alexander Workman ...	laborar	...	...	iiij <i>d.</i>
William Seaker ...	laborar	...	...	iiij <i>d.</i>
Hugh Teyler ... ..	laborar	...	...	iiij <i>d.</i>
William Hanykok ...	laborar	...	...	iiij <i>d.</i>
William Reding ...	laborar	...	...	iiij <i>d.</i>
Thomas Parchimennor ...	laborar	...	...	iiij <i>d.</i>
Roger Glover ... ..	artificer	...	...	x <i>d.</i>
Robert Parchimennor ...	artificer	...	...	v <i>d.</i>
Roger, famulus to the said Robert	...	...	...	iiij <i>d.</i>
William Bekyngton ...	laborar	...	...	iiij <i>d.</i>



William Tyborde	...	laborar	...	...	iiij <i>d.</i>
Peter, famulus to the said Roger Glover	...		...	...	iiij <i>d.</i>
Roger, famulus to the said Roger	...		...	...	iiij <i>d.</i>
William, famulus to the said Roger	...		...	...	iiij <i>d.</i>
John Colingborne	...	laborar	...	...	iiij <i>d.</i>
John Busseswayne	...	laborar	...	...	iiij <i>d.</i>
Robert Cissor	...	( <i>nil</i> )	...	...	iiij <i>d.</i>
Henry Cissor	...	( <i>nil</i> )	..	...	iiij <i>d.</i>
Richard Pochon	...	pedeler	...	...	xij <i>d.</i>
Thomas, son of the said Richard	...		...	...	iiij <i>d.</i>
Robert Bolle	...	pedeler	...	...	xij <i>d.</i>
Herri Wolley	...	laborar	...	...	iiij <i>d.</i>
Richard Cluberd	...	pedeler	...	...	ijs.
Margery, servaunt to the said Richard	...		...	...	iiij <i>d.</i>
Herri Tonker	...	artificer	...	...	vj <i>d.</i>
William, servaunt to Richard Clewer	...		...	...	iiij <i>d.</i>
John, servaunt to the said Henry Tonker	...		...	..	iiij <i>d.</i>
William Horligham	...	artificer	...	...	vj <i>l.</i>
Nicholas Heyward	...	laborar	...	...	iiij <i>d.</i>
Agnes, daughter of the said Nicholas	...		...	...	iiij <i>d.</i>
John, famulus to Philip Touker	...		...	...	iiij <i>d.</i>
Margery, famulus to Walter Webbie	...		...	...	iiij <i>d.</i>
John, famulus to the said Walter	...		...	...	iiij <i>d.</i>
Thomas, famulus to John Gregorie	...		...	...	iiij <i>d.</i>
Herri Fawe	...	artificer	...	...	xij <i>d.</i>
Nicholas Coobler	...	soutor	...	...	xij <i>d.</i>
Thomas Leche	...	( <i>nil</i> )	...	...	xij <i>d.</i>
John Masoun	...	( <i>nil</i> )	...	...	xij <i>d.</i>
Richard Brower	...	artificer	...	...	xij <i>d.</i>
William Langstone	...	artificer	...	...	vj <i>d.</i>
Henri Soyler	...	artificer	...	...	vj <i>d.</i>
Gilbert Henton	...	artificer	...	...	xij <i>d.</i>
John Gobell	...	( <i>nil</i> )	...	...	vj <i>d.</i>
John Honor	...	artificer	...	...	vj <i>d.</i>
William Hogg	...	sutor	...	...	xij <i>d.</i>

Total :—xxxiijs. ij*d.*

Grand Total :—xli. ij*d.*

The following analysis of this valuable document, in a tabulated form, will bring out and show its contents more clearly :—

	Stall Street.	Walcot Street.	Brade Street.	Northgate Street.	Sowter Street.	Westgate Street.	Southgate Street.	By ye batho Street.	Bynburi Street.	TOTAL.
Artificers. ...	5	16	7	10	3	...	...	...	...	41
Brewers ...	4	...	...	1	1	...	...	...	...	6
Butchers ...	2	...	...	1	...	...	...	...	...	3
Daughters ...	1	1	...	1	...	...	...	...	...	3
Filators ...	3	...	1	2	3	1	1	...	...	11
Folators ...	3	1	1	...	...	...	1	...	...	6
Goldsmith ...	...	...	...	1	...	...	...	...	...	1
Hostlers ...	...	...	...	...	2	...	...	...	...	2
Labourers ...	21	17	15	10	11	12	11	13	8	118
Pedlars ...	4	3	...	2	5	...	...	...	...	14
Petty Merchants ...	1	...	...	...	1	...	...	...	...	2
Servants ...	...	3	...	8	5	...	...	...	...	16
Servicns ...	19	3	7	...	5	1	...	...	...	34
Famulus ...	...	12	8	3	...	...	...	...	...	23
Shoemakers ...	1	2	1	1	1	2	...	...	...	8
Skinners ...	2	...	...	...	...	...	...	...	...	2
Smiths ...	2	...	...	1	1	...	...	...	...	4
Sons... ...	...	1	1	...	...	...	...	...	...	2
Tailors ...	5	...	...	1	1	...	...	...	1	8
Tanners ...	...	...	...	...	...	...	1	...	...	1
Weavers ...	1	...	1	...	...	1	...	...	...	3
Nil ...	3	6	5	1	...	1	...	...	...	16
Illegible ...	...	...	...	...	...	...	4	...	...	4
Tctal....	77	65	47	42	39	18	18	13	9	328

The totals here number 329 people including the mayor, the amount received being £10 0s. 2d. ; thus this poll tax as a personal tax, rather than a property tax as the previously noticed returns may be called, taking in a lower stratum gives a fuller and more satisfactory return of the inhabitants.

Looking at the list several questions arise and some remain unexplained. Thus there is no guide as to the number married and so paying only as one, and curiously there is nothing to guide as to the number of children. Two sons and three daughters only are mentioned, no others appear to have been taxed, yet it can hardly be supposed these were the only children above sixteen years of age.

As to the probable population, deducting say one third of the above number or 110 for the young and unmarried, the 220 couples remaining may be supposed to average another 110 children above the age of sixteen, and two children per couple or 440 children under the age of sixteen, making together 660 adults and children ; the grand total now with the 440 people married being 1,100. Or as a shorter calculation for such a case simply multiply the number of householders by five, then five times 220 make an exactly similar total of 1,100. The "true mendicants," the poor probably being meant, are not included, their number cannot be found in any way. These remarks are made only as suggestions to aid in realising the general position ; the argument must remain open for individual opinion or for further evidence and research.

The occupations followed will be seen at a glance in the tabulated form. It will be remarked that there is no baker, although the name Pistor appears as an artificer in Stall Street. There is no doubler or dauber or builder, but the name Masoun, his occupation not otherwise given, appears in Walcot Street. There is no milner or miller, yet the mill was an important adjunct to the Priory, it may not, however, have been considered a part of the city. There is no bowyer, fletcher or arrowsmith,

although the name Fletcher appears in Southgate Street. There is no spicer, a strange want to us with our habits and demands upon the grocer of to-day. But our great articles tea, coffee, tobacco and snuff had no existence here, were all unknown, and pepper was a rarity, extremely dear, hence the custom of a pepper rental. Then there is no medico except the name Leche in Walcot Street, no occupation being attached to it, be taken as indicating the one happy man. There is no occupation noted as in any way connected with the bathing or the baths. As with those above, the other names having no occupations attached were apparently derivative; thus in Stall Street there are Palfryman and Plomer, in Walcot Street there are two Cissors and one Webbe; in Northgate Street are two Aurifiabers, one of whom has the foreign sounding Vylbo for his servant, and in Brade Stret are two Follators or Fullers, a Cissor and a Faber. In Brade Stret also was John Gregory, his occupation not given, yet he appears perhaps the most important man in the city. In Brade Stret also John Natton's servants paid their tax. It would be useless to constantly write say John Fuller, fuller, yet in Northgate Street occurs once this unnecessary doubling in the entry John Carnifex, carnifex, as perhaps also in Walcot Street, in the case of Nicholas Coobler, sutor.

Of the personal names some are curious, either for their spelling or derivation. Zawoher is splendid Zummerzset for Sawyer; then there is the very remarkable name of Schoylocke, and the scribe does himself full justice in Jolifphe for Joliffe. The Deyare of the previous roll becomes Deyher; others on this first roll do not reappear. There are no names from either vegetables or flowers. Foreign influence appears twice, in the surname Fleming and the Christian name Deodonay. There seems nothing remarkable in the Christian names: John of course is common, as would be Joan, our Jane, for his wife; but there is no trace of any extra or ultra influence either royal or otherwise, such as we have in the Georges, Georginas, and Wilhelminas of a

generation or so ago, or the Almas, Alberts, Victorias and Alexandras of to-day. Of the street names given Bynbury Strete remains as Bynbury Lane. Sowter Stret, with its suggestive but unexplained name, has disappeared. By y<sup>e</sup> Bathe Strete, spelled in one document By<sup>e</sup>Bay<sup>e</sup> St., may have a fair representative in the Bath Street of to-day. This position leads to the conclusion that the baths used were the Cross bath and the Common bath; the King's bath was enclosed behind the houses then facing Stall Street, standing on the site of the now Queen's bath and the western end of the Pump Room, and was in fact Crown private property within the precincts of the Priory. Stall Street was evidently the thoroughfare, but how was Southgate Street without the walls within the city jurisdiction, or how came it that Walcot Street and Broad Street are included. Such questions perhaps take us back to Domesday and the subject of hidage, so they must be passed here for this occasion. Yet, with Walcot Street, Broad Street and Southgate Street outside the walls, their inhabitants must be deducted from the previous estimate when attempting to determine the population within the walls.

Much has been said from time to time of the former industrial occupations of the city of Bath, and assertions have been made that great wealth was accumulated from the woollen trade once existing: all such statements being from tradition and as yet almost entirely without any supporting evidence. In these Rolls this question receives some assistance, as besides the often recurring names of Dyer, Fuller, Webbe, i.e. Webber, and Tucker, there are actually as traders three textors or weavers and six filators or fullers so returned, enough in such a population to warrant the conclusion that these industries were briskly carried on. Then there are eleven filators, mostly women, whose occupation must have been that of spinsters or spinners of yarn in connection with this same woollen business. In one case too there is just a help towards explaining the work of the often

noted artificer, as when in Walcot Strete, John Gregory is returned as a "webbe artificer." With our customs this seems at first to read as John Gregory Webbe, artificer, but as no third names were given in these early days the "webbe" must be taken here as in conjunction with the general working designation. Other so called artificers too must have been men of fair status, as in the case of Walter Webbe, in Brade Strete, who paid as much as two shillings and had three servants; Thomas Barbor, Thomas Webbe, and Roger Glover in Walcote Strete, all had three servants; and others it will be seen had one. Thus without much imagination Bath can be discovered as an industrial city depending on the woollen trade, neither the waters nor the baths in any way contributing.

The servants are seen as divided into three classes. The *famulus* I take to be the household or domestic servant; the *serviens* was probably a bond servant of some sort, perhaps an apprentice; then there were the servants, so called, whose status I cannot suggest, except that they did the out-door work.

There is one other question which must not be omitted, one not easily realised, one extremely difficult, perhaps impossible to decide certainly: viz.—what was the relative value of money between then and now; what was the purchasing power of the silver tokens then and now called shillings and pence. Omitting all questions about the standard of living, without saying more, let it be roughly assumed that the 3d. a day of the mechanic in Elizabeth's time, say 1580, was equivalent for all purposes of life to the 5s. a day of the mechanic of our own time, a difference of 20 times. But the difference of two centuries before 1580—in the time of this Roll—would be again very great, as the increase of wealth after the freedom which came with the Reformation was both rapid and widely diffused. If we say that between now and the time of the Roll, the difference was 40 times, it would not be too great. The 4d. of the Poll Tax at 40 times would then be our 13s. 4d.; and the £10 0s. 2d. received

from the whole city would be £400. Following this to the assessment valuation, the £130 become £5,200: here probably this calculation of a 40 times difference fails to approach the valuation of to-day.

As with the question of population, these points are only mentioned to enable the mind to realise somewhat the very great differences and the many difficulties always to be encountered when considering these subjects in relation to our early days.

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*Remarks on some Hemiptera-Heteroptera taken in the Neighbourhood of Bath.* By Lieut.-Col. BLATHWAYT, F.L.S., F.E.S.

(Read February 8th, 1888).

One hundred and twenty years ago Linnæus completed the plan of his *Systema Naturæ*; he was then acquainted with about 3,000 species of insects. Stephens, writing in 1839, says that he then possessed 11,898 species of *British* insects in his own collection; and Professor Westwood, about the same time, in his "Modern Classification of Insects," stated that the number of beetles with which entomologists were actually acquainted could not be less than 35,000; and now, in the opinion of Dr. Sharp, the President of the Entomological Society, there are in the collections of the world, at least 200,000 species of insects; he said also that from collections made by recent travellers, and from other data, he inferred that we very likely do not possess as yet more than one tenth of those existing. This would give a total of 2,000,000 species.

In Linnæus' time an entomologist might say he studied *all* insects; but, as the number of known species increased, he would have to restrict himself to *orders*, and now a single *Family*, or even a *genus*, is about as much as one person can well undertake. Buckton's recent "Monograph on the Aphides"—restricted to

British species—and, as he says, to those only which have come under his own observation, extends to four good sized volumes.

Formerly the study of entomology was looked upon as a somewhat frivolous and useless pursuit, and Kirby and Spence record that an attempt was made to set aside the will of Lady Glanville on the ground of lunacy, evinced by no other act than her fondness for collecting insects, and that Ray had to appear at Exeter on the trial, as a witness to her sanity. Or, coming nearer our own time, when less than 50 years ago (as recorded by Darwin in his *Naturalist's Journal*), a certain M. Renous found himself arrested at St. Fernando in Chili on a charge of witchcraft, because he kept some caterpillars that turned into butterflies.

Latterly we have had a good illustration of the usefulness of this study—I allude to the Hessian Fly scare. It has been found that this destructive insect did not come unattended, but that several species of parasites came with it, which it is to be hoped may keep it in due bounds. Exactly 100 years ago (1788), there was a perfect panic about it in this country. It was called the Hessian fly, under the idea that it was carried to America by the Hessian troops in their straw from Germany. It is a very small two-winged fly, belonging to the same family as the common Daddy-long-legs (*Tipulidæ*).

In a French newspaper, the *Montpellier Médical*, for February, 1885, there was an article under the title, “un nouveau cas d'application de l'entomologie à la Médecine légale” (Entomology and Medical Jurisprudence). It said that when pulling down an old house at Montpellier, the workmen discovered the mummified remains of a new-born infant concealed under the flooring. An enquiry was held on the remains, which (owing to their condition) mainly resolved itself into a question as to how long a period had elapsed since they were deposited. As insect remains were present, M. Lichtenstein was asked to report as an “expert.” He found in the linen in which the body was wrapped numerous



empty pupæ of Diptera, numerous "runs" of Lepidopterous larvæ, which he considered the work of *Aglossa pinguinalis*, and the remains of Anthrenus. On the body itself were débris of Ptinus and the cast skins of Acari. But nothing whatever in a living state. In taking into consideration the nature of the insect remains, M. Lichtenstein arrived at the conclusions that four or more years must have elapsed since the body was deposited where it was found, and (from the Dipterous pupæ), that it must have previously been exposed to the air for some time.

A slight knowledge of entomology might have saved Rogers from a great mistake. In his "Pleasures of Memory" he says—alluding to the bee—

"That eye so finely wrought,  
Beyond the search of sense, the soar of thought,  
Now vainly asks the scenes she left behind ;  
Its orb so full, its vision so confined !"

And to this he appends the following note :—"This little animal, from the extreme convexity of her eye, cannot see many inches before her."

Rogers had probably read somewhere that shortsight was caused by a too great convexity of the cornea, and noticing that the bee had a very convex eye, came to the conclusion that it must in consequence be extremely shortsighted.

The truth is just the other way—the more convex the eye of an insect the further it is able to see—for the eye is not simple but compound, composed of a number of facettes, varying much in different species, and many insects, the bee among the number, are provided with ocelli, or simple eyes, probably to enable them to see objects when quite close, as inside the corolla of a flower for instance.

The specimens now before you, and which have all been taken by myself in this neighbourhood, comprise 46 species of the sub-order Hemiptera-Heteroptera, and these are probably not more

than a quarter of the number which might be found by diligent search, for Dale, in his "History of Glanvilles' Wooton," records 178 species as having been taken in that parish, and I have no reason to believe that this neighbourhood will prove less prolific. His father and he had however been assiduous collectors for at least 70 years.

The total number of described British species is about 415, many of which are said to be very rare; but when really indigenous, and not a mere chance introduction, "rare" must be taken to mean, as a rule, locally so, and I have little doubt, that if anything like the attention bestowed on the butterflies and the beetles were given to this sub-order, a great proportion of our so-called scarce species would be shown to be in reality quite common. There is a rather handsome insect in the box, among the Capsidæ, *Calocoris Sexguttatus*, regarding which Messrs. Douglass and Scott, in their monograph say, "This species appears to be somewhat scarce. Dr. Power has taken it at Thornton Reservoir, Leicestershire, in July." This insect swarms in places near here on the blossoms of various umbelliferous plants in July and August. And the converse I also find to hold good, of many species said to be "abundant everywhere" I have never succeeded in finding a single specimen.

In their classification, the Heteroptera have been a good deal shifted about. The Linnean order, Hemiptera, was divided by Latreille into two sub-orders, Homoptera and Heteroptera. Dr. Leach and Mr. McLeay considered them as separate orders—an arrangement adopted by Professor Westwood in his "Modern Classification of Insects."

The order, Hemiptera is now divided by some entomologists into five sub-orders (1st, Phytophthiria, scale insects and Aphides, tarsi one or two jointed; 2nd, Homoptera, tarsi three jointed—these two forming Westwood's order Homoptera; 3rd, The Heteroptera; 4th, Thysanoptera—Thrips—regarded as a distinct order by Westwood; and 5th, Mallophaga parasitic, mostly on

birds). Others, however, adhere to the classification of Latreille, H. Homoptera, and H. Heteroptera, and it is with these latter only that we have now to do.

I must now offer an apology for a word I shall have frequently to use. The common English for this class of insects is "Plant-Bug," and though "Phytophagous Norfolk Howard" might sound better, it would be less concise. The Americans use the word "bug" for insects in general, just as we make the word "insect" include the Myriopoda and Arachnida. So if an American lady is to be held blameless for calling a beautiful butterfly a lovely bug, I must consider myself fully justified in calling a spade a spade.

The Heteroptera vary considerably from other insects both in their structure and their so-called metamorphoses.

The mouth of a typical insect may be divided into six parts. First there is an upper lip called the labrum, and a lower lip the labium; but then in place of the upper and lower jaws, possessed by man and other mammals, the one fixed and the other moving up and down, the insect has one pair of upper jaws, mandibles, and one pair of under jaws, maxillæ, both of which move from side to side.

These six parts may be represented thus—

	1	
2		3
4		5
	6	

In which 1 shows the position of the upper lip, 2 and 3 the upper jaws, 4 and 5 the lower jaws, and 6 the lower lip.

Taking one of the common ground beetles—this is the head as seen from above—the upper lip, the two upper jaws, the two lower jaws, each with a feeler attached, and the lower lip which closes the mouth, with a palpus or feeler on each side of it.\*

It would take up too much time to go from one order to

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\* Referring to sketches not reproduced.—H. H. W.

another, showing all the various modifications of the mouth. So I now draw the head of a cabbage butterfly sideways. In this case the upper lip and the upper jaws have almost disappeared, though their rudiments can be seen, but the two lower jaws are enormously developed—they are joined together but capable of being separated—and forming a tube through which the insect sucks up its food; when not in use it is curled up like a watch spring, and guarded by the two labial palpi, which stand up on each side of it.

In the Heteroptera the upper and the lower jaws have become very long and slender like stiff pointed bristles, and these are enclosed in the lower lip, which is greatly prolonged, and which curls up round them forming a sheath—the feelers have almost disappeared.

This combination of jaws and lip forms the instrument by which they are able to pierce plants and suck their juices, for as a general rule they are vegetarians, though some few are blood-suckers, and some feed on weaker insects. A wound is made by the four internal bristles, and the juice is then drawn up by a gradual contraction and dilatation of the tube formed by the lower lip. This form of mouth was called by Kirby and Spence *promuscis*, from *musca*, a fly, but it is now generally termed *rostrum*. This *rostrum* is either three or four jointed, and when not in use, lies close to the breast between the bases of the legs.

It is from the formation of their wings that they have received the name "Heteroptera" (different wings), the upper wings being partly leathery and partly membranous, and the under wings being entirely membranous.

All insects were thought to pass through four distinct stages or metamorphoses, the egg, the larva, the pupa, and the imago or perfect insect. But with some it appears that this is hardly the case, the Heteroptera for example. When first hatched from the egg, the young larva is very similar to the perfect insect, only it has no trace of wings which come gradually after a series of

moult; it has no quiescent stage like the chrysalis of a moth or butterfly, neither does it change its food, its mouth organs having always the same form.

Regarding the natural history of these insects comparatively little is known, and it is very difficult to keep them alive in confinement.

Most insects, probably all, have their parasites. I have not looked for them much among the Heteroptera, and all I have yet noticed belong to the genus *Scirus* (snouted mites). Among the water bugs I have frequently found *Gerris Gibbifera*, with its colour changed from that of black velvet to a brilliant scarlet by the number of these parasites\* that had fastened themselves to it.

I said that most insects had their parasites, two specimens of which I have brought to show you. The first is one of the Hymenoptera, *Trichiosoma lucorum*. The parasite, an ichneumon fly, lays a number of eggs in the body of the larva of *Trichiosoma*. This larva looks very like a green caterpillar, and unless looked at closely might easily be mistaken for the larva of a butterfly or moth; but whereas the true caterpillar has never more than 16 legs, this larva has 22. These eggs soon hatch into little white maggots within the body of the larva, and reach their full development by feeding on its substance, and they are endowed with a wonderful instinct which prevents their attacking any vital part, and so killing their host, for in this case they would die also. The larva therefore is left with sufficient strength to form its cocoon, but having done so it dies, and the small ichneumons, which belong to the same order of insects, the Hymenoptera, proceed to make their own cocoons within it, where they remain until the following spring, when they appear as the fly you see by its side.

This is an example where the parasites are large, and where

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\* I have not examined these; they probably belong to a different family.

anyone who paid the smallest attention to the *Trichiosoma* would be sure to notice them. But on the other hand some are very small, and these again are said to be subject to the attacks of other parasites.

On the other side of the small box are a number of eggs, or rather egg-shells, for they are now empty, of, I think, the Pale Tussock Moth (*Dasychira pudibunda*), the caterpillar of which is known as the Hop-Dog, and which must be classed among our injurious insects. Now in each of these eggs a small Hymenopterous insect, a *Teleas*, belonging to the family *Proctotrupidæ*, has laid a single egg of its own. After a short time the enclosed egg hatched, and the young larva found sufficient nourishment in the contents of this one egg to grow to its full size, make its cocoon, and soon after force its way out, a full grown *Teleas*.

How very small this young parasite must be, you may judge from the fact that the moth's egg, which contains all the food it requires, is rather less than the 1-25th of an inch in diameter, so that one cubic inch of food would suffice for a generation of at least 20,000 of these parasites.

I am afraid I have been rather straying away from my subject—the Heteroptera. The first group, in which the Scutellum is very large, consists of three families; the most important of which is the *Arthropteridæ*, of which the first insect in the box, *Acanthosoma Hæmorrhoidale*, affords a good example. Closely allied to this is *Acanthosoma griseum*, quite common enough, though I have not yet come across one. They are particularly partial to raspberries, and often quite spoil the fruit they touch; they are popularly known as Bishops, or Bishop's Mitres. Their peculiar odour is caused by a very volatile fluid they have the power of emitting from two small pores on the underside of the body, and which is only perceived when the insect is alarmed and which it probably uses for defensive purposes.

Although most of this family are injurious to the horticulturalist, there is one—a native of France—that is said to destroy

a small beetle which is very injurious to the vines. The *Phylloxera vastatrix* which has destroyed so many of the French vineyards, belongs to the other sub-order—the Homoptera.

In the next group, the Scutellum, is much smaller. One family is the Pyrrhocoridae, of which in England we have only one genus containing but one species—*Pyrrhocoris apterus*. This species is rather uncommon, and I have not yet succeeded in finding a specimen, though it is chiefly confined to the south-west of England. When, however, it does appear there would seem to be plenty, for Curtis mentions that he once saw a rock in the sea, near Teignmouth, perfectly red with them; this seems peculiar, for as a general rule they have no wings.

Curtis had a theory that climate had something to do with the development of the wings, but later entomologists have doubted this.

The typical family is the Capsidae, it contains a good many genera, and there are 32 species in the box. It is also called Phytocoridae, from the genus Phytocoris, which means Plant Bug. Of the next family Anthocoridae, *Anthocoris nemoralis* is interesting, as I have known one of them kill and suck a spider larger than itself, or I should say suck and kill, for the spider appeared to die from extreme suction.

The family Acanthidae has but one genus, *Acanthia* or *Cimex*, and it contains four species, of which I regret to say I have no specimens.

Three of them should be of interest to members of the Bath Field Club, as I believe they were first named and described by our President, Mr. Blomefield; they are *Acanthia columbaria*, *A. pipistrelli* and *A. hirundinis*; these, as their names denote, are found on the pigeon, the bat and the swallow. And No. 4, who should by right stand at the head, is *Acanthia lectularia*.

This creature has given rise to much discussion among entomologists, as to when and how it was first introduced into England. Some thought it was brought over from America in timber used

in rebuilding London after the great fire of 1666. It certainly does not seem to have been common in the time of Queen Elizabeth, as no mention is made of it in Shakespeare or any of the old dramatists so far as I am aware.

Kirby and Spence quoting Mouffet or Muffet, as his name is sometimes spelt, who wrote his *Insectorum Theatrum* towards the close of the 16th century, though it was not published until 1634, said that in 1503 two noble ladies were sadly frightened by finding spots on their bodies which they thought to be the plague, and were not tranquillized until their doctor, who happened to be a naturalist as well, assured them that they were only the bites of *lectularia*; and that this refutes the opinion that *lectularia* was not known in England before 1670.

The original name, the same authors say, was *Chinche*, or Wall-louse, and the term *Bug*, which is a Celtic word, signifying a ghost or goblin, was applied to them after Ray's time (d. 1705), probably because they were considered as "terrors by night."

In Matthews' Bible (1537), Ps. xci., verse 5, is rendered, "thou shalt not need to be afraid of any bugs by night." In this sense also Shakespeare uses it—

Winter's Tale—Act iii., Scene 2. *Hermione*—"Sir, spare your threats, the bug which you would fright me with I seek."

King Henry VI.—Act v., Scene 2. *King Edward*—

"So lie thou there, die thou, and die our fear,  
For Warwick was a *bug* that feared us all."

And Hamlet Act v., Scene 2—

"With ho ! such *bugs* and goblins of my life."

*Puck* in "Midsummer Night's Dream" would seem to be only another form of "bug," and Spencer—

"A ghastly *bug* doth greatly them afear."

According to Professor Westwood, the insect was well-known to Pliny, Dioscorides, Aristophanes and Aristotle.



The next of most interest is *Reduvius Personatus*, the large insect in the fourth row with spread wings. These insects have a habit of flying towards the light. The only two I have ever taken came in at my window at night. It has received the name of *Personatus* (disguised), on account of a habit it has while in its larval state, of covering itself with a thick coating of dust. It is said to be a great enemy to the Bed-Bug, and the Rev. J. G. Wood says he knew of a case in which the larva of *Reduvius* kept in captivity used to eat three or four bugs daily.

They are not very common. Dale in his "History of Glanville's Wootton," omits them altogether from his list of local insects, but as he states, that only in one instance, namely on the 1st September, 1874, was *lectularia* captured in his parish, though his father before him was an assiduous insect collector since the beginning of the present century, it could hardly have been expected to remain where its favourite food was so scarce.

Of the Hydrometridæ, *Hydrometera Stagnorum* is the only British species. I have not included it in my local list, as I have not yet taken it in this neighbourhood, though no doubt common enough. The one in the box came from Bournemouth.

*Velia Currens* is the little black velvety thing you must have often seen running over the surface of the water. My specimens were not taken here. They are in the fifth row beneath *Hydrometra*.

*Gerris Gibbifera* (the last but one in the fifth row). In this species, which darts about on the surface of the water like *Velia Currens*, the female is nearly twice the size of the male. In these insects the wings though sometimes developed are in general rudimentary.

We now come to the true water bugs, one of which *Notonecta glauca*, the last in the fourth row, is tolerably common in stagnant water, but is rather difficult to capture. The popular name is water boatman, and was given on account of the appearance they present when resting on the surface of the water; their long hind

legs are thrown out at right angles to the body, so that it looks like a waterman resting on his oars. The scientific name *Notonecta* (back swimmer), was given for a similar reason. The hind legs are furnished with a fringe of hair, which enables them to "feather their oars," so to speak; as the leg is drawn forward the hairs lie straight and parallel to the line of motion, but as soon as a back stroke is given the hairs turn at a right angle, which gives it great propulsive power.

The rostrum of the Water-boatman is very strong and sharp, and will pierce the skin if carelessly handled.

The last that I have to mention is the large Genus *Corixa*, which contains 28 British species, but of which the box contains only one, *Corixa mæsta*. Of this Genus there is a Mexican species, regarding which a French naturalist, M. Virlet D'Aoust, has published an account. "Myriads of these little 'flies,'" he says, "(Moucheraus) fly about over the surface of the lake, and then plunge into the water to lay their eggs at the bottom. I had the advantage of being present at a great fishing for these eggs, which under the Mexican name 'haoutle,' are much appreciated by the Indians, who make them into a kind of cake. The manner of gathering the eggs is as follows:—The Indians place bundles of reeds upright in the water at some distance from the bank. After ten or fifteen days these reeds will be completely covered with eggs; they are then taken out of the water and laid on pieces of cloth in the sun to dry, after which the eggs are easily rubbed off and the reeds are put back again."

M. Virlet thought that these were the eggs of flies, but Guerin-Meneville having received some eggs from which the "haoutle" was made, determined them to be of two species, one well known, as the *Corixa Mercenaria*, and the other he named *C. Femorata*.

Pascoe in his "Zoological Classification" says, though he does not give his authority, "that at the present day in the Lakes of Texcona and Chalco, a white limestone rock is forming from the eggs of *Corixa Mercenaria*."

The specimens I have brought do not comprise all I have taken in this neighbourhood, but only those that I feel pretty sure I have named correctly. I propose to leave the list in manuscript, and place the insects in the Local Insect Cabinet, and hope by next winter to have added largely to their number; and should any entomologist doubt the correctness of the list, the insects, like Jack Cade's father's bricks, will there be alive to testify it, or in case of mistake correct it.

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*Recent "Finds" in the Victoria Gravel Pit.* By Rev. H. H. WINWOOD, F.G.S.

(Read February 15th, 1888.)

In the "List of Fossil Mammalia found near Bath," Vol. vi., No. 1, p. 95, of our "Proceedings," "*Morefield Cutting*, Somerset and Dorset Railway," occurs as one of those places where Mammalian remains had been found. Some members of the Club may recollect visiting a section, whilst that line was in process of construction, made through gravel beds resting on Blue Lias clay, immediately E. of the third bridge after crossing the main road, this was called at the time "*Morefield Cutting*." Since then the gravel banks on each side have been concealed by a clothing of vegetation, and their presence forgotten save by a few especially interested in the subject. As good gravel becomes every year more scarce and valuable in our neighbourhood, the property in which these beds occur having been purchased by a gentleman who had a keen eye to their commercial value, excavations have of late years been made to the S.W. of the line, and a fine exposure of gravel was the result, and the pit was given the name of "*Victoria Gravel Pit*." These few preliminary explanations are deemed necessary, as confusion often arises from one and the same place having two names. As in addition to the "finds"

of the bones of extinct animals when the beds were first opened many more have since been discovered, it will be well to place these on record in the pages of a publication whose chief use and object is to take note of such local events ; hence my excuse for taking up your time this afternoon.

Before however alluding to the bones, let me say a few words as to the material composing the gravels, as there are many interesting facts connected with it. Our valley is not particularly rich in its gravels ; patches occur here and there, but not of any thickness. One often hears of a bed of gravel having been opened, but it does not fulfil the conditions of *true gravel*. Frequently on the slopes of our hills a mass of small angular and subangular stones mixed up with clay and loam fills up the depressions and small hollows of the ground ; to this the name of angular drift ought to be given, as there is no indication in its sharp edges of transport from any distance or of attrition by water. Moreover the material of which it is composed consists of portions of the rocks on or near which it lies. Whatever may be its origin, whether the result of a crust of land ice breaking off the subjacent rock over which it passes in its downward movement ; or whether the result of subaerial denudation and wearing away of rock surfaces, it never was deposited in its present position by swiftly flowing water as true gravel must be ; moreover, it is destitute of any shells or other remains which could fix its position in the geological record. On the other hand the true gravels in our basin contain many indications of their age, and are of very great interest and importance ; and, as Charles Moore wrote, "help to fix some milestones in our journey backwards from the present time into the dim vista of the past." Looking at our present gently flowing Avon, winding its sluggish and somewhat dirty course through our beautiful valley, we can with difficulty realise the time when it must have been a rushing torrential river, now swinging from this side, now from the other ; shingle banks accumulating in the more rapid

reaches, sand, silt and mud in the less rapid and more embayed curves and back rushes, leaving its footprints at various levels at which it once flowed. What a history, too, do these deposits unfold of the wear and tear of our so-called everlasting hills! For in most of the sections hitherto examined, and more especially in the one about to be described, are specimens of all the formations between this and the Mendip Hills. This evidence I will at once proceed to place before you in the section of the "Victoria Gravel" pit, taken on the S.W. side, lately exposed, and whence most of the recent "finds" have come.

## SECTION VICTORIA GRAVEL PIT, S.W. SIDE.

	Feet	Inches
1. Reddish loam with angular and subangular stones ...	1	7
2. Gravel .. ...	1	9
3. Lenticular band of sand ...	1½	2
4. Gravel ... ..	0	10
5. Black band ... ..	0	2
6. Gravel ... ..	0	4
7. Black band ... ..	0	1
8. Irony coloured gravel ...	0	7
9. Ditto coarser, with black bands and mottled clay containing <i>mammalian</i> remains and resting on light blue clay...	1	8

These beds occur about 100 feet above the level of our present Avon, and are therefore some of the highest gravels in our neighbourhood yet opened up. In the soil overlying the gravel an earthen pot was found, containing portions of bones apparently calcined. The vessel was so rotten that it fell to pieces on exposure to the air. From the character of the pottery it was probably of the Romano-British period. Besides this there is

nothing particularly worthy of mention in the top divisions beyond the reddish loam containing the angular and subangular fragments of principally Oolitic debris with now and then an unrolled flint; a deposit of comparatively recent age, the last evidence of denudation possibly occurring just at the dawn of the historic period; and the evidence beneath this in the lenticular bands of sand, and indications of current marking of the many changes which took place in the force of the stream when they were being laid down. When we come to the base however our curiosity is aroused by the size of the blocks which are seen lying on the clays beneath—the old land surface on which they were dropped—large blocks of Sandstone and Oolite principally from the Coral bed which caps our hills, especially those which flank the Warley Valley. Just above these in the ferruginous and black gravel bands was found the portion of an elephant's tusk which some Members of the Club saw in situ in the Autumn. Before however giving further details of the Manmalian remains let me describe the character of the gravel. Though the great mass of it consists of Oolite and Lias from our hills and valleys more or less rounded, we have in a less proportion flints and chert from the Chalk; Limestone and Millstone grit from the Mendips. These latter are well rounded as we may expect from their distant transport, some score of miles from their parent beds. It would be interesting to trace their course from their home near Frome, through the many windings of that picturesque little river in its present woody and peaceful valley to its junction with the Avon at Freshford; and onwards through the Warley valley into the Bath basin and to their present site so high above the river level. So far for the materials of which the gravels are made up. Now for some peculiarities connected with its deposition. At the base of the beds and resting upon the mottled Liassic clays are many large blocks of Grit and Oolite, which it is difficult to account for, as having been transported by water alone. One

block of subangular Oolite from the Coral band of Great Oolite which caps our hills, measured in its greatest length 1ft. 10½ in., in breadth 1ft. 3in., and in thickness 11in. Another block of a lightish yellow Saccharine Sandstone, most probably Millstone Grit, measured in its greatest length 2ft. 9in., in breadth 1ft. 6in., and in thickness 8in. This was smoothed and polished, and had its angles rounded. Charles Sawyer, the man who digs the gravel, informed the writer that the largest stone he had taken out weighed near three cwt. How were these large masses moved and dropped in their present position? I would venture to suggest they may have been rafted down from their site by ice floes; which as they gradually melted dropped their burden on to the floor on which they grounded. Though from the nature of the rocks around us they are too soft to preserve any traces of a glacial period, yet we may infer that there was a time when our local hills and valleys were coated in an ice sheet—as were we know those of the North and Midland Counties of England. Indeed, Charles Moore always held this opinion from other indications which in his long and intimate knowledge of our local geology he had from time to time observed. It is time now to mention the contents of our pit. From the section it will be noticed that many ferruginous stained bands of sand and gravel run through it; in or near these, and especially at the base, bones of extinct animals have been found, amongst which may be enumerated the following—Molar teeth and portions of bones and tusk of *Elephas primigenius*; Molar tooth of *Elephas antiquus*(?); Molar teeth of *Rhinoceros tichorinus*, and *Bos (primigenius)*,—teeth and Metatarsal bone of *Equus fossilis*, &c. With regard to the portion of the tusk of the Mammoth—having at the close of the meeting of the British Association at Manchester, in September, heard that some bones had been recently uncovered, on my return I at once went to the pit and found at the depth of five feet below the gravel the portion of a tusk of that Mammal, lying point upwards and sloping down into the gravel. The

material around it was so black that my hands were stained as if with soot. The ivory was discoloured outside with the black coating and so fragile that the least touch caused it to fall to pieces; and, seeing at once that it was almost impossible to take it out or pour liquid plaster round it for a cast owing to the pervious nature of the bed in which it was lying, I had it covered up temporarily and called the public attention to it in one of the weekly papers. It remained in this state for some time and was frequently visited until some one out of curiosity or mischief attempted its removal, the result being that only portions were left behind. Its length was 2 feet  $7\frac{1}{4}$  inches, outside curve— $10\frac{3}{4}$  inches in circumference measured round the middle; and tapering off at its exposed end to 3 inches. A tooth of Bos was found near it, and the root of one of the elm trees growing above had penetrated below the tusk.

Such is the evidence afforded by a gravel pit of the changes which have gone on around us in recent times when these quaternary gravels were deposited; changes in contour of hill and valley, climate and fauna, so difficult to realise, but changes which nevertheless it is certain must have taken place in the yesterday of Geologic time, and which it is the proud boast of the latest born of Sciences to have demonstrated by an ever increasing weight of uncontrovertible facts.

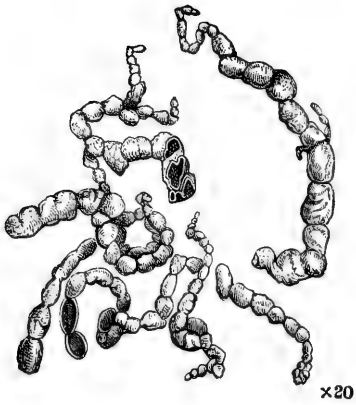
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*Note on Webbina irregularis, (d'Orb; ) from the Oxford Clay at Weymouth. By C. DAVIES SHERBORN, F.G.S.*

(Communicated Feb. 15th, 1888.)

Dr. G. J. Hinde, F.G.S., has kindly drawn my attention to a fragment of a large specimen of *Gryphæa dilatata*, from the Oxford clay of Weymouth, collected by R. Formby, Esq., of Bath. The fragment, which measures 20 × 14 cm., is occupied on its exterior by one very large and two smaller *Serpulæ*, and part of the





WEBBINA IRREGULARIS, D'ORBIGNY.



lower valve of an *ostrea*, all being covered by thousands of specimens of *Webbina irregularis*. The specimens of this finely arenaceous foraminifer do not call for any especial notice, except for their great abundance, the whole surface of the shell appearing white with them; the chambers also are slightly more oblong than in those specimens previously figured. The majority of the individuals are filled with iron-pyrites and allow the arrangement of the stolon-connected chambers to be readily made out. *Webbina irregularis* ranges from the Lias\* to the present, but I do not remember any previous mention of its occurrence in the Oxford clay.

C. DAVIES SHERBORN.

NOTE. Mr. Robert Formby having shown me a specimen of *Gryphæa dilatata* which he had obtained from the Oxford clay at Weymouth, covered with a net work of delicate branching organisms, I sent it on to Dr. Hinde for examination. The latter finding it covered with Foraminifera, forwarded it to Mr. C. Davies Sherborn, an authority upon the subject. The occurrence of this peculiar form being rare, so low down in the Geological Strata, Mr. Sherborne thought it worthy of record in our local "Proceedings," kindly made a figure of it, and drew up the above note, for which the Club is much indebted to him.—H. H. W.

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*Summary of Proceedings for the year 1887-8.*

MR. PRESIDENT AND GENTLEMEN,

Your Secretary has again to begin the record of the Club's Proceedings with the statement that the Anniversary dinner was not held. The committee appointed at the October meeting to make the necessary arrangements did their part, but having received only five names in answer to their appeal, they had not any other alternative but to put it off. The papers read at the

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\* Figured by H. B. Brady, "Proc. Somerset Arch. Nat. Hist. Soc.," vol. xiii., p. 232, 1865-6, Pl. I., figs. 2 and 3.

afternoon meetings have been of much value, and the attendance of members has been encouraging, notwithstanding a lack of discussion which was very evident on several occasions. On March 9th, Mr. Irvine, well-known for his archæological researches in Bath during his superintendence of the restoration of the Abbey by Sir Gilbert Scott, contributed some interesting Notes on Old Bath, collected chiefly from the Municipal Records of the City; and facts connected with the history of the Church of St. Mary de Stalles (Stalls Church) not hitherto apparently made public. Mr. Austin King added some valuable additional information respecting the Municipal Records, and considered that the word "Stalls" arose from the permission given to the public to erect stalls for the sale of their goods outside the walls in that part of the parish extending down what is now Stall Street. In the course of the discussion it was elicited that the valuable collection of papers and prints connected with Bath, formerly made by the late Mr. William Long, was now in the possession of his son Colonel Long. The winter portion of the session began with a communication of great value from Professor Rupert Jones, F.R.S., F.G.S., and Mr. C. D. Sherborn, F.G.S., on the Ostracoda found in the neighbourhood of Bath. The Secretary, to whom the paper was entrusted to read, prefacing it by a short history of the Entomostraca in general—their habits, food and characteristics—stated the condition under which these in particular were found. The Fuller's Earth industry having lately been much developed in our locality, new excavations have recently been made on the North side of the hill on which Midford Castle is situated, and a driving of some length on the horizon of the Fuller's Earth, here about 20 feet thick. Several visits were paid by him from time to time to the works in company with Mr. H. B. Woodward, of the Geological Survey and others, and specimens of the Blue Clays and Yellow Earth were sent up to Professor Rupert Jones who was engaged in a microscopical examination of such clays

for Eutomostraca, with a rich result as his paper shows. The clays sent to him for the same purpose from Bradford were obtained from the deposit peculiar to that locality, and underlying the Forest Marble. The thanks of the members present were returned to the authors for their contribution to the "Proceedings" of the Club.

Mr. PUMPHREY followed with a paper on "Landslips and Subsidences." The remarkable landslip at Zug, in Switzerland, visited by him last summer, being first described, he proceeded to touch upon the same natural phenomena in our own locality, special allusion being made to what has been going for so long a period at Hedgemoad. A conversation followed in which Messrs. Skrine, Bartrum, Morgan and the Secretary took part; and well-known instances of local slips on our hills were described, a distinction being drawn between subsidences and landslips. The general opinion as to the cause of the Hedgemoad slip seemed to be the comparatively recent addition of new houses on the steep slopes, without the precaution being taken of piercing through the *talus* and laying the foundations of the houses in the natural ground instead of the subaerial wash of the hill. To this may be added the result of water percolating between the natural slope and the *talus* greasing the "slips" as it were and thus aiding the natural effect of gravitation.

The second afternoon Meeting on December 14th was given up to Mr. AUSTIN J. KING, who made a valuable contribution to the ancient history of Bath in "Some Notes on Stalles Church, Bath."

The CHAIRMAN (Mr. Shum) thanked Mr. King for his most interesting Antiquarian paper, especially valuable to Bath people and placed before the Club in an admirable and succinct manner. It was well known how very little information was obtainable respecting that particular portion of the ancient history of the City; but Mr. King having been so favourably situated for research, had made most admirable use of his opportunities of hunting up the Municipal Records, and had from time to time given to the

public the result of his enquiries therein, of which the present contribution was by no means the least valuable.

Several members joined in the discussion afterwards, and questions were asked as to the position of the Chapel of St. Lawrence, on the Old Bridge, and whether there was originally a ford where Bridge Street now crosses the river, &c.?

The SECRETARY stated that Mr. Irvine was of opinion that Bishop Fitzjocelin, who rebuilt the Churches of St. Marie and St. Michael, *intra muros*, probably pulled down the Great Temple in Bath, and used up the materials for that purpose. A window, possibly of the Church he pulled down, was found during the White Hart excavations, and is now, together with a fragment of a Saxon cross found at the same time and place, in the Bath Museum. Two other fragments of Saxon crosses which are also in the Museum, were found when the Grand Pump Room was built in 1790.

Local history had another able exponent in Mr. EMANUEL GREEN, who read a paper on January 11th, on "A Bath Poll Tax: 2, Richard II." In the discussion which followed, Mr. MORGAN asked whether the estimate of the population was not rather small, and whether it would not be increased very much by large numbers of beggars, and whether there were not many serfs in the city?

Other members desired to know what the servants would be that were mentioned in the records, also whether the records referred to were the property of the Bath Corporation?

Canon ELLACOMBE said it was a curious thing that whilst the names of nearly all trades were preserved in surnames of the present day that of shoemaker seemed to have vanished. They had "Schumacher" in Germany, and he was interested to hear the name "Sutor" in Mr. Green's list. He thought the reason that so few children were mentioned was because many of them might be apprentices and included under that head in the record. He supposed that if the majority of people were asked

to mention the oldest city in the West of England, they would name Bristol, because it possessed a number of ancient buildings. Now, Bath was very much older than Bristol, but did not possess many architectural remains above ground ; it was, however, very rich in old records, which such papers as the present one were very useful in bringing to light.

Mr. GREEN in replying said he had no clue as to the number of mendicants, but probably they would be very numerous ; it was very doubtful if serfdom existed in the city. The returns of the poll tax were no doubt very much "cooked" in those days, especially as regarded the clerics and certain favoured individuals. The number of burgesses however in the Domesday Book was only one hundred and fifty, which, multiplied by five, would give seven hundred and fifty as the gross population. The servants consisted of three classes, corresponding most likely to domestic servants, apprentices, and hired men servants. He would be glad of some information as to the locality of Bimbery Street and Sowter Street mentioned in the old records. The records he had worked up his paper from were not in Bath, but in London, and were written in very difficult text.

Mr. BROWN said that Bimbery Lane still existed along the east side of the United Hospital, and he thought that "By ye Bathe Strete" might be the street on the W. side of the Hospital now called Hot Bath Street, and that "Sowter Stret" may be Beau Street.

The CHAIRMAN having dwelt upon the usefulness of all information as to population and antiquities of Bath, in view of the early preparation of a handbook to Bath, for the use of the British Association, went on to say, that whilst there had been much investigation concerning the Roman and Saxon periods in Bath there had not been so much done for the immediately succeeding period. As regarded the Roman period, it was now considered probable that Frontinus, a great engineer, and the immediate predecessor of Agricola in these islands, was the

founder of the Baths of Bath. If so that would be during the reign of the Emperor Titus. Prebendary Earle had done good work with regard to the Saxon period, and it was now important to throw some light on the Mediæval Period which this paper was calculated to do. A vote of thanks was accorded to the reader of the paper and the Chairman.

The fourth and last afternoon of the session, on February 8th, was given up to Natural History and Geology. The first paper was from Colonel LINLEY BLATHWAYT, "On Hemiptera-Heteroptera taken in the neighbourhood of Bath," the second by the SECRETARY on recent "Finds in the Victoria Gravel Pit;" who also had a communication from Mr. DAVIES SHERBORN on "*Webbina irregularis*," a Foraminifera found on a fossil oyster shell from the Oxford Clay, near Weymouth. Unfortunately neither of the Authors were able to be present to read their papers, owing to illness in their families, but Canon Ellacombe (who took the chair) and Mr. Norman very kindly undertook to do so for them. No slight compliment was paid to the first paper by a member present who evidently was not a naturalist reporting in substance that it was a dry subject admirably handled and made most interesting. The Secretary was indebted to Mr. Formby for the specimen of *Gryphæa dilatata*, from the Oxford Clay, near Weymouth, which was sent to Dr. Hinde for examination of the parasitic growth with which it was covered. Through his kindness the specimen was forwarded to Mr. Sherborn—hence the note of the occurrence of a form of Foraminifer in the Oxford Clay, undoubtedly rare and desirable of being inserted in our local Proceedings. Thanks were returned to the respective authors for their communications.

#### EXCURSIONS.

Passing on to the four Excursions considered evidently by a section of the members the most important events of the year, the record is one of success. The first took place on April 26th to



*Thornbury Castle.* The long spring drought broke up on Tuesday, April 26th, and the first Excursion of the Club was inaugurated by six hours of continued rain. Notwithstanding this unpropitious circumstance sixteen members met at the Midland Station at 10.40, and comfortably seated in a saloon carriage proceeded to the Yate Station, whence owing to the inconvenient arrangement of the trains they were obliged to engage a special engine to take them on to Thornbury. The interesting strata through which they passed were but dimly seen through the streaming windows, but enough was visible to indicate that they crossed the N.E. portion of the Gloucestershire coal-field at Yate, and at Tytherington Station entered deep cuttings of the Mountain Limestone coming out on to the old Red Sandstone. Thus traversing during their morning's ride the breadth of the coal basin, from its S.E. edge at Bath, to its N.W. at Thornbury. The deserted streets of that town echoed dismally to the falling rain and footsteps of the party as they made their way under umbrellas and mackintoshes to the church; the inhabitants peered through their windows wondering at the sight. At the church the vicar, Mr. Hodgson, met the members in the S. porch and proceeded at once to give a short history of the building, for which, he said, he was indebted to the late vicar, the Rev. T. Waters. Dedicated to St. Mary the Virgin, the present church, he said, stood on the site of an earlier one, founded probably in the 12th century, as in an ancient deed still extant in which Simon, Bishop of Worcester (1125-1150), confirmed to the Abbey of Tewkesbury various grants of churches, tithes, &c., formerly given by Robert Fitz Hamon to that monastery, the church of Thornbury is mentioned amongst others. Of this early church probably there are not any remains existing, unless the transition N. and S. doorways and square font similar to that at Oldbury church are examples. The slender pillars of the nave support a clerestory which appears to have been a later addition when the flat roof replaced a more pointed one in 1599. The circular string moulding over the

bays finishes off differently on the S. side to that on the N. at the E. end. The wooden corbels supporting the roof brackets were replaced by stone at the last restoration in 1848 ; on them are emblazoned the arms of the proprietors of the Manor and Castle from William Rufus to the Howards on the N. side, and those of ecclesiastical dignities on the S., seven on each side. The chancel contains remains of the Decorated period in its triple Sedilia and S. window. Some old glass in one of the S. windows has the "Sun in Splendour," the badge of Edward IV. The beautiful Perpendicular tower, with its overhanging pinnacles, fine specimens of the 16th century work (c. 1540), much resembles those of St. Stephen's Bristol, Dundry, and Gloucester Cathedral, though the first was built c. 1470.

Before leaving the church, Mr. Stafford Howard, who had purposely come to Thornbury to meet the Club, joined the members and conducted them at once through the celebrated gateway to the inner courtyard of the Castle. The walls of this fine specimen of Baronial Castle, built by Edward Stafford, Duke of Buckingham, between 1511-1522, are nearly perfect. The roof, however, owing to his death in 1522 seems never to have been put on. Before passing round to the S. front, Mr. Howard directed attention to the beautiful stack of brick chimneys on the N. face of the S. wing, with the date 1514 carved below, showing what progress had been made in three years since the building of the gateway. Tradition existed that the decoration on the chimneys had been carved out after they had been erected, and that the bricks had not been moulded in that form. The far famed bay windows on the S. side, the carved brick chimneys and the little spirally decorated stone chimney above, were much admired (as indeed they could not fail to be by everyone who wants a model for such necessary, but generally hideous appendages to the modern roofs); and the party having left their dripping umbrellas and overcoats in the conservatory, were conducted through the interior adapted during the lifetime of

the last owner to serve all the requirements of a modern dwelling house. The construction of the bay windows, catching every ray of sun, was duly appreciated from the inside ; and the fine tower as seen through them was a beautiful architectural object. Passing out to the N. side of the quadrangle, the remains of the huge oven, the kitchen and buttery hatch, and the stables for the horses and men were visited, and the tour of the courtyard having been made, a cordial vote of thanks was given to Mr. Stafford Howard for his courtesy, and the members returned back to the long street and found warmth and refreshment in the hostelry of the Swan. Attempts were made after lunch to visit the neighbouring heights for a view of the Severn valley (the walk to Oldbury Camp was necessarily postponed, the rain being too persistent even for the walking members of the Bath Field Club), but these generally proved unsuccessful, though some umbrellas in the far distance indicated various efforts that way. The Secretary, however, in a slight intermission of the rain, visited an interesting section of Old Red in a field about three-quarters of a mile S.E. of the station and to the N. of the line. A small opening had been made and exposed the Old Red Conglomerate. The top bed beneath some 2 feet of Red Marl being coarse Conglomerate, with large white quartz pebbles, graduating downwards into simple quartzite, with dark brown or black specs thickly scattered throughout. The peculiarity in this section being that the top bed was divided from the bottom by fissile bands of red shales, having at their base a band 2 inches thick of loose quartz pebbles, held but slightly together in a yellow matrix, and crumbling away in the fingers ; the whole depth of the section was 7 feet. At 4.50 the return journey was made, and for the first time during the day the rain ceased, and the sun shone out allowing distant glimpses of the Severn and Welsh hills in the back ground to appear sufficiently clearly to show us what had been hidden from our view during the morning. (*Vide* Proceedings, vol. i., p. 102 for further account of Thornbury Castle.)

*Savernake, May 25th.* Three hours' tedious railway journey to Savernake station were passed in comfort in the saloon carriage provided for us by the G.W.R., the delay at Trowbridge being taken advantage of to visit the Rectory and Church where the poet Crabbe passed some years of his life, and now lies buried (*Vide Proceedings, vol. vi., No. 1, p. 106.*) Arriving at the station at 1.30 the members were not sorry to leave their carriage and breast the rising ground leading to the entrance of the Forest on the S.W. Making direct for the obelisk, showing its top above the trees on the left, they struck across the springy turf, and from the traces of sand, pebbles, and chalky debris which the rabbits had brought out to the entrance of their burrows saw at once how suitable the soil was for tree growth. The obelisk tells its own tale from the following inscription on the S.E. face:—

This column was erected  
by Thomas Bruce, Earl of Ailesbury,  
as a Testimony  
of gratitude  
to his ever honoured Uncle,  
Charles, Earl of Ailesbury and Elgin,  
Who left to him these Estates,  
and procured for him the Barony of Tottenham.  
And of loyalty  
To his Most Gracious Sovereign  
George III.,  
who unsolicited conferred upon him  
the honour of an Earldom.  
But above all  
of Piety  
To God first, highest, best,  
Whose blessing consecrateth  
every gift  
And fixeth its true value.  
MDCCLXXXI.

The long vista to the S.E. carries the eye to Tottenham House. Turning to the right and following one of the roads to the N.E., the members were tempted to wander off in quest of

some "Ruins" inscribed on a sign post, and after much wandering and the usual divided counsels found themselves at the edge of a park like expanse of greensward, with large herds of fallow deer grazing on the left. The "ruins" were then discovered to be merely the remains of Savernake Lodge, after the fire which destroyed it a few years since. However this detour was not without its advantage. The tall straight stems of the beech trees, with their light green spring foliage, arose on either hand as far as the eye could reach, and one felt penetrated with the the spirit of the forest primæval; then an oak tree struggled up here and there tall and slim like its beech brethren; then as one advanced further into the inner penetralia a large and wide spreading solitary oak maintained its true dignity and asserted its right of expanse; until passing through a wooden fence boundary magnificent old oaks reared their gnarled arms and heads in solemn grandeur alone, keeping their brother trees at a respectful distance, and claiming respect due to their patriarchal age. Then again there was much of interest in remarking the soil upon which these trees grew. A section on the left revealed some four or five feet of Tertiary beds, rounded flint drift on the surface succeeded by sand and angular chalk flint debris resting upon clay, thus affording an admirable subsoil and nourishment for the forest growth before its roots reached the Chalk beneath. Whilst enquiries were being made of a gardener, near the lodge, for the nearest way to the "King Oak," the botanists found several dwarf orchids in flower, either *Maculata* or *Morio*, and the photographers of the party made their first attempt with the camera. Turning westward, the party struck across the grass for the great avenue, crossing it in the direction of the "12 o'clock avenue;" just before doing so a fine herd of fallow deer away to the left, picturesquely feeding in the open, were unconsciously the object of most earnest attention by two curiously posed figures beneath a black pall in front of a tripod; the distance, however, was probably too far for their successful capture.

Following the avenue southwards for a little way, a detour to the right led to the place where the "King Oak" formerly held his court. At the last visit of the Club, in 1868, one arm still remained to this magnificent old tree, measuring from 23ft. to 24ft. in girth, since then this has disappeared, said to have fallen the day after the Duke of Connaught lunched beneath it, now 16 or 17 years ago. Palings protect all that remains of its former greatness reduced to a hollow stump, on which a notice board has been fixed warning visitors of the danger of lighting fires in its vicinity. Within a few paces grows the "Queen Oak," venerable but apparently still healthy and as yet uninjured. Many a jubilee year has her Majesty seen, and may she continue to see many more! Luckily last winter's destructive snow storm seems to have dealt very gently with her, and her branches remain unscathed, though fine oak trees all around have suffered considerably. The destruction caused by that storm is very remarkable amongst the oak trees; whilst the beech seem to have escaped without a twig broken, the former have huge limbs and branches torn off in all directions. Successful photographs having been taken of the "King Oak," the members retraced their steps back by the "12 o'clock avenue" to the "eight walks," and by the aid of useful direction posts struck into the "great avenue" of Beeches four miles long. Nothing can excel the beauty of the view down the long vista of tall slim smooth boles, with their graceful over-arching limbs; the foliage, too, of the beech was just perfect in its spring freshness, and the chequered light added picturesqueness to the undulating character of the ground. Leaving the Forest by the old and now disused Turnpike gate for the Marlborough Road, a walk of about one mile and a quarter was all that intervened between the Forest and the Ailesbury Arms; the rich vale of the Kennet spread out in front. Folly Farm, the ancient Cunctio was passed, the "Five Alls" Inn was glanced at and the much needed lunch was fairly earned. A herd of goats picturesquely lying about in the Market Place

attracted much attention, reminding us of continental ways; the camera was focussed upon them, with what success as yet remains to be seen. Nineteen members took part in the excursion.

It was remarked as a sign of the lateness of the season that the oaks in the forest were but a very little out in leaf, and that the note of the cuckoo was silent.

*Barry Island and Docks, June 14th.*—Owing to the Jubilee to be celebrated on the 21st (the original day fixed for this excursion), it was thought advisable by the committee to alter the date to the 14th. Summer having burst upon us with sudden energy, twenty-three members assembled at the G.W.R. Station, at 10.18 for Cardiff viâ the Severn Tunnel lately opened for passenger traffic. The comfort to passengers by the through route was most fully appreciated. Instead of the inconvenient change from carriage to steamer, down and up the dirty and slippery steps with the chance of a wetting in crossing the "Trajectus" from rain above or Sabrina's muddy water below, one passes through the Tunnel in a few minutes, sensible chiefly of the extreme freshness and purity of the air. From reliable information obtained en route, the following facts in connection with this vast and important work were obtained. Between Pilning Station, the last stopping place on the Bristol side, and the Severn Tunnel junction on the opposite side, the distance is 7 miles, 1,000 yards; the actual length of the Tunnel being 4 miles 624 yards, or nearly  $4\frac{1}{2}$  miles. The line appears to have a descent both ways to the centre where it is level for a short distance, about 12 chains; the gradient on the Pilning side being 1 in 100, that on the opposite side being 1 in 90. So that the time occupied in passing through ought to be longer on the down than on the up side; this was verified at the time, eight minutes being calculated on the down journey to Cardiff between the entrance and exit, and about 7 minutes on the return up journey.

On arriving at Cardiff two breaks met the members, and after a hot, dusty, and disagreeable ride of about 9 miles through an

undulating and wooded country, leaving Penarth docks and the fine Rhætic section on the left, it was a relief to descend on terrâ firmâ at the Wenvoe Arms, Cadoxton juxta Barry, where the usual signs of large works in progress were seen in lounging navvys and a noisy bar. After a few minutes' delay below on the newly made line connecting Cardiff with Barry, a locomotive with saloon carriage attached was seen steaming up from the west, which Mr. John Robinson, the Resident Engineer of the Docks, and Mr. C. H. Walker, the nephew of the great contractor of the works, had kindly put at the disposal of the members. Under their guidance the various details of this truly great work were pointed out. Steaming away to the E., the foreshore—from which is obtained some of the best blocks of Limestone and Red Sandstone for the masonry of the docks—was reached by a temporary line of rails. The section exposed here was New Red Marl resting upon a Limestone Conglomerate of varying thickness, below which came horizontal beds of Red Sandstone, with intercalations of greenish bands. Returning westwards in the direction of the docks, a fine section of Keuper Marls was passed to the N., a pretty little fault bringing down the Lower Lias beds on the W. Passing on to the middle of the works the members alighted, and then were enabled to appreciate the magnitude of the undertaking. Barry Island, surrounded by water at high tides, has been connected with the mainland by a raised causeway, cutting off the waters of the Channel on the E. and W. The large bay on the E., 110 acres in extent, is to be converted into accommodation for shipping; for this purpose breakwaters have been run out from the mainland and island—a temporary sea bank at present serving the purpose of a dam to exclude the waters. Inside this bank, which will be cleared away when the work is finished, Dock gates will be erected, the foundation work being now in progress; the width of the gates to be 80 feet, and the depth of the water at ordinary low tides 12ft. 6in. These gates admit to a fine deep basin, 600 feet long by 500 feet wide, about



7 acres. The walls made of local stone, 17 feet thick at the base, are coped with Cornish Granite and will enclose the largest single basin in Great Britain, containing an area of 73 acres at high water. Along the N. side of this, arrangements will be made for shipping the coal by a railway running from the Rhondda, Merthyr, and Aderdare valleys. The vast heaps of stones and mud banks appearing chaotic at the first view gradually assume some order and design as one wanders about the works; and the magnitude of the undertaking, employing 2,500 men, grows upon one, and a wonder finds expression whether it is possible for the work to be finished within two years as stated. It was commenced in 1884, the estimated cost being £1,520,000.

Walking across the excavations many large trees were passed, and some peat had been cut through; this Mr. Robinson informed us had been found throughout the excavations in the Dock proper but not in the Basin; its thickness at the W. end being from 6 to 8 inches. On the N. side of the Dock it is 2 feet thick and comes in about 16 feet above Dock bottom, (the latter being 20 feet below ordnance datum) and rests upon Lias shale or clay.

Time now drawing near for departure Mr. Robinson took the members to his house at East Barry, where he had hospitably provided tea and other much needed and welcome refreshments, and then showed them a collection of Red deer antlers, bones and horns, a skull of a *Bos longifrons* and other remains found during the excavations. Amongst these may be specially mentioned two bone needles and a human skull, the teeth of which were well preserved. The two needles were found below a layer of sand and fine gravel on top of the mud about 18 feet below the surface, and 10 feet above the Dock bottom on the S. side. The skeleton of the man about 40 yards to the East of this, about 12 feet below the surface and on the top of the layer of fine gravel about 6 feet thick at this point.

Having returned their grateful thanks to Mr. Robinson for his courtesy and hospitality, the saloon carriage and truck took the

members speedily back to Cadoxton, when they mounted the breaks and had even a more disagreeable ride than the morning's one back to Cardiff, leaving by the 6.25 train for Bath.

*Deerhurst, July 19th.* A very agreeable and interesting archaeological excursion was taken to Deerhurst and Tewkesbury. Notwithstanding the season, when proverbially speaking, "there is no one left in Bath," a goodly array of members mustered, no less than 21, a number exceeding the average on these occasions. Starting at 8.45 from the Midland Station, the train was due in Gloucester at ten, and arrangements had been made to proceed from thence on the Severn by steamboat, advertised to leave at 10 o'clock. The courteous captain had promised to wait if the party was not "very late," but as the distance from the railway station to the starting place on the river was at least a mile there was no little anxiety, lest, on arriving at the bridge, the boat should be seen steaming away in the distance. Happily the captain's patience was not exhausted by twenty minutes' waiting; the party was soon on board, and not a moment lost in starting. The prospect of a long day's work suggested the propriety of husbanding time. A telegram was therefore forwarded to secure a break at Deerhurst to take the Club to Tewkesbury after seeing the churches of Deerhurst. The river was an agreeable change after the railway, and with a bracing wind from the north, the members congratulated themselves on having selected this route. The appearance of black angry clouds gave the pessimists an opportunity of prophesying wet jackets before returning to Bath; but the more sanguine ones protested, and, as often is the case, were right. Before reaching the landing place at Deerhurst a remarkable geological section opposite the Wainlode cliff was seen, and permission to wait a few minutes for a closer inspection might have been obtained if any one of the party had been equal to the occasion and able to enlighten his fellows, but unfortunately the secretary, the Rev. H. H. Winwood, always at home in this department of science, was far away in the "land of cakes."

Soon after 12 o'clock Deerhurst was reached, and an examination of the Saxon Church, which has recently attracted so much attention, immediately entered on. To call it a chapel would be more in accordance with its history; and its unpretentious and non-ecclesiastical exterior had very much the appearance of the old-fashioned timber-built dwellings so common in Cheshire.

Here Mr. SHUM, F.S.A., upon whom, in the absence of the secretary, devolved the management of the excursion, gave a brief account of the building. He commenced by saying that in no part of England could a student of English architecture alight upon two edifices of so much value and interest as this Saxon chapel, and the pre-Norman parish church, both situated in the charming, though now sparsely populated and out-of-the-way village of Deerhurst; not only on account of the great antiquity and genuine character of the remains, but because of the many moot points and difficult questions connected with the several periods of the architectural details. He stated that the Saxon chapel was discovered in August, 1885, by the Rev. G. Butterworth, vicar of the parish, who, he (Mr. Shum) regretted was unable to accompany the club in consequence of his absence in Scotland. Great credit was due to him, not only for its discovery and judicious restoration, but for the able and accurate description he had given to the Society of Antiquaries in London and to the Bristol and Gloucestershire Archæological Society. Originally the building was a chapel attached to the Manor House of Deerhurst, and up to the date first mentioned had been considered a very picturesque old farmhouse, commonly known by the name of "Abbot's court;" in the latter part of Edward the Confessor's reign the manor of Deerhurst belonged to Pershore Abbey, but in the last year of his life he granted both the manors of Pershore and Deerhurst to his royal abbey of S. Peter, at Westminster. The Dean and Chapter of Westminster afterwards became the owners until it fell into the hands of the Ecclesiastical Commissioners. In consequence of a change of tenancy in 1885, the Commissioners

proposed to turn the farmhouse into cottages, and commenced to do so. Plaster of amazing thickness encrusted the walls both inside and outside, effectually obliterating all ancient marks. At the back of the building Mr. Butterworth detected a slight depression about 14 feet from the ground, which he imagined, from its semi-circular shape, might have been a window. On moving the plaster this was found to be the case. After further careful investigation, a chapel, consisting of a nave and chancel was found, separated from each other by a chancel arch. The extreme length is 46 feet, the width of the inside of the nave 16 feet, that of the chancel 16 feet, but the original wall on the south of the chancel has been destroyed. The height of the side wall of the nave is 17 feet, and the thickness of the walls 2 feet 6 inches; the material is blue Lias of the locality, but the angles, arches and jambs are worked in dressed stone of an Oolitic character. The height of the chancel arch is 10 feet, the width about 6 feet. It is built with large blocks of stone. Like the Saxon Ecclesiola of Bradford-on-Avon, this chapel had two entrances towards the west end of the nave. The one on the south side is scarcely discernible, but on the north side half of the arch remains of horse-shoe shape, and one entire jamb consisting of five solid blocks of different sizes. There appear to have been no doors. The dimensions of the entrance arch are about 8 feet high by 2 feet 8 inches wide. There is another resemblance to the Bradford Chapel in the absence of windows at both the east and west ends. In the chancel there is a window of the 16th century, and in the south wall of the nave an original semi-circular window, about 10 feet from the ground, and on the north wall there are evidences of a window opposite. The roof is modern, resting upon two side walls; across these walls are old oak beams black with age, probably a thousand years old. The existence of these *in situ* gives a unique character to the remains, and in this respect more interesting than the Bradford Chapel with its open modern slanting roof. In the

east end of the chancel is inserted in the wall for preservation a curious stone, with an inscription showing it to have been the dedication slab of an altar. It was discovered in some Tudor work of the Manor house; originally square, it has been cut to form the head of a window, and Mr. Butterworth supposes the inscription was to this effect—"In honore sanctæ Trinitatis hoc altare dedicatum est."

Mr. Butterworth says "that as the English Council of Cealchythe in the year 816 one of the canons ordered that care should be taken in the erection of new churches that the names of the holy persons to whom they were dedicated should be inscribed on the wall or on a tablet or on the altars." This fact invests the discovered stone with considerable interest, as there are so few examples known in English churches. It is difficult to assign a date to this chapel, Mr. Butterworth thinks it dates from the 11th century, but if the late Canon Jones was correct in assigning the Bradford Chapel to the 8th century, Deerhurst cannot be so late as the 11th. Some portion of the masonry bears unmistakably the character of early Saxon, and just as part of the Saxon work in the pre-Norman parish church in the same village gives evidence of Norman influence, so the rough cemented stone work of the Saxon Chapel bears a likeness to Roman work.

The Club then proceeded to an examination of the parish church, when Mr. Shum read a brief account, being a summary of Mr. Buckler's exhaustive paper, now in the British Museum, but which has been published in the Bristol and Gloucestershire Society's Proceedings, with notes by Mr. Butterworth. A volume might be written of this most interesting pre-Norman Church; of varied history in Saxon, Danish, Norman and Reformation periods, and of its peculiar adaptations to conventual arrangements and services. After a pleasant drive to Tewkesbury, and an invigorating lunch at the Swan Hotel, the members assembled in Tewkesbury Abbey, where a very well-informed guide, connected with the church, gave a full description of the various

chapels, &c. Mr. Adye, of Bradford, member of the Club, was present, and with his professional knowledge greatly assisted the party in obtaining an accurate knowledge of this church, so rich in historical associations, and so full of architectural beauty and interest. (N.B.—The Secretary is indebted to Mr. Shum for these notes).

*Bye-Excursions.*—The break up of the long continued severe weather ushered in the 22nd of March on which the Club began its Excursions. On that morning 22 members met at the G.W.R. Station and proceeded to Bristol to continue the explorations of the antiquities of that ancient city. They were met at the Bristol Station by Mr. Harold Lewis and his friend, Mr. W. E. Jones, assistant city surveyor, and these gentlemen conducted them at once to S. John's Church adjoining the north gateway of the city, following generally the old line of road and crossing the site of the High Cross. The two figures on either hand of the gateway looked grimly down as one by one the party passed in through the south door, and mounting a flight of steps found themselves in the long parallelogram of a church lighted by nine Perpendicular windows. Mr. Jones at once proceeded to give the history of the building. The original church, he said, was founded in 1174, and in spite of tradition to the contrary the present structure could not have been erected on the walls, as those were of 15th century date, but followed the line of the old wall. The stone shafts, with their capitals now supporting a horizontal beam, originally carried a stone vault. The present wooden roof of late 16th century is poor in construction and carpentry, as are most of the roofs of that date. The records of S. John's were numerous and interesting, and from them it appears to have been most favoured by the ancient guilds. The hour glass in frame of hammered iron, which once existed on right side of pulpit, is now placed in the vestry. Attention was called to the Jacobean woodwork, in which Bristol was very rich, and the prevalent form of bracket, which for want of a better name,

Mr. Jones called the Bristol bracket—a form of scrollwork to be seen outside many houses in the city. Passing out by the same door, and through the gateway, which now carries the tower and spire of the church, the party disappeared through a low doorway on the north side into the crypt beneath dedicated to the Holy Cross. Considered by Freeman to be of late 16th century work, it has many features of interest, especially the stoup on the left hand of doorway and the vaulting. At the most easterly portion the shafts carry capitals; at the remaining part on the west the groining dies off into the shafts, which are quite plain throughout. Service was originally held here. S. Stephen's, with its far-famed tower, built by John Shipward, Mayor of Bristol, in 1455, claiming to be one of the handsomest parish church towers in England, was the next point. Entering through the south doorway some good stone groining over south porch attracted attention. The present building, dating from 1450 to 1490, apparently contained no traces of the earlier date (1304) assigned to the building. Probably it was longer than at present. The peculiar feature of the west wall, containing a good window with flaring glass, running askew and not at right angles to the rest of the building, may be attributed probably to the necessities of construction, and avoiding obstruction to a right of way to the west. The piers, according to Mr. Jones, appeared to be of somewhat different date to the arches which they carried, the moulding being much poorer. As to the tombs, owing to the common practice of placing older slabs under later recesses, there was much doubt about their true date. The somewhat highly ornamented reredos gave rise to an interesting discussion. Mr. Jones stated that the whole had been resuscitated from one old piece of Perpendicular cornice which had been preserved. The period when the Renaissance style was overlapping the Perpendicular seems to be well represented here, as a certain classic refinement in the carving is plainly perceptible, especially in the pine apple form occurring in the cornice,

indicating an acquaintance of the workmen with the fruits of the east. The next place visited was the Black Friars, now called the Quakers' Friars. Founded early in the 13th century by Dominic de Guzman, hence called the Dominican or Black Friars, this order had an important establishment in the city. The Priory, of which there are still many interesting remains; was founded by Sir Maurice Berkeley de Gaunt and Matthew de Gurney. Two rectangular buildings, running east and west—that on the north called the dormitory, and that on the south the baker's hall—is the property of the Quakers, and serves at the present time for a commodious Board School. The beautiful roof, which Mr. Jones said could not be surpassed by any other 14th century roof in this part of the country, is in excellent preservation. The lancet windows on the south side still remain. The west window is remarkable for the beautiful tracery in the head lights. Beneath this room, on the ground floor, there is a beautiful 13th century two-light window. After lunch the party proceeded under Mr. Jones's guidance to the Chapter House. Here he drew the attention of the members to the well-known beauties of its transition style of architecture, and pointed out what he considered to be a portion of somewhat later date, *i.e.*, the upper portion of interlacing arches in the wall, the older work being the plain round arches beneath the string course. He also differed from the view which attributes the carving in the fireplace in the adjoining room to Saxon times, and considers it to be of much later date. Proceeding hence to the interior of the cathedral and the beautiful Newton Chapel on the south, he called attention to the ornamentation round the arch. The party afterwards proceeded to the cloisters and inspected a small chapel near the Chapter House, which was discovered and opened five years since. After visiting the ruins of the Bishop's Palace, destroyed in the Bristol Riots of the year 1831, Mr. Jones conducted his visitors to All Saints' Church in Corn Street, the last item of the day's programme. The edifice, a



building of mixed styles, existed in 1216. The south aisle was rebuilt early in the 15th century by the fraternity of Calenders, and served as their chapel. At the east end of this aisle is an imposing monument to Edward Colston in the classic style. Some volumes belonging to the libraries of the ancient Guild of Calenders, which was the first free library known, are preserved in the vestry. Before separating Mr. Jones was cordially thanked for his kindness in giving up so much of his valuable time for the purpose of showing the members the interesting antiquities of his ancient city.

*Roman Villa at Tockington.* Another Bye-Excursion was arranged on Oct. 11th to see the recently opened up Roman Villa near Alveston. The train was taken to Patchway, thence a walk of three miles along the ridgeway through Almonsbury, with fine views of the Severn, brought the members to a lane on the right hand leading to Tockington Park Farm, when Mr. Smith, the tenant, courteously showed them over the remains, a small charge being made towards the expenses of the excavations. These have been very extensive, cutting into the farm yard and buildings on each side, and covering a space about the size of St. James' Square, some 200 feet from N. to S. and 136 feet E. to W. It was known before that Romans had occupied this site, for about 58 years ago a tessellated pavement had been uncovered at the N.E. of the buildings. The present discovery lies to the S. of the farm-house, and arose through the labourers, whilst digging the foundation for a wall across the farm-yard, cutting through a fine piece of Roman pavement about 16 feet square, with a border of plain tesserae 18 inches wide. Since then other floors have been found of much finer work and beautiful design. The materials of which the walls were made are the local stone of the district,—the Carboniferous Limestone; a narrow water course or flue being composed of Pennant Sandstone. The tesserae consist of blue and white Lias and brick, the different shades of the blue Lias being most artistically worked into the

somewhat elaborate pattern of scroll, fret and other work ; figure subjects being entirely absent. The following notes from Dr. Beatson and Mr. Barlow may help to illustrate the patterns :—

1.—The principal tessellated floor 18 feet square (discovered 12 inches below surface\*), colours red, blue and white. The former appears to be red brick, the latter blue and white Lias. The tesserae are larger in the margin of the pavement than in the pattern which is very complex. The centre consists of a circle, with a star, surrounded by an octagon inclosed in a hexagon. The corners of this pavement do not seem to correspond.

2.—There is a smaller pavement adjacent [double key pattern?], upon which was discovered the base of a freestone column.

3.—A third pavement has been opened up in the Court Yard, this appears to be at a lower level than the previous two, and has been known some time previous to the present explorations.

4.—A fourth pavement has been opened up in the kitchen garden (this would be about the same level as the preceding one), with a very beautiful pattern, the centre of which is a circle containing a cross with four hearts surrounding.

The thickness of the walls of the Villa vary from 1 foot 6 inches to 2 feet thick, and from even the present amount opened up seems to suggest an extensive plan.

W. H. B.

Mr. Smith says “there are *five* colours, but it is not easy to make out the fifth.” This is because the colours are red, blue, white, and a grey or drab of two shades, in one of which blue in the other yellow slightly predominates. In the first pavement, which has been least protected by its covering, the colours are dull and a good many tesserae have been removed, so the pattern is difficult to follow, but it is, I think, mainly as above described. The figures are not all geometrical, and the corners are

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\* One part only six inches below.

filled in with freehand scrolls. These are all freely not formally drawn, and this accounts for the irregularity of the pattern.

Similar forms varying in their proportions are found on all the pavements, but are best shown in No. 4. This has an outer border of the Roman or Etruscan well-known key pattern, and an inner one of Greek fret or wave pattern. In the corners of the principal square are pyriform ornaments. In the centre a circle with four heart-shaped figures placed base to base separated by a cross. Bands of an interwoven knot pattern cross the squares diagonally. A space between walls is shown which was lined with Pennant, this is supposed by some to be a drain, but is probably the channel by which hot air was conveyed from the hypocaust. There is also below ground a well arched drain or conduit which now contains water.

Mr. Smith said there was a tradition that a Roman road ran near the house, and that it is marked by an avenue of trees. We found what we believed to be this avenue in a field above the farm, on our way to the next village (Almonsbury).

There are several portions of pottery and fragments of bones, some distinctly those of sheep or other domestic animal, two I thought were bits of human long bones, humerus and lower end of radius.

W. B. B.

#### WALKS.

Two of these are especially worthy of record. The first on March 8th was to the Cromlech near Cold Harbour Farm, through Weston, following the escarpment by Woodbine Cottage to Hanging Hill, thence over the brow to Beech Farm and through the fields to the lane by Granham Rocks (Carboniferous Limestone) and so to the farm. Several "Bitton Sawyers," as the local people call the pebbles of Millstone Grit, were observed in the lane near the rocks. The field in which the Cromlech is situated lies to N.E. of the farm, and adjoins that in which the Club some years ago excavated a Roman Villa. Two stones

alone remain now, but Mr. Davey, the Lord of the Manor, had been superintending some excavations here in the morning, and had uncovered the portion of a third from which two other large blocks had been broken off, according to Mr. Matthews some 42 years ago, and are now lying in the hedge. The stones are Dolomitic Conglomerate, and probably have been brought from some distance, as that rock does not occur close at hand. After due inspection of the stones and some photographs had been taken, the members walked across to Tracey Park and partook of the grateful hospitality of Mr. Davey. After lunch a part returned to Bath by the Granville Monument and the rest prolonged their walk round by Bitton.

The second was on Jan. 2nd, 1888, to Northstoke, the object being to inspect the stone coffin and skeleton lately found just under the brow of the hill. Crossing the Roman Camp behind the Grand Stand, the rampart surrounding it stood out in marked prominence owing to the shortness of the herbage and the low position of the sun on the other side throwing its slanting rays athwart it. Passing over the outer rampart and ditch of the pre-Roman fortification, and following the escarpment to the promontory above the Church, whence a fine view of the Avon winding through the valley was seen, a descent was made to Church Farm, where the proprietor, Mr. Gibbs, had carefully conveyed the coffin and skeleton. The body of the coffin was quite perfect, and had been roughly hewn out of the Great Oolite which caps the hill, measuring 6ft. 6in. on the outside and 5ft. 11in. inside; 18in. in its broadest part at the shoulder and  $7\frac{1}{2}$ in at the foot; thickness from 3 to 4 in. It was covered by three slabs of the same material, the portion covering the head was exposed at the surface when found, and the whole only a few inches below the soil. The bones of a male, supposed to be Roman by Dr. Beddoe, were lying at the bottom, and the whole had been filled by the natural earth which had found its way into the interior through the

imperfectly closed lids. The skull had been broken, there were four or five teeth in the jaw sound but slightly worn. The bone of the left arm had been broken since it was discovered ; this was at the end of November, 1887, whilst excavating for wall material near the top of the lane leading up to Lansdown, from the N.E. of the Church and on the right hand side, in a depression or slip of the Great Oolite beds just under the brow.

As a record of the Walks pure and simple, in which exercise alone seems to have been the chief object, the following letter from Mr. Henderson to the Secretary may be of interest.

Knowing your partiality for statistics, I append a list of the walks, ordinary or subsidiary, together with the number of miles they cover, which I, and a few other members of the Field Club, have taken during the past four years, *i.e.*, from January, 1884 to 1887 inclusive.

In 1884	we walked	408	miles in	24	walks.
„ 1885	„ „	336	„ „	18	„
„ 1886	„ „	583	„ „	30	„
„ 1887	„ „	1011	„ „	53	„

—————  
 Making a total of 2338 miles in 125 walks.

The longest walk I achieved was on 14th July, 1884. I was not accompanied by any of the members of the Field Club ; but went to Frome and back, a distance of 29 miles. No member would undertake this stretch, so my younger son, then a cadet at Sandhurst, and I tramped it alone. The shortest walk was on 26th April, 1887, when 16 members of the Field Club went by train to see Thornbury Castle and Church, when 4 miles would about cover what we did in the walking way. The day was wet, probably that was the cause of so limited a walk. It may amuse you to hear that I have walked the above 2338 miles in two pairs of boots, whereby I think you will admit that I have beaten the celebrated Somersetshire traveller, Tom Coryate. In 1608 he walked 900 miles in one pair of shoes, which on his return he hung up as a curious relic in Odcombe Church, in this county ! I conclude they were past work ; but mine,

after their long tramp of 2338 miles, are still to the fore, and too good to be hung up as a relic anywhere, even assuming that they would be worthy so honoured a position.

In conclusion, I will only add that I have been most frequently accompanied in my walks by Major Menars, General O'Connell, General Burn, Major Evans and Mr. Holst.

W. H. H.

On the 15th June about 100 members of the Cardiff Naturalists Society visited Bath, and were received at the Royal Literary and Scientific Institution by a committee of our Club, appointed for the purpose.

After inspecting the Geological Museum and other objects of interest they went to the Abbey, when Mr. T. Browne conducted them over the building and pointed out its Architectural details; thence to the Roman Baths, under the guidance of the Rev. Prebendary Scarth. After luncheon at the Grand Pump Room Hotel they were driven up the North Road and walked to the Wansdyke and Earthworks on Claverton Down; returning to the Hotel for tea. As a slight return for the hospitality shown to our members on a former occasion at Cardiff, conveyances and tea were provided by the Club; the expenses incurred being nearly met by a private subscription. The day was fine and general satisfaction was expressed, and thanks returned to the committee for their reception and arrangements.

The Club still continuing on the list of the Corresponding Societies of the British Association, your Secretary attended the last meeting of that body at Manchester, and at the quarterly meeting in January laid the report of that meeting on the table for the perusal of members; it contains many useful suggestions for the direction in which the work of such clubs may forward the objects recommended as worthy of attention or research by the various committees of the different sections.

Your Treasurer, to whom the thanks of the Club are due for his attention to the finances, reports that the audited accounts

show the receipts as £48 2s. 6d., the expenditure £45 11s. 10d., leaving a balance for the year of £2 10s. 8d. in his favour.

Five members have resigned and one withdrawn and five new ones elected, so that at present there are 92 members on our list. In accordance with the request of the late Mayor, the names of six members were sent in as representatives of the Club on the Local Committee of the British Association for 1888.

Your Secretary, at the request of the last quarterly meeting, and in accordance with the suggestions in the Report of the Corresponding Societies of the British Association, again urged upon the Chairman of the Baths Committee the necessity of having regular systematic observations taken of the temperature and volume of the Hot Springs.

The Library continues to be enriched with many valuable Transactions and Proceedings of the different Societies, amongst them the publication of the United States Geological Survey stand out conspicuously, and the album has had additions made to it from time to time by Dr. Mantell and Mr. Powell.

H. H. WINWOOD,

*Hon. Sec.*

*Pres*

9 JUN. 92



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## CONTENTS OF NO. 3, VOL. VI., 1888.

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	PAGE
1.—ON SOME OSTRACODA FROM THE FULLERS-EARTH OOLITE AND BRADFORD CLAY, BY PROFESSOR T. RUPERT JONES, F.R.S., F.G.S., and C. DAVIES SHERBORN, F.G.S. ... ..	249
2.—LANDSLIPS AND SUBSIDENCES, BY W. PUMPHERY...	278
3.—THE DESTRUCTION OF THE TWO CHURCHES OF ST. MARY IN BATH,* BY AUSTIN J. KING ... ..	285
4.—A BATH POLL TAX, 2 RICHARD II., BY E. GREEN, F.S.A. ... ..	294
5.—REMARKS ON SOME HEMIPTERA-HETEROPTERA TAKEN IN THE NEIGHBOURHOOD OF BATH, BY LIEUT. COL. BLATHWAYT, F.L.S., F.E.S.... ..	315
6.—RECENT "FINDS" IN THE VICTORIA GRAVEL PIT, BY THE REV. H. H. WINWOOD, F.G.S. ... ..	327
7.—NOTE ON WEBBINA IRREGULARIS (D'ORB.), FROM THE OXFORD CLAY AT WEYMOUTH, BY C. DAVIES SHERBORN, F.G.S. ... ..	332
8.—SUMMARY OF PROCEEDINGS FOR THE YEAR 1887-88, BY THE SECRETARY ... ..	333

PROCEEDINGS

OF THE

BATH NATURAL HISTORY

AND

ANTIQUARIAN FIELD CLUB.

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VOL. VI, No. 4.

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1889.

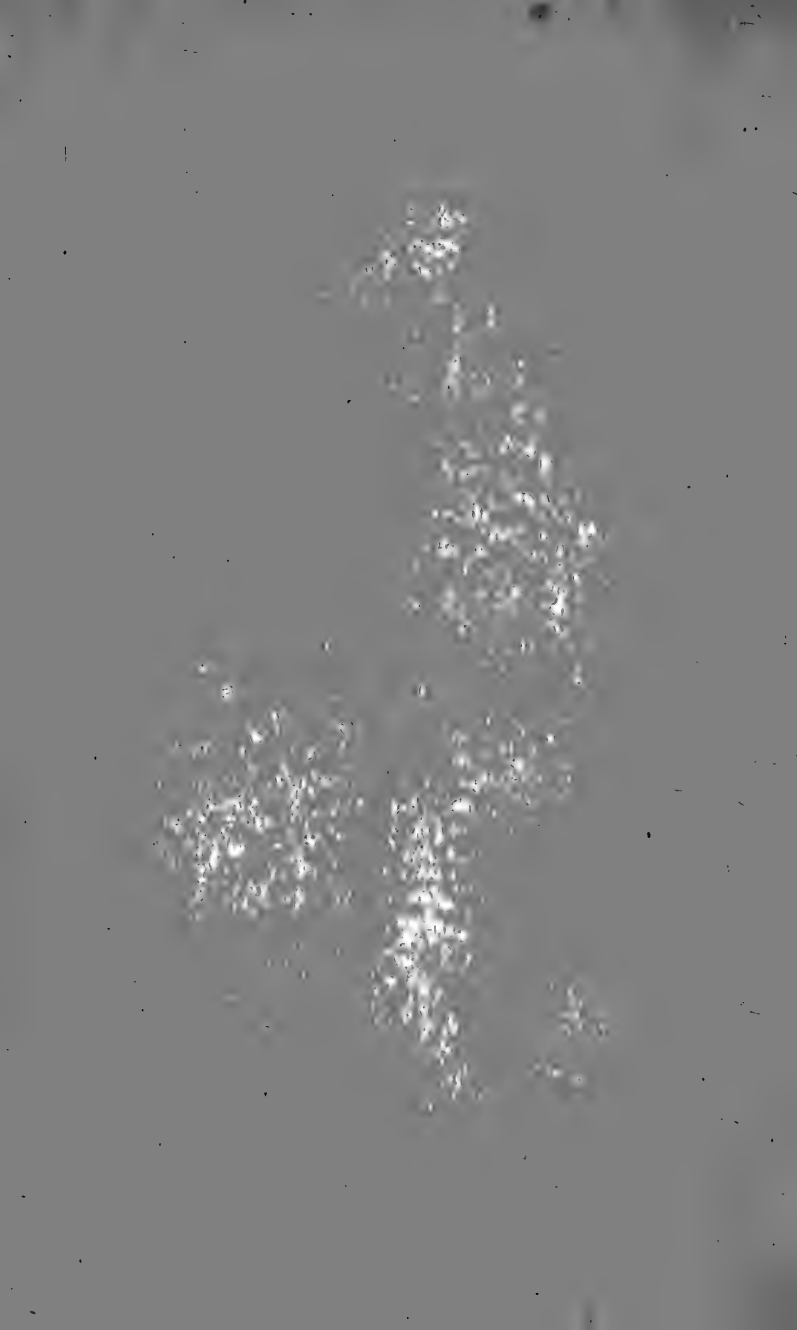


PRICE HALF-A-CROWN.

BATH :

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1889.



*On Church Doorways.* By the Rev. REGINALD A. CAYLEY, M.A.  
(Read December 12th, 1888).

I fear that the subject of church doorways is one of only limited interest; but as the various domains of Mediæval Church Architecture in this country have been so carefully mapped out and discoursed on, in all their leading features, by earnest students both professional and amateur, in the past 50 years, there are only such minor subjects left for us moderns to take up.

They have however their proper place in the history of the art, and though this one of church doorways cannot compete in attractiveness with many others, it yet, as I hope to show you, is instructive, if it only draws our attention to the general rules which guided the builders of old in their treatment of such necessary parts of a building.

People, in ridicule, may perhaps compare this subject with the poet's sonnet "To his Mistress's Eyebrow," when he might have extolled in verse the charms of her whole face. Be it so. I simply claim for my subject a patient hearing. Ridicule it as much as you please after you have heard what I have got to say.

In this Paper I will not attempt to describe the architectural designs and details of church doorways, but rather try to give a brief sketch of the various positions that they occupy, and draw from them certain historical deductions to which they point.

In England, from the fact of our nationality being extremely mixed (more so in fact than is the case of any other nation of Western Europe), we have had in bygone ages architectural influences passing over us in successive waves, each of which has left its mark in the marvellous variety of ground plan, structure, and detail, noticeable not only in E. and W., N. and S., but even in adjacent counties and dioceses.

Now, perhaps, I may be ridiculed for holding the opinion, as I do most firmly, that though, after the withdrawal of the Roman legions, A.D. 401, the Brito-Roman civilization and Christianity

were to a great extent stamped out by the English, Saxon, and Jute invaders of the S.E. of Britain, yet this effacement was, after all, gradual and partial, as the following approximate dates will show.

The kingdom of Kent was founded c. 450 ; that of Wessex c. 500, *i.e.*, only about 77 years before St. Augustine's mission. It is therefore hardly credible that Christianity could have totally disappeared in so short an interval. From this consideration we can better understand how St. Martin's Church at Canterbury was restored for the use of Ethelbert's Queen, and still exists ; as also does the Castle Church of Dover, which is generally believed, from the rudeness of its detail, to have been the work of native workmen *after the withdrawal of the Roman garrison*. From these survivals to the present day, we may fairly surmise that St. Augustine found (perhaps) hundreds of churches in the country, possibly dilapidated, but capable of repair.

To the W. and N.W. of the island (especially in Wales) we know that Christianity was never extinguished, and even now there are Brito-Roman buildings extant, in part, at any rate ; as for instance, St. Pirans Church (Perran-zabuloe), in Cornwall, and possibly the little known St. Trillo's Chapel, on the seashore, about two miles E. of the Little Orme's Head in N. Wales ; a building which I have the authority of Mr. M. H. Bloxam in assigning to early in the 6th century, and thus uninfluenced by St. Augustine and his mission. Another fact to which sufficient attention has not been paid is the way that the majority of the Cornish and Welsh Churches are dedicated to local saints of these early times, whose names are unknown elsewhere, and thus pointing to a continuous existence from their foundation.

Now, though this civilization and architectural tradition is of such ancient date, I think its influence is still to be seen even in the present day ; but to this subject I shall have to return later on. Mr. Fergusson, in his most useful handbook of Architecture, makes the very just observation that in the churches of the

Latin races the principal doorway faced the high altar ; whereas in those of the Teutonic races lateral entrances mostly prevailed.

Here, in England, from the peculiarities of our early history, we find the two arrangements striving for the mastery, and in the end often combined in the same building.

If we examine carefully the ground plans of our great Cathedrals, Minsters, and Monastic churches, we shall find that the position of doorways in them is not accidental, but follows certain intelligible general rules, which I will try to point out, and then proceed to those of our parochial churches, which, having less complex requirements, have not the same variety as the larger buildings.

For the sake of clearness of arrangement it will be well to classify our subject as follow :—I., Secular Minsters ; II., Augustinian ditto ; III., Benedictine Abbeys ; IV., Cistercian Abbeys ; V., Parish Churches.

Of course, this does not comprise the numerous Carthusian, Franciscan, and other minor religious houses, the examination and classification of which would be highly interesting, but would take up more time and space than their relative importance demands. The above-mentioned classes will be quite enough for our consideration at present.

In the larger buildings comprised in classes I.—IV. the doorways may be sub-divided into three main groups, to which a few exceptional arrangements (to be noted hereafter) may be added. These are A, Western ; B, Lateral (*i.e.* flanking the nave) ; C, Transeptal.

First in importance is undoubtedly the triple west doorway—an importation from France, and that not till the middle of the 12th century. This is a happy combination of the useful with the dignified which cannot be well surpassed. I do not consider the sub-division of the central doorway by a shaft, as at York, Winchester, and, I believe, formerly at Bath, to be more than a mode of ornamenting the entrance, not a structural

variation. The triple W. doorway is, however, almost entirely confined to class I., though there are instances in class II. (*e.g.* Ripon, to be considered later) and in class III., Peterborough, Winchester, Bath, and Durham (though the latter requires an explanation which will exclude it). In class IV., as far as I know, it is not to be found.

The reason why I assign the middle of the 12th century for the introduction of this arrangement is that the earliest instance we have is at Lincoln Cathedral. Here, the central portion of the west facade (to judge from the wide-jointed masonry—an infallible test of 11th century work) is the work of Bishop Remigius (1067—1092); and, from excavations made about five years ago, it was conclusively proved that this originally had no west doorways *at all*, but was entered in all probability under the rich quasi-transeptal gables that project N. and S. from the west towers, although the structural alterations of the 13th century have completely obliterated such entrances. The triple portals were insertions by Bishop Alexander (1123—1148), and in one instance show faint traces of Transitional detail, thus placing the work at the extreme end of his episcopate.

Where we do find triple portals, as at Salisbury, Wells, Lichfield, and even in the great Metropolitan Church of York, where everything else is on so large a scale, they are noteworthy for their comparative insignificance, when we remember the huge cavernous west portals of French cathedrals—often their most striking external feature.\*

In class II. (Augustinian Minsters) the arrangement at Ripon is altogether exceptional, and for its size is by far the grandest design in England. Here the three portals are closely

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\* This is the more remarkable since, as Canon Ellacombe (who was in the chair when this Paper was read) observed, the round-arched doorways in our English churches are infinitely finer and grander than the corresponding ones in France.



grouped, and open side by side into what originally was a wide aisleless nave, having west towers projecting N. and S., as at Wells. It was only at the end of the 15th century (almost contemporary with the rebuilding of the Abbey here) that the present side aisles were added. The only instance at all similar is the 9th century nave of Beauvais Cathedral (*La basse œuvre*), which has three west doorways closely grouped, and opening into the centre aisle. It is possible that, as Archbishop Roger, the builder of the nave of Ripon (though the actual west front was carried out by his successor Archbishop Walter Gray), came from Pont l'Évêque, this arrangement *may* have been a traditional one in the Seine valley and neighbourhood in early days. At Beverley, and a few others, there is a central and *one* side doorway, but the rule is to have only one west doorway.

In class III. (Benedictine Abbeys) in early Norman days there was no west doorway at all, *e.g.* Worcester (where the west front is entirely modern) and Romsey; though we find one at Rochester, but of so decidedly a French type that it looks as if it had been imported bodily from Burgundy—so far is it from following the usual English treatment. In all other extant Norman west fronts there is but one central doorway to be found.

The only exceptions in class III., in later times, are Peterborough, early 13th century (where the whole west front is unique); Winchester, 15th century (where the Norman nave was shortened by nearly two bays); St. Albans (an unfinished 13th century design, which has survived only to be murdered by Lord Grimthorpe in the 19th), and Bath, a 16th century rebuilding.

Durham *seems* to be an exception in having three west doorways; but the side ones were only pierced by Bishop Langley in the 15th century to give access to the Galilee (Lady) Chapel; at which time the central doorway (the former entrance) was closed by screen-work and an altar, until the present century.

In class IV. (Cistercian Abbeys) a single west doorway was, I believe, the invariable rule.

B, LATERAL DOORWAYS.—These may be sub-divided into two groups; viz., 1st—Those available for the laity frequenting the building; and 2nd—Those communicating with the Cloisters and the private buildings of the clergy.

1st.—In classes I., II. and III., we find these people's doorways, as a rule, the grandest feature of the church, and they would appear to be survivals of the early Teutonic custom of having no west entrance, but sometimes even a west apse, as it is on record once existed at Canterbury.

They usually had a porch projecting some 20 or 30 feet (generally of two bays), with a chamber above, to which various uses have been assigned. At Durham (destroyed by the sacrilegious hand of Wyatt) this chamber was occupied by two monks night and day, who watched for and admitted any who came and claimed sanctuary.

This doorway and porch was usually on the N., side of the church—the S. being a more convenient position for the Cloisters and other premises belonging to the clergy, nestling under the shelter of the high walls of the nave; but occasionally, as at Canterbury, Gloucester, Chester, and Malmesbury, these positions were for local reasons reversed. At Canterbury the "Suthe dure," in the same position as at present, is recorded as the principal entrance long before the Conquest.

This porch is usually in the second bay from the west, but in class I. we find it sometimes half-way up the nave (the result of the early nave having probably been lengthened at some rebuilding). In class II. it is often in the third bay, and in class III. in the first bay.

In class IV., to the best of my recollection, with the exception of Kirkstall, such a lateral doorway is not to be found; but this may be accounted for by the fact that the Cistercian were never otherwise than alien houses, exempt from episcopal visitation, and did not follow old English customs in the matter of ground plan—not to mention that it is very doubtful whether the

laity, beyond those immediately connected with the domain, were, according to the original intentions of the foundation, ever admitted to the church at all.

2nd—The doorways communicating with the Cloisters are common to almost all buildings of classes II., III. and IV., and in all cases hold pretty nearly the same relative positions. As I mentioned above, they are usually to the S., but exceptions are found, caused by some peculiarity of the sites chosen for the religious houses.

The more eastern of the two doorways is usually in the bay adjoining the great transept, and opens opposite the east walk of the Cloister; but there are the following exceptions to be noted; viz., Canterbury, where the east doorway opens out of the transept (facing the south walk), an arrangement entirely exceptional, as far as I know, in a religious house, and this is little more than a postern. That this is its original position we know from the records of the Martyrdom of St. Thomas of Canterbury. At Peterborough, both east and west doorways are one bay, within the lines of the corresponding walks. This would lead us to infer that originally the transept had a west aisle, as at Ely and Winchester, and that the Cloister garth was smaller. At Westminster, the exact opposite is the case. The east walk of the Cloister is, as it were, cut out of the west aisle of the transept, showing that there was no west aisle to the older church.

The westernmost doorway is usually opposite the great porch (or, more strictly speaking, the west Cloister doorway rules the position of that opposite) and depends for its position on the size of the Cloister garth, and not on its distance from the west front which, in the great eastern cathedrals of Norwich, Ely, Peterborough and St. Albans, is often carried many bays west of the Cloister.

Between these two doorways there was a considerable difference both in size and treatment in class III., but their richness of detail does not correspond with their size. The smaller were

much richer in ornament and were called the Abbots' (or, in cathedral churches, the Priors') doorways, while the larger, or Monk's, doorways were not so ornate. Their relative positions depended on whether the Monk's day room (with dormitory above) lay on the west side of the Cloisters, as at Durham, Worcester, Norwich, Winchester and others; or on the east side, as at Westminster, Canterbury, Bath, Gloucester, Tewkesbury, &c., in which case the Abbot's (or Prior's) house occupied the west side.

In class IV. (Cistercians) the west doorway was for the use of the *Conversi* (or lay brothers), who were only admitted to the western parts of the nave; the eastern one was for the Monks. The Abbot's entrance led direct from his house, which lay to the south east of the great transept, as at Fountains.

In a few cases in class II. (*e.g.* Ripon) we find no trace of a Cloister or its doorways, unless in this case it followed the example of Wells and a few other secular churches, and had no walk under the wall of the nave—the east walk ending with the north transept doorway. There is a 16th century doorway towards the west end of the nave which *may* have corresponded with an earlier one in Archbishop Roger's nave before the aisles were added. This, however, is merely conjectural. There is no evidence one way or the other beyond what I have here stated. These remarks lead us to our 3rd division.

C, TRANSEPTAL DOORWAYS.—In France, these give some of the most striking features of the larger churches, and only slightly fall short of those at the W. in size and grandeur, *e.g.*, Amiens, Chartres, Paris, Rheims, Rouen (both the Cathedral and St. Ouen); but in England, where they are found at all, they are, comparatively, quite insignificant. We only find them in classes I. and II., and here they are quite subordinate features of the elevation. In the larger churches of class I. they are placed under the apex of the gable, while in the smaller ones and in class II. they are usually close to the west wall, *e.g.*, Southwell, Beverley, Carlisle, Ripon, &c.

In class I. it is not uncommon to find a doorway of some importance opening through the south bay of the west wall, *e.g.*, at Lincoln, into the Galilee porch, and at Salisbury into the Cloisters. In each case, they were the state entrances for the Bishop, though at Lincoln, when the choir was lengthened, another was substituted near the high altar.

In class III. transeptal doorways are never found, with one remarkable exception, *viz.*, Westminster Abbey; where that in the north transept (triple in plan, though the east one is unpierced) is a thoroughly French design, carried out with purely English details. Perhaps the reason for this exceptional arrangement lies in the fact that this north transept abutted on the Royal Palace, and consequently was the state entrance for the King.

In class IV. Strata Florida Abbey, in S. Wales, shows a doorway in the centre of the north wall of the transept, but this is the only instance that I am aware of.

In addition to these, as exceptional arrangements, I may mention the great south doorway at Lincoln (spoken of above), giving access to the Palace, the College of Vicars' Choral, and (together with a less important one opposite) to the Prebendal houses in the Close. We have doorways in nearly similar positions at Hereford, leading through a short Cloister to the College of Vicars' Choral, and at Chichester into the east walk of the Cloisters. At Lincoln, also, a doorway leads from the N.E. transept to the Cloisters. Besides these important doorways, we find small posterns in various positions, which either led to buildings now destroyed or were convenient means of access from the surrounding precincts.

Such is a brief summary of the doorways to be found in our larger churches, classified as I., II., III. and IV.

In our numerous parish churches, class V., we find endless varieties of arrangement, from the small village church, consisting of an aisleless nave and chancel, to the large semi-collegiate or semi-monastic building, which is a combination of the Minster

and parish church. In all, however, notwithstanding some marked exceptions of particular periods, we find the lateral doorway to be the principal one, even if there be a west one as well; and we often find, in by no means large churches, both north, south, and west doorways of pretty nearly the same date.

The position of the principal doorway (whether lateral or western) depends, to a great extent, upon the date of the original foundation of the church.

To explain my meaning, I may say broadly that when there are any traces of work previous to the reign of Edward the Confessor (the real introducer of the Norman style), we find the tower almost invariably at the west end of the nave, into which it opens through a low narrow arch (sometimes merely a square-headed doorway); but the west wall is unpierced by a coeval doorway, though such piercing often took place in the 12th and later centuries, but rarely for a principal one.

With Norman influence, about the middle of the 11th century, a great revolution in the ground plan of our churches was introduced. In lieu of single west towers and lateral portals, flanking west towers, as at Melbourne, in Derbyshire, or a single one between nave and chancel, either with or without transepts, as at Iffley, near Oxford, and Englishcombe, became the rule; but if the church was a rebuilding on old foundations, the lateral doorway was generally preserved (with a porch) of equal or greater importance, as a sort of survival from the previous style.

We may gather from this that the lateral entrance was in accordance with the old English and Teutonic custom, in contradistinction to the Norman, and that when the architectural influence of the latter race waned (as it most undoubtedly did by the middle of the 12th century), the west doorway, though not exterminated, sank into comparative insignificance.

As in the greater churches above considered, we usually find the lateral doorways in the last or penultimate bay of the nave. Where this is not the case, and the doorway is found further east, in

existing buildings, we may often gather from this abnormal position that the building has been lengthened westwards. For instance, at Ashchurch, near Tewkesbury, we find a very fine late Norman doorway exactly central between the tower and chancel; but a close examination of the exterior rubble walling W. of the porch reveals a straight joint, showing how the church had been lengthened in the 14th century. Why, in such a case, the doorway was not moved westwards is obvious when we consider that when a walk leads through a graveyard to a doorway (especially if it be to the main one) the graves cluster thickly on either side, and in course of time there comes an accumulation of soil on either hand, till the path becomes a sunken one. If then, in consequence of the lengthening of the building, the doorway were to be moved westward, a fresh path would have to be made, and the consequent disturbance of many graves and tombs would ensue. This would naturally be avoided, except in case of absolute necessity.

When the original church had no aisles, and in later days these were added, we often find the early doorway re-inserted in the later aisle-wall in the same relative position, so as to cause as little change as possible in the approaching footpath.

To sum up, and if possible to apply the lessons to be gathered from these observations, we may conclude that in the early Brito-Roman churches and in their lineal successors (to judge from the ground plans surviving in the Keltic districts of Great Britain and Ireland), the principal doorway (if not the only one) was to the W., facing the altar.

This is one among other features which point to a barbarous development of the Basilican arrangement, strongly influenced however by that Eastern (Ephesian) element, which showed itself so markedly in our ancient office books, and which is, to this day, perpetuated in the square east end of our churches—a feature universal here (except from 1042—1150 at latest), yet quite exceptional in any other part of W. Europe. With the revival

of Christianity after St. Augustine's mission, when church building became extensive, a plain west wall (or sometimes a west apse, as at Canterbury), and, in later times, a west tower unpierced with any external doorway became customary—as we find in the early Rhenish churches—and lateral doorways became the prevailing use. We may, therefore, take it for certain that an early tower at the west end of the nave is not later than 1050, while many are a century or two earlier. Where we find a very small village church, consisting of an aisleless nave and chancel (often without a chancel arch), with west entrance only, it is, I believe, a survival in ground plan, if not in actual work and detail, of the Brito-Roman style, and may very possibly stand on such early foundations. Such churches are common enough in all the Keltic parts of Great Britain and Ireland, and are to be also found, though not so commonly, in the more Teutonic parts.

We are expressly told that Archbishop Wilfrid built his church at Ripon "*more Romano.*" All that remains of this church is the crypt, almost identical in position, design, and dimensions, with that in his sister foundation at Hexham. Now both these crypts are rectangular and have their principal entrances to the W. If, in the same way, a west entrance was used in the superstructure it may possibly account for the description of its having been built "*more Romano.*"

We may observe that the west towers of early churches opened into their naves through doorways too low and too narrow to admit of a funeral procession passing through; so that, even when these towers were pierced in later times for external doorways, they could rarely have been intended for principal entrances.

In considering all these various modes of treatment of doorways in their several classes in connection with the history of the buildings of which they form so necessary a part, we must ever bear in mind they were erected, *primarily for use—for ornament* quite in a secondary degree. Such a triple portal as



that at Ripon is the only instance I can call to mind where the idea of ornament seems more prominent than that of utility. It is, however, so graceful, and withal so dignified, that it disarms the criticism of mere utilitarianism.

Many theories have been held in different districts as to whether the N. or S. should be the chief entrance. These are often very ingenious, but to my mind they do not account for the variation half so plainly as the simple question of situation, nearness to highroads, houses, &c.

I am afraid my paper has run to undue lengths, but I should like, if I may, to say a few words respecting Bath Abbey, in connection with what I have been just saying.

In its present condition it is a building thoroughly abnormal in ground plan, and unfortunately we have little to guide us as to the original design. Bishop de Villula's Church had probably a single west entrance, but whether its west front coincided with the present one I have never been able to learn for certain, though I have a strong suspicion that the lower parts of the turrets on which are carved the ladders and angels are *Norman in core*. There was probably a people's door, with a porch, opposite the present south door of the nave.

This south door, adjoining the ancient Palace of de Villula, which afterwards became the Prior's lodging, must have been the Prior's doorway, opening into the west walk of the Cloisters, while the corresponding Monks' doorway must have been that of the present vestry.

But here comes the difficulty. If the north walk of the Cloisters lay close under the aisle wall (as is the case in every Benedictine house in England, to the best of my knowledge) the question arises; How is one to get over the difficulty of the projection of the transept right through the line of the walk?

After having constantly had it in my thoughts for the past three years, and after having considered theory after theory only to discard them as failing to satisfy necessary requirements all

round, I have at last formed an opinion which I put forward with great diffidence; for, though it may be satisfactory to my own mind, it does not follow that it may be equally so to others. I therefore give you full leave to criticise and pull it to pieces as you please.

I believe, then, that de Villula's Church had no transepts proper, that it covered the same ground as at present up to the existing east end; that beyond this there was an apse, a procession path, and circlet of chapels—the present east end marking the chord of the apse.

Further, I believe this building had no central tower, as at present; but, like Exeter Cathedral and Ottery St. Mary's, it had two towers flanking the building on the site of the present transepts, and marking the division between nave and choir. We know that in the late Norman or Transitional choir, built by Archbishop Roger at York, there were two flanking towers, which, when the choir and Lady Chapel were extended and rebuilt in the late 14th century, were absorbed into the building in the form of transeptal-bays, only projecting as far as the aisle walls, but, in other respects, the counterparts of the transepts of Bath, but with earlier details.

The lower story of the southern tower I once thought had been pierced for the Cloister walk to pass through, but I have had reasons of late, as I shall presently show, to modify this opinion. We know, however, that the south bay of this transept was not built above the lower window sills till about 1610, when all need for a Monastic Cloister had passed away, and by that time the central tower had been erected.

The common opinion that the existing building is merely the nave of the earlier church, and that eastwards of it lay transepts, choir, &c., I cannot accept as possible, for the following reasons.\*

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\* I am here speaking of de Villula's erection. There is reason to believe that a considerable extension eastward was made before the end of the 12th century.

1st.—Between the east end of the present church and the city wall there is not room enough for transepts, choir, apse, procession-path and chapels, unless we suppose the east end came quite close to the city wall, which is unlikely to have been the case in the 11th century, whatever may have been done in more settled times, especially as there was plenty of ground on which to build westwards towards Stall Street.

2nd.—The two turrets that flank the present east window are Norman, as we can see by the way they push out of their proper position the arches over the east windows of the aisles. We see the same derangement at the same place in the choir aisles at Durham (c. 1074), though the turrets have disappeared. Turrets in this position, *i.e.*, at the chord of the apse, are not uncommon in Norman work, as we can see at Peterborough and Gloucester; but they are unheard of in the angles between the nave and transepts, as would have been their position according to the popular theory.

3rd.—The position of the doorway, east of the vestry, can only be accounted for on the supposition that it is that of the ancient Sacristy—a suitable and customary place for it if the high altar stood at, or near, its present site; but incongruous and inconvenient in the extreme if it stood some hundred feet further east, as it must have done if we accept the popular theory.

4th.—In the bays, east of this doorway, we find on the exterior the plinth is raised some 18 inches. This probably marks the rise of the Sacarium floor. If this aisle here was merely that of the nave, there would be no need for such a change of level, *especially as of old the ground sunk east of the present transept.*

5th.—The fact that the Norman turrets and adjoining arches (above referred to) were preserved, and worked into the new building, seems to point to the inference that when the new work was taken in hand, the Norman apse was still standing, and was not removed till the new choir was complete. Then the arch across the chord of the apse, which sprang at the level of the second set-

off on the outside (as a break in the masonry shows), was removed, and the great east window was placed to fill in the gap as a makeshift (as we can see by the exterior straight-joint running down on either side between it and the turrets). At the same time, as all apparent need for side chapels was at an end, the apse, &c., were destroyed, and the east doorways and windows inserted in the aisles blocking up the Norman arches.

6th.—There is just the springing of a semi-circular arch to be seen at the east extremity of the north aisle (against which a 17th century buttress has been built), and an old engraving shows a similar one on the south, which could not have anyhow had to do with a transept, but may well have opened into the western-most of the circlet of chapels on either side.

It has been suggested that these arches opened into the west aisles of the transept. If that be so, the section of these arches being considerably wider in span (if they were semi-circular) than those adjoining across the nave aisles, it would follow that the transepts had wider aisles than the nave, which is contrary to my experience, nor do they rake with the arches that would spring from the piers whose bases are exposed at the east end.

If the above arches were pointed they must belong to the later work, and may have in that case opened into a low transept, like the eastern one at Wells.

For these reasons I must discard the popular theory as to the site of the high altar.

Since reading this Paper, a plan, dated 1725, has been shown to me that clearly marks out the square of the Cloister. It gives its dimensions as about 110 feet each way. Its north walk, unlike that of any other Benedictine house in England, as far as I can learn, was not against the wall of the church, but clear of the transept, and connected with the church by short passages of about the dimensions of the present vestry. The east walk, owing to a fall in the ground, was at a lower level by about 3 feet.

It would appear that in the Transition period the procession path and chapels were pulled down, and a building of the same width as that to the W. was extended nearly to the city wall, terminating in a square east end. The bases exposed at the east end are, I believe, those of the junction of the extension with the apse; the large round base of the pier being that of the arch of the apse, the two smaller members being those of the extension.

I fear I have been too long and tired out your patience by giving you many words and little matter. I thank you for your kind attention, and await with interest your criticisms on what I feel to be a venture beyond my power to handle as it deserves.

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*Bath Lay Subsidies, Henry IV. to Henry VIII. By EMANUEL GREEN, F.S.A.*

(*Read 9th January, 1889.*)

In my Paper read last year, a notice was given of all the earliest documents preserved in the Record Office relating to the taxation of Bath, leading up to the Poll Tax of Richard II., who died in 1399. In continuation, all other Subsidy Rolls, dating from the time of Henry IV., A.D. 1400, to the end of the reign of Henry VIII., A.D. 1547, are now examined, thus exhausting the returns of this class to the last named date. Unlike a Poll Tax a Subsidy was a tax on property, so that whilst the former helped us to some speculations as to the population of its time and their occupations, the latter will aid towards a realisation of the value of the principal properties and give us the names of the leading inhabitants.

The first document to be noticed is one of the second year of Henry IV., 1401, entitled the account of John Marreys and John Pochon, collectors of a tenth of all moveable goods of

the laity in the city of Bath and the suburbs of the same; one half being payable at the Feast of the Holy Trinity and the other half at the Feast of All Saints next following. The amount received for the first half and duly paid into the Exchequer, was £6 13s. 4d., the receipt stating that the particulars relating to the same were "contained in a certain schedule deposited in the Treasury."\* In 1416, 4 Henry V., John Huett and Richard Honybrugge were collectors of two-tenths granted by Parliament at Westminster, payable one whole tenth and half-a-tenth at the Feast of the Purification, the other half-tenth at the Feast St. Martin next following. The receipt accounts for £26 13s. 4d. for the whole two-tenths.† To these receipts are usually added the names of a Baron of the Exchequer and a clerk, as auditors, the document being then cancelled by drawing a pen across it. The schedules of particulars are in neither of the above cases now to be found. In 7 Henry V., 1419, Thomas Martyn of Bath, and Thomas Holbrook of Bath, webber, were collectors of a whole-tenth and the third part of a tenth, and duly accounted for the sum of £17 15s. 6½¼d.,‡ being £13 6s. 8d. for the tenth and £4 8s. 10½¼d. for the third. In 1429, 8 Henry VI., William Hoggekyns and John Hereford, in response to a writ dated 28 August, accounted for two whole-tenths; one payable on the morrow of St. Hillary and the other on the octave of St. Martin in the following year. The amount, £26 13s. 4d., was duly received of the Burgesses and other men of the city "que est de antiquo dominico Regis."§ Seventeen years later, in 1446, 24 Henry VI., William Hogeckyns again, with now William Drayton, accounted for £20 for a tenth and half-a-tenth, by writ dated 16 July; the tenth payable at the Feast of St. Martin in winter next following, and the half at the same feast in the next year.||

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\* Subsidies Lay 169—56 Somerset. † Subsidies 169—71.

‡ Subsidies 169—74. § Subsidies 169—84. || Subsidies 169—97.

For the defence of the realm, in 1449, 27 Henry VI., the "poure communes by his commaundment" granted half a quinzisme and half a disme, there being now a reservation of £3,000 to be deducted for the "relief and coumfort of pouere townes desolate, wasted and destroyed, or to the said quinzisme and disme too greatly charged or too greatly empoverished." Accordingly, in response to the above writ to them directed,\* Richard Kokesale and William Bushell gathered in from the city of Bath two halves of a fifteenth and tenth, the first half paid at the Feast of St. Martin in winter next following, half of the other half at St. Martin in 1450 and the other half of this half at the same Feast in 1451. The amount acknowledged was again £13 6s. 8d.† It may be noticed here that, notwithstanding the new expression in the writ of a fifteenth and tenth instead of a tenth only, the amount received was the same. The tenth was the tax levied on cities, the fifteenth was for counties.

In 1453, 31 Henry VI., by writ dated 12th June, Hugh Coleynges and John Were were appointed collectors of a fifteenth and tenth payable half at the next Feast of St. Martin and half at the same Feast in the next year; also for half a fifteenth and tenth payable half at the Purification and half at the Feast of St. John Baptist next after; the whole amount being £20.‡ The return seems not to have been made until 1455 after the whole was collected.§ Six thousand pounds were to be set aside for decayed cities, &c., as before.

The office of collector was not apparently altogether a comfortable one, being not only objectionable to the taxed, but also, as two were always appointed, there was a chance that one of these may prove dishonest.

In 1421, 9 Henry V., a remedy was attempted to enable collectors to protect themselves. The statute, in Norman French,

\* Subsidies 169—99. † Subsidies 169—98, 101.

‡ Subsidies 169—103. § Subsidies 169—104.

records that divers collectors of dismes and quinzismes had by brocage and subtlety absented themselves, so that the honest and true men when they brought their gathering could not get an acquittance, but on the contrary, were charged to find the whole sum due or in default were sent to prison, or their lands and tenements seized. The remedy conceded was the power to proceed against the dishonest "by action of debt and double damages," a proceeding which must have been as bad, or worse, than the trespass. These difficulties were increased by the exactions of the officers or clerks in the Exchequer. So great was this oppression that in 1455 a prayer was made to the Commons for protection against the extortion of these men who "take fees and wagez of you for theym and their clerkez in grete and outrageous yefts for doying of thaire offices ayenst all reason and conscience, and their office will not doo to the deliveraunce of your accomptauntz, till they have suche outrageous fees and yifts. The which causen Shiryves and others to take outrageous and excessive fees for their offices doying, to the grete hurt and destruction of all your said liege people." The result was a statute by which the fees of the Exchequer were determined, so that the officers and others who "take fees and wages of the King for their work" should not also extort excessive gifts from the sheriffs or others in counties.

In 1460, after a reign of thirty-eight years, Henry VI. had to give way to Edward IV. In 3 Edward IV., 1463, Andrew Dedford and Thomas Wyther were collectors for Bath of a fifteenth and tenth granted for ten years, the usual £6,000 for poor cities to be deducted. The amount received from the Counts, Barons, Magistrates, Knights, Citizens and Burgesses of Bath, was, as before, £13 6s. 8d.\* In 8 Edward IV., 1468, William Walley and William Walker were collectors for two whole tenths, to be collected in moieties in 1468 and 1469, and

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\* Subsidies 169—111.



they accounted accordingly for two moieties and for £6 13s. 4d. for a third moiety.\*

After a reign of ten years, in 1470, Edward IV. had to give way to Henry VI., who reigned until 1471 only, when the battle of Barnet drove him finally from the throne, and Edward IV. returned. For the present purpose, however, neither appears again; there are no Bath Lay Subsidy receipts for these dates.

The accession of Henry VII. in 1485, settled all the long existing disputes. In his third year, 1487, the "pore commens" granted two whole fifteenths and tenths, "to be taken and levied of the moveable goodes and cattalles and other thynges of the lay people in forme as aforetime used;" £6,000 to be retained as before, for the relief of decayed towns. The collectors for Bath were, for the first of the two-tenths, William Walley and John Geffrey, and for the second William Wodeward and John Graunsyre, as returned by the oaths of William Walley and William Walcer formerly collectors.†

In 1491, 7 Henry VII., calling to mind the "great zeal, love, and tenderness" of the King to defend the realm, the Parliament granted two whole-fifteenths-and-tenths, with the usual exception — for places decayed; collectors were now to be discharged of all fees due to the Exchequer. The collectors for Bath were Richard Lacy and Laurence Lech for the first of the two, and for the second, which was paid in 1492, Stephen Cooke and Edward Broughton.‡

The manner or plan of procedure was, first certain commissioners or assessors were nominated by the "persons of the city coming to the Parliament," and these having found and determined the amounts to be received appointed collectors, who were ordered to charge only the amounts named in the assessment.

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\* Subsidies 169—113, 115. † Subsidies 169—120, 121, 122.

‡ Subsidy 169—127, 128.

In 1496, 12 Henry VII., when a grant of two Subsidies was made as a guard against the "cruell malyce of the Scottis," the commissioners for Bath were Laurence Leche, Robert Batyn, William Tyler, and John Cokkis. They appointed as collectors John Chapman, touker, and John Slugge, baker,\* who in turn appointed as sub-collectors, John Gypbons and John Gunner, for the first grant, and for the second grant Richard Herst and Thomas Chapman, who duly accounted for the usual old sum of £13 6s. 8d.,† as being raised from certain persons of the city having land, tenements, possessions, or hereditaments, of the value of xxs. per annum not being liable for spiritual tithes, and from certain persons having goods and chattels of the value of ten marcs.

There being, unfortunately, no schedules of particulars now remaining attached to any of the forgoing returns, much desired information is lost to us. The very old gross valuation of about £133 as existing since 1340 being retained, if the number of people taxable had increased the amount levied on each must have decreased, the amount to be paid to the Exchequer being always the same, as was also the gross amount of the Subsidy granted, viz., £37,000.

We come now, however, to a time when some changes occur, and these documents, hitherto so uniform, are more full in detail and consequently, more interesting.

In February, 1516, 7 Henry VIII., the Parliament granted a Subsidy of £110,000, just three times the former amount, to be raised from lands, tenements, goods, chattels, wages and profit from wages; lands "dymable" only excepted. The collectors for Bath were Henry Cabell and Thomas Weste, who, proceeding upon the old lines, accounted for the receipt of the old amount, the usual £13 6s. 8d.‡ Others presumably did the same, so

\* Subsidies 169—130, 131. † Subsidies 169—132.

‡ Subsidies 169—138.

that the money received falling short of the amount to be raised, another collection was ordered. The reason assigned for this Subsidy, which was to be paid yearly for four years, was the hostile conduct of the French King—remembering our own King's "royall viage with puissant army" into France and his "intendyng further pursuite of his noble enterprise of reducing Louis, the late French King" from the "scisme and division of Christendome unto due obedience of the See Apostolique." The charge was no longer a tenth. All lands, tenements, rents, revenues, annuities, or profits, paid one shilling in the pound. All coin, plate, stock of merchandise, household stuff, and goods and chattels moveable—except apparel, jewels of gold and money owing—paid one shilling in the pound for £20 and upwards, under £20 and down to 40s. every pound paid sixpence. Aliens in every case paid double.

Every man of sixteen years of age and above, worth forty shillings in goods, or in daily or weekly wages up to twenty shillings or above and having no other substance taxable, paid fourpence. Aliens, taking neither wages nor profits, nor having either goods or chattels, paid eightpence. Heads of monasteries were charged for their servants; but care was ordered for all the privileges of Holy Church, nothing in any wise hurtful to be done. Sometimes separate returns were made of the aliens, these, no doubt, helping the authorities to a knowledge of their number.

The commissioners first called to their assistance such inhabitants as they chose and then administered the following oath:—"I shall trully enquire wyth my fellowes that shalbe sworn with me of the best and moost value and substaunce of every person dwellyng or abydyng withyn my lymytes, without any concealment, favour, love, affection, dread or malice, so God me help, and all Sayntes by this book." Aided thus, they made their assessment, the result being the following interesting documents.

If every man of substance be thus returned we shall have a fair census of the wealthy of the city in the time of Henry VIII. ; as by the Poll Tax given last year we had of the population, the indigent excepted, in the reign of Richard II. To bring the amounts to about our own currency they may be multiplied by twenty.

By Indenture of 30th November, 1523, 15 Henry VIII., John Kent, mayor, Thomas Chapman, Thomas Styll, John Byrde, and Geffraye Francombe being "citesyunes" of the city, and the Recorder of the same, were appointed commissioners for the levy of the first payment.\* They in turn having made their assessment, deputed Thomas Chappleigh and John Cheppman "inhabitaunts there" to be high collectors, to "receyve, perceyve, and take" of every Ward the particular sums contained in "fyve foiles" as sealed with the seal, and signed with the sign manual of the foresaid commissioners, which "oon certeyne sum of monie by anticipation amounteth to xlii. viijs. vjd." As near as possible three times the old amount.

The two high collectors appointed as sub-collector, William Rumsey, who, being duly sworn, made a return on one file of apparently only the five commissioners,† H. Cavell being substituted for J. Byrde, viz. :—

Thomas Cheppman, cc. marcs in goods ; for the King ... ..	vjli. xiijs. iiijd.
Thomas Style, cli. in goods ; for the King	cs.
Geffrey Francam, xlii. in goods ; for the King	xls.
Henry Cavell, xlii. in goods ; for the King	xls.
John Kentt, cc. marcs in goods ; for the King ... ..	vjli. xiijs. iiijd.
Total :—xxijli. vjs. viijd.	

The sum actually paid to the Treasury was—xxijli. vjs. iiijd., the receipt attached being noted, sic h'ent surplus viijd.

\* Subsidies 169—141.

† Subsidies 169, 179.

This document has a further special interest as it is the first that occurs in English and it is the first that mentions together three names now somewhat historic. Says Leland, the often quoted, in his *Itinerary*, writing of Bath :—"the Toun hath a "long tyme syns bene continually most mayntained by making "of clothe. There were *in hominum memoria* three clothiers at "one tyme thus named—Style, Kent, and Chapman, by whom "the toun of Bath then flourished. Syns the death of them it "hath somewhat decayed." Until the publication of the Poll Tax last year this entry has been a constant puzzle, no previous history in any way recording Bath as a manufacturing city.

The next files are yet more full; the title, somewhat long, being here slightly epitomised :—This indenture of certificat made the xvij. day of Aprell the xv. yere of the reign of our Sovereign Lord King Henry the VIII. by John Kent, then maior of the Citie of Bath, Thomas Chepman, Thomas Style, John Bryd, and Jeffray Francom, of the said citie, and by Thomas Gibbes, Recorder there, Commissioners for the said citie and the suburbes of the same, &c., witnesseth, &c., the names and surnames of every person and persons with their values and profits inhabitaunts within the same, also of the some or somes of money thereof rated and assessed, at the utasse of (eight days after) the Purification of our Lady last past, &c.\* Thomas Whelpleigh and John Chepman were then nominated to be high collectors, to receive of the petty collectors the money gathered by them according to the five schedules annexed. An allowance of sixpence in the pound was deducted, twopence for the commissioners and their clerk, twopence for the high collectors, and for the petty collectors twopence.

The total sum for the whole city was £43 6s. 4d. By good fortune we have now not only the names of those who paid, but also their parishes in which they lived. First came the—

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\* Subsidies 169—142.

## PARISH OF ST. MICHAEL

BY THE BATH THERE.

Sedule of the seid hole parishe of and within the Warde of Westyate Strete and by the Bath of the seid Citie, of the names and surnames of every person and persons inhabitaunts within the same chargable of and for the first yeres payment of Subsidy at the last Parliament graunted, as by sumes of money assessed of and uppon there valuations and euerich of theym here folowith and by theym payed to Thomas West and John Cheppman, petye collectoures for the same assigned.

Thomas Whelpleigh, in goods xxvs.	Subsid	...	xxvd.
Thomas West, in goods xxx <i>li</i> .	...	Subsid	...
Thomas Haslett, servant, in wages xxs.	Subsid	...	iiij <i>d</i> .
John Cheppman, in goods cs.	...	Subsid	...
Thomas Bankes, in goods xls.	...	Subsid	...
William Kyght, in goods xls.	...	Subsid	...
Thomas Smyth, profit by wages xxs.	Subsid	...	iiij <i>d</i> .
John ———, profit by wages xxs.	Subsid	...	iiij <i>d</i> .
Thomas Dauntley, profit by wages xxs.	Subsid	...	iiij <i>d</i> .
John Pyttard, in goods xls.	...	Subsid	...
William Wodd, in goods xls.	...	Subsid	...
Nicholas Albard, in goods xls.	...	Subsid	...
David Horsman, in servant's wages xxs.	Subsid	...	iiij <i>d</i> .
John Geld, in goods xxs.	...	Subsid	...
William Bocher, in goods xxs.	...	Subsid	...
Robert Penner, in profit by wages xxs.	Subsid	...	iiij <i>d</i> .
Richard Whyte, in profit by wages xxs.	Subsid	...	iiij <i>d</i> .
Total of the Subsidy for the whole parish above said—			lxvs. v <i>d</i> .

## PARISH OF THE BLESSED MARY

WITHIN THE NORTH GATE THERE.

Sedule of the seid hole parishe of and within Ward of Northyate Strete of the seid Citie, of the names and surnames of every person and persons inhabitauntes within the same chargable of and for the first yeres Subsidy at the last Parliament graunted, as by sumes of money assessed of and vpon there valuations and euerich of theym here folowith and by theym payed to John Sachffild and Richard Strong, petye collectoures for the same assigned.

John Byrd, in goods <i>xxli.</i>	...	Subsid	...	<i>xxs.</i>
John Fisher, in goods <i>cxxs.</i>	...	Subsid	...	<i>ijs.</i>
William Hayes, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
Thomas Wylson, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
Dionis Payton, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
John Coffyn, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
Robert Wylbye, servant in wages <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
William Cheppman, in goods <i>xxvli.</i>	...	Subsid	...	<i>xxvs.</i>
Thomas Wyldycote, in land and tenements <i>xxjli.</i>	... ..	Subsid	...	<i>xxjs.</i>
Thomas Grauntesher, in goods <i>cs.</i>	...	Subsid	...	<i>ijs. vjd.</i>
Richard Stronge, in goods <i>vjli. xiijs. iiijd.</i>	...	Subsid	...	<i>ijs. iiijd.</i>
Richard Batyn, in goods <i>lxxxs.</i>	...	Subsid	...	<i>ijs.</i>
Thomas Poynt, in profit by wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
John Sachfeld, in goods <i>xiiijli. vjs. viijd.</i>	...	Subsid	...	<i>vjs. viijd.</i>
John Cheppman, in goods <i>xiiijli. vjs. viijd.</i>	... ..	Subsid	...	<i>vs. viijd.</i>
William Busshe, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
Robert Styll, in goods <i>xxvli.</i>	...	Subsid	...	<i>xxvs.</i>
Thomas Wodward, in goods <i>lxxxs.</i>	...	Subsid	...	<i>ijs.</i>
George Danson, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
John Ap Even, in goods <i>lxxxs.</i>	...	Subsid	...	<i>ijs.</i>
Henry More, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
John Hoke, in profit in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Isabell Chaunceler, in goods <i>xxli.</i>	...	Subsid	...	<i>xxs.</i>
Agnes Ricardes, in goods <i>xijli.</i>	...	Subsid	...	<i>vjs.</i>
Henry Cavell, in goods <i>xlvjli.</i>	...	Subsid	...	<i>xlvjjs.</i>
Thomas Styll, in goods <i>cli.</i>	...	Subsid	...	<i>cs.</i>

Payed by Thomas Cheppman and Thomas Styll, by anticipation, Collectores assigned for the same.

Total of the Subsidy for the whole parish above said, with anticipation, *xivli. xviijs. vjd.*

#### THE PARISH OF THE BLESSED MARY DE STALLES THERE.

Sedule of the seid hole parishe of and within the Warde of Chepe Strete and of the seid citie of the names and surnames of every person and persons inhabitantes within the same, chargable of,





Agnes Wedward, in goods, <i>xxli.</i> ...	Subsid	..	<i>xxs.</i>
William Hochyns, in goods <i>xli.</i> ...	Subsid	...	<i>vs.</i>
Richard Brownborugh, in goods <i>xiiijli. vjs viijd.</i> ...	Subsid	...	<i>vjs viijd.</i>
William Broll	Subsid		
Thomas Hichcock, in goods <i>viiijli.</i>	Subsid	..	<i>iiijd.</i>
James Cogan, in goods <i>xxs.</i> ...	Subsid	...	<i>iiijd.</i>
Lodowic Cherrye, in goods <i>xls.</i> ...	Subsid	...	<i>xijd.</i>
Robert Dealley, in profit in wages <i>xxs.</i>	Subsid	...	<i>iiijd.</i>
Richard Wykeing, in goods <i>lxxxs.</i>	Subsid	...	<i>ijs.</i>
Richard Jolye, in goods <i>xls.</i> ...	Subsid	...	<i>xijd.</i>
John Sydman, in goods <i>xiiijli. vjs. viijd.</i>	Subsid	...	<i>vjs. viijd.</i>
William Cornyshe, in profit by wages <i>xxs.</i>	Subsid	...	<i>iiijd.</i>
Thomas Cheppman, in goods <i>cxixiiijli. vjs. viijd.</i> ...	Subsid	<i>vjli. xiijs. iiijd.</i>	

payed to Thomas Cheppman and Thomas Styllé, by anticipation, collectores assigned for the same.

Sum of the Subsidy for the whole parish above said, with the anticipation,—*xli. xiijs. viijd.*

### THE PARISH OF ST. MICHALL

WITHOUT THE NORTH GATE THERE.

Sedule for the hole parishe of and within the Warde of Brade Strete and Walcot, suburbes of the seid citie, of the names and surnames of every person and persons inhabitauntes within the same, chargable of and for the first payment of Subsidy as by somes of money assessed of and vpon ther valuations and euerych of them here folowith, and by theym payed to Richard Kypping and Thomas , petye collectores for the same assigned.

John Gybbons, in goods <i>lxs.</i> ...	Subsid	...	<i>xviijd.</i>
John Dealley, in goods <i>viiiijli.</i> ...	Subsid	...	<i>iijs.</i>
John Coffyn, in goods <i>lxs.</i> ...	Subsid	...	<i>xviiiid.</i>
John Clement, in goods <i>xiiijli.</i> ...	Subsid	...	<i>vjs.</i>
Thomas Cottyn, senr., in goods <i>cs.</i>	Subsid	...	<i>ijs. vjd.</i>
Thomas Pottiner, in goods <i>xjli.</i> ...	Subsid	...	<i>vs. vjd.</i>
Richard Kypping, in goods <i>vjli.</i> <i>xiijs. iiijd.</i> ...	Subsid	...	<i>iijs. vjd.</i>

Thomas Sqwall, in goods lxxvs. viijd.	Subsid	...	
Thomas Parker, in goods vjli. ...	Subsid	...	ijs.
John Warren, in goods cs. ...	Subsid	...	ijs. vjd.
Thomas Kien, in goods cs. ...	Subsid	...	ijs. vjd.
John Sydelcroft, in goods lxs. ...	Subsid	...	xviijd.
David Ap John, servant, in wages xs.	Subsid	...	iiijd.
Ralph Danford, alien, servant in wages xxs. ...	Subsid	...	viijd.
William Smyth, in goods lxs. ...	Subsid	...	xviijd.
Thomas Battyn, junr., in goods xls.	Subsid	...	xijd.
Thomas Sherston, in goods lxs. ...	Subsid	...	xviijd.
Thomas Ricardes, in profit by wages, xxs.	Subsid	...	iiijd.
Thomas Knappe, alien, servant, in wages xxs. ...	Subsid	...	viijd.
Richard Bowne, in goods lxs. ...	Subsid	...	xviijd.
William Francombe, in goods xls....	Subsid	...	xijd.
Thomas Ap Yevan, in goods lxs. ...	Subsid	...	xviijd.
Richard Gylbard, in goods xls. ...	Subsid	...	xijd.
Thomas Smyth, in goods lxxvs. viijd.	Subsid	...	xxd.
Thomas Waryngton, in profits by wages xxs. ...	Subsid	...	iiijd.
William Smyth, senr., in goods xls.	Subsid	...	xijd.
Robert Smyth, in goods xls. ...	Subsid	...	xijd.
John Henburys, servant, in wages xxs.	Subsid	...	iiijd.
Robert Wattes, in goods liijs. iiijd.	Subsid	...	xvja.
Richard Griffyn, in goods xls. ...	Subsid	...	xijd.
Richard Playce, in goods lxs. ...	Subsid	...	xviijd.
Thomas Chestre, in goods xls. ...	Subsid	...	xijd.
Thomas Wattes, in goods lxxxs. ...	Subsid	...	ijs.
John Byrd, in goods xls. ...	Subsid	...	xijd.
Thomas Kentt, in goods liiis. iiijd.	Subsid	...	xvjd.
Thomas Goodynowe, in goods xxs.	Subsid	...	iiijd.
John Davys, in goods xxs. ...	Subsid	...	iiijd.
William Jonson, in goods xls. ...	Subsid	...	xijd.
Edward Denmede, in goods lxxxs.	Subsid	...	ijs.
Thomas Roo, in goods xls. ...	Subsid	...	xijd.
Laurence Rawlyns, in goods xxs. ...	Subsid	...	iiijd.
Edward Pachment, servant, in wages xxs.	Subsid	...	iiijd.

Philip ———, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Peter ———, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
John ———, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
—————, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
————— Batyn, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
————— Hendley, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
Walter Harper, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
John ———, in profit by wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Richd. Coffyn, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
————— Coffyn, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Philip Morice, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
John Axbridge, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Philip Wevere, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Thomas Toser, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Thomas Burche, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
William Pysen, profit in wages <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
Richard Dicker, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Thomas Rode, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
William Southrey, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
William Weston, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
John Browne, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Richard Warper, in profit by wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Henry Cokes, in profit by wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Thomas Worryat, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Thomas Whyting servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Richard Whytt, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>

John Kentt, in goods *cxxxiiij*li.** *vjs.* *viiij*d.**, Subsid *vj*li.** *xiijs.* *iiij*d.**,  
 payd to Thomas Cheppman and Thomas Styll, by anticipation,  
 collectores assigned for the same.

Sum of the Subsidy for the whole parish above said, with the  
 anticipation—*xli.* *xiijs.*

#### PARISH OF ST. JAMES THE APOSTLE THERE.

Sedule of the seid hole parishe of and within the Wardes of South-  
 yate Strete and Bynburye of the seid citie of the names and surnames  
 of euery person and persons inhabitauntes within the same, chargeable  
 of and for the first yeres payment of Subsidy att the last Parliament  
 graunted by sumes of money assessed of and vpon ther valuations and

euerich of them here followith, and by them payed to William Griffyth and John Walishe, petye collectores for the same assigned.

William Pytt, in goods <i>ixli.</i>	...	Subsid	...	<i>iijs. vjd.</i>
William ———, <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
William Filice, in goods <i>xli.</i>	...	Subsid	...	<i>vs.</i>
Richd. Filice, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
John Bewshen, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
John Walishe, in goods <i>xijli.</i>	...	Subsid	...	<i>vjs.</i>
William Philipp, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
William Colyns, in goods <i>cs.</i>	...	Subsid	...	<i>ijs. vid.</i>
John Mog, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
John Fyse, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
John Netherwent, in goods <i>cs.</i>	...	Subsid	...	<i>ijs. vjd.</i>
Richd Cockes, in goods <i>xijli. vjs. viijd.</i>	...	Subsid	...	<i>vjs. viijd.</i>
John Cockes, servant to the same, in wages <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Robert Batt, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
William Griffyth, in profit by wages <i>lxs.</i>	...	Subsid	...	<i>xviijd.</i>
Thomas Jacson, in wages <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
Johu Ballerde, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
John Baker, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
Andrew Baylie, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
Maurice Chalke, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
Thomas Foster, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
John Geye, in goods <i>cxxs.</i>	...	Subsid	...	<i>iijs.</i>
Thomas Hunt, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
Gilbert Cysbiryne, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
John Gyls, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Thomas Mede, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
William Kynnewerd, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
John Baroune, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Thomas Chaffer, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
William Davye, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
John Boyce, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Thomas Perce, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Thomas More, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
John Baker, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
John Hylman, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>

John Andrewes, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Edward Browne, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Richard Davys, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Richard Dawes, in goods	...	Subsid	...	
John Marchall, in goods <i>xxs.</i>	...	Subsid	...	<i>iiijd.</i>
Thomas Aldaye, in goods <i>viiijli.</i>	...	Subsid	...	<i>(iiij<sup>s</sup>.)</i>
Edward Donyett, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>(iiij<sup>d</sup>.)</i>
John Ball, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>(iiij<sup>d</sup>.)</i>
Richard Fosebroke, in goods <i>xls.</i>	...	Subsid	...	<i>xijd.</i>
William Savege, in goods <i>xxs.</i>	...	Subsid	...	<i>iiij<sup>d</sup>.</i>
John Vaghan, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiij<sup>d</sup>.</i>
Willm. Gylles, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiij<sup>d</sup>.</i>
John Bryant, servant, in wages <i>xxs.</i>	...	Subsid	...	<i>iiij<sup>d</sup>.</i>

The domestic servants of the Prior and Priory of the city as below written.

Richard Salford, servant to the same, in goods <i>lxs.</i>	...	...	Subsid	...	<i>xijd.</i>
Thomas Dewke, servant, in wages <i>xls.</i>	...	...	Subsid	...	
Giles Wattes, servant, in wages	...	...	Subsid	...	
William Coper, in goods <i>xls.</i>	...	...	Subsid	...	
Thomas Denham, in wages	...	...	Subsid	...	
Edward Gronger, servant to the same in goods <i>xxs.</i>	...	...	Subsid	...	

Geoffry Frauncom, in goods *xlii.*, Subsid *xs.*, payed to Thomas Cheppman and Thomas Styll, by anticipation, collectors assigned for the same.

Sum of the Subsidy for the whole parish afore said, with the anticipation—*cvjs. iiij<sup>d</sup>.*

By Indenture, dated 17th January 1525, 16 Henry VIII., Geoffry Francam, maior, John Kent, Thomas Style, and John Byrde, citizens, and Thomas Jubbes, Recorder, were appointed commissioners to collect and certify, &c., to the Exchequer. They appointed Henry Cavell and John Clement high collectors, to receive of the parish collectors; the total amount for the city being £43 8s. 10d.,\* according to the following assessment.

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\* Subsidies 169—178.

Schedule of the parish of Stalles of and within the Ward of Chepe Strete and Stall Strete : of Saynt Jamys of and within the Ward of South Strete and Bynburye : and also of Saynt Michell by the bath of and within the Warde of Westyate Strete and by the bath, of the names and surnames of every person and persons inhabitauntes within the same, chargable to the Subsidy at the last Parliament graunted of and for the seconde yeres payment of the same as here folowith.

## PARISH OF ST. MARY DE STALLES.

Roger Gregorye, in goods lxs. ...	Subsid	...	xviij <i>d.</i>
Anthony Hudyng, in goods xxs. ...	Subsid	...	iiij <i>d.</i>
William Romsey, in goods lxs. ...	Subsid	...	xviij <i>d.</i>
Thomas Parker, in goods cs. ...	Subsid	...	ijs. v <i>d.</i>
Richd. Parker, servant, in wages xxs.	Subsid	...	iiij <i>d.</i>
Willm. Vawse, in goods xxs. ...	Subsid	...	iiij <i>d.</i>
Nich. Doore, in goods xxs. ...	Subsid	...	iiij <i>d.</i>
Edith Cheppman, in goods cxxxiiij <i>li.</i> vjs. viij <i>d.</i> ...	Sub.	cxxxiijs.	iiij <i>d.</i>
Henry Lerke, alien, in goods lxxx <i>s.</i>	Sub.	...	iiijs.
Thos. Por, in goods xxvjs. viij <i>d.</i> ...	Sub.	...	v <i>d.</i>
Thos. Godpath, in goods xxvjs. viij <i>d.</i>	Sub.	...	v <i>d.</i>
John Wakefield, in goods xls. ...	Sub.	...	xij <i>d.</i>
John Gwynne, in goods xxvjs. viij <i>d.</i>	Sub.	...	v <i>d.</i>
Hugh Yettes, in profits by wages xxs.	Sub.	...	iiij <i>d.</i>
Henry Wokem, profit in wages xxs.	Sub.	...	iiij <i>d.</i>
John Norres, in goods xls. ...	Sub.	...	xij <i>d.</i>
Willm. Mylton, in goods xxxiijs. iiij <i>d.</i>	Sub.	...	viiij <i>d.</i>
Hugh Lane, in goods xls. ...	Sub.	...	xij <i>d.</i>
John Talbot, in goods lxs. ...	Sub.	...	xviij <i>d.</i>
Richd. Wolgrove, in goods xxvjs. viij <i>d.</i>	Sub.	...	v <i>d.</i>
John Dolyng, in goods xxvjs. viij <i>d.</i>	Sub.	...	v <i>d.</i>
Maurice Nicoll, in goods xxvjs. viij <i>d.</i>	Sub.	...	v <i>d.</i>
Edward Gefford, in goods xxvjs. viij <i>d.</i>	Sub.	...	v <i>d.</i>
Thomas Cantt, in goods xxvjs. viij <i>d.</i>	Sub.	...	v <i>d.</i>
Isabell Clerke, in goods xls. ...	Sub.	...	xij <i>d.</i>
Edward Chewman, profit in wages xxs.	Sub.	...	iiij <i>d.</i>

John Aworsetre, in goods xxvjs. viijd.	Sub.	...	vjd.
Hugh Yevan, in goods xxvjs. viijd.	Sub.	...	vjd.
John Benett, in goods vijli.	...	Sub.	... ijs. vjd.
Maurice Briscotte, in goods xxvjs. viijd.	Sub.	..	vjd.
John Laurence, servant, in wages xxs.	Sub.	...	iiijd.
Willm Marten, in goods xls.	...	Sub.	... xijd.
John Mydylton, in goods cxxs.	...	Sub.	... iijs.
Agnes Wodward, in goods xxli.	...	Sub.	... xxs.
Robt. Hochyns in goods xli.	...	Sub.	... vs.
Richd. Browneberugh, in goods xiiijli. vjs. viijd.	...	Sub.	... vjs. viijd.
Thos. Hichcock, in goods viijli.	...	Sub.	... iijs.
James Cogan, in goods xxvjs. viijd.	Sub.	...	vjd.
Edward Chyrrye, in goods xxxiijs. iiijd.	Sub.	...	viijd.
Robt. Walley, in goods xxvjs. viijd.	Sub.	...	vjd.
Richd. Jobyn, in goods xxvjs. viijd.	Sub.	...	vjd.
John Sydnam, in goods xiiijli. vjs. viiid.	Sub.	...	vjs. viijd.
Willm. Cornishe, in goods xxvjs. viijd.	Sub.	..	vjd.
Thomas Coke, in goods xls.	...	Sub.	... xijd.
Richd. Wylton, in goods xls.	...	Sub.	... xijd.
Richd. Yonge, in goods xxvjs. viijd.	Sub.	...	vjd.
Total :—xjli. xijs. vijd.			

## PARISH OF ST. JAMES APOSTLE.

Geoffrey Francman, in goods xlli.	...	Subsid	... xls.
Willm. Pytt, in goods ixli.	...	Sub.	... iijs. vjd.
Willm. Filice, in goods xli.	...	Sub.	... vs.
Richd. Filice, in goods xls.	...	Sub.	... xijd.
John Bewshen, servant, in wages xxs.	Sub.	...	iiijd.
John Walishe, in goods xijli.	...	Sub.	... vjs.
Willm. Colyns, in goods cs.	...	Sub.	... ijs. vjd.
John Fosse, profit in wages xxxiijs. iiijd.	Sub.	...	viijd.
Richd. Cokes, in goods xiiijli. vjs. viijd.	Sub.	...	vjs. viijd.
Robert Call, in goods xls.	...	Sub.	... xijd.
Willm. Griffith, servant, in wages lxs.	Sub.	...	xviijd.
Thomas Jackson, servant, in wages xls.	Sub.	...	xijd.

John Ballard, in goods xls.	...	Sub.	...	xijd.
John Baker, in goods xls.	...	Sub.	...	xijd.
Andrew Bayly, in goods xls.	...	Sub.	...	xijd.
Maurice Chalke, in goods xls.	...	Sub.	..	xijd.
John Jaye, in goods cxxs.	...	Sub.	...	iijs.
Thos. Hunt, in goods xls.	...	Sub.	...	xijd.
Gilbard Cysburye, in goods xls.	...	Sub.	...	xijd.
John Gylys, servant, in wages xxvjs. viijd.	... ..	Sub.	...	vjd.
Thos. Mede, in goods xxs.	...	Sub.	...	iiijd.
Willm. Kynneward, in goods xxvjs. viijd.	... ..	Sub.	...	vjd.
John Baron, in goods xxvjs. viijd.	...	Sub.	...	vjd.
Willm. Davye, in goods xxxijs. iiijd.	...	Sub.	...	viijd.
John Boyce, in goods xxs.	...	Sub.	...	iiijd.
Thomas Moore, in goods xxs.	...	Sub.	...	iiijd.
John Baker, in goods xxs.	...	Sub.	...	iiijd.
John Hyllman, in goods xxs.	...	Sub.	...	iiijd.
John Andrewes, in goods xxvjs. viijd.	...	Sub.	...	vjd.
Edward Browne, in goods xxs.	...	Sub.	...	iiijd.
Richd. Dawes, in goods xxvjs. viijd.	...	Sub.	...	vjd.
John Marshall, in goods xxs.	...	Sub.	...	iiijd.
Thomas Alday, in goods viij <i>li</i> .	...	Sub.	..	iijs.
Edwd. Danyal, servant, in wages xxvjs. viijd.	... ..	Sub.	...	vjd.
John Ball, servant, in wages xxs.	...	Sub.	...	iiijd.
Richd. Fosebroke, in goods xxxs. iiijd.	...	Sub.	...	viijd.
Willm. Savage, in goods xxs.	...	Sub.	...	iiijd.
John Vaghan, in goods xxs.	...	Sub.	...	iiijd.
Richd. Salford, servant, in wages lxs.	...	Sub.	...	xviii <i>d</i> .
Thos. Webbe, servant, in wages xls.	...	Sub.	...	xijd.
John Wattes, servant, in wages xxs.	...	Sub.	...	iiijd.
Willm. Copar, in goods x <i>li</i> .	...	Sub.	...	vs.
Edwd. Grainger, servant, in wages xxs.	...	Sub.	...	iiijd.
Thos. Denham, servant, in wages lxs.	...	Sub.	...	xvii <i>jd</i> .
Richd. Pereman, in goods xls.	...	Sub.	...	xijd.
Thos. Toker, in goods xxs.	...	Sub.	...	iiijd.
Thos. Amevoo, in goods xxs.	...	Sub.	...	iiij <i>d</i> .



John Crowder, in goods <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
Thos. Poynte, in goods <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
John Rudman, in goods <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
Richd. Coke, servant, in wages <i>xxs.</i>		Sub.	...	<i>iiijd.</i>
Richd. Jenkyns, servant, in wages <i>xxs.</i>		Sub.	...	<i>iiijd.</i>
Total :— <i>ciijs. xd.</i>				

## PARISH OF ST. MICHAEL

## BY THE BATH.

Thos. Whelpely, in goods <i>xxvli.</i>	...	Sub.	...	<i>xxvs.</i>
Thos. West, in goods <i>xxxli.</i>	...	Sub.	...	<i>xxxs.</i>
John Cheppman, in goods <i>cs.</i>	...	Sub.	...	<i>ijs. vjd.</i>
Thos. Bankes, in goods <i>xls.</i>	...	Sub.	...	<i>xijd.</i>
Willm. Woddes, in goods <i>xls.</i>	...	Sub.	...	<i>xijd.</i>
Willm. Kyght, in goods <i>xls.</i>	...	Sub.	...	<i>xijd.</i>
Thos. Smyth, in goods <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
Richd. Aprice, in goods <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
Robt. Payne, in goods <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
Thos. Bythwaye, in goods <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
John Packard, in goods <i>xxxiijs. iiijd.</i>		Sub.	...	<i>viijd.</i>
Thos. Baker, servant in wages <i>xxs.</i>		Sub.	...	<i>iiijd.</i>
John Geele, in goods <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
Willm. White, in goods <i>xxs.</i>	..	Sub.	...	<i>iiijd.</i>
Richd. White, in goods <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
John Groombold, in goods <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
John Hancock, servant, in wages <i>xxs.</i>		Sub.	...	<i>iiijd.</i>
Nichs. Alford, in goods <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
Willm. Lawncedowne, servant, in wages <i>xxs.</i>	...	Sub.	...	<i>iiijd.</i>
Total :— <i>lxvs. ijd.</i>				

Schedule of the parishe of Saynt Mighell withoute Northyate of and within the Warde of Brade Strete and Walcot Strete, and also of the parishe of our Lady within the seid yate of and within Warde of Northyate Strete of and within the seid citie of names and surnames of every person and persones inhabitauntes within chargable to the Subsidy att the last Parliament graunted of and for the seconde payment of the same as here folowith.

## THE PARISH OF ST. MICHAEL

WITHOUT THE NORTH GATE.

John Kent, in goods cxxxiiij <i>li</i> . vjs. viij <i>d</i> .	Sub.	cxxxiijs. iiij <i>d</i> .
John Gebonis, in goods lxs.	... Sub.	... xviiij <i>d</i> .
John Waller, in goods viij <i>li</i> .	... Sub.	... iijs.
Thos. Batyn, sen., in goods cs.	... Sub.	... ijs. vj <i>d</i> .
John Clement, in goods xiiij <i>li</i> .	... Sub.	... vijs.
Thos. Palmere, in goods x <i>li</i> .	... Sub.	... vs. vj <i>d</i> .
Richd. Kypping, in goods cxxxiijs. iiij <i>d</i> .	Sub.	... iijs. iiij <i>d</i> .
Thos. Sqwall, in goods lxxvs. viij <i>d</i> .	Sub.	... xxd.
Willm. Jonson, in goods xls.	... Sub.	... xij <i>d</i> .
John Jonson, in goods xls.	... Sub.	... xij <i>d</i> .
John Warren, in goods cs.	... Sub.	... ijs. vj <i>d</i> .
Thos. Parker, in goods cxxs.	... Sub.	... iijs.
Thos. Keyn, in goods cs.	... Sub.	... ijs. vj <i>d</i> .
Willm. Smyth, in goods lxs.	... Sub.	... xviiij <i>d</i> .
John Shelcrofte, in goods lxs.	... Sub.	... xviiij <i>d</i> .
Thos. Batyn, junr., in goods xls.	... Sub.	... xij <i>d</i> .
Willm. Francam, in goods xls.	... Sub.	... xij <i>d</i> .
Walter Harper, in goods lxs.	... Sub.	... xviiij <i>d</i> .
Thos. Shereston, in goods lxs.	... Sub.	... xviiij <i>d</i> .
Philip Denmede, in goods xxvjs. viij <i>d</i> .	Sub.	... vj <i>d</i> .
Thos. Batyn, in goods xxs.	... Sub.	... iiij <i>d</i> .
Thos. Goodynowe, in goods xxxiijs. iiij <i>d</i> .	Sub.	... viij <i>d</i> .
John Burde, in goods xls.	... Sub.	... xij <i>d</i> .
Thos. Kent, in goods liijs. iiij <i>d</i> .	... Sub.	... xvj <i>d</i> .
Richd. Playce, in goods lxs.	... Sub.	... xviiij <i>d</i> .
Thos. Chestre, in goods xls.	... Sub.	... xij <i>d</i> .
Robert Wattes, in goods liijs. iiij <i>d</i> .	Sub.	... xvj <i>d</i> .
Thos. Wattes, in goods lxxxs.	... Sub.	... ijs.
Edward Denmede, in goods lxxxs.	... Sub.	... ijs.
Thos. Smyth, in goods lxxvs. viij <i>d</i> .	Sub.	... xxd.
Thos. Roo, in goods xls.	... Sub.	... xij <i>d</i> .
Thos. Buckeler, in goods cs.	... Sub.	... ijs. vj <i>d</i> .
Thos. Ap Yevan, in goods lxs.	... Sub.	... xviiij <i>d</i> .
Willm. Smyth, in goods xls.	... Sub.	... xij <i>d</i> .
Robt. Smyth, in goods xls.	... Sub.	... xij <i>d</i> .

Philip Wevere, in goods xxvjs. viijd.	Sub.	...	vjd.
Richd. Griffyn, in goods cxxs.	...	Sub.	...
Thos. Hendley, in goods xxvjs. viijd.	Sub.	...	vjd.
Willm. Sowthrey, in goods xxvjs. viijd.	Sub.	...	vjd.
John Morres, in profit by wages xxs.	Sub.	...	iiijd.
Laurence Rawlynes, in goods xxvjs.	Sub.	...	vjd.
Thos. Leche, profit in wages xxs.	...	Sub.	...
Henry Coke, servant, in wages xxs.	Sub.	...	iiijd.
Thos. Toner, in profit in wages xxs.	Sub.	...	iiijd.
John Batyn, in goods xxvjs. viijd.	...	Sub.	...
Robert Cosyn, in profit by wages xxs.	Sub.	...	iiijd.
Thos. Waryngton, in profit by wages xxs.	Sub.	...	iiijd.
John Henburye, in profit by wages xxs.	Sub.	...	iiijd.
Philip Saunderses, in profit by wages xxs.	Sub.	...	iiijd.
Henry Henterden, in profit by wages xxs.	Sub.	...	iiijd.
Thos. Ricardes, in profit by wages xxs.	Sub.	...	iiijd.
John Browne, in profit by wages xxs.	Sub.	...	iiijd.
George Olyvere, in profit by wages xxs.	Sub.	...	iiijd.
David Ap John, in profit by wages xxs.	Sub.	...	iiijd.
Willm. Hoke, in profit by wages xxs.	Sub.	...	iiijd.
Thos. Burche, in profit by wages xxs.	Sub.	...	iiijd.
Thos. Whytinge, in profit by wages xxs.	Sub.	...	iiijd.
Willm. Weston, in profit by wages xxs.	Sub.	...	iiijd.
Richd. Gylberd, in goods xls.	...	Sub.	...
Roger Morres, in profit in wages xxs.	Sub.	...	iiijd.
John Axbruge, in profit by wages xxs.	Sub.	...	iiijd.

Total :—xli. xs.

### PARISH OF ST. MARY

#### WITHIN THE GATE.

John Fysher, in goods cxxs.	...	Subsid	...	iijs.
John Atkins, in goods xls.	...	Sub.	...	xijd.
Thos. Wylson, in goods xls.	...	Sub.	...	xijd.
Henry Cavell, in goods xlii.	...	Sub.	...	xls.
John Coffyn, in goods xls.	...	Sub.	...	xijd.
Thomas Style, in goods cli.	...	Sub.	...	cs.
Robert Wysbiche, servant, in wages				

xxvjs. viijd.	...	...	Sub.	...	vjd.
Richd. Wrenche, servant, in wages					
xxvjs. viijd.	...	...	Sub.	...	vjd.
Willm. Cheppman, in goods xxvli.	...	...	Sub.	...	xxvs.
Thos. Wydycote, in lands and					
tenements xxli.	...	...	Sub.	...	xxs.
Thos. Granteshher, in goods cs.	...	...	Sub.	...	ijs. vjd.
Richd. Stronge, in goods cxxxiijs. iijd.	...	...	Sub.	...	ijs. iiijd.
Richd. Wekinge, in goods lxxxs.	...	...	Sub.	...	ijs.
Richd. Baten, in goods lxxxs.	...	...	Sub.	...	ijs.
John Sacheffild, in goods xiiijli. vjs. viijd.	...	...	Sub.	...	vjs. viijd.
John Cheppman, in goods					
xiiijli. vjs. viijd.	...	...	Sub.	...	vjs. viijd.
Willm. Busshe, in goods xls.	...	...	Sub.	...	xijd.
Robt. Style, in goods xxvli.	...	...	Sub.	...	xxvs.
Thos. Wodward, in goods xls.	...	...	Sub.	...	xijd.
George Benson, in goods xxvjs. viijd.	...	...	Sub.	...	vjd.
John Ap Yevan, in goods xxxs.	...	...	Sub.	...	ijs.
Isabell Chaunceler, in goods xxli.	...	...	Sub.	...	xxs.
Henry More, in goods xxvjs. viijd.	...	...	Sub.	...	vjd.
John Byrd, in goods xxli.	...	...	Sub.	...	xxs.
Willm. Kyng, servant, in wages xxs.	...	...	Sub.	...	iiijd.
John Lentall, servant, in wages xxs.	...	...	Sub.	...	iiijd.
Agnes Ricardes, in goods xijli.	...	...	Sub.	...	vjd.
John Hoore, servant, in wages xxs.	...	...	Sub.	...	iiijd.

Total :—xiiijli. xiijs. ijd.

The next document relating to Bath occurs in 1540, 32 Henry VIII., a void of fifteen years, when the Parliament granted four Subsidies payable in four years, the first in 1540; the second in 1541; the others in 1542-43. The change in the reason given for the grant will be noticed. It was now, remembering the innumerable benefits of the King's reign, during which every one had lived in surety for their wealth, quiet, and rest; and remembering too, that by the inestimable grace God had given him, he had brought his true subjects out of all blindness and ignorance into the true and perfect know-

ledge of God's most holy Word ; in the abolishing also of the Bishop of Rome and his usurped authority, by whose "subtyll" "devises, exceeding somes of money have wonte daylye and "yerelye, to be conveyed out of the realm."

The first Indenture for the first half is between Robert Styll, mayor, and Sir Edward Gorges, Knt. as commissioners, and John Byrde, alderman, and Anthony Scrope, gent., as high collectors, the amount accounted for being £8 18s. 4d.\* as follows:—

Robt. Styll, mayre, in goods <i>xlii.</i> ...	Subsid	...	<i>xxs.</i>
Harry Kavell, in goods <i>xli.</i> ...	Subsid	...	<i>xxs.</i>
John Byrde, in goods <i>xxli.</i> ...	Subsid	...	<i>xs.</i>
John Sachefyld, in goods <i>xxxli.</i> ...	Subsid	...	<i>xvs.</i>
Anthony Scrope, gent., in goods <i>xxli.</i> ...	Subsid	...	<i>xs.</i>
Richd. Chapman, in goods <i>xxli.</i> ...	Subsid	...	<i>xs.</i>
The Stake of the Chamber ther <i>xli.</i> ...	Subsid	...	<i>xls.</i>
John Clement, in goods <i>xxli.</i> ...	Subsid	...	<i>xs.</i>
John Clement, the yonger, in goods <i>xxli.</i> ...	Subsid	...	<i>xs.</i>
Richd. Perreman, in goods <i>xxxli.</i> ..	Subsid	...	<i>xvs.</i>
John Chapman, in goods <i>xxxli.</i> ...	Subsid	...	<i>xvs.</i>
Harry Larke, alyen, in goods <i>xxs.</i> ...	Subsid	...	<i>xijd.</i>
The same Harry have a son of 18 years of age ...	Subsid	...	<i>iiijd.</i>
John Lewys, alyen, in goods <i>xls.</i> ...	Subsid	...	<i>ijs.</i>
Total :— <i>viiijli. xviijs. iiijd.</i>			

The return for the second half is in duplicate, between John Chapman, maire, Edward and Henry Capell, Knts. as commissioners, and John Sachfyld and Robt. Chapman as collectors, the amount received being £13 11s. 4d.,† viz., from:—

John Chapman, maier there, in goods <i>xxxli.</i> ...	Subsid	...	<i>xvs.</i>
Henry Cavell, in goods <i>xlii.</i> ...	Subsid	...	<i>xxs.</i>
John Sachefyld, in goods <i>xxxli.</i> ...	Subsid	...	<i>xvs.</i>

\* Subsidies 170—189. † Subsidies 170—195—197.

Anthonie Scrope, in goods <i>xxli.</i> ...	Subsid	...	<i>xs.</i>
Joan Style, widow, in goods <i>xxxli.</i>	Subsid	...	<i>xvs.</i>
And she has in her custody for the use of John Style, a legacy, <i>xlii.</i>	Subsid	...	<i>xls.</i>
And she has for the similar use of Thomas Style, <i>xlii.</i> ...	Subsid	...	<i>xls.</i>
Richd. Chapman, in goods <i>xxli.</i> ...	Subsid	...	<i>xs.</i>
John Clement, senr., in goods <i>xxli.</i> ...	Subsid	...	<i>xs.</i>
John Clement, junr., in goods <i>xxli.</i>	Subsid	...	<i>xs.</i>
Edward Ludwell, in goods <i>xxli.</i> ...	Subsid	...	<i>xs.</i>
Richd. Perman, in goods <i>xxxli.</i> ...	Subsid	...	<i>xvs.</i>
Walter Bems, in goods <i>xxli.</i> ...	Subsid	...	<i>xs.</i>
Margaret Felbes, in goods <i>xxli.</i> ...	Subsid	...	<i>xs.</i>
The Chamber of the City <i>xlii.</i> ...	Subsid	...	<i>xls.</i>
John Lewes, alien, in goods <i>xxs.</i> ...	Subsid	...	<i>xijd.</i>
John Larke, alien, in goods <i>nil</i> ...	Subsid	...	<i>iiijd.</i>
Total :— <i>xiiijli. xjs. iiijd.</i>			

The return for the second Subsidy, collected in 1541, is made in parishes, the total being £15 15s. only.\*

#### THE CITIE OF BATHE.

##### THE PARYISHE OF SAYNT MICHELL

###### WITHOUTE THE YATE.

John Clement, thelder, in goods and chattels <i>vjli.</i> ...	Subsid	...	<i>iijs.</i>
John Walley, thelder, in goods and chattels <i>cs.</i> ...	Subsid	...	<i>iijs. iiijd.</i>
John Clement, the yonger, in goods and chattels <i>cs.</i> ...	Subsid	...	<i>iijs. iiijd.</i>
John Walley, the yonger, in goods and chattels <i>cs.</i> ...	Subsid	...	<i>iijs. iiijd.</i>
Richard Keteley, in goods and chattels <i>cs.</i> ...	Subsid	...	<i>iijs. iiijd.</i>
Total :— <i>xvijs. iiijd.</i>			

## THE PARRISHE OF SAYNT MARY'S

## WITHYN THE YATE.

Henry Cavell is worth in goods and chattels <i>xxli.</i> ... ..	Subsid	<i>xxvjs. viijd.</i>
John Busshe, gent, in landes and tenements by the yere <i>xxli.</i> ...	Subsid	... <i>xls.</i>
John Sachefeld, in goods and chattels <i>xvli.</i> ... ..	Subsid	... <i>xvs.</i>
Joan Style, widowe, in goods and chattels <i>xvli.</i> ... ..	Subsid	... <i>xvs.</i>
Willm. Horsyngton, in goods and chattels <i>xxxli.</i> ... ..	Subsid	... <i>xls.</i>
The same Willm. Horsyngton so charged the last yere and not payd <i>xxxli.</i>	Subsid	... <i>xls.</i>
Richd. Chapman, in goods and chattels <i>xvli.</i> ... ..	Subsid	... <i>xvs.</i>
Edward Ludwell, in goods and chattels <i>viiijli.</i> ... ..	Subsid	... <i>vs. iiijd.</i>
Alys Birde, widowe, yn annuyte by yere <i>iiiijli.</i> ... ..	Subsid	... <i>viijs.</i>
John Style, in goods and chattels <i>xli.</i>	Subsid	.. <i>xs.</i>
Willm. Abyan, in goods and chattels <i>cs.</i>	Subsid	... <i>iijs. iiijd.</i>
Willm. Pypper, in goods and chattels <i>cs.</i>	Subsid	... <i>iijs. iiijd.</i>
Total :-- <i>xli. xxd.</i>		

## STALLES PARISH.

Richd. Pereman, in goods and chattels <i>xxli.</i> ... ..	Subsid	<i>xxvjs. viijd.</i>
Alys Chapman, widowe, in goods and chattels <i>cs.</i> ... ..	Subsid	... <i>iijs. iiijd.</i>
Willm. Cowp, in goods and chattels <i>vjli.</i>	Subsid	... <i>iijs.</i>
David Meredith, in goods and chattels <i>vjli.</i> ... ..	Subsid	... <i>iijs.</i>
Walter Barry, in goods and chattels <i>cs.</i>	Subsid	... <i>iijs. iiijd.</i>
Thomas Pewyd, in goods and chattels <i>cs.</i>	Subsid	... <i>iijs. iiijd.</i>
Willm. Mitton, in goods and chattels <i>cs.</i>	Subsid	... <i>iijs. iiijd.</i>
Total :-- <i>xlvijs.</i>		

## THE PARRISHE OF SAYNT JAMYS.

Jeffrey Stayner, in goods and chattels cs.	Subsid	...	iijs. iiijd.
James Sherston, in goods and chattels cs.	Subsid	...	iijs. iiijd.
Willm. Wattes, in goods and chattels cs.	Subsid	...	iijs. iiijd.
Michel Drake, in goods and chattels cs.	Subsid	...	iijs. iiijd.
Joan Wilman, widowe, in annuyte			
by yere lxs. ...	Subsid	...	vjs.
Edward Apevan, in lands and			
tenements by yere xxs. ...	Subsid	...	ijs.
Total :—xxiijs. viijd.			

## THE PARRYSSHE OF SAYNT MICHELL

BY THE BATTHESYDE.

Joan Ball, widowe, in goods and			
chattels cs. ...	Subsid	...	iijs. iiijd.
Total :—iijs. iiijd.			

The total of the second payment of the Subsidy for the said City,—*xvli. xvs.*

In 1545, 37 Henry VIII., as remembering the blessings enjoyed under the King and especially the perfect peace in which all lived “even as the small fishes of the sea in the most tempestuous weather doe lie quietly under the rocks or bancks side and are not moved nor stirred howsoever the wind bloweth,” two whole fifteenths and tenths were granted, payable the first in June next and the second before 30th June, 1547. The certificate of Aldred Fitzjames of Bath, and another whose name is torn away, for the first payment of this subsidy, sets out by parishes the valuation of all the lands, tenements, goods and chattels of the contributories in the city of Bath with their names and surnames.\*

## PARISH OF STALLES THERE.

Richd. Pereman, is worth in goods			
and chattels <i>xxli. ...</i>	Subsid	...	xxvjs. viijd.

\* Subsidies 170—218.



Alice Chappman, widow, is worth in goods and chattels viij <i>li</i> . ...	Subsid	... vs. iiij <i>d</i>
Willm. Cotop, is worth in goods and chattels viij <i>li</i> . ...	Subsid	... vs. iiij <i>d</i> .
Willm. Belshyre, is worth in goods and chattels x <i>li</i> . ...	Subsid	... xs.
Thomas Pewyd, is worth in goods and chattels vij <i>li</i> . ...	Subsid	iijs. viij <i>d</i> .
James Masters, is worth in goods and chattels cs. ...	Subsid	... iijs. iiij <i>d</i> .
David Meredith, is worth in goods and chattels vj <i>li</i> . ...	Subsid	... iijs.
David Higgins, is worth in goods and chattels cs. ...	Subsid	... iijs. iiij <i>d</i> .
Thomas Garland, is worth in goods and chattels cs. ...	Subsid	... iijs. iiij <i>d</i> .
Total :—lxvjs.		

## PARISH OF ST. MARIE

## WITHIN THE GATE.

John Birde, has annual of the annual value of cs. ...	Subsid	... xs.
Henry Kavell, is worth in goods and chattels xx <i>li</i> . ...	Subsid	xxvjs. viij <i>d</i> .
John Sachefeld, is worth in goods and chattels xvj <i>li</i> . ...	Subsid	... xvjs.
Joan Stile, widow, is worth in goods and chattels xviiij <i>li</i> . ...	Subsid	... xviijs.
John Stile, is worth in goods and chattels xv <i>li</i> . ...	Subsid	... xvjs.
Richd. Chappeman, is worth in goods and chattels xv <i>li</i> . ...	Subsid	... xvjs.
Edward Ludwell, is worth in goods and chattels x <i>li</i> . ...	Subsid	... xs.
Willm. Abyam, is worth in goods and chattels cs. ...	Subsid	... iijs. iiij <i>d</i> .
Willm. Pÿpper, is worth in goods and chattels cs. ...	Subsid	... iijs. iiij <i>d</i> .

John Busshe, is worth in goods and chattels cs. ... ..	Subsid	... iijs. iiijd.
John Clement, is worth in goods and chattels cs. ... ..	Subsid	... iijs. iiijd.
John Whyte, is worth in goods and chattels cs. ... ..	Subsid	... iijs. iiijd.
Agnes Chappman, widow, is worth in goods and chattels cs. ... ..	Subsid	... iijs. iiijd.
Total :—vj <i>l</i> . xs. viij <i>d</i> .		

## PARISH OF ST. MICHAEL

## WITHOUT THE GATE.

John Clement, senr., is worth in goods and chattels vj <i>l</i> . ... ..	Subsid	... iijs.
John Walley, senr., is worth in goods and chattels vij <i>l</i> . ... ..	Subsid	iijs. viij <i>d</i> .
Thomas Long, is worth in goods and chattels cs. ... ..	Subsid	... iijs. iiij <i>d</i> .
Richd. Keteley is worth in goods and chattels viij <i>l</i> . ... ..	Subsid	... vs. iiij <i>d</i> .
Total :—xxs. viij <i>d</i> .		

## PARISH OF ST. JAMES.

John Wilman has annually of the annual value of lxs. ... ..	Subsid	... vjs.
Geoffrey Francom is worth in goods and chattels cs. ... ..	Subsid	... iij <sup>s</sup> . iiij <i>d</i> .
Thomas Sherford is worth in goods and chattels cs. ... ..	Subsid	... iijs. iiij <i>d</i> .
Richd. Gilberd is worth in goods and chattels cs. ... ..	Subsid	... iijs. iiij <i>d</i> .
Michael Drake is worth in goods and chattels cs. ... ..	Subsid	... iijs. iiij <i>d</i> .
Edward Abyam has in land per ann. xxs. ... ..	Subsid	... ij <sup>s</sup> .
Total :—xxjs. iiij <i>d</i> .		

## PARISH OF ST. MICHAEL,

WITHIN THE GATE.

Willm. Kyte is worth in goods and  
chattels cs. ... Subsid ... iijs. iiij*z*.

Johanna Ball, widow, is worth in  
goods and chattels c*z*. ... Subsid ... iijs. iiij*z*.

Total :—vjs. viij*z*.

Grand total :—xij*l*. vs. iiij*z*.

The earlier rolls having only a uniform total attached, give but little opportunity for remark. These last require some attention, and the following tabulated form will help to bring the changes or differences in them directly under notice.

PARISH.	Date.	Names.	Paid.			Valuation.		
			£	s.	d.	£	s.	d.
MICHAEL WITHIN ...	1524	17	3	5	6	55	5	0
	1525	19	3	5	2	79	13	4
	1541	1	0	3	4	5	0	0
	1545	2	0	6	8	10	0	0
MARY WITHIN ...	1524	26	14	18	6	341	6	8
	1525	28	14	13	2	239	3	4
	1541	12	11	1	8	177	0	0
	1545	13	6	10	8	129	0	0
STALLS ...	1524	45	10	14	8	255	3	4
	1525	46	11	12	7	275	13	0
	1541	7	2	8	0	52	0	0
	1545	9	3	6	0	56	0	0
ST. JAMES'S ...	1524	54	5	6	8	158	6	8
	1525	52	5	3	10	139	3	8
	1541	6	1	4	8	24	0	0
	1545	6	1	1	4	24	0	0
MICHAEL WITHOUT ...	1524	69	10	13	0	297	10	0
	1525	61	10	10	0	289	2	8
	1541	5	0	17	4	26	0	0
	1545	4	1	0	8	26	0	0

The point brought out here in this table is the great change or decay during the fifteen years from 1525 to 1540. How, or why, came this change? After the deaths of the three clothiers, Kent, Style, and Chapman, the city decayed somewhat says Leland. When then did they die? The exact year when Leland visited Bath is uncertain. His Commission to travel is dated 1533, but his notes generally are not dated. Some part of the Journal however is dated 1542. Bath was visited three times, once when the notes were recorded—*Itinerary*, *Vol. ij.*, *p.* 57; again, when passing through only—*Vol. vij.*, *p.* 87; and a third time when passing by—*Vol. vij.*, *p.* 99. The city is also mentioned in *Vol. iij.*, *p.* 116. In the record of his official visit, after noting the names of the three clothiers and the decay of the city, the next paragraph speaks of the "late monasterie." As the dissolution of this occurred in 1539, this entry must have been made after that date. But in the next paragraph he says "The Prior of Bath told me," &c.; thus either the Prior continued to be known by that name after the dissolution, or the allusion is to some earlier conversation. The second is possible, as a few paragraphs further on, he notes that "nine years sines" he saw the old church lying waste and unroofed. The first is also possible as the Prior had given him for a dwelling "a tenement in Stall Street, wherein one Jeffry Stainer lately dwelled," being of the yearly rent of twenty shillings. (*Augment: off: Miscell: Bks.* 245, *f.* 109.) Taking the case of Bath generally as above, the entries as they have come to us must have been made after 1539, and may be fairly taken as made when dated viz. 1542. Some references to the last documents herein considered will help rather to confirm this. In the Subsidy for 1525 John Kent is Mayor, but his name appears no more. In the Roll for 1540, for the first collection Robert Style is Mayor; in the second collection he is gone, and there then appears Joan Style, widow. At the time of this second collection John Chapman

was Mayor, but in the next year, 1541, he is gone, and there appear Alice Chapman, widow, in Stalles; and Agnes Chapman, widow, in St. Mary's within. It was then, after the year 1541 that Leland's record was made. The position can be further seen by an Act of the year 1540, 32 Henry VIII., passed to compel the rebuilding of several decayed towns, Bath being one where the houses had fallen down and so "do lye as desolate and vacant groundis, many replennyshed with unclennes and filth." Bath, however, was not alone even locally, as Leland also tells us the same of Keynsham; and at Bridgwater two hundred houses, he says, had decayed within the memory of man. Not omitting the earlier decay noted from 1449, although Bath is not mentioned, we have again to ask what cause could have produced this change? The deaths of three such men as those named would be no doubt a great loss, but it is clear they must have felt the change before their deaths. Such decay could not have come suddenly. Perhaps a further examination of other documents, bringing an accumulation of detail extending over many years, may help towards a satisfactory conclusion.

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*The Divining Rod.* By THOS. FORDER PLOWMAN.

(*Read 6th February, 1889.*)

In view of the attitude assumed by scientists generally towards the subject of this Paper—a not altogether unnatural attitude under the circumstances—I feel that I need some justification for bringing it under the notice of a scientific society. I venture to hope that an excuse for my temerity

may be found—1stly, in the fact that the phenomenon under discussion (supposing it to exist) can be utilised for the benefit of mankind ; and, 2ndly, in the character of the evidence which I shall submit, in my endeavour to show that the subject is not altogether unworthy of your attention.

The belief in Rhabdomancy, or divination by means of a rod or wand, extends over a long period of time and a wide geographical area. The term itself connects it with the Greeks, and allusions in early writings sufficiently show that it was practised by the Romans, Scythians, Medes, Persians and other ancient peoples, including, of course, the Chinese, who, unless they are over-rated, seem to have known everything that anybody else ever did, and a good deal more besides. Cassiodorus, in one of his epistles written in the 6th century, speaks of the utility of the professional water discoverers, but this allusion is exceptional, as, until much later times, the divining rod appears to have been mainly regarded as a medium for the detection of crime, or as an indicator of desirable courses of action in the affairs of life. As no one nowadays claims for it the position either of a police detective or a confidential adviser it is unnecessary to make further reference to that branch of the subject.

The alchemistic literature of the 15th century drew attention to the more utilitarian purposes of the divining rod by dwelling upon its power to discover hidden treasure or metallic ore. Its use with reference to metals, especially, became general in Germany, and was extended thence through Flanders, England, Sweden, France, Italy and Spain before the end of the 17th century. Many works were published on the subject, in which various theories were advanced to account for its attributes. Scientific explanations were given by some, others regarded the rod and its operator as recipients of a divinely-given faculty, whilst many more put it all down to the credit of the Evil One, which was a very convenient way of accounting for many,

otherwise unaccountable, things in those days. Some writers described the divining power as genuine, some as illusory, some as superstitious, and some as sorcerous, and much contradictory evidence was the result. As, however, it is not my purpose to discuss the question from an antiquarian point of view, I will, having stated sufficient to indicate the lengthened vitality of the belief, proceed at once to consider it in its present-day aspect.

The use of the divining rod now appears to be restricted to the discovery of oil, metal and water, and for this purpose we find it continually employed in various parts of Europe, in America, and also in many uncivilised portions of the globe. I shall confine myself to a consideration of its use in this kingdom, and mainly in relation to the discovery of water. The subject may be said to have a special local interest, inasmuch as it is in this part of the country that a belief in the divining power especially flourishes. De Quincey affirms that he has often seen the divining rod used with success, and says that in a vale of North Somerset most of the tea-kettles are filled by Rhabdomancy, whatever science may have to say to the contrary. The prevalence of the belief in these parts may be to some extent attributable to the success which has attended the operations of certain local practitioners, but whether the supply of these is due to a greater demand for them here than elsewhere, or whether the supply itself creates a demand, I am unable to say. At any rate the services of the Western diviners, and one in particular, are in frequent requisition in other parts of the kingdom.

In speaking of the power of the divining rod it must be understood that this is inherent, not to the rod itself, but to the person using it, the former being merely a means of communication between the person affected and the object which calls the latent faculty to life. The misapprehensions as to this, which have occasionally come under my notice, furnish a reason for stating what to many would appear self-evident. A water diviner is

of

commonly known in these parts as a "dowser," and his instrument as a "dowsing rod" or "twig." It is usually a forked branch of hazel, of from two to three feet in length, and shaped like the letter "V." But other mediums are sometimes used; among others a steel watch spring, forked rods of iron or brass wire, &c. The dowser's method of procedure to find water, as witnessed by myself, is as follows:—He grasps a limb of the twig firmly in each hand, the point where the limbs meet being turned in a slanting direction towards the earth. He carries the twig in front of him and proceeds slowly, necessarily stooping somewhat to bring it as near as possible to the ground. When he comes across running water the spot is supposed to be marked, without any voluntary action on the part of the diviner, by the twig jerking up and down, and, in some cases, twisting round in the operator's hand.

The following incident first drew my attention to this subject, and is mainly accountable for my after-investigations:—Some time ago I met a personal friend, Mr. William Brown, of Middlehill House, Box, at the Board Room of the G.W.R. Company, at Bristol, whither we had both come to attend a meeting, quite unconnected with either water or divining. While we were waiting, some one called to see Mr. Brown, and before this person left my friend asked me if I had ever seen a water diviner, as he could show me one. I replied that I had heard of such persons, but had never dropped across them. He then introduced me to John Mullins, who, he said, had been most successful in finding water on his property. After I had had some conversation with Mullins, my friend asked him to leave the room for a few moments. When he had done so Mr. Brown informed me that, although Mullins would not bind himself to find anything but water, he had had proof of his capacity to discover hidden metal, and he would test it in my presence. He then took three sovereigns from his purse and placed them in a line, and several feet apart, underneath the



Turkey carpet. I may say that the door of the room was closed, and that no one could observe our proceedings through the keyhole, as it did not command the end of the room we were in. We then called Mullins in, and asked him to use his rod along the left hand side of the room. He took a forked twig from his pocket and proceeded up the room with it, holding it in front of him as I have described. It showed no agitation at first, but soon did so, and we marked the spot with a piece of paper. Twice afterwards this occurred, and Mullins said he had no doubt but that he had come across some water conveyed under the flooring, probably the supply to a cistern. We then turned up the carpet and found the sovereigns on the spots indicated by the rod.

It was this circumstance which first aroused my interest in the subject, and I thought it sufficiently remarkable to be recorded here, but, at the same time, my observations have not led me to believe that diviners are so invariably affected by the presence of metals as of water. I have read of instances where diviners, other than Mullins, have failed to discover metal under similar conditions to those just narrated. Mullins, however, told me that, although he could detect the presence of gold, he did not feel equally sure about other metals, and, in fact, that he did not bind himself to find anything but water.

As I expressed a desire to follow this matter up, Mr. Brown was good enough to furnish me with the following particulars as to his own experiences:—He said, “I employed Mullins to try for water near Box, the only well near, which was 180 feet deep, being often out of water from September to December, after a dry summer. Mullins marked the track of four different springs, one of which, he said, was rather stronger than the others. I asked him how deep the best spring was under the surface, and he said ‘about 110 feet.’ I then directed Mullins to search for an old well, which, when I was a lad, my father had discovered in an open quarry at the time the Box Tunnel

was being made. Although it had been filled up many years ago, and there were no outward signs of it, I had an opinion as to where it was, and directed Mullins where to try. They worked all day, but came upon no trace of it, and the general opinion was that I was mistaken as to the spot. However, I ordered them to go on in the same direction the next day, and in the afternoon, after working a little more westward, they suddenly came upon the well, and, on examining, we found that the marks Mullins had made in the first place to denote the position of the strongest spring pointed exactly into the centre of the well. I then directed him to go down further for the water, and, strange to say, at 111 feet, viz., within a foot of the distance he had stated at first, we found the spring come in, and just where he had marked it. The well now supplies 20 cottages, and if, in a very dry season, they draw all the water out by night, there is plenty again the next morning.

“Whilst this work was in progress, some friends and myself arranged to test Mullins’ capacity for discovering metal. In his absence we took ten stones off the top of a wall, and, having placed them on the road, we deposited a sovereign under three of them. Mullins passed his rod over the top of each stone, and, without the slightest hesitation, told us at once under which stones the sovereigns were. When he came to a stone under which there was no sovereign, he at once said ‘Nothing here, master,’ but when he got to the others he remarked ‘All right, master, thankee,’ turned the stone over and put the sovereign in his pocket. He afterwards tried for water on the Cottle’s House Estate, the then owner, Dr. Parfitt, being very anxious to obtain it, as there was none on the estate. Mullins, however, tried in vain, and, having given it up as a bad job, was leaving for home, when, just as he passed the front of New House Farm, with his rod in his hand, it suddenly indicated the presence of water. He at once said there was a strong spring at a depth of about 18 feet only below the surface. He sank a

well on the spot, and the water was found exactly at the depth he stated. The tenant has told me it is capital water, and the supply never runs short. After Mullins has indicated water I have blind-folded him and turned him round and round, but whenever after this he crossed the spring up went the rod directly. I conclude by saying I believe in him thoroughly."

The value, or otherwise, of such evidence as this lies very much in one's previous knowledge of the individual who gives it. Mr. Brown has been a member of the Council of the Bath and West of England Society for many years, and has occupied a seat on other public bodies, and anyone who knows him as well as I do can as readily testify both to his integrity and capacity. I observe that he is present here to-day, and so can endorse, or otherwise, my statements with reference to his experiences.

John Mullins, who resides at Colerne, near Chippenham, was brought up as a stone mason, and he still follows that occupation, but much of his time is now employed in searching for water in various parts of the kingdom. He undertakes to sink wells in localities where he has previously stated water will be found, so that he does not shirk the final test of his own powers. Cases have come under my notice in which he has adopted the principle of "no cure, no pay," and has contracted to sink the well with the condition that he would make no charge for the work if a plentiful supply of water were not forthcoming. I have interviewed Mullins on more than one occasion, and have been present when he has been searching for water. He is open and straightforward in manner, and is without any of the outward characteristics of the professional charlatan. He puts on no air of mystery or pretentiousness, but appears ready and willing to tell all he knows, and to submit to any practical test. I catechised him on various points, and obtained the following answers to my questions. He has no reason to believe, he said, that he inherited the gift, as he never heard of any other member of his family possessing it. He discovered it in himself

during his boyhood, when, having witnessed the operations of a dowser, he picked up the twig and found he could use it. He has several children, to none of whom has he transmitted his power. He finds a hazel twig gives the best results, and a hawthorn one next, but has no idea why; box, elder, and plane will not do at all. He feels a sensation in his arms similar to that produced by a very slight electric shock when the rod is agitated by the presence of water or metal, and the degree of force in the sensation enables him to say whether the spring is a strong or a weak one, and, usually, to predicate the depth within a few feet. A twig of some sort is necessary for the discovery of water under-ground, but when standing over a strong stream above-ground he feels a slight tingling sensation, although he may not have the rod. I particularly enquired of him whether the power was influenced in any way by the state of his health. He said that when he had a bad cold or was otherwise indisposed, he felt an exhaustion after using the rod, such as he would not experience at other times. As he himself put it, "It seemed to take more out of him then." A too-prolonged use of the rod at any time was apt to produce sleeplessness. He will undertake to find running, but not stagnant, water. He does not confine himself to one particular rod, but usually goes to the nearest hedge and cuts one when he wants to use it. His experience leads him to believe that the power is more frequently to be met with in women than men. This view has been corroborated by my own investigations in other directions. On one occasion, myself and about a dozen other persons, who were observing Mullins when he was dowsing, all tried the rod at two or three spots where, in Mullins' hands, it indicated the presence of water, and the only person with whom the rod moved was a lady.

I may say that I do not attach any special importance to the mere movement of the rod in the hands of a diviner, as very similar motions can be produced by voluntary muscular contractions. I had evidence of this on the part of a friend, in

whose hands the twig moved readily enough, and in a way that deceived all who were present at the time, except Mullins himself, who pointed out a slight difference in the movement of the twig, by which he knew it was caused by the will merely of the holder. This my friend at once admitted, and showed us how he did it.

I am not so unreasonable as to desire to inflict upon this meeting more than a small proportion of the evidence I have accumulated in the course of my investigations. In selecting what I shall lay before you, my endeavour has been to illustrate as many different points as possible.

The Earl of Jersey, the Lord-Lieutenant of Oxfordshire, a nobleman who has no ordinary endowment of business capacity, as anyone in that county will testify, has frequently employed Mullins on his estates to find water. I have both conversed and corresponded with his lordship's estate agent, Mr. W. D. Little, and he informed me that a number of wells had been sunk on the estate on spots indicated by Mullins, and in every case abundant supplies of water had been obtained from them. Mr. Milton Druce, of Fyfield, Abingdon, a leading agriculturist, a member of the Council of the Bath and West of England Society, the Smithfield Club, and other bodies, informed me that Mullins not only discovered water for him but told him at what depth it would be found, and his accuracy was proved within a foot when the well was sunk. On one occasion, in order to test Mullins, he took him across a grass field, underneath which there was a drain for the conveyance of water. It had been put in many years before, and not a trace of it was visible above ground; nevertheless the rod in Mullins' hands at once indicated the presence of water, and correctly traced the whole course of the drain.

I have a letter from Mr. W. H. Ashhurst, of Waterstock, a county magistrate of Oxfordshire, testifying that he was present when Mullins was divining for water on Mr. Henley's estate,

and in every case his correctness was proved by the sinking of a well. In this instance a lady was again the only person among the spectators who could use the rod, and she seemed to be able to do so quite as well as Mullins.

Sir W. E. Welby Gregory, Bart., of Denton Manor, Grantham, formerly M.P. for South Lincolnshire, and who has just been elected chairman of the Lincolnshire County Council, gives some interesting experiences in a published letter which is too long to quote in its entirety, but from which I will extract the most essential points. He was preparing to build a large country house on a site selected, among other reasons, for its dryness, and it was a problem where the water supply was to come from, as there was none apparent which could be brought to the house without great expense. Mullins was sent for, and he was first tested by being taken across the lawn of the old house, underneath which was a current of water at a depth of a few feet, though there was nothing to indicate it. Whenever he crossed the drain, however, the twig at once turned upwards. He then went to the kitchen garden, where there had always been much want of water, and presently the twig stopped him at a spot apparently as dry as the rest and with nothing distinctive about it. Here he said was water at a depth of 'between 20 and 30 feet. He next proceeded to the site of the new house, and indicated two lines, about 30 yards apart, along which, he said, water was flowing in somewhat greater volume than the rill he had found in the kitchen garden. He afterwards went further afield, but could find no other signs of water. From his repeated trials he appeared to be exhausted, and was dismissed to tea in the housekeeper's room. The remainder may be told in Sir Welby Gregory's own words:—

“After tea several of the servants, whose curiosity was excited, got him to exhibit his art to them, and tried whether they themselves had any power with the twig. My gardener, Joseph Towers, found that it worked in his hands nearly as strongly as in

those of Mullins himself. I took no further action then in the matter; but described what I had seen to an eminent civil engineer, who assured me that from his knowledge of the geological formation of the country, he could say confidently there was no chance of finding a water supply under my new house at a depth of less than 120 or 130 feet, and his opinion was confirmed by another geological authority who was then in the neighbourhood. So I virtually gave up all hope of deriving any benefit from Mullins' assertions. Some weeks later, however, my gardener came to me and said that he was in great want of water in the kitchen garden; that he had tried repeatedly with the twig over the place where Mullins indicated a rivulet; that it invariably turned up at the spot, and that he was quite convinced there was water there. If I would allow him, he could sink a well with the garden labourers, so as not to involve any additional expense. I consented to this; the well was sunk to a depth of nearly 20 feet, when water poured into it freely, and it has supplied a long range of hot-houses ever since.

“On the strength of what had occurred in the kitchen garden, I set Towers to traverse the new site, where the lines of water indicated by Mullins had been marked by pegs 60 yards or 70 yards apart, and just visible above the grass. These lines Towers and his twig emphatically confirmed, and I proceeded to test him. I had the projecting extremities of the prongs of the twig held tight by pincers, so that there could be no voluntary action on Towers' part when crossing the marked lines. Despite this, the point of the twig twisted itself upwards till the bark was wrinkled and almost split, while the strain and pressure upon the muscles of the man's hands were most apparent. I then blindfolded him, and turned him loose. The result was precisely the same. Whenever he crossed Mullins' lines, up went the twig. The presumption now appeared to be so strong in favour of the twig that I determined to disregard the geologists, and have a well sunk on one of the lines. This was done; at the depth of about 28

feet the water rushed in, and rose till it stood about 8 feet deep, at which it now remains, having, in the meantime, fully supplied all the requirements during building the house, which were probably not less than 1,000 gallons a day for three years or more. I may add that I have since had occasion to sink a shaft for a lift between the two lines indicated by Mullins, some 12 yards or 15 yards from either, and to a depth considerably greater than the well. As no water came into this, though the formation was precisely similar, and the well has not been affected by it, I am satisfied that, had I not employed Mullins, I might have sunk wells in any number to no purpose under my house, unless I had happened to hit upon the rills indicated by him with such perfect precision."

There are one or two remarkable features in this letter:—

1.—It shows that the diviners were more correct in their conclusions than the geologists. I do not call attention to this with a view to reflecting in any way upon the latter, but merely to meet the scientist's argument that a knowledge of physical geography and geology is amply sufficient to account for the divining power. If the stone mason and the gardener had in this case proceeded upon these lines, in all probability Sir Welby Gregory would have waited in vain for the water which, under other circumstances, he obtained.

2.—The letter testifies to the diviner's utility in pointing out, not only where water is, but where it is not, which, as some persons contend it can be found almost anywhere, is worth remarking.

3.—It furnishes a remarkable instance of the corroboration of one diviner by another.

I will trouble you with extracts from another letter, as the evidence is valuable, as coming from one so well-known as the present Earl of Winchelsea, he being at the time the letter was written, viz., in 1884, the Hon. M. E. G. Finch-Hatton, M.P. for the Spalding Division of Lincolnshire, and also because it supplies



a particularly good instance of the blindfold test. He had heard of Mullins as a diviner, and was anxious to test his powers, so he sent for him to come to Haverholme Priory, near Sleaford, his then residence. Lord Winchilsea says :—

“ We established it on good authority that Mullins had no previous acquaintance with Haverholme.

“ 1.—I took him on to the grass in front of the house, across which the water supply pipe passed. There was no indication of its presence on the surface, nor did I previously mention its existence to Mullins; on crossing it the twig moved in the manner described, and he could trace the water to right and left, by its means, along the path actually taken by the pipe.

“ 2.—On our way to the kitchen garden Mullins discovered a spring on the open lawn, whose existence was unknown to me, it had been closed in so long, but was subsequently attested by an old labourer on the place, who remembered it as a well, and had seen it bricked in many years before.

“ 3.—On reaching the kitchen garden I knew that a lead pipe, leading water to a tap outside the wall, crossed the gravel path at a certain spot. On crossing it the twig made no sign. I was astonished at first, till I remembered what Mullins had said about stagnant water, and that the tap was *not running*.

“ I sent to have it turned on, re-conducted Mullins over the ground, when the twig immediately indicated the spot.

“ When Mullins had passed on I carefully marked the exact spot indicated by the twig. When he had left the garden I said, ‘ Now, Mullins, may we blindfold you and let you try ? ’ He said, ‘ Oh yes, if you don’t lead me into a pond or anything of that sort.’ We promised.

“ Several sceptical persons were present, who took care the blindfolding was thoroughly done. I then re-conducted him, blindfold, to the marked spot by a different route, leaving the tap running, with the result that the stick indicated, with mathematic exactness, the same spot. At first he slightly

overran it a foot or so, and then felt round, as it were, and seemed to be led back into the exact centre of influence by the twig.

“All present considered the trial entirely conclusive of two things.

“First, of the man’s perfect good faith.

“Secondly, that the effect produced on the twig emanated from an agency outside of himself, and appeared due to the presence of running water.

“My brother, Mr. Harold Finch-Hatton, is present as I write, and confirms what I say.

“It is true that one of the Misses Wordsworth tried the twig, and was surprised to find that an influence of a similar nature, though not so strong, was imparted to it.”

Within the last few days I have been fortunate enough to obtain some other very valuable and significant evidence. Valuable from the fact that it is the testimony of one whose position and attainments entitle him to be heard on any subject with respect, and significant on account of its remarkable corroborative character. It came from Mr. H. D. Skrine, of Claverton Manor, who says :—

“My first acquaintance with the divining rod was in January, 1865. I had heard that one John Mullins, a well sinker, who lived at Colerne, had the gift of finding water by the rod. I sent for him and took a walk through the great wood at Warleigh and a field called Biggs’ Leaze, adjoining the village of Conkwell, where I had thought of building a cottage as a sort of sanitorium for my wife, who was then in delicate health and required a more bracing air than Warleigh. On the way, he tried the divining rod several times, and I was aware that in a line below the points where the twig turned with him there was a spring in the wood which came to the surface. Arrived on the field, the twig turned with him in several places, and he set a mark on the wall opposite the spot. A few days after I asked Mr. Earle, Rector

of Monkton Farleigh, to meet John Mullins and myself on the field (this was Friday, January 20th, 1865), as I had heard that Mr. Earle had the gift, and had discovered water by it on his own land at Monkton Farleigh. He was not aware of the marks on the wall, but the twig turned with him at the same places as with Mullins; they differed only in the position in the field as to the best place to sink the well, both being in the same line. The well was sunk, and water was found at about 80 feet in yellow clay under the rock, but this not being of sufficient depth, and the clay being a thin bed, Mullins went down about 25 feet lower and came on a good spring in the blue lias. This allowed a cavity of 4 feet, but, as the bed was not water-tight much farther down, we ended with this.

“Mullins afterwards found some springs near the house, and traced them up to the spot where, under the croquet lawn, a spring had been found some years before. Since then I have employed him at Claverton, and sunk two wells successfully, and he has again traced several springs which have been verified. In two instances where the line of a drain had been lost he recovered the spot, and was always correct. My two sons, who had watched the operation, found they also had the gift. I cannot resist the conclusion that it is a real gift possessed by some persons, and that it may have been a natural provision to enable men to obtain that very necessary element (water) when there are no signs above the surface.”

I have referred especially to John Mullins because I have seen and heard more of him than others, and because it would hinder too much of your time to go into details in reference to more than one diviner. I have, however, information with regard to several others, and a notable one in this district is Mr. W. S. Lawrence, of Bishopston, Bristol, who uses a piece of watch-spring as well as a hazel rod, and to whose success in finding water for them, Messrs. Evans and Owen, of the Ely Paper Works, Cardiff, have recently testified in the *Bristol Times and Mirror*.

The evidence I have submitted has particularly referred to professional diviners, but the following exceedingly interesting letter is from one who has only practised the art as an amateur. The writer is Mr. Frederick Webster, who is engaged in the estate office at the Queen's Home Farm, at Osborne, and his testimony is endorsed by Mr. A. Blake, Her Majesty's Steward, whom I have long known and esteemed. Mr. Webster says:—

“Mr. Little has asked me to write you an account of how I first found that I possessed the power to find water by means of the ‘dowsing’ or ‘divining rod,’ and the effects produced at the time of using it and afterwards.

“Until I saw John Mullins, of Colerne, Wilts, who was engaged by the Earl of Jersey, in the dry summer of 1884, to find water on his estate at Middleton Stoney, Oxfordshire, I had not seen the dowsing rod, nor had I even heard of it, but whilst Mullins was there I was induced, amongst many others in the village, to try and see if it worked with me, when I was greatly surprised to find that it would, but I was the only one that it did turn up with.

“The twig can be either nut or white thorn, and in shape like the large letter ‘V.’ The two branches are held between the two first fingers and thumbs of each hand, with the bottom of the twig pointing to the ground; then the performer walks at a steady pace, and when nearing a spring there is a sensation in the arms and wrists like a slight shock from an electric battery, which gradually increases in force until you get directly over the spring, when, if the spring is a strong one, the end of the twig which was pointing to the ground will suddenly rise and point upwards, but if the spring is weak it will only rise gradually. Some people imagine that the performer forces the twig up with his fingers, but it can be easily proved that this is not the case, for if the end of one of the branches or forks of the twig is broken off, all but the bark, and the performer holds the piece that is broken in one hand, and the other branch in the other hand, the twig will turn up the same as before.

“ I have tried the effect of the twig over a stream, and found that when I stood directly over the stream the twig would turn up quicker and stronger than if I stood with one foot on each side of the stream, which leads me to think that the electricity (or whatever other force it is) passes through the body into the twig.

“ If the twig is used very much in a day, and the springs are generally strong, it causes a dull, sleepy, heavy and weakening feeling, and the wrists get quite painful, but if the springs are weak it has a less marked effect upon you.

“ I have been out on several occasions with Mullins, when he has been searching for water on estates, under the management of Mr. Little, both in Oxfordshire and Wiltshire, and in every case in which a well has been sunk on the spot indicated by Mullins water was found, and the most curious thing is that Mullins can tell (by means of the force working in him), to within a few feet, how deep you will have to dig to get to water. The correctness of his opinion as to the depth to be dug to the water was very strikingly shown in digging a well on the Charterhouse Estate, in Wiltshire, which Mr. Little had dug to supply two new cottages with water; Mullins said they would have to go 50 feet, but when the man who was digging the well got down to 48 feet, he said it was no use going any lower for there was no water, as the ground was so dry, but Mr. Little told him to keep on till he did find water. He had only gone the other two feet when he had to beat a hasty retreat, the water came in so fast, and in two days there was 23 feet of water in the well, the well being about four feet six inches in diameter.

“ The ‘ dowsing rod ’ is very useful in finding drains, if there is any running water in them; the water must, however, be running, or the twig will not turn up. It has also been the means of saving a great deal of expense in searching for water.”

This latter is a case, and there are many of a similar character, which is worthy of particular notice. Here the possessor of the

gift made no profit out of it, and had no inducement to practise a deception. To do so was to court an imputation of dishonesty without any counterbalancing advantage.

Mr. Vaughan Jenkins, of Cheltenham, to whom the two letters I have quoted from Sir Welby Gregory and the Earl of Winchelsea were addressed, has a most valuable collection of contemporary evidence on the subject, some of which has been examined and published by the Society for Psychical Research, whom he supplied with between 60 and 70 well-authenticated cases, which he obtained in a very short space of time.

Among these is a very remarkable one, which came under his notice at a time when he was incredulous as to the power in question. He required water on an estate whereon he was about to erect a residence. The architect fixed upon the most convenient spot for the well, but after the well sinkers had reached a depth of 51 feet they decided, from the nature of the strata, &c., that it would be perfectly useless to proceed further, and the authorities who were consulted came to the conclusion that, owing to the peculiar dip of the land and for various other reasons, there was not the least chance of water being obtained on the plot of land anywhere. One of the workmen, however, persuaded Mr. Jenkins to allow the divining rod to be tried, as he had a son, a boy eleven years old, who could use it. The rod on being passed over a portion of the land exhibited signs of motion, then began to revolve, and ultimately twisted about to such an extent that the boy was obliged to let it go. The father's positive assurance that there was now a certainty of success induced Mr. Jenkins to sink a well, and, at a depth of 48 feet, they struck on a strong spring of water. In a few hours the well contained 10 feet of water, which occasionally rises now to 15 feet. Mr. Jenkins says:—"I was then, and I am now, fully convinced of the total absence of deceit or collusion, and of the full integrity of the whole transaction, no fee or reward being asked for or expected." Here, according to scientific experts,

water ought not to have been discovered, but a mere child, unlikely to be guided by any clues supplied by science, proves to the contrary.

I approached this investigation with the one desire of ascertaining the truth, and, if the evidence I have submitted to you has been one-sided in character, it is because those with whom I have been brought into contact, who have tried the diviners, could testify of successes only, and not failures. At the same time, I am far from saying there are no failures, or that there are no pretenders in this, as in other matters.

The value of the evidence in favour of the existence of the power we have been considering lies chiefly in the following points:—

Firstly.—That it is supplied by individuals of education and position, whose general intelligence and shrewdness are not likely to be called in question.

Secondly.—That none of it is anonymous in character, but is capable of being verified by a reference to the individual who gives it.

Thirdly.—That it has not been gathered from a band of enthusiasts in communication with each other, and bent upon pushing some theory or hobby to the front, but has been collected from independent and isolated witnesses, who could have no object to serve by misrepresentation.

Fourthly.—That the bulk of it is derived, not from the professional diviner, who has an interest in a belief in it, but from those who lay no claim to the possession of the power they concede to others.

Fifthly.—That much of it is of a corroborative character, as illustrated, especially, in those instances where an amateur has followed the professional diviner, and, without any knowledge of what the latter has indicated, has been correspondingly affected.

This evidence, as far as a plain statement of facts is concerned, can only be impugned on the ground either that the witnesses

were accessories to a fraud, or victims of it; and the knowledge one has of them, whether as regards their probity or their acuteness, does not lend itself to either supposition.

But there are some who, while admitting that diviners frequently fulfil what they undertake, deny the existence of any special power confined to certain individuals. They have several ways of accounting for a diviner's success, and the following is a summary of them. They contend:—

1.—That he makes a guess at the position of what he has to discover, and the fact that he is sometimes right is a mere coincidence. The adoption of this theory would lead to the conclusion that luck favoured the diviners to a much greater extent than the rest of mankind, and stood by them even when they were blindfolded.

2.—That a knowledge, on the part of the diviners, of the locality and of its geology sufficiently accounts for their discoveries. Western diviners, however, are frequently sent for, on very short notice, to distant parts of the kingdom where they have never been before, and with successful results. But even admitting their possession of a knowledge of locality and geology combined, this would not help them much when they were blindfolded, or were passing over artificial water courses and drains.

3.—That the so-called power is merely due to an involuntary muscular action resulting from a fixedness of idea. But there must be something behind the idea which determines its adoption, and the correctness of the results indicates the working of a guiding principle.

Lastly, there is the irrefutable sledge-hammer argument—that there can be no such power as is claimed, because there is no accounting for it within the lines which science, as represented by man (an essential point), has laid down. This is almost equivalent to saying that man has adopted certain principles to which Nature is expected to adhere, and that any departure from them



is to be rather deprecated than otherwise. A friend once said to me—"As a man, I believe in divining; as a scientist, I can't."

Time will not permit me to enter upon a discussion of the many theories which have been set up to account for the phenomenon we have been considering by those who have a belief in it. Some attribute it to electricity, others to magnetism, whilst some cherish the idea that it is an altogether new force which, if its origin and conditions could be traced out, would prove of vast utility and importance to mankind. The faculty possessed by some animals of scenting water a considerable distance off may be worth remembering when we begin to theorise.

Premising, of course, that no claim to supernatural power is, or can be, set up by those who possess the divining gift, to what preliminary conclusions does the evidence we have been considering seem to point:—

1.—That some persons are distinctly influenced by the presence of water or metal.

2.—That this is due to no law universally applicable to all persons alike, but to one whose operation is dependent upon certain exceptional conditions in the individual.

3.—That it is the physical rather than the mental organization that is affected.

Investigation, methodically pursued, may in time bring us nearer to a solution of the questions:—How is that influence generated? and, What are the exceptional conditions in the individual affected by it? And possibly the germ of a great principle may be found in the answers. This course seems, at any rate, preferable to that of regarding any phenomenon as outside the pale of scientific enquiry if it does not fit in with a preconceived plan of accounting for it. "There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy" is as perfect a crystallization of the truth now as when it was first uttered nearly three centuries ago, and it will

probably remain so for many a long year to come. In this spirit, I commend this subject to your consideration, and, if I have done anything towards vindicating its claim to a spare corner in the wide region of practical research, my labour has not been in vain.

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*List of terrestrial Hemiptera-Heteroptera taken in the neighbourhood of Bath.* By LIEUT.-COL. BLATHWAYT, F.L.S., F. Ent., S.

The following list, which is a continuation of a paper read on the 8th February, 1888, and specimens of which are deposited in the Bath Local Museum, contains the names only of such insects as I have myself taken within a walk from my house at Batheaston, and does not pretend to be exhaustive. The classification adopted is that of Mr. E. Saunders, F.L.S., published in the Transactions of Entomological Society 1875-76. In the column of remarks the words "Rare," "Not Common," &c., merely show what I have hitherto found the insects to be; and very possibly one rare in this immediate neighbourhood may be exceedingly common on the other side of Bath. Against four I have purposely left a blank, because I believe that my failure to find more than one or two specimens may be attributed to the search not having been made in the right places.

The month is only that in which I have found the insects most abundant, and does not mean that they are not to be found either earlier or later.

ARTHROPTERIDÆ.

- Acanthosoma hæmorrhoidale*, L. Not common.  
*Tropicoris rufipes*, L. ... .. On oaks not common.

## LYGÆIDÆ.

Scolopostethus adjunctus, <i>Dougl.</i>			
<i>de Scott.</i> ... ..	Very common on nettles,	<i>July.</i>	
" <i>affinis, Schill</i> ...	Ditto	<i>do.</i>	
Drymus sylvaticus, <i>Fab.</i> ...	Very common on herbage in summer, and in winter under stones and bark.		

## TINGIDIDÆ.

Monanthia cardui, <i>L.</i> ...	...	Swarms on thistles,	<i>July, August.</i>
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## ARADIDÆ.

Aneurus lævis, <i>Fab.</i> ...	...	Moderately common under bark at all seasons.	
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## CAPSIDÆ.

Miris calcaratus, <i>Fall.</i> ...	...	Common on herbage,	<i>July.</i>
" <i>lævigatus, L.</i> ...	...	Ditto	<i>do.</i>
Megaloceraea erratica, <i>L.</i> ...	...	Ditto	<i>do.</i>
Leptoterna dolobrata, <i>L.</i> ...	...	Ditto	<i>do.</i>
" <i>ferrugata, Fall.</i> ...	...	Moderately common,	<i>do.</i>
Phytocoris longipennis, <i>Flor.</i> ...	'	Common on hazel,	<i>July, August.</i>
" <i>tiliæ, Fab.</i> ...	...	Not common, various trees,	<i>do.</i>
" <i>varipes, Boh.</i> ...	...	Ditto	<i>do. do.</i>
" <i>ulmi, L.</i> ...	...	Ditto	<i>do. do.</i>
Oncognathus binotatus, <i>Fab.</i> ...	...	Very plentiful on herbage,	<i>do.</i>
Calocoris fulvomaculatus, <i>De Geer</i>	...	Common on hazel,	<i>do.</i>
" <i>sexguttatus Fab.</i> ...	...	Very common on flowers of umbelliferæ,	<i>do.</i>
" <i>roseomaculatus, De Geer</i>	...	Moderately common on various flowers,	<i>do.</i>
" <i>bipunctatus, Fab.</i> ...	...	Plentiful on various plants,	<i>do.</i>
Rhopalotomus ater, <i>L.</i> ...	...	Common on nettles,	summer.
Capsus lanarius, <i>L.</i> ...	...	Somewhat rare.	
Liocoris 3-pustulatus, <i>Fab.</i> ...	...	Very common on herbage,	<i>July, August.</i>
Pœciloscytus Gyllenhalii, <i>Fall.</i> ...	...	Not common.	
Lygus pabulinus, <i>L.</i> ...	...	Common on nettles,	<i>July, August.</i>

- „ *lucorum*, *Mey.* ... .. Common on oaks, *July*.  
 „ *pratensis*, *Fab.* ... .. Not common.  
 „ *Kalmii*, *L.*... .. Not common.  
*Camptobrochis lutescens*, *Schill.*... Very common on limes, *July*.  
*Globiceps flavomaculatus*, *Fab.* ... Moderately common on herbage,  
*July, August*.  
*Cyllocoris histrionicus*, *L.* ... Common on oaks, *July*.  
*Campyloneura virgula*, *H. Scff.* ... Somewhat rare on oaks, *do*.  
*Ætorhinus angulatus*, *Fall.* ... Swarms on alders, *July, August*.  
*Chlamydatus ambulans*, *Fall.* ... Not common.  
*Dicyphus pallidus*, *H. Scff.* ... Common on various plants, *July,*  
*August*.  
*Malacocoris chlorizans*, *Block.* ... Very common on hazel, *do*.  
*Orthocephalus saltator*, *Hahn.* ... Common on herbage, *do*.  
*Harpocera thoracica*, *Fall.* ... Rare.  
*Phyllus melanocephalus*, *L.* ... Not common on oaks, *July*.  
 „ *palliceps*, *Fieb.* ... .. Moderately common on oaks, *do*.  
 „ *coryli*, *L.*... .. Moderately common on hazel, *do*.  
 „ *avellanæ*, *H. Scff.* ... Very plentiful on hazel, *July,*  
*August*.  
*Atractotomus mali*, *Meyer* ... Moderately common on herbage, *do*.  
*Psallus betuleti*, *Fall.* ... .. Rare.  
 „ *Ambiguus*, *Fall.* ... .. Common on alders, *July, August*.  
 „ *variabilis*, *Fall.* ... .. Common on oaks, *July*.  
 „ *simillimus*, *Kirsch.* ... .. Rare.  
 „ *Rotermundi*, *Scholtz.* ... .. Rare.  
 „ *Sanguineus*, *Fab.*... .. Not common.  
 „ *lepidus*, *Fieb.* ... .. Not common.  
 „ *roseus*, *Fall.* ... .. Common on alders, *July*.  
 „ *alnicola*, *Dougl. & Scott* Common on alders, *do*.  
 „ *varians*, *H. Scff.* ... .. Common on oaks, *do*.  
*Plagiognathus viridulus*, *Fall.* ... Common on herbage, *July, August*.  
 „ *arbustorum*, *Fab.*... Common on herbage, *do*.

## MICROPHYSIDÆ.

- Microphysa pselaphiformis*, *West* Not common.  
 „ *elegantula*, *Baer.* ... Not common.

## ANTHOCORIDÆ.

<i>Anthocoris nemorum</i> , <i>L.</i> ...	...	} Common on various trees all the summer, and in winter found under bark and stones.
„ <i>nemoralis</i> , <i>Fab.</i> ...	...	
<i>Piezostethus galactinus</i> , <i>Fieb.</i> ...	...	

## REDUVIDÆ.

<i>Reduvius personatus</i> , <i>L.</i> ...	...	Not common, occasionally flies into the house at night.
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## NABIDÆ.

<i>Nabis major</i> , <i>Costa.</i> ...	...	...
„ <i>flavomarginatus</i> , <i>Scholz</i> ...	...	...
„ <i>rugosus</i> , <i>L....</i> ...	...	...

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*Summary of Proceedings for the year 1888-89.*

## MR. PRESIDENT AND GENTLEMEN,

Twice within the existence of our Club the British Association for the Advancement of Science has visited Bath ; once in 1864, and, after a elapse of 24 years, a second time during the year just passed. Some of our members survive who took part in the business of the various Sections at both meetings ; some have passed away from our midst. It is a subject, however, of congratulation to us, and one worthy of record, that our venerable President, the Founder of this Club, and at the same time one of the oldest, if not the oldest, surviving member of the Association, was enabled to be present on more than one occasion. Though his advancing years preclude him from taking any active share in our Afternoon Meetings, or the customary Excursions, yet the vigour of his intellect remaining unimpaired, he never ceases to watch over the interests of the Club ; and by his

counsel and advice materially assists in the advancement of Science, and the forwarding those objects for which the Club was constituted.

The committee of six members appointed as your representatives on the Local Committee of the B.A. did good work, and, without particularising names, it is but right to say that the active share taken by two or three conduced not a little towards facilitating the arrangements for the reception of the guests, and contributed much to render the meeting the success it was. One of the results of the recent meeting was the appointment of a committee for the purpose of placing a tablet on the house in Bath where William Smith, the "Father of English Geology," lived longest. After making every possible enquiry the committee found such an uncertainty attaching to the exact house (at least two or three localities having been suggested) that they decided to recommend that the memorial should be placed on the house called Tucking Mill at Midford, where, without doubt, he resided for many years during his construction of the Somerset Coal Canal, and the members at their Anniversary meeting, held on February 18th, decided that the memorial tablet should be erected there at the cost of the Club.

The afternoon meetings for the session began on Wednesday, 18th of December, when a paper on "Church Doorways" was read by the Rev. Reginald A. Cayley. His subject was divided into five heads, viz.—1, Secular Minsters; 2, Augustinian ditto; 3, Benedictine Abbeys; 4, Cistercian Abbeys; 5, Parish Churches. These were treated under the several divisions of Western, Lateral, Transeptal and Exceptional positions; in conclusion he attempted to apply the foregoing considerations to elucidate the original design of the Bath Abbey Church (*Vide* p. 363).

Canon ELLACOMBE, who took the chair, expressed the pleasure with which he had listened to Mr. Cayley's paper, and said that it was just the sort of treatment of an out-of-the-way subject, applied to details close at home, so useful to a Club like theirs.

Such an intimate knowledge of architectural details was shown by Mr. Cayley that he hardly dared to criticise anything he had said ; but still he hesitated to accept the statement that when Augustine landed in England he found hundreds of churches in existence. On the contrary, he was of opinion that the ancient churches had well nigh vanished at that time, in England at least. As to the comparative insignificance of our western doorways as compared with those on the Continent, he thought an exception ought to be made in the case of those of the Norman period ; the English examples of doorways of that date not only being unsurpassed by any foreign ones, but, indeed, being far superior. He agreed with Mr. Cayley as to the lateral doorways of our parish churches being situated in accordance with the position of the highway or the contiguity of houses, but asked for the evidence of Cloisters having existed on the south of the Abbey. In conclusion, he thanked Mr. Cayley for his admirable paper, and called upon those present for any criticisms.

Mr. BROWNE remarked that the paper went over a large number of illustrations, and was certainly of great interest for the care and research evinced by Mr. Cayley. He referred to the large south-eastern porch at Lincoln as a further illustration of the points mentioned by the reader of the paper. In regard to our parish churches, there could be no doubt that the position of the doorways N., S. or W. was in many cases governed by considerations of convenience for access or conformity to the levels of the ground. As an instance, he mentioned the entrance of Sompting Church, Sussex, on the south side, with several steps up to the nave level, and in what was practically a south transept. With reference to Mr. Cayley's theory of the original Bath Abbey Church being finished at the east end with an apse surrounded by an ambulatory, it was certainly novel and ingenious, but, before accepting it, a more careful study of the Abbey in the light of the new theory was desirable. The Norman remains to be seen in the bases of columns below the

pavement of the north aisle, and especially also those on the exterior of the east end, must be taken into account, and although not absolutely inconsistent with such a theory as was now propounded, yet it was far from clear that these remains at the east end would adapt themselves to such a termination of the building.

Mr. J. S. BARTRUM referred also to the Norman remains found during the restoration of the Abbey by Sir Gilbert Scott, and also doubted whether a Cloister could have existed on the south side of the Abbey Church, as the site was so much occupied by the Roman Baths, the remains of which are known to exist under the *Chronicle* Office.

Mr. CAYLEY, in reply, stated that he had long thought upon the difficulties in connection with the present eastern turrets; and, on the principle of comparative anatomy, had come to the conclusion that they were Norman in structure and originally flanked the chord of the apse—a not uncommon position in Norman work, but not usual at the corners of transepts, a position they must have occupied on the theory of the present east end being the site of the central tower of the Norman Church. As to the evidence of the existence of Cloisters on the S., it was admitted that the Prior's House existed there, and other buildings connected with the Monastery, and, moreover, Benedictine Abbeys always had Cloisters attached to them.

There was a good attendance at this meeting, and Mr. Cayley promised to illustrate his remarks on some future occasion by taking the members round the Abbey and showing them some of the points under discussion.

The second meeting was held on January 9th, for Mr. Emanuel Green's paper on "Bath Lay Subsidies, Hen. IV. to Hen. VIII." (*Vide* p. 379) Mr. SKRINE took the chair, and, whilst expressing his admiration for the care Mr. Green had shown in drawing up his paper, stated that he was under the impression that an assessment of a tenth or fifteenth on property was a fixed sum, and the levying of it in the hands of local officials,



but the Subsidy was an uncertain and arbitrary tax, and often made most oppressive and unfair. He invited discussion. Mr. H. M. Skrine asked whether Prior Holloway sold his rights for £5 a year, charged on Bathford parish, and paid to Cromwell for his trouble in arranging the cession of the Abbey to the Crown ?

Mr. AUSTIN KING spoke of the valuable labours of Mr. Green in illustrating, by means of patient research, a phase of English history which historians had, for want of accurate information, been unable to deal with. The Proceedings of the Field Club were becoming every year more important as a store-house of valuable information on historical subjects.

The afternoon of Wednesday, February 6th, was given up to Mr. Plowman, Sec. B. & W. Eng. Soc., for a paper on "The Divining Rod." (*Vide* p. 411.) An animated discussion followed the reading of the paper.

Mr. H. D. SKRINE, who was in the chair, in moving a vote of thanks to Mr. Plowman for his interesting paper, mentioned a few instances in his experience when water had been discovered by means of the divining rod ; in one case, some years ago at Warley, two of his sons who possessed this power when they were boys, by the use of the divining rod found a spring of water beneath the library. He himself and the only other person who knew of its being there were not present at the time they found it.

Col. THOMPSON related an incident which occurred when he was serving with his regiment 40 years ago in Ireland. A "dowser" was searching for water, using an ordinary hazel twig ; he accompanied him, and found water in several places. He wished to try himself, by using the man's rod, but the latter suggested that he should "cut his own stick," which he did. He was at first unsuccessful, so also was the "dowser" who followed him ; but soon afterwards the stick distinctly bent, and on the "dowser" coming to the same spot his twig was similarly affected. On a subsequent trial in another locality the twigs of both again

moved, and he found on enquiry that a water course carrying water from a lake on the hill to a pond below crossed under that field at the place indicated.

Prebendary SCARTH remarked that the question of the insulation of the "dowser" had not been touched upon. In his part of the country there was a tradition that if four glasses were placed over running water and a piece of slate or glass placed on them, the water finder, when standing on this sort of platform, was insulated and lost all power of divining. The divining rod had been used in every part of the country more or less successfully for the discovery of water.

The Rev. DE COUREY MEADE said that in the neighbourhood of Swindon, instead of "dowsing" it was known as "jossling."

Mr. W. J. BROWN related his experience at Box, when Mullins was employed by Mr. W. A. Bruce, who was no believer in the efficacy of the divining rod. Water was, however, found, and a well sunk, which gives a good supply to the present time, and Mr. Bruce was converted to a belief in the "dowsing" rod.

Mr. J. L. STOTHERT said that at the Bristol Gas Works a man named Lawrence, who was supposed to possess the power of water finding, had been tested by the Secretary, and pointed out, by the aid in this case of a metal spring, without any previous knowledge, a spot in the yard under which there was a water supply.

Surgeon-General BEATSON spoke of water being found under a particular portion of the late ice factory, just where it was wanted, but he was rather inclined to believe that the man must have known water was under the whole place, and only pointed out the particular spot, knowing that it was the most convenient to the manager of the works. He also drew attention to a letter on the divining rod in Hone's year book, written at Bath, in which there is not any mention of "dowsing." The "dowser" is there called "finder," and the implement a "finding stick."

Mr. T. BROWNE was not inclined from his experience to entirely believe in the properties of the divining rod. He related a circumstance which took place at Swanswick some ten years ago, when a well was sunk to a depth of 60 feet, and water found which lasted for 18 months, and then the supply ceased. The supply was renewed again some time after, but subsequently stopped altogether. Mr. Browne mentioned a second case at Wellow where the water finder entirely failed. On the other hand, at the Viaduct Hotel, Mullins pointed out a spot where water could be found, and he was confirmed by Willcox, another "dowser," and a well was sunk which yields a good supply of water.

The Rev. H. H. WINWOOD, while admitting that Mr. Plowman had made out a very strong case, and also that there was a good deal which could not be explained with reference to the divining rod, yet, he said, in most of the instances given where water had been discovered, the finder had been accompanied by some one who knew of its position before, and he, therefore, was inclined to believe that it was more by thought-reading than by the use of the rod that water was discovered. With regard to Mullins, he considered him to be a good practical geologist, and, in neighbourhoods which he knew well, could easily point out where water was to be found from his knowledge of the nature of the ground.

Mr. FOXCROFT related his experience of an attempt by Willcox to find water for him some years ago. A spot was selected by means of the divining rod where water was to be found at a depth of 30 or 40 feet. The attempt was made, and so far persevered in, that a depth of 130 feet was reached, without, however, coming to water. The springs in the immediate neighbourhood are from 30 to 40 feet in depth. Mr. Willcox appeared completely baffled, and the attempt was abandoned.

The discussion was continued by the Rev. R. CAYLEY and Messrs. GILL and MORGAN, Major-General BURN and Colonel BLATHWAYT.

Mr. PLOWMAN replied to various points that had been raised in the course of the discussion, and expressed his satisfaction that the conclusions to which his investigations had led him had been endorsed by the majority of those present, many of whom had furnished remarkable and significant evidence derived from practical experience. The main testimony that had been given by the speakers was, undoubtedly, in favour of the proposition that water divining was no myth, but a real power possessed by certain individuals.

#### EXCURSIONS.

The four Excursions fixed for the year have all been carried out under generally favourable conditions as to weather.

The first to Caldicot Castle and the Severn Tunnel took place on 24th April. Notwithstanding the gloomy sky and a cold north-east wind, which prevented many faint-hearted ones from putting in an appearance, twenty-four members and two visitors had sufficient confidence in Field Club weather to start by the 10.18 train on Tuesday, the 24th inst., for the Severn Junction. To those who had taken part in the Barry Docks excursion last year the road was familiar as far as the Junction. Here the saloon carriage, which, through Mr. Graham's agency, had been provided by the G.W.R., was left, and a start made for Caldicot, about one mile distant. Passing along a somewhat uninteresting road and through the straggling village, the church was the first object visited. Having been re-built some twenty-seven years ago, there was nothing worthy of note in the inside, the tower being the oldest part; one of the many towers built for defence it is solid and massive, the lower stage being larger than the upper and apparently of a somewhat earlier date, the belfry and windows indicating an early Perpendicular period. The Rev. E. V. Collins the Rector of the parish, courteously guided the members across the fields to the Castle, and pointed out its various architectural

details. Crossing a depression in the ground he said that was the first outer defence on the side which was most unprotected naturally. Recent excavations had uncovered the base of a square building, probably a tower, from which the foundations of a wall extended to the N. The Castle, an irregular polygon, running mainly E. and W., was seen from this point to have been erected on ground slightly raised above the surrounding level marsh land, and presented a very imposing appearance. The large round tower, with its bold machicolations, on the N.W. seemed to be the oldest portion of the existing building, and reminded many of a Norman keep, though it was gathered from Mr. Collins's statement that Mr. Cobb, the owner, who had spent so much time and labour in the excavation and in the preservation of the ruins, considered that there was not any portion of the building so old as the Norman times. Passing round the outside of this tower to the western entrance, the recent excavations had disclosed a flight of steps leading to a doorway opening out into what was formerly a ditch, the entrance to the Castle having been originally through the gateway over this postern. Attention was drawn to the string course round the tower not following the line of the curtain wall, showing that the latter was of more recent date. Entering through a small door on the E., a square stone on the right side of the jamb and low down, had the word "Thomas" cut on it in old English characters, the first letter being a small "t," not a capital as one would expect; on another square stone inside at the base of a wall on the left hand was cut the word "Elanor," in incised lettering—query, was this corroborative of the legend that Sir Thomas Woodstock was born here, whose wife's name was Elanor? Major Davis considered that the masonry in the wall above was Norman; but that the name was cut on the stone later, in the beginning of the 15th century. Walking across the neatly kept greensward to the west gateway, the round arch over which was considered by some to be Norman, the

amount of material now removed, which once covered up the small postern beneath, could be fully understood and the labours of Mr. Cobb duly appreciated. The hall was situated on the south side, some very elegant Decorated windows still remaining; on either side of the great gateway are flanking square towers, which serve as a residence for the proprietor. That on the right hand on leaving the Castle has its battlements resting on corbels carved into heads. The Castle formerly belonging to the Bohun family passed by marriage to Thomas of Woodstock, Duke of Gloucester, and gives the title to the Barony of Beaufort. Having thanked Mr. Collins for his kindly guidance, the members traversed the short distance between Caldicot and Portskewet, visiting the church on the way. Unlike that of Caldicot, it can boast of having been spared the hand of the restorer for many years, and remains in its covering of ochre and whitewash, concealing doubtlessly unknown bits of antiquity beneath. An old cross, with its steps and upright shaft of New Red Sandstone, stands in the churchyard, and the now rare wooden stocks can be seen outside the wall to the E.; no longer a terror to evil doers, but still a sport to the village boys whose boast it appears to be that they had once been put in the stocks themselves. An excellent hot lunch at the Black Rock Hotel at 2.30 prepared the members for an inspection of the great pumping works in connection with the tunnel. Under the guidance of Mr. Hosken, who met them at the works about a quarter of a mile from the hotel, they were first of all conducted to the outfall, where a fine body of clear fresh water was rushing into the Severn, the result of the pumping then going on representing the drainage of the surrounding area to the amount of 20,000,000 gallons per day. At the present time, owing to the late heavy rains, the quantity was increased to 22,000,000 gallons, 11,000,000 of which came from the Sudbrook spring alone, a seemingly sad waste of an element becoming daily more necessary to the people of England whether in large

towns or in the rural districts. To give some idea of the gigantic nature of the undertaking, on which the safety of the tunnel depends, one has only to inspect the building where the engines are at work in connection with the Sudbrook spring, which has given the authorities so much trouble. Here six steam cylinders, each 5ft. 10in. in diameter, work day and night (at this time it was necessary to work four only), it may be said almost noiselessly, so smooth is their action, drawing by the united efforts of "plunger" and "bucket," 2,160 gallons per stroke, as the following table shows:—

Steam Cylinder.		Description.	Pump Diam.	Stroke.	Gallons per Stroke.
No.	Diam. in inches.		In.	In.	
1.	70	Bucket	34	9	336
2.	"	"	"	"	"
3.	"	"	"	"	"
4.	"	Plunger	{ 12	9	42
5.	"		{ 35	"	356
6.	"	"	{ 12	"	42
	"		{ 35	"	356

Passing on through the boiler house the great fan, 40ft. in diameter, was visited, so necessary to the ventilation of the tunnel. A minute or two was quite sufficient for the small parties of six at a time to witness its murky revolutions, and to be smirched with the black greasy residuum from the vitiated air that was drawn up from below. Time was all too short to dwell much on these works, and a quarter of an hour was alone permitted to a small party of four at a time to descend in cages to the bottom of the shaft, whence the Sudbrook spring is pumped 180 feet below the surface. The huge pumps slowly and methodically working up and down in the darkness, just rendered visible by the workmen's lamps, and the noise of the running water underfoot contributed much to the weird uncanniness of the scene. An iron door slowly moving on its hinges admitted

to a bricked tunnel through which, in a crouching attitude, the venturesome few passed along till they arrived at the spot where the water was seen rushing from the subway beneath the main tunnel, to be drawn to the surface by the monsters they had just left behind them. Returning by the way they came they were speedily hauled to the surface, and tendering their sincere thanks to Mr. Hosken, who had shown himself so anxious to explain everything, wended their way rather dirty from their underground experience to Portskewet Station, much pleased and instructed by their visit. The whole excursion was very much facilitated by the railway arrangements made through Mr. Graham, and by the opportune assistance afforded by Mr. Oliver Norris, who placed himself and trap at the disposal of the more infirm of the members.

The second Excursion was a two-day-one to Christ Church, Hants, on Tuesday, May 15th, under the guidance of the Vice-President of the Club. The party left Bath in a saloon carriage, provided for them by the Midland Railway, and reached Bournemouth in the afternoon, when they were met by a break at the Bournemouth Station, and drove through the town and its picturesque outskirts to Christ Church. Here they were met by the Rev. G. H. West, who had kindly undertaken to explain the church to the party. The Priory Church dates its foundation to the time of William Rufus, and the nave, the earliest portion, is pure Norman, and the work of Prior Flambard, who was afterwards removed to Durham, and who built the nave of that Cathedral in the same style; there is a close correspondence between the two buildings. But Christ Church, like Durham, contains specimens of every style of architecture, from the early Norman to the late Perpendicular work of the time of Henry VIII.; besides which the church has several crypts of an early date, and chantry chapels not less interesting than the main building. The Cloisters, the Infirmary, the Guest House, and all the arrangements of a Conventual Cloister



are now gone, and their site on the southern side is occupied by a modern house; but the Monks' walk along the river on the south side of the church can still be seen. Near the church, on the north side, stands the old Norman Castle, the keep of which is placed upon an artificial mound, probably of still earlier date; beyond the site of the Castle is the house of the Castellan, or Governor, a pure Norman house, and one of the very few, and indeed said to be the best specimen of the kind left in this island. The ancient bridge across the Avon river is probably Norman also, and the view one of the most picturesque and perfect in England. The eye rests upon the ancient house, now much covered with ivy, with its tall Norman chimney still standing, and the Castle beyond, with its mound crowned by the square keep, which breaks the long line of the Priory Church roof. Beyond is the blue sea with its line of broken cliffs, below the junction of the two rivers, the Avon and the Stour, which unite their waters below the meadow on which the Priory stands. It has the name of Christ Church, Twynham, from this junction of the rivers, as is noted by Camden, and still retains it. The church has had ample justice done to it by the late Mr. Benjamin Ferry, architect, by the late Rev. Mackenzie E. C. Walcott, B.D., whose family resided not far distant from it, and by the present Mr. F. A. Paley, LL.D., who has written a short but able treatise upon its architecture. Full time was given to the inspection of the church, which was very lucidly explained by Mr. West, and the party having taken leave of him, with many cordial thanks, drove to the Chine Hotel, where they spent the evening. The situation on the Cliff is very pleasant, and the hotel most comfortable. The next morning, after breakfast, a paper on "The Church and its History," (*Vide* 448) was read by the Vice-President, and the morning until mid-day was spent by the members of the Club in visiting the town of Bournemouth, with its walks and gardens, which were new to some members. At noon the party started for Poole to

examine the harbour and district around, and to note the direction of the Roman road, which seems to have run from thence in a line for Badbury Rings, where is a well-known earthwork ; in the neighbourhood Roman roads have been traced, one of which connected it with Maesbury Camp, on the line of the Fosse Road. A well-known line of Roman road along the Mendip hills connected the camp last mentioned with the Roman port at Uphill on the Severn, and thus united the Bristol Channel with the harbour of Poole on the English Channel, and so connected the Western and Southern coast of Britain. The party then returned to Bath after an agreeable two days' excursion. The following is the paper read by Rev. Prebendary Scarth.

The Priory of Christ Church, Twynham, dedicated to the Holy Trinity, takes its name from its peculiar position between two rivers, which flow one on each side, viz., the Avon and the Stour. According to Camden the ancient name was "Twinamburne," "Ubi ad confluentes intersidet emporiolum frequens, nunc ab Æde Christo Sacrá, CHRIST CHURCH, olim quod inter amnes interpositum, TWINAMBURNE, eodem plane sensu quo Italiæ *Interamna*. Sub quo Sturus et Avona uno conjuncti ostio in mare effunduntur." (See Camden's *Britannia*, 1st edition, 1586, p. 123.) The *meadow* between the two rivers aptly describes its position.

Respecting the site of the present Church, we find a college with a dean and secular canons planted there very early in Saxon times. According to Camden, Ralph Flambard, afterwards Bishop of Durham, was Dean of Christ Church, Hants ; he built the nave of the present Church in the time of William Rufus. Previous to this the College of Secular Canons had nine small chapels and manses. Christ Church afterwards became a community of Augustine or Austin Canons, founded by Bishop Flambard\* and the Earl of Devon, A.D. 1150.

The Austin Canons were constituted an Order A.D. 1061, and had as many as 175 houses in this island. Many of their Churches remain, and are still in use, as Christ Church. The community consisted of 18 canons.

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\* He became Bishop of Durham, A.D. 1099.

The nave of the Church, as we see it at present, is the work of Bishop Flambard (1093-9), who also built the nave of Durham Cathedral, which, although on a much grander scale, corresponds in style to that of Christ Church. The intersecting arcade along the S. wall is a characteristic feature of his design. The ground storey and triforium are plain but fine Norman work, the clerestory is Transitional, or first pointed, of the date of Henry I. The transept is Norman, and has a beautiful turret in the N.E., covered with net-work ornament. The large north porch is early English, and had a parvise, or chamber, over it. The stone rood screen with the rood loft above is of the time of Edward III., and forms the entrance to the choir.\* It is one of the few to be met with in our Collegiate or Priory Churches. The work is probably of the time of Edward III.† There is a contraction at the entrance of the choir or chancel which is skilfully concealed by this screen—for the choir (erected, time Henry VI.) is seven feet narrower than the Norman nave. There is a narrow stone staircase ascending to the rood loft. Slight traces of ancient colouring remain, and the niches were anciently filled with statues. The Priory of Christ Church, according to Mr. Ferry, could boast of screens equal to those of any other Church in this country. The massiveness of these stone screens forms a great contrast, to the light and elegant character of the many oak rood screens which remain in the counties of Somerset, Devon and Norfolk. The architectural designs of the stone rood screens consisted in a series of niches.

The Rev. Precentor Walcott, in his account of Christ Church, says "that the parish altar stood one bay westward of the crossing, thus leaving a choir entry for the canons." There are crypts under the transept, and a third crypt below the sanctuary. Mr. Walcott states that this formed the Chantry Chapel of the first founder, de Redvers.

The chapels of the N. aisle are Early Decorated, and above one was the designing room, and, on its plastered wall is delineated the perfect tracery of a window. The eastern chapel of the S. aisle is apsidal. There are 36 canopied stalls of late Perpendicular work; these

\* For an engraving see "Archæological Journal," vol. v., p. 73, from a drawing by Mr. Ferry.

† See "Archæological Journal," vol. v., p. 142-145.

retain "misericords" most fantastically carved.\* The vaulting of the choir was added 1502-20. On the north is the Chantry Chapel of the Countess of Salisbury, Margaret Pole, beheaded 1541 by the cruel tyrant, Henry VIII. The ornamental work of the chapel of the Countess of Salisbury at Christ Church is supposed to be by Torrigiano. The Heraldic work was ordered to be defaced by Henry VIII., because she was the mother of Cardinal Pole; she was executed because she would not disclose the retreat of her son, who was supposed to have stirred up the rebellion in Yorkshire. The Countess was granddaughter of the Earl of Warwick, the King Maker. She married Sir Richard Pole. Henry VIII. seized all the members of Cardinal Pole's family. Cardinal Pole had written against Henry in his Book on the Unity of the Church, "in which he inveighed against the King's supremacy."† She was buried in the Tower of London, in S. Peter's Church, not in the tomb which she had designed for her resting place at Christ Church.

Eastward is the reredos, having as its subject the Tree of Jesse, David with his Harp, Solomon in his Glory, and the Epiphany. The other subjects, viz., The Death, Coronation and Assumption of the Virgin, have been removed to the aisle. Two doors open eastward on a small gallery.

The Hary's Chantry (date 1525) is in the south aisle. Prior Draper's Chapel at the E. end has a stone screen (1552).

On the N. side there are the effigies of the two Chidiockes (1449) in alabaster; this monument was originally in the N. transept.‡

The Lady Chapel is Perpendicular work of the end of the 14th century. It has a rich traceried vault like that of the choir, a mutilated reredos, and the old altar slab of Purbeck marble, one of the few ancient altars now remaining in England, and the old "sedilia" still remain. Above is the chapel of S. Michael, approached by covered stairs from the outside. This was formerly

\* See description in "Bright's Guide to Bournemouth," p. 115, which contains a very good account of the Priory Church. Also "History of Hants," by Theod. Wilks, vol. iii., p. 102 and following.

† See "Hume's History of England."

‡ See "Wilks's History of Hants," vol. iii.

used as a school, being granted for that purpose from the date 1666. The Sacristy opens into S. choir aisle.

The total length of the Church is 311ft. ; Nave, 118ft. by 58ft. ; Choir, 70ft. by 60ft. ; Transept, 101ft. by 24ft. The West Tower is 120ft. high ; Lady Chapel, 36ft. by 21ft. ; S. Michael's Loft, 58ft. by 19ft. The Refectory measured 36ft. by 20ft., the Infirmary was to the S. of it. The Dormitory stairs remain at the W. end of the S. aisle. The Prior's Lodge was in the S.E. The Mill and Porter's Lodge (16th century) remain.

In the year 1404 there were 33 canons, and at the Dissolution 18. The name Paradise still points out the Canons' walk by the water.

At the Dissolution in the time of Henry VIII., the Prior implored the King to spare the house on the ground of its utility to the neighbourhood, because there "was neither church, town, nor parish of any substance where any honourable or honest man might have succour or repose on horseback or on foot nigh thereto, by the space of 8 or 9 miles, and some ways by the space of 16 or 18 miles ; and the poor folk, inhabitants of the town, and also of the country thereabout, are daily relieved and sustained with bread and ale."\* There is a bridge over the Avon a short distance from the Church, and is of old construction, probably the 12th century, or still earlier. The view from it takes in the ruins of the Castle with its Norman keep ; and the hall of the "Castellan," or custodian, partly covered with ivy ; and has been thought to be one of the most picturesque in England, commanding as it does the Castle, the Hall and the Priory Church, with the landscape beyond. The Norman house† is stated to be the most perfect house of the 12th century remaining in England, the walls being entire, though much concealed with ivy. It is thus described by Mr. Hudson-Turner in his work on "Domestic Architecture of the 12th century," p. 38 :—"At Christ Church, in Hampshire, is the ruin of a Norman house, rather late in style, with good

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\* See "Walcott's English Minsters, 1879," and also his "Memorials of Christ Church," and B. Ferry's "Delineations, 1834," and "Remarks on the Architecture of Christ Church," by F. A. Paley, LL.D.

† See "Journal of the Archæological Institute, Great Britain and Ireland," vol. ii., p. 310.

windows of two lights, and a round chimney-shaft. The plan (of the house) is a simple oblong, the principal room seems to have been on the first floor. . . . Whether it formed part of another series of buildings or not, it was a perfect house in itself, and its character is strictly domestic. On the ground floor are a number of loop holes ; the ascent to the upper storey was by a stone staircase, part of which remains ; the ground floor was divided by a wall, but the upper storey appears to have been all one room, lighted by three double windows on each side ; near the centre of the east wall, next the river, is a large fire-place, to which the round chimney belongs. At the N. end there appears to have been a large handsome window, of which part of the arch and shaft remain, and there is a small circular window in the south gable. From what remains of the ornamental part of this building, it appears to have been elegantly finished and cased with squared stones, most of which are now taken away. There is a small projecting tower, calculated for a flank, under which the water runs ; it has loop holes both on the north and east fronts, these walls are extremely thick. By the ruins of several walls, there were some ancient buildings at right angles to this hall, stretching away towards the keep.\* This was probably part of the residence of Baldwin de Redvers, Earl of Devon, to whom the manor of Christ Church belonged about the middle of the 12th century.”\*

I have dwelt more particularly on the features of this very interesting house, because it is one of the few Norman houses still remaining in this country, and it is to be hoped that it may always be preserved as a specimen of the houses of great nobles in the Norman period. These ancient works grow fewer year by year, but what remain should be preserved as landmarks of our national history, which, if once obliterated, can never be recovered.

It ought to be recorded that the stained glass in the west window in the tower of Christ Church, as well as that in the east window of the Church, was the gift of Admiral Walcott, once member for Christ Church, and for a long period resident in Bath. The west doors were the gift of his sister, Mrs. Dixon.

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\* See “Grose’s Antiq.,” vol. ii., p. 178.

\* See “Domestic Architecture of 12th century,” p. 39.

*Hereford and Kilpeck, June 19th.*—Either the unseasonable, chilly weather, or the two days' programme, must have been the cause why only eight members started on Tuesday, June 19th, for Hereford. The route selected being by the 10.40 a.m. Midland train, *viâ* Gloucester, there was ample time before the next train started for Hereford to allow of a walk to the Cathedral in the former city, and of a renewed acquaintance with its architectural beauties. Its 15th century tower and delicate perforated pinnacles; its Norman nave and lofty round piers; its Perpendicular cased choir and early Norman crypt; and above all its beautiful early 15th century cloisters—the most perfect in England, with the recesses on the south side used by the monks for their studies and illuminating their MSS. — its lavatory on the north, some 30 or 40 feet in length, once supplied by a running stream, now only wanting the cowled forms to make the realistic picture complete—being rarely equalled. Passing out by a side door in the neighbourhood of the Bishop's Palace, and back to the station, the 1.45 G.W.R. train for Ross and Hereford was taken, and after a pleasant run through rich meadow and woodland scenery skirting the Forest of Dean, and many crossings of the much-winding and now, alas! weedy Wye (for the *Anacharis alsinastrum* weed was in full bloom), the Green Dragon received the party about 3 p.m. The leary portion of the travellers having speedily secured the rooms which suited them best, a visit to the Cathedral was the next object of engrossing interest. "Injured by Wyatt, rebuilt by Cottingham, and restored by Sir Gilbert Scott," few can surpass its rich specimens of 11th, 13th and 15th century architectural work. Entering through the fine north-west porch, with its parvise chamber, built by Bishop Booth in 1520, the first thought that occurred was the superiority of the nave as compared with that so recently seen at Gloucester, in the softened richness of its red sandstone and beautiful proportions of its massive Norman piers. The eye wanders upwards in admiration to the 13th century triforium and still later

clerestory ; but as it rests upon the roof the architectural harmony is spoilt by its inappropriate and discordant colouring, said to be the work of Cottingham. The celebrated metal work screen, well known to visitors to the first Exhibition in 1851, toned down by age, has not lost in beauty. Before passing through it, the curious stone gratings of the lantern tower, upon which an inner casing of the side walls rest, was the subject of much speculation, and the venerable verger in charge of the party discoursed largely upon Cottingham's mechanical ingenuity, whereby in 1843 the tower was underpinned, whilst the piers, then in a dangerous state, were being rebuilt from foundation to capital. The Norman choir and Early Decorated clerestory, grotesque stall carvings, and reproduction in tiles of the murder of King Ethelbert by the Saxon Offa, having been sufficiently admired, the party passed through the south choir aisle and under the fine organ to a building now used as a vestry, in which a glass case contains various relics, rings, patens, crosiers, MSS., &c. ; and then examined the far-famed "Mappa Mundi," preserved in a suitable oaken case and glazed, considered to be one of the oldest maps in the world—a curious and grotesque representation of the then known world, a plain surrounded with its ocean, whereon are represented cities and places in unusual juxtaposition, man and beast and things creeping innumerable, after the fashion of the times, and ascribed as the work of one De Haldingham, 1300. It only remained to visit the crypt, called Golgotha, end of 11th century, under the Lady Chapel, and the south transept ; on the east wall of which is some Norman work, supposed to be the earliest Norman work in the Church. A fire-place of much later date is in the west wall, and appears to be about the date of the window in that wall, *i.e.*, Bishop Trevenant's time, 1400.

The fine organ, the especial care of Sir Fredk. Ouseley, the Precentor, having warned the members of the commencement of afternoon service, a few of them remained, whilst the rest



wandered round the exterior and through the town, and across the bridge to the right bank of the Wye, whence a pretty view of the tower is seen through the rich foliage of the Bishop's Palace gardens. After service was over, a visit was paid to the Red Coat, or Coningsby Hospital, in the outskirts to the N. of the City, in Widemarsh Street. Formerly a Preceptory of the Knights of S. John of Jerusalem, it is now supported principally by the generosity of one individual as a place of retirement for old army pensioners and their wives. It consists of open quadrangle with rooms round it, the north side being occupied by a plain and simple Chapel and an old Hall. Some gardens at the back contain the remains of the Refectory of the Black Friars Monastery, founded in 1276; also an hexagonal preaching cross, approached by steps and closed in on all the six sides (how was it entered?). A walk round the Castle Green—home of children and perambulators—a courteous invitation from an inhabitant to see some curiosities in the garden of his house, facing the river (the said house having a Norman pilaster on the north side, and the walls of which were stated to be more than 6ft. thick, with a secret stairway from the roof to the bed of the adjoining river), closed a most instructive day. The Green Dragon provided a good dinner and comfortable quarters for the night.

*Wednesday, June 20th.*—Leaving Hereford at 9 a.m., in a break and pair, the members started for Kilpeck, about eight miles on the Abergavenny road, crossed the Wye over the bridge to the south of the City, left the flourishing Benedictine Monastery of Belmont on the right, skirted the rich meadows of Allensmore on the left, with its fine oak trees, and turned off from the main road to St. Devereux, whence the first view of the little Church of Kilpeck was seen standing below on its woody knoll. Having obtained the key from an adjoining cottage, they entered through the south porch into one of the most perfect little Norman churches that probably exists in England, and the Secrétary at

once read some extracts from a paper by Sir George Cornwall, kindly furnished to him by one of the members, of which the following is an abstract :—“The design of the south doorway is that of the 12th century. The tympanum is filled with sculpture representing the vine. The grotesque figures surrounding it are the ordinary carvings representing the beak or cat's head. The figures on the W. of the doorway are said to be in Anglo-Saxon costumes ; the twining forms on the east side are those of serpents or dragons. The interior is in the form of the ancient Basilica or Hall of Justice, and therefore the earliest type of Christian Church, with its nave, choir and sanctuary terminated with a semi-circular apse. The chancel arch is of ordinary Norman character, its jambs have figures of Saints carved on the west side, holding their various attributes ; one figure appears to be that of S. Peter with the keys, one that of a female. On the south wall of the choir is an Early English window and a priest's doorway of later date. The apse has ribs with Norman zig-zag moulding and a central boss with grotesque heads. The font is a large shallow bowl composed of the Old Red Conglomerate of the district. In the apse is what appears to be a holy water stoup, with a pair of human arms around clasping it, and the head of a serpent looking downwards ; it is detached, and has probably been moved from its original position. The altar stood away from the east wall, leaving a space behind it for the Questor's seat in ancient times, and subsequently for that of the Bishop or Presbyter.” Having fully mastered the interior arrangement the members passed out and noted the corbel table with its grotesque heads and monsters under the eaves of the roof, crocodiles, dragons, rabbits, and the distinct emblem of Christianity, the Lamb and the Cross ; and at the west end the gargoyles or brackets, probably a survival of the projections from the end of the wall-plates in timber houses. The west window, high up under the roof, was particularly elegant with its Early Norman columns, and roll of the same size as the columns

carried round the head. This peculiarity and the ornament are supposed to be purely Celtic. Separated from this little gem of a Church on the W. by a deep ditch and vallum are the remains of the Castle, of which but a small portion of the wall remains. The members mounted the steep sides of the keep, whence a view of the Black Mountains can be seen, but the atmosphere was too hazy, and finally paying a visit to the site of the Priory founded by Hugh Fitz Norman in 1134, saw only a barn and a not altogether obliging female native, and then mounted the break for Pontrilas. One of their party was left here with his bag to await the arrival of a friend from some distant spot (he hardly knew where) to pick him up—and he may be there still. The rest drove merrily on to Pontrilas, took the train, ran through Abergavenny, Pontypool road, and the Severn Tunnel, and reached Bath at 4.20, after a two days' delightful and instructive excursion.

*July 17th, 1888.*—The Club was most fortunate in its excursion to Clevedon and Portbury, Tuesday last having been one of the very few sunny days in the midst of the recent wet and gloomy weather. The Great Western Railway having by their arrangements made the journey to Clevedon very pleasant, a large break received the party, numbering 18, at that station, and trundling merrily through East Clevedon rounded "Sir Abraham Elton's" hill, a woody spur of Mountain Limestone, and entered the rich pastoral valley, busy with its haymakers, running up like a grassy straight between two rocky headlands, to Portishead in the hazy distance. Passing Walton-in-Gordano, with its picturesquely-situated castle on the hill above, the first halt was made at the church of Weston-in-Gordano, well known for its almost unique ground plan, consisting of nave, chancel, tower at the south-east end of the nave, with chapel E. of the tower and S. of the chancel, curious south porch and *sanctus-bell* cot over the nave gable. Entering by the south porch the singular gallery over the inner doorway gave rise to the usual

discussion as to its object. Evidently built at a date subsequent to that of the doorway, which is 13th century, it has a passage cut in the east wall leading up to it with a niche over the doorway above. The general idea prevailed that it was used for some function in the 15th century connected with the Romish ritual. Inside the square lead-lined font on the left hand attracted attention, and was pronounced to be late 12th century work, its steps were composed of fine Dolomitic Conglomerate of the neighbourhood; the base was either of the same material or of Oolite, the hammer of the sacrilegious geologist not being permitted to test its structure. A tomb to one Richard Percival, in the north wall of the nave, was much admired for its beautiful wrought-iron enclosure. The following inscription surrounded the stone slab:—"Cy gyste le corps de Rycharde Percyvale le quel mort l'an de boinet Jesus Dieu ay pitie de son Ame. MCCCCLXXXIII.," one of the latest French inscriptions on a monument now existing. The Percivals were the original founders of the Church. The old stone pulpit exists on the S., entered through the thickness of the wall. Beneath the tower on the S. are the steps leading up to the rood loft. The chancel, with its waggon roof, is later than the rest of the building, being a transition from the Decorated to the Perpendicular; indeed the whole Church is a very interesting specimen of that transition period. The north doorway is now closed, but the Vicar, who courteously conducted the members through the Church, stated that some of the parishioners remembered that when baptisms took place in former times the north doorway was always opened to allow the evil spirit to escape during the ceremony. The journey was now resumed through pleasant lanes to Clapton-in-Gordano. Here a short walk through fields led to the Church, almost concealed from view on its woody knoll. Entering through a small gate on the E. of the churchyard, a beautiful English three-lighted window at the east end of the north chapel was the first object of

interest. The plan is, nave, chancel with transept chapel N. of nave, and a chapel N. of chancel. The threatened restoration, so much dreaded, has had its dire effect, and the interior is spoilt—the least said about it the better. A few of the fine early 13th century bench ends remain. The reredos, which has been recently “beautified,” still retains the curious supports for the candlesticks—two 13th century Purbeck marble shafts, with their capitals topsy-turvey, forming the base, and a 15th century plaster capital, subsequently stuck on, forming the top. The stone slab, now the vestry table in the north chapel, appears to have been once an altar slab or a tombstone, and is composed of Dolomitic Conglomerate. A large “squint,” forming an archway into the chapel on the N., is a peculiar feature. A consecration cross, painted on the north wall over the “squint” still remains, and some of the old timbers and carving on the chancel roof are there—the rest has been repaired with pitchpine. Over the 15th or 16th century doorway of the south porch are the remains of a Norman tympanum cut into to form the present inner doorway. A Maltese cross, in original red colouring, still remains. The tower is of special interest, supposed to be 13th century. It has some features about it, which to some of those present indicated an earlier origin; *e.g.*, the small light immediately beneath the belfry window on the N. The parapet is comparatively modern, the corbel table beneath Norman. The top story batters and the plaster seemed to some to be 13th century, the masonry underneath it being very rough, and apparently consisting of the reddish stone of the knoll on which the Church stands. By the courtesy of the tenant, Mrs Stowell, the members were permitted to inspect the Manor house, nestling in its quiet nook below the knoll to the W. of the Church, and ascended the tower porch, date 1442. The original portion of the manor dates from the time of Edward II., and the wooden screen formerly in the hall, but now forming the entrance to the

garden in front, framing a lovely view across the valley, has been considered to be the earliest domestic screen in existence. Returning to the break the members were too earnestly bent on the lunch awaiting them at Portbury to give much attention to the interesting geology around them. About the distance of a bow shot to the E. of the Church was the shaft sunk, not so long ago, for coal, the section passed through being :—

Soil and N. Red Sandstone...	...	...	...	10 ft.
Dolomitic Conglomerate ...	...	...	...	11 ft.
Pennant Sandstone and Marls, with 10in. vein of coal ...				489 ft.

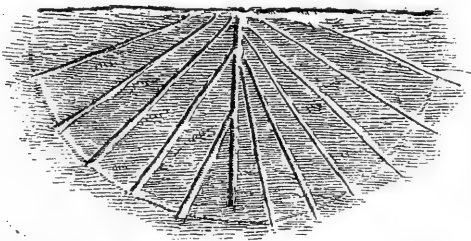
The geological question being, whether if the boring had been continued it would have passed through the Pennant Sandstone to the true lower Coal Measures beneath or whether these beds were absent altogether? The remarkable nature of the geology here being the fact that the higher ground is Carboniferous Limestone, lower down on the slope the Pennant Sandstone comes in, as proved by the boring, whilst still lower down to the N. is a section of Carboniferous Limestone again. A complicated series of faults must be called in to account for this abnormal state of things. However, lunch at the Priory Hotel, Portbury, drove all other thoughts away. Due justice having been done to it, some of the more earnest minded antiquaries resumed their researches afterwards. The Church was visited under the guidance of the Rev. G. O. Tyler, who lovingly pointed out all its peculiarities. The contrast between the restorations here and at the last Church visited was most marked—nave, aisles, chancel and western tower have all been reverently dealt with. The plainness of the piers and arches, 13th century work, was very noticeable, also the great width of the Church. A stone bench runs round the north, south, and west walls of the building. The “squint” is one of the largest in existence. The three Early English sedilia on the south chancel wall are very elegant. Three other sedilia also exist, somewhat plainer, on the south side of the south aisle. N.

of the chancel is a stone ribbed recess 13th century—query, a chapel or Easter sepulchre? The old parish chest with three locks has been preserved in the nave, and a Dolomitic Conglomerate slab close at hand records the fact that one Goodwin Wolcombe, of Portbury, yeoman, died at the age of 95. On the north wall of the north aisle is a small quaint brass, date 1621, to the memory of Sarah, widow of Walter Kemish. Under the east window of the same aisle, and much out of the centre, is a small niche, discovered during the restoration. This gave rise to some discussion amongst the party as to its probable use, but no satisfactory conclusion was arrived at. In the south aisle is a Norman font, very similar to the one previously seen in Weston Church. Attention was attracted to the piers between the aisles, which are much out of the perpendicular, all of them leaning outwards from the top, although there was no evidence of the foundations having sunk at all. The body of the Church was reseated at the restoration, but the old oak benches were not destroyed, and have been placed in the south aisle, where a second altar has been erected, and the aisle is used now for early celebrations and special services. Passing out of the Church the two magnificent old yew trees said to be as old as the Church (why not older?) were much admired. One of them was measured by a member of the party and found to be over 17ft. in circumference at a height of 5ft. from the ground. The churchyard is entered through a lych gate, a structure rarely met with now. The Priory, now a parish school, was next looked at, and the 5.10 train afterwards taken for Bath.

Every reasonable effort was made to carry out the bye-Excursion to Bowood, but proving unsuccessful, owing to the return of the Marquis of Lansdowne from Canada, it was postponed for some future and more favourable opportunity.

The weekly walks have been maintained with more or less energy. Several proposed during the months of January and February of the present year have been prevented by the snow

and other causes due to the weather. One to Langridge came off on Tuesday, February 5th; some nine or ten members were present, and having first of all enjoyed the hospitality of the Rector, the Rev. C. W. Shickle, were conducted by him to the Church, having first of all looked at the two stone coffins, one now forming a water trough in a field beneath the rectory, the other lying much mutilated to the S. of the school house. The Church, and Manor House adjoining built by the Walshes in the 14th century, are so well known, and have been lately described by the Rector in the *Bath Chronicle* for December 13th, 1888, that it is unnecessary to give any details; it will be sufficient to state that there is a great need of speedy restoration, otherwise the Rector's fear that the ancient structure will crumble away before his eyes will be realised. The crack in the tower is widening and ominous, and the new chancel, built within the last 17 years, appears to be running away from the body of the Church. Some incised lines on a stone in the S. wall of the nave and E. of the S. porch, about 3ft. 9in. from the present level of the ground, and 2ft. 6in. above the plinth, may indicate traces of an early sundial.



Diameter of Circle, 8 in.

Length of Gnomon,  $3\frac{1}{2}$  in., barely reaching to Circumference of Circle.

Depth of Lines,  $\frac{1}{8}$  in.

The Finances of the Club, so carefully looked after by your Treasurer, are in a healthy condition, as the Balance Sheet will



show. Notwithstanding the somewhat heavy expenditure incurred in lithographing the Ostracoda (illustrating Prof. Rupert Jones's valuable contribution to last year's Proceedings on those curious Crustaceans), yet there is a balance of £1 0s. 9d. in the Club's favour; the total receipts being £49 15s. 8d., and the expenditure £48 14s. 11d.

Owing to various causes arising from change of residence, &c., and in one instance that of the decease of a member (General Mundy),\* ten vacancies have occurred during the past year; three new members have since been elected, leaving a total of 86 members at present. Many valuable contributions to the album, from Dr. Mantell, have been made, illustrative of some of the points of interest seen during the Club's rambles, and will, in course of time, form a valuable accession to the library of the Club now deposited in the Literary and Scientific Institution.

H. H. WINWOOD,

*Hon. Sec.*



\* Since this was written we regret to state that two other members have deceased, E. J. Morgan and A. F. Janvrin.



*The Honorary Treasurer in account with "The Bath Natural History and Antiquarian Field Club"  
for the Year ending February 18th, 1889.*

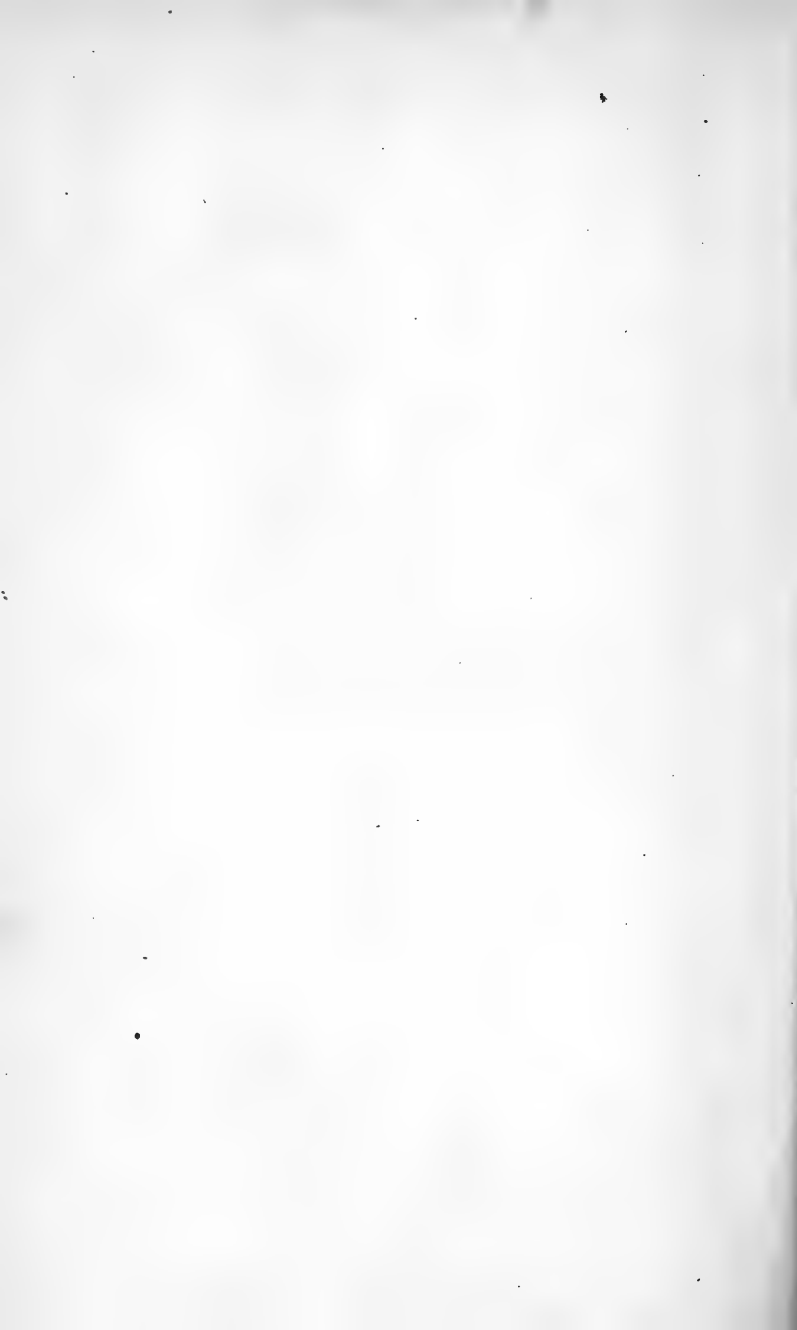
	Dr.		Cr.	
		£ s. d.		£ s. d.
Balance from last year's Account	...	2 10 8	Donation to the Literary and Scientific Institution	4 0 0
592 Subscriptions, at 10/- (four arrears from 1887)	...	46 0 0	Gratuities—Librarian, 10/-; Assistant ditto, 7/6;	1 0 0
5 Entrances, at 5/- ...	...	1 5 0	Porter, 2/6	0 5 0
			Ditto at Printer's for Addressing Cards, &c.	0 15 6
			Ditto at Excursions	1 1 0
			Donation to the Broome Botanical Fund	13 5 6
			Lithographing Professor R. Jones's Drawings	...
			Messrs. Lewis, viz. :—	...
			Printing Proceedings & Postage of do.	22 0 5
			Cards, Circulars, &c.	5 11 10
One Subscription Unpaid				27 12 3
			Postage, viz. :—Honorary Secretary	0 5 9
			" Treasurer	0 7 5
			" at Institution	0 2 6
			Balance in hand	0 15 8
				1 0 9
		<u>£49 15 8</u>		<u>£49 15 8</u>

Also Deposit in Post Office Savings Bank of £40, with Interest to 19th March, 1888, £1 15s.—Total £41 15s.

Examined and found correct,

J. T. CHANDLER, *Treasurer.*  
 { R. I. TAYLOR,  
 JAMES HERDMAN.

15th February, 1889.





## CONTENTS OF NO. 4, VOL. VI, 1889.

---

	PAGE
1.—ON CHURCH DOORWAYS, BY THE REV. REGINALD A. CAYLEY, M.A. ... ..	363
2.—BATH LAY SUBSIDIES, HENRY IV. TO HENRY VIII., BY EMANUEL GREEN, F.S.A. ... ..	379
3.—THE DIVINING ROD, BY THOMAS FORDER PLOWMAN	411
4.—LIST OF TERRESTRIAL HEMIPTERA - HETEROPTERA TAKEN IN THE NEIGHBOURHOOD OF BATH, BY LIEUT.-COL. BLATHWAYT, F.L.S., F.Ent.S. ...	432
5.—SUMMARY OF PROCEEDINGS FOR THE YEAR 1888-89, BY THE SECRETARY ... ..	435









