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PROCEEDINGS

OF THE

BATH NATURAL HISTORY

AND

ANTIQUARIAN FIELD CLUB.

VOL. VIII.

BATH:
PRINTED (FOR THE CLUB) AT THE HERALD OFFICE, NORTH GATE.
1897.

TABLE OF CONTENTS.

No. 3.

No. 4.

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VOL. VIII., No. 1.

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PRICE HALF-A-CROWN.

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A LETTER

From the President to the Members of the Bath Natural History and Antiquarian Field Club.

BATH; May 25th, 1893.

GENTLEMEN,

The great age I have attained, with its infirmities, of necessity, yearly increasing, renders it extremely improbable that I shall ever again be able to address you personally, as I should like to have done. I avail myself, therefore, of the only way open to me for saying a few words to you, as Founder and President of the Club, before the final separation takes place. I call myself Founder of the Club, as usually so considered to be, but in truth it would be more correct to speak of the late Mr. Broome and myself as joint founders, for neither would have thought of it without the other. This was in 1855, nearly forty years ago. The Club seems always to have well kept up its numbers; there is nothing amiss here. But it has sometimes seemed to me as if there was a tendency to drift away from the professed object of the Club so clearly stated in the rules; viz., "To make excursions around Bath, with the view of investigating the Natural History, Geology and Antiquities—of the neighbourhood." I do not say these objects have been forgotten. Far from it. But I imagine some of those who have joined the Club of late years have done so more for the sake of the distant excursions by train, fixed at the anniversary meeting, than for that of the weekly walks (for such they were in the first instance)—appointed for carrying out the investigation of the neighbourhood of Bath. But the good work that has been done by some of us should be an encouragement to others.

I do not say that these distant excursions are undesirable. They serve to introduce a little variety in relief of the sameness, which necessarily attends walks confined to the immediate neighbourhood of a town. At the same time they open the mind to wider spheres of usefulness, and sometimes offer suggestions that may be turned to good account nearer home. To illustrate what I mean: A man who has studied the geology of England as a *whole* would be better able than others, from wider experience, to explain the details of any particular district he is set to investigate.

After frequent thinking on the matter of these excursions, it was a pleasant surprise to receive a notice from our secretary announcing a proposed Botanical excursion to Glastonbury Moors. This was quite a step in the right direction. But such a walk, as in the case of all Botanical walks, should be taken in connection with the time of year. None, or very few, of the plants which Broome and I found on Shapwick Moor the second week of July would be in flower much before Midsummer Day, if so soon. A list of them may be seen in manuscript at the commencement of the copy of Babington's *Flora Bathoniensis* in the Jenyns Library.

And while on this subject I may remark that several short or moderate walks in *this* neighbourhood might be taken any day by such Members of this Club as like to go; which would be especially useful if directed to the purpose I spoke of in my last lecture to the Club, in the autumn of 1891. I then mentioned, if you remember, how desirable it would be to ascertain whether certain of the more interesting species of the Bath Plants were still to be found in the localities in which they were met with formerly. A few such walks as suggest themselves to me I will put on paper separate from this letter.

I would further remark, in connection with this subject, that in the Jenyns Library at the Literary Institution, below the general Herbarium of British Plants, there is a cupboard to the left in which will be seen a large folio volume labelled *Bath*

Flora. The only *specimens* contained in this volume are mostly those of species added of late years; but at the commencement of the volume there is a catalogue of all the Plants obtained by myself in the neighbourhood of Bath, with reference to the exact volumes and page in the general herbarium in which any particular species is to be found. Reference to such would be very useful, in the case of any species which it is wanted to identify. And here I might go on to say how great are the advantages afforded to us in the Bath Literary and Scientific Institution. I would almost venture the remark that—apart from London and the Universities and the Kew Gardens—there is, perhaps, no place in this country where students of Natural History can find so much, in the way of books and collections, to aid them in their researches, as here in Bath. The Jenyns Library, with a most valuable and nearly complete Herbarium of British Plants; the Broome Botanical books and collections in an adjoining room; the Duncan Museum, illustrating the Fauna of the Bath district and in part that of Somerset; the invaluable collection of Fossils, collected, I believe, mostly in the West of England, by the indefatigable researches and industry of the late Mr. Charles Moore, one of the early members of our Club; what more, it might be asked, could the student require?

The books in the Jenyns Library, the far greater part of which relate to Zoology and Botany, amount at the present time to considerably more than 2,000 volumes. It is especially rich in periodicals bearing more or less on the above subjects. It contains complete series of some of those published in the earlier part of this century; besides which it possesses all the Transactions, Journals and Memoirs published by the Linnean and Zoological Societies, all the volumes of the Ray Society, the Anthropological Society and the Entomological Society. With respect to this last, I would call attention to the circumstance of the library possessing the first volume (and only volume that was ever published) of the Transactions of an Entomological Society that

existed before the present one, dating back to 1812. It is interesting to us of Bath, from its containing the only coloured figure that I know of, representing the great Longicorn beetle, of which there are two such fine specimens, taken in Bath a few years since, now exhibited in the Jenyns Library on the top of the bookcase before the window. The figure above referred to is that of a specimen taken, I believe, near London.

Besides the Periodicals and Transactions of Scientific Societies, the library contains the works of all the most distinguished Naturalists in earlier days, as well as those of the first half of the present century. It will suffice to mention the names of Linnæus. Cuvier, Fabricius, Lamarck and De Geer among the Continental Naturalists; along with those of Ray, Willughby, Pennant, Latham, Selby, Yarrell, Stephens, Leach, Curtis, Kirby, Spencer and Darwin (including all his works), as belonging to this country. These, however, are a mere selection of names that happen to occur to me just now. If more information is wanted, the catalogue itself had better be consulted, which I may here observe is divided into two parts—alphabetical and classical. The latter is a catalogue of subjects *classically* arranged, and is worked out with very extended subdivision and great particularity. No one could fail easily to ascertain what books there were in the Library bearing upon any subject or question relating to the Natural Sciences, to aid him in his studies, or upon which he needed information. True the Library does not contain some of the most recent works on Natural History, published since the time when—from age and other causes—I was obliged to desist from all further attention to the subject; but any book that was particularly called for might probably be obtained by the help of the Duncan Trust Fund.

And now to return to the subject of our Club. It was in the year 1851, or the year following, that Broome came to my house at South Stoke, where I was then living, and proposed my joining him in a Botanical walk. This I gladly acceded to; and after-

wards he proposed that we should take a similar walk every week, making the start from each other's house in turn. It was not long before two or three friends asked to join us in our expeditions, and in time others followed; leading, in 1855, to the establishment of a Field Club for the investigation of the Natural History of the neighbourhood of Bath. They were pleased, on the occasion, to appoint me to be President; and I trust that the papers which I have read to the Club, and the addresses that—from time to time—I have made to its members (most of which will be found in its printed Proceedings) will serve to show the interest I have always taken in it. The Club has done well up to the present time. Its future, Gentlemen, is in your hands; may there be no falling off in the number of its members, nor abatement of the work for which it was originated in the first instance. I pray for its continued success and industry in all that it undertakes. There are some things which man is better able to effect in union with others than when left to himself. I pray for a blessing on your combined labours. Hold all well together. Encourage one another. *Farewell!*

LEONARD BLOMEFIELD, *late* JENYNS.
Aged 93.

SUGGESTIONS FOR SOME BOTANICAL WALKS (FIELD CLUB),

Short or Moderate.

(1) Enter wood on Claverton Down by Sham Castle, and follow up the long branch of it leading down towards Bathampton; look on right side for the Deadly Nightshade (*Atropa Belladonna*). Does it still grow there?* Fl. (June to August).

* Keep notes of the plants found, as also of those no longer to be met with where they grew formerly.

(2) Follow up the footpath at the back of Old Widcombe Church leading on to the down: cross a style which presents itself about halfway up, and when over look immediately to the left, without advancing further, and at the roots of Hazel bushes look for Toothwort (*Lathræa squamaria*). (May).

(3) Look for *Polypodium calcareum* in Box Quarries, and see what Ferns, or whether any, can still be found in the Quarries.

(4) From Box Quarries the party might proceed to Bathford, and look for *Monotropa hypo-pytis* (parasitical on the roots of Firs and Beeches) in a Beech plantation on the rocks above Bathford; where also may be found (if still there) *Cystopteris fragilis*—a Fern. (July, August).

(5) Monkton Farley—Look for *Helleborus viridis* (Green Hellebore) in waste places, old woodyards and out-of-the-way holes and corners. (Spring).

(6) *Tulipa Sylvestris* (Wild Tulip). Look for it in a meadow near Combe Hay, where it was formerly in great plenty.

(7) Look for *Herminium Monorchis* (musk orchis) on hill side, Weevern Mill, near Rudlowe, where it grew in plenty in July, 1853.

(8) There are two plants—rare and local—which should be especially watched after and looked after (both flowering about Midsummer Day). *Lysimachia thyrsiflora* and *Euphorbia epithymoides* (Bab. Fl. Bath. p. 44).

The former (*Lysim-thyrs*) is very rare in the south of England, but grows in bogs adjoining or very near to the Horse and Jockey Pond near South Wraxall. Broome and I found it there in great abundance June 24, 1853. In the same bog may be found some other notable plants, especially *Ranunculus lingua* (Great Spearwort Crowfoot).

(9) The *Euphorbia* (spoken of above) was not uncommon formerly in the lane (behind the R. C. Cemetery) leading to Combe Down, but I believe it to be extinct there now. But it still exists, and in some plenty, in the wood mentioned in

"Babington's Bath Flora," p. 44. This wood was cut down one year, when Broome and I found it in full flower, and in profusion all over the ground. When the wood grows again, only here and there stray plants are to be met with near the edges of the wood and gate of entrance.

(10) Look for *Polygonum bistorta* (Snake weed) on the left side of the brook at St. Catherine's.

(11) At the top of St. Catherine's Land, in a pasture to the left hand, as also in a wood adjoining, Wild Daffodils grow in abundance, if they have not by this time been all rooted up by the country people.

19, BELMONT, BATH;
July 5th, 1893.

DEAR Mr. MARTIN,

I thank you much for your official notice, as Secretary of the Field Club, announcing the kind way in which my letter to the Members had been received, accompanied by the desire that the same be published in the next number of the Proceedings. I feel much honoured by this arrangement. But with regard to what you call the Appendix, by which I supposes you mean what I called "Suggestions," I merely meant them as hints, or notes to assist those Members who are disposed to take, from time to time, and according to season, short botanical walks, in order to see whether our rarer plants are still in their right places. If the Club *wish* to have these suggestions published along with the letter, I make no objection; but in any case, a *Note-book* should be kept by the Secretary, in which such walks, with date and direction, or where to, should be recorded, along with the results obtained.

Believe me,
Dear Mr. Secretary,
Most truly yours,
L. BLOMEFIELD.

Chapel Plaster, near Box, Wiltshire. By THOMAS BROWNE, Esq., Architect.

(Paper read in the Chapel, October 10th, 1893.)

This interesting little building is situated on Corsham Ridge, about one-and-half miles from Box. Aubrey mentions it as heretofore a place of entertainment for pilgrims that went from Malmesbury to Glastonbury.

For many years it had been used as a cottage, and as an out-house to an inn, that formerly occupied the site of the adjoining premises, and latterly it has been used as a lumber shed, and had become very much dilapidated.

The building comprises a nave, chancel, North transept and West porch. The total internal length is about 40 feet, and the width of nave 10 feet.

The Rev. Edward Northey, the owner of the property, being desirous of having it repaired and restored, put the work in the hands of myself and partner, Mr. Wallace Gill.

We found that large portions of the north and south walls of the nave were in a ruinous condition, and required rebuilding, and a large amount of repair was necessary to the rest of the walls. Several of the original windows had been blocked up with masonry, and an outside stone staircase of recent date was built up against the South wall for access to an upper floor.

All these obstructions were removed and the windows re-opened.

The style of work of the original building seems to be mostly early 15th century, but a great many alterations have been made at more recent times, and several windows of 17th century and later date inserted to adapt the building for a dwelling-house.

The earliest alteration seems to have been the formation of an upper story over the nave, and the oak beams of this floor now remain, but the turret staircase at the South-west angle has long since been destroyed with the exception of the upper and lower

doorways. About the same time the transept would appear to have been walled off from the nave, and doorways and fireplaces inserted. There appears also to have been an upper floor formed in the transept, but this has also disappeared.

At a later period perhaps, a huge chimney was formed at the East end of the chancel stretching all across the width, and resting on a large oak beam, the ends of which were inserted into two small windows of very early date in the ground floor. Part of the East wall was also cut away for the formation of an oven on the outer side, and also for a boiler and flue on the inner side on the South-east corner.

The chimney was so dilapidated that I decided to pull it down, and on doing so there was found in the East wall a group of three large niches of very good design, but much damaged by heat and smoke. The projecting canopies and corbels had been cut away, probably in forming the chimney, but fragments of the canopies were found in the loose masonry, and portions of the mouldings having ball ornaments and carved crockets.

The central niche has a curious circular flue, about 12 inches in diameter, built partly in the niche and partly in a buttress on the outer side of the wall. The front part of this flue has been nearly all broken away, but fragments of it were found, as also a semi-circular cap stone to go near the top of the niche.

The lower part of the flue has been splayed out and brought to the front, but all the work below down to the ground had been destroyed with the exception of two jambs of a recess about 4 feet wide and 3 feet high. A broad shelf was carried on either side of this recess at the East end, and returned for a short distance along the North and South walls. The recess is so clean that it does not appear to have been a fireplace, and the flue is only slightly stained with smoke which seems to have come from the oven and boiler.

The upper part of this flue was evidently destroyed when the large chimney was formed, as at that time the East gable appears

to have been re-built. This I found was in bad condition and had it again re-built. In doing this work two of the flue stones were found lying sideways in the wall and they have now been re-placed in their proper position, but nothing was found to show how the flue was finished at the top.

It is conjectured that the recess before mentioned was intended as a place for the altar, and the broad shelf for a retable. The flue being used for hoisting up a lantern to guide the wayfarers over the hill.

There is in the corner of the North transept a somewhat similar flue of rather smaller diameter, but here again there is nothing to indicate how it was finished at the top.

In Baring Gould's recent work on "Modern Survivals," &c., he refers to several instances of flues built in churches in connection with lamps.

The walls of the chancel and transept appear to have been intended for finishing at a lower level than the present eaves, and the East and North gables have apparently also been intended for roofs of a lower pitch, and afterwards raised.

The present main timbers of the roof probably belong to an early period of the building, but the first intention seems to have been to cover the chancel with stone slabs resting on arches in a somewhat similar manner to the tower roof at South Wraxall Church.

Three of the springers of these arches were found near the East end on removing a casing of loose rubble stones, but the scheme does not appear to have been carried out (probably owing to the walls being found too weak) and the walls were raised up to receive the timber roof.

In the North transept are the remains of a good three light early 15th century window which I have had carefully restored.

At the West end of the nave is a very good 15th century doorway with shields in the spandrels; and above this, but somewhat out of centre, is a large and handsome square projecting

lantern niche, pierced on the sides as well as the front, and with a richly moulded and traceried head and finial. Over this again on the nave gable is a square bell turret.

The West porch is of later date than the nave, and is very plainly built, with a small outer door, and a window over the same. There are the remains of a holy water stoup on the South side of the door towards the road.

The building presents many curious problems for the archæologist as well as for the architect, and the work done last year, in uncovering and revealing so many interesting features will no doubt attract the attention of some learned men who may be able to throw more light upon the subject of the original purposes and design of the building.

The repairs have been carried out with the utmost care to preserve all the old work and wherever any part had to be rebuilt the old stones were replaced in the exact positions which they previously occupied.

Some further repairs will probably be done this summer, and it is the intention of the owner to devote the building for the purposes of a mission room or chapel, and thus preserve the place from any further risk of damage or injury.

There are interesting articles relating to the Chapel in the "Gentleman's Magazine," vol. iii., new series January to June, 1835, p. 143, also in the "Wiltshire Archæological and Natural History Magazine" vol. x., 1867, and in the "Wiltshire Collections," Aubrey and Jackson. 1862, p. 59.

The Weather of the past Season and its Effects on the Garden. By the Rev. CANON ELLACOMBE, M.A., President-Elect.

Read December 13th, 1893.

It would be very difficult for any member of this Club, and it is impossible for me, to open our Winter Session, especially with

a paper on "Weather and Flowers," without some reference, however short, to him who was at once our Founder and President, and a great authority on everything connected with the Weather and Flowers, and who has been recently taken from us. I shall say very little, because I look forward to our Vice-President's paper in January; yet something I must say. I have on more than one occasion tried to put before you the immense advantage that it has been to this Club to have had Mr. Blomefield for so many years, not only as our Founder and President, but also as one of the most active members even to the last; and for myself I have always considered it a great privilege that he admitted me among the number of his friends. It has been a great pleasure in my life to have known many scientific men, but I can honestly say that I have never met with anyone who more nearly approached my ideal of the truly scientific man—always learning and always ready to impart knowledge to others—with no scorn for those who knew so much less than he did, and with no pride in his own great knowledge—never thinking that he had learned all that could be learned about any single thing; and showing the sweetest courtesy, and even humility to anyone who could teach him anything—patiently collecting facts, and noting them carefully but with no desire to twist them into fitting his own pet theories—thinking nothing beneath his notice even though he might not at once see its scientific value, but content to leave it to find its own right place in science, which time and fuller knowledge might allot to it, following in this and in many other ways his old friend Darwin, and like him finding that such pursuits, whether successful or not, made life happy and useful. More than once I pointed out to Mr. Blomefield the description of the natural philosopher drawn long ago by the wise man of old, and I may now without offence apply it to himself; "he had certain knowledge of the things that are, the operation of the elements, the alterations of the turning of the sun and the change of seasons, the circuit of the years and the positions of the stars, the natures of living

creatures, the violence of winds, the diversities of plants and the virtues of roots; because in him there was an understanding spirit, holy, subtil, lively, clear, plain, loving the thing that is good, ready to do good, kind to man, sure, pure, and steadfast." (Ecclus. vii. 18.)

I may connect him with my paper to-day, by saying that from very early years he was a close observer of the weather; not for the object of posing as a weather prophet, but from his desire to search out all he could of the laws which govern the physical world; and besides his other works on the subject, he read several very interesting papers on the Weather to our Club, which are published in our Proceedings. He was also from very early years a close observer and lover of plants. Everything in plant-life had a great interest for him, but his chief delight was in the flora of Great Britain, and especially in the flora of the neighbourhood of Bath, and on this too he contributed valuable papers to our Proceedings.

I will say no more on this subject, but I could scarcely say less; yet before I leave it, I hope I may be allowed to add one sentence of a personal nature. You have been kind enough to nominate me as Mr. Blomefield's successor in the Presidency of this Club. On that I will only say now, that while I consider it a great honour to have been so nominated, I consider the honour to be largely increased by your thinking me in any way fit to succeed him as the second President of the Club. I cannot expect or hope in any way to equal him as President, for indeed it would be hard to find his equal as President of a Field Club. I can only say that I shall, however feebly, try to follow in his steps, though I feel very keenly that it will be a case of *sequar non passibus æquis.*

I now come to the real subject of my paper—the weather of 1893, and its effects on the garden.

It will be most convenient to take the twelve months from November 1st, 1892 to November 1st, 1893, and a short record of

the weather of each month will help us to gauge the weather of the year accurately. You will remember that the autumn of 1892 was fairly mild. In November there were five days on which the thermometer was below 32°, but the frosts were very slight. In December there were sixteen such days but the frosts were very slight, so that the mean minimum for the whole month was only 32°, yet in the last week the frosts were severe, and on the 27th the extreme minimum of the year was reached, the thermometer going down to 17°. From that time for nearly three weeks there were almost continual frosts, and there were fourteen days of frost in January with little wind and almost no snow. The rainfall of January was a little over two inches and at the end of the month the thermometer was up to 52°. In February there were four days of slight frost, but there was over three inches of rain, and the thermometer reached 57°, and the month might be called almost favourable throughout. Then began the bright fine weather which lasted so long. March was fair all through with slight frosts on three days, with the thermometer reaching 65° and only four-tenths of rain, though rain was recorded on eight days. In April there were two slight frosts, the last of the season; the month was bright all through, the thermometer reaching 79° and the rainfall only ·06, which fell in one day. May was almost equally fine but not quite; the thermometer reached 77°, and there was a rainfall of 1·7 spread over six days. June was a splendid month though rain was recorded on eleven days; the thermometer reached 87°, and there was one inch of rain. In July there were a few wet days in the middle of the month, and rain altogether on fifteen days, making a rainfall of 4·3, but on the whole it was a fine month with the thermometer reaching 83°. August also was a beautiful month, with 1·7 of rain spread over ten days, and the thermometer reaching 86°. September was equally fine, with 1·4 of rain spread over fourteen days, the thermometer reaching 77°. In October the weather began to change; it was on the whole a bright month, the thermometer reaching 69°, but

there were 3·4 inches of rain much needed, and on the two last days of the month there were frosts, and the glory of the garden was at an end for the year. The outcome of the year was this; nearly seven months of bright sunshiny weather with very slight intervals of rain; a warm but not an oppressive summer, with very little dew at night and almost no thunderstorms; and bright blue skies and clear atmosphere throughout. The only summer with which we can at all compare it was the summer of the Jubilee year, but that was in many respects very different. In that year there were three beautiful months of true summer, with very little rain; but it did not begin till the middle of June, and was preceded by a dull and wet spring; and that entirely altered the conditions, and so produced very different effects in the garden.

The effects of the long summer in the gardens this year were very remarkable; and in speaking of them I shall confine myself as much as possible to my own garden; and so speaking from personal observations shall be able to speak with more certainty.

The results were not altogether good, and it will be better to clear away first the bad side of the account. It has been a most disastrous year to all newly-planted things, and especially to newly-planted trees and shrubs. Many of them promised well for a time, but they could not stand the prolonged drought before they had got a good grip of the ground to enable them to draw their necessary supplies from the soil. For many plants, but especially for newly-planted ones, no amount of watering will supply what is wanted, and that is a moist atmosphere especially at night. It was also a very disastrous year to plants which had been long established, but had been weakened by previous bad seasons, and were struggling back into strong life. For you will remember that the two previous winters had been very severe; and when you think of the hard frosts of December and January last, it is easy to understand that the constitutions of many plants had been sorely tried. Still many were not killed, and would have been able to make a successful struggle for life if there had been

a mild and dripping spring, but they could not fight against the long continuance of bright suns and a dry atmosphere, and many of them died. That then was one item on the wrong side of the account; another was the great abundance and luxuriance of the weeds. The abundance cannot altogether be put down to the bright summer; it arose from the wet autumns of the two previous years when the destruction of the weeds was almost an impossibility. In that way they had become well established, and then they seemed to revel in the bright sunshine of this year. I will name two particularly. I never saw dandelions so abundant or so magnificent. I very much admire the dandelion; in leaf, flower and seed, it is one of the most beautiful plants I know, and I often wish it was not such a weed that I might grow it as one of our most brilliant flowers. This year it surpassed itself in brilliancy, and I often stopped to admire the size and the depth of colour of the flowers in the hedgerows; and I was not, and indeed never have been, surprised at the praises it has won from some of our best poets, such as Tennyson and Jean Ingelow. The bright sun, and still air also produced the beautiful heads of seed in great perfection and I am afraid in too great abundance; and many of you will remember the grand specimens that we gathered in the churchyard of Malmesbury Abbey of its near relation, the wild salsafy. The other weed that was produced this year as abundantly, and even more unpleasantly, was grass. It is quite remarkable how our flower beds have become almost covered with strong plants of grass; I am sure that in my own garden there are several borders which would by this time have been quite covered if let alone. This is easily explained. There has been exceeding little lawn mowing this year. The lawns like the fields produced no growing grass for many weeks, but on the lawns, as in the fields, the grasses, though very dwarf, went to seed, and the seed was scattered on the borders which were well warmed and ready to receive them, and there they soon germinated, and produced abundance of plants. The same thing

occurred with the large grasses, the bamboos, of which I grow several species. They made no growth at all during the hot weather, but as soon as the drought was over they sent up vigorous shoots, but too late to reach their full growth. I should not have been surprised if some of them had flowered, but I am glad to say they did not; for when a bamboo flowers, it dies.

So much then for the bad side of the record; now for the other side. Surely it was a summer of prolonged delight, it was something to record and remember that for six months we could be in our gardens under a cloudless sky almost every day and all day long. That is the general aspect of the summer; but there are many particulars well worth noting; and first we note the flowers. Flowers of all sorts, with some few exceptions, have been most abundant. The one great exception was with the lilies, which in my garden were dwarf and stunted, and very poor in flower. But after making that exception and a very few others, think only what the roses were; they were in masses, and though the hot sun faded them sooner than usual, they seemed to come again and again. Not only was this the case with the hybrid perpetuals, but with the summer roses as well, and even with the spring roses, for the Banksia roses, both white and yellow, were in good flower in October, so that I am sure I could pick roses from March till the frosts came at the end of October. But there were many flowers which I saw this year almost for the first time. I may mention these few, the *Eulalia zebrina* which I never saw in flower before out of Devonshire; the *Osmanthus ilicifolius*, the *Asparagus verticellatus* and *acutifolius*, the grand *Hibiscus grandiflorus* from the Southern United States which in former years did not produce even its buds till October and never came to perfection, but this year produced both flowers and seeds; and the Japanese *Bignonia* or *Tecoma grandiflora*, which I never saw in flower out of doors till this year, though it has often formed buds.

From these few flowers I pass to the fruits, meaning by fruits all seed vessels. To me the most interesting was the Japanese

Orange, *Citrus trifoliata.* I have had a few small fruit on my tree in previous years, but they did not ripen. This year the tree was covered with blossoms in the Spring, and as we had no late frosts, I had plenty of beautiful fruit which fully ripened and produced good seeds. The *Catalpa* had an abundance of fruit like long French beans; this also fruited in the Jubilee year. The *Cassia Marylandica* produced abundance of fruit and good seeds for the first time, which was also the case with *Phygelius Capensis; Caryopteris mastacanthus; Aralia spinosa,* very elegant in fruit, like a delicate ivy to which it is closely allied; the common Box tree, *Magnolia Lennei,* with brilliant scarlet berries, and the fine *Asparagus verticellatus.* Outside my own garden I was pleased to see in the Botanical Garden in the Victoria Park the curious fruit of the Chinese *Xanthoceras sorbifolia,* and the very pretty berries of the *Clerodendron trichotomum.* I have both these in my garden, and I believe older plants than those in the Park, but I have never had fruit on them. And it is rather curious to note trees that have not fruited this year. There are no holly berries, and very few berries on the thorn trees; I have had no fruit on the Japanese *Diospyros,* or on the Christ's thorn, though I have had them in other years not so favourable; nor have I had fruit on the *Kohlreuteria* which was covered with its golden pods in the Jubilee year; and pomegranates in Bath, though they have formed their fruit have not ripened them. But it is quite certain that this non-fruiting arose not from the peculiarities of this year, but from the weather of last year, and perhaps even the year before.

The autumnal tints were wonderfully good; and that must chiefly be put down to the bright summer, but partly also to the absence of early autumnal frosts. The late Miss Marianne North told me that of all trees she knew, and she had seen trees in all parts of the world, none could compare in beauty of autumnal tints with the *Salisburia*; but I never realized the truth of this till this year. I have a fine specimen on my lawn, and the autumnal tints came on gradually, a lovely pale gold colour,

beginning with the lower branches and slowly spreading to the top, and lasting in their beauty a long time. The autumnal colour of the Tulip tree is almost as beautiful, but with this curious difference. As long as the leaves are on the trees they are of a fine golden colour; but as soon as they fall, they at once become of a dull ugly brown, whereas the leaves of *Salisburia* retain their colour long after they have fallen, and form a golden carpet underneath the tree, until they are swept away. I grow a good many species of vine, and they all showed a wonderful wealth of colour; though their near relation, the *Ampelopses*, were not by any means so brilliant as I have often seen them, and the tints of the *Parrottia* were very poor.* And in connection with the autumnal appearance of the garden, it is worth noting that many people thought that we should have no autumn flowers on account of the early flowering of most of the plants, but the alarm was needless. The gardens this autumn were wonderfully gay, mine certainly was. Most of this, no doubt, was owing to the summer bedders, which this year had in many gardens an increased value; but leaving them out of the question, and without entering into details I can say that my garden in September and October was bright and gay. I rather expected to see an abnormal growth of Spring flowers; but it really was very little more than in ordinary years; there were a few primroses, as there always are; *Triteleia* showed a few flowers, and some of the Narcissi are showing their leaves well above ground, but speaking generally things are not too forward, but are, in gardener's language, in their right place. But I have one remarkable exception to this; I have had for many years a good plant of the *Mandragora autumnalis* from S. Italy and Greece. When I first had it, it flowered in the Autumn, its normal time of flowering, but year by year it altered its time, and for several

* Since writing this, the first volume of the Index Kewensis has been published; and in it *Ampelopsis* disappears as a genius, and all the species are placed under Vitis.

years past it has always flowered in the Spring. This year, I suppose it thought it was again in the South ; it sent up its curious leaves at the end of September, like a gigantic green star lying flat on the ground, and its beautiful flowers have been in great luxuriance all through October and November, and are still in their beauty. (Dec. 16).

There are two accidental curiosities which must be entirely put down to the hot summer. One is the re-appearance of long-lost plants. I have two such that are worth mentioning. I have good seedlings, not very near together, of some *Cytisus*, now healthy young plants ; and yet I cannot call to mind ever having had a *Cytisus* that would produce such seedlings. The other case is much more curious. Many years ago, perhaps twenty or more, I used to grow the pretty little Cape Plant, *Bulbine annua*. I am sure it is at least ten or twelve years since I have seen a plant in my garden ; but this year they are in abundance and in many parts of the garden ; and what adds to the curiosity is that they have come up in the same way in a friend's garden in the Isle of Wight, and he also cannot call to mind when he last saw the plant in his garden, but he is sure it is many years ago.

The other accidental curiosity I would mention is the effect of the summer on our store fruit. Apples are keeping very badly ; and in most cases ripened prematurely. Pears and grapes too are ripening badly, and keeping badly. The greengrocers tell me it is the same with chestnuts, and the further result is that the cider of this year will not keep, and housekeepers are mourning over the premature spoiling of their jams by mould. I suppose in the case of our own fruit, especially apples, the sugar has been formed too rapidly, and formentation has set in, and this may help us to understand why it is that apples do so much better in temperate regions than in hot climates ; the fruit to be good must mature slowly. But this is only a guess ; I do not profess to know all the mysteries of an apple, or I might be able to explain how it is that the apple is the hardiest fruit tree known,

ripening its fruit as far as 64° North, yet apple blossoms are more tender than those of the apricot and peach.

Leaving the garden I should like to mention one memorable result of the fine summer. If it has been a great delight to the healthy and strong, it has been an untold delight to the weakly and invalid, and in many cases a prolonging of life and even a renewal of strength. In my own parish I have a remarkable proof of this. The ecclesiastical parish of Bitton has a population of 1,200, and in the thirteen months from November 1st 1892 to December 1st 1893, there have been only three deaths, and of those three one was a child of a few weeks, sickly from its birth; another was an older child who died from the effects of rheumatic fever, but whose life was certainly prolonged for at least three months, and happily prolonged on account of the bright sunny weather; the third only was a man of full age. When you remember that 17 in 1,000 in a year marks a healthy area, you will see something of the effect of a bright summer in reducing even that to 3 in 1,200 in 13 months.

The interesting question now remains what will be the effect of the long hot summer on the present winter and on the gardens next year. I do not pretend to be a weather prophet, but I do not suppose that the weather that is past has very much effect on the weather to come, yet I am very hopeful that this winter will neither be long or severe. It is very true that we have had severe frosts and several of them rather earlier than usual, but an early winter is very seldom a severe or prolonged winter; and the late Sir Robert Christison, a very accurate observer gave it as his experience for 40 years that sharp frost late in October and early in November had been always followed by mild winters.*

* "A period of from four to seven days of continuous sharp frost in the last week of October or first week in November. In the course of forty years I have not met with one exception to the rule that the frost then ceases and the winter continues open as far on through the winter as the last week of January. My observation does not carry me further." *Life of Sir Robert Christison*, vol. ii., p. 127.

I have little faith in weather cycles but I have great faith in weather averages, and it would be against all experience to have four severe winters in succession. I call that a severe winter for the garden when there is much skating; for skating requires a continuous frost and very little snow; and it is a continued frost that works mischief in the garden, especially if there are high winds and no snow. I am sure that a fortnight of cold weather with the thermometer at 25° is more destructive to plant life than two or three nights with the thermometer at 15° or even 10°. Certainly it is so if the ground is fortunately covered with snow during the lower temperature. But all this is literally *in nubibus*, and there we must leave it; but whether the winter is severe or not it is quite certain that the long, hot summer has added much vital strength to all plants. There was during the autumn a formation in many cases of sappy shoots, which will probably be cut off even if the winter is mild, but the main life of the plant will be safe. And from all present appearances next year will be a good year for flowers and fruit. We can gather that from the few which show the promise of next year; such as the Pyrus Japonica and the early Magnolias which are full of flower buds, the hazels which are covered with catkins, and the pears and peaches which are well provided with plump fruit buds. And I should expect nearly all bulbous plants to flower well next year; for most bulbs rejoice in a good roasting when dormant, and that they have certainly had this year.

And so I bring my paper to a close. Much might be said on the agricultural aspects of the year, but that is outside the limits of this paper. Much also of interest might be said on the effects of the summer on animals, birds and insects, and some of that I hope will be told us by some other member of the Club more competent to do so than I am. My work was limited to the weather and the garden, and on these two points there can be but one conclusion. The year has been indeed an *annus mirabilis*, a year which our children and grand-

children will look back to, and when they are grumbling, as they certainly will grumble, at the bad weather of their own day, they will speak with regret of the lovely old-fashioned summer they remember when they were young; a year to be remembered and to be thankful for.

Bath and Early Lithography. By EMANUEL GREEN, F.S.A.

(Read January 10th, 1894.)

The process known to us as Lithography, the art of drawing on stone, was early described as based on the dislike which water has for grease and the affinity which calcareous stones have both for water and grease or greasy substances. As with other important inventions it was discovered by accident by one Aloysius Senefelder, who born at Prague the son of an actor in the Munich theatre was destined for the law, but all cash supplies being stopped by the death of his father he was obliged to leave his studies and in turn joined the theatre as a singer in the chorus. After enduring the usual poverty here he left this to try his fortune with his pen. This also proved a failure, but during this time he was brought into contact with the printing press and learned something thereby. Especially was he bitten with the desire for some form of cheap reproduction, but having no means to buy a press he made many experiments in engraving; thus it happened that his attention was directed to a stone he had purchased on which to grind some colours, it occurring to him that by writing on it backwards and biting in with *aqua fortis* he could print by pressure with but little trouble and multiply at no cost. The attempt was so far encouraging that he bought a stronger or thicker stone, and having settled on the quality or sort of ink to be used he was preparing this stone for an etching when his mother entered his workroom and desired him to write a list for the laundress who was waiting.

Not a slip of paper nor a drop of ordinary ink was at hand, so the list was written with the prepared ink on the stone and left to be copied at leisure. When about to wipe this writing off the idea struck him to try what the effect would be if an impression were taken direct. This was tried, and encouraged by the result of various other trials he began to foresee the probability of a new invention. Determined to follow up his experiments but being without money he enlisted as a substitute in the artillery receiving a premium of two hundred florins, but on presenting himself for admission he was rejected as not being a native of Bavaria. With every feeling of despair he was obliged to return home without his cash. Next by chance a badly printed piece of music attracted his attention and as this sort of work seemed exactly suited for his new method he arranged with a musical friend who was about to publish some pieces, that they should publish on a joint account, and this was done with fair success. This was in 1796. Experiments, difficulties and failures followed amidst great opposition and ridicule, until by the adoption of improvements and an improved press confidence in success was restored. By the year 1800 the process was so fairly established that a Mr. André a music seller of Offenbach gave Senefelder two thousand florins to learn the business and to have a press of his own. André, assisted by his three brothers, then established presses in the principal capitals, and came to London with Senefelder in 1800, partly on business as his son Philip was settled there, and in part to learn how to obtain a patent. They deposited a caveat or circumstantial description of the invention at the Patent office, and then returned to Germany. These caveats seem not to have been preserved. There is no record in any form in the Patent office. No actual patent was obtained. André, senior, came again to London in 1801, and, with the help of Philip his son, started a press, and then returning home left the son to manage the new venture.

The English name given to the new art was Polyautography,

the especial idea being the multiplying actual writing or drawing in facsimile. There was of course plenty of opposition, especially from the engravers. It was called a mean art and failures were dubbed greasy daubs. Further an almost prohibitory import duty of twenty shillings per cwt. was put on the stone, and this with the heavy duty on paper made success almost impossible. Costly experiments, subject to often failure in the early stage of the art, could not be made on the bare possibility of a perfect impression. The duty on the stone was said to be for the purpose of stimulating search in England for a similar or equally suitable quality, and a reward was offered for such a discovery. None such being found, the duty was removed after three years. From the strong opposition, the many difficulties, and many failures the consequence really of want of skill, the art failed and Mr. André gave up the struggle and left England. His position was taken up by Mr. Volweiller his assistant. André had projected a work as containing specimens of his process and had collected for the purpose drawings done by the best and most influential artists of the time, and parts one and two had been issued in 1803 before he left the country. Mr. Volweiller keeping to the plan issued the following circular, itself very neatly lithographed, and perhaps the first of its kind. As it must be unique it is given in full as showing, better than any epitome could do, the ideas of the time and the plan pursued to obtain patronage.

G. J. Volweiller, No. 9, Buckingham place, Fitzroy square, most respectfully informs the nobility and gentry that he has undertaken the management of the art of printing from stone called Polyautography, lately under the direction of Mr. P. André and continnes (*sic*) the publication of specimens of Polyautography commenced by him.

This work consisting of impressions taken from original drawings made on stone claims the attention of the lovers of the

art in a two-fold respect; in the first place it furnishes very excellent studies by the best artists of this country, in every kind and in every style; secondly, it shows the true and unmixed style of the most distinguished artists, the impressions being taken from the drawings themselves they are but multiplied originals. Mr. Volweiller has had the high honour of laying the work before Her Majesty and their Royal Highnesses the Princesses who honoured it most graciously with their patronage. It is published by subscription in numbers containing six drawings each, price 10s. 6d. a number, and six numbers will form a book. The fourth number, which has just been published, accompanies this advertisement as a specimen, and the editor flatters himself that the lovers of the art will kindly encourage him in his undertaking by favouring him with their subscriptions for the publication of so valuable a work; to whose praise it will be sufficient to mention the names of the artists who have already been so kind as to honour it with their drawings, viz., Messrs. B. West, P.R.A., T. Barker, J. Barry, H. W. Chalon, R. Cooper, R. Corbould, W. Delamotte, H. Fuseli, R.A., C. Gessner, W. Hawell, T. Hearne, Ch. Heath, R. Ker Porter, W. H. Pyne, J. T. Serres, T. Stothard, R.A., H. Singleton, R. L. West, and some distinguished dilettanti. The four numbers already published may be had of Mr. Volweiller and the principal print-sellers, and the fifth and sixth numbers which close the first book shall appear without delay.

Those who will encourage the work by their subscriptions please to put their names at the bottom of this; and in the course of two days it shall be called for.

Those who already had knowledge of this art whilst under the direction of Mr. André will find it considerably improved by its application to letter and music printing of which the present advertisememt, as well as the title page and the enclosed sheet of music, are specimens.

For those who are not yet acquainted with this art the follow-

ing short description will be sufficient to show the great usefulness of this invention. A drawing or any other subject intended to be printed is made on a stone with a pen and a particular ink or with a kind of chalk, which may be done with the same facility as on paper, and every person who can draw on paper may draw on this stone. By a simple chemical process this drawing is rendered capable of being printed off in any number of copies without the least alteration of any stroke or dot on it, so that the impressions are perfectly like the original, and by means of this invention the art obtains an advantage never known till now, both in preserving and multiplying the works of great masters in their perfect originality.

In the application to letter-press printing this art may be likewise highly useful, as circular letters, &c., &c., written on this stone may be printed in any number and one hundred fair copies ready for circulation may be taken in an hour.

Amateurs and artists who wish to multiply their drawings may have them printed by Mr. Volweiller who furnishes a stone and the necessary materials for drawing and of whom further particulars may be had.

Having completed the volume by the issue of parts 4, 5 and 6 the title of the published work, in folio, ran :—

By His Majesty's Royal Letters Patent; and under the patronage of His Majesty and their Royal Highnesses the Princesses.

Specimens of Polyautography consisting of impressions taken from original drawings made on stone purposely for this work.

London, published May 1806, by G. T. Volweiller; patentee, successor to Mr. André, No. 9, Buckingham Place, Fitzroy Square.

The first plate, by Benjamin West, is dated 1801, and thus

must be the very earliest; the plates by Ric. Cooper, R. Corbould, W. Delamotte and R. L. West are dated 1802. The plate by Thomas Barker of Bath, is not dated, but it may be placed as done in 1803. Thus this issue brings in our local interest with T. Barker's plate, a full length figure, and so connects Bath with the first publication on the subject. Notwithstanding that the President of the Royal Academy appeared as a contributor and that the critics considered the volume a proof of the accuracy, distinctness and minuteness, with which this work could be done, the opposition of the engravers was too strong, and the trade could not be induced to take the new art up. Persevering efforts however were continued especially directed to enlist the sympathy of amateurs. From the Polyautographic office was issued another circular, which shows us how this was done and the direction in which the process was pushed. It is entitled :—

Terms for amateurs who wish to draw on stone and to have impressions taken from it, Mr. Volweiller lends a stone, gives the ink and chalk necessary for drawing, and delivers 50 impressions of the drawing made, at £1 11s. 6d.; or 25 impressions at £1 1s. If more impressions are ordered the price of 100 copies of drawings in chalk is £1 11s. 6d; 50 copies 16/-; 25 copies 9/-;

100	copies of	drawings	in ink	£1 1s.
50	,,	,,	,,	12s.
25	,,	,,	,,	7s.

The paper to be charged extra.

The stone with the drawing must be returned in a fortnight's time; if kept longer it will be charged with half-a-crown per week.

After the delivery of the first twenty-five or fifty impressions the stone remains eight days for further orders and if these are not given within that time the drawing is erased. If it is desired to let the drawing remain longer on the stone five shillings per

month will be charged. If a single or a few prove impressions are desired they will be charged one shilling a piece.

The patronage resulting was again so small, and the sales continued so few, that Mr. Volweiller to avoid further loss than he had already incurred closed his establishment and left England in 1807. Besides the other difficulties, there was at this time but little appreciation of art in any form. The best engravings were looked upon as simply a lot of black lines on white paper. Mr. Landseer too, in his Lectures on Engraving, whilst willing to allow there were some possibilities for the new art, warned his auditors "not to be led away by the false lights of a specious prospectus."

In 1806 one attempt was made to use the process in a book illustration, viz., by J. T. Smith in his Antiquities of Westminster, published in 1807. This "new mode of producing prints" is minutely described, and besides the author, there were present two eminent medicos and a scientist to watch the process. The plate was drawn with a common quill pen dipped in the prepared ink, which was the trade secret long closely kept. The great advantages expected were frustrated by a misfortune or accident, as after printing off three hundred copies the stone was laid aside for the morrow and when then worked, the drawing being dry stuck to the paper and was drawn away from the stone. Confidence being thus lost the attempt was not repeated, a copper-plate being substituted. Thus some volumes of this work have two plates, others only one. This accident was, perhaps, the greatest blow the new invention could have met with.

After Volweiller's departure the art ceased, was entirely neglected, and seemed likely to be lost, had not Mr. Redman, one of his assistants, been discovered and employed at the Horse Guards in 1811, for printing plans of battles, circulars, &c., but not getting here sufficient pay he left the work, and so lithography again ceased to be practiced in London.

Mr. Redman next moved to Bath where he started for himself in 1813. Probably more than one reason influenced this move. Mr. Thomas Barker may well be considered to have had something to do with it. Bath, too, was a literary centre, the only provincial place where an artistic coterie could be found; and where some good letter press work could be, and was, executed. Further the stone required was supposed to have its counterpart in the neighbourhood. The stone brought from, and supposed to be peculiar to, Germany, as in fact it still is, was thought to be "precisely the same as the White Lias or Layer found in such great abundance in the immediate neighbourhood of Bath, being the stratum lying under the Blue Lias, used for burning into lime, paving the streets, and for coarse walling." For the purpose of lithography no other stone was considered so eligible, as it took a very good polish, was compact, fine grained, and absorbed water, and it could be procured of any superficial dimension required. The "immediate neighbourhood" here was Corston, but this encomium did not hold good as in the end this stone was found to be too soft and porous and had to be abandoned. As showing how an error may creep into a statement, either from want of knowledge or careless inexactness, a writer, writing on this subject some years later, in 1829, says, "The stone used is not unlike Bath stone, the best substitute hitherto discovered in England." So that here the White Lias quickly becomes Bath stone; hardly acknowledged to be the same thing.

Mr. Redman being in Bath the new art was briskly pushed, especially as before amongst amateur draughtsmen. In this year was printed at Bath in octavo, the very first pamphlet on the subject ever printed. It is entitled :—

> Lithography, or the art of makings drawings on stone for the purpose of being multiplied by printing. With two drawings. By Henry Bankes.

This very interesting pamphlet consists of twenty-three pages, and is dated September, 1813. It gives full particulars of the

process, and the author in his eagerness writes :—"What a rich inheritance might have descended to us if the old masters had possessed this art. The rapid effusions of the imagination, the spirited sketches and brilliant first thoughts, never perhaps realised even in the finished painting might have been given to the world with unlimited liberality. Whatever the poet has effected by means of the press, the painter would have achieved with the same facility. How many works of topographical description or discovery in natural history have been imperfectly illustrated for want of drawings which this art might have afforded at an expense no longer an objection." The specimen drawings given are not signed or initialed, but in style they closely resemble that of Mr. T. Barker. One, an old woman seated and wearing a large slouched hat, is almost the same figure as one by him. This pamphlet has another interest as it tells us that this process was first called Lithography at Bath; in fact the title page gives the first example of the use of that name. On page 8 the author says, "I have taken the liberty to change the name to Lithography with a view to confine the invention to drawing as strictly the first branch of the Fine Arts. It never can equal an engraving on copper or indeed answer any purpose to which the graver is appendix. It has a higher destination from which it ought never to be diverted." The author also says that the stones of Polyautography had passed into his possession and that he proposed to republish in parts, but this does not appear to have been done, or it would have further connected Bath with that publication.

Mr. T. Barker was early busy with the new art, and besides some single impressions, in this year, 1813, he published a folio volume at "the flattering solicitation of friends" which is the first private venture in England; Polyautography being a trader's issue and more of the nature of an advertisement. The work is entitled :—

Forty Lithographic impressions from drawings by Thomas

Barker selected from his studies of Rustic Figures after nature. Published by subscription at Bath, December.

This may be taken as the first printed use of the word lithographic. The plates all figures, are mounted in the folio and are all good; some, being on toned paper, are specially strong. The volume as a whole must have given a clear idea of the intention, as being the reproduction of drawings exactly showing every characteristic of the artist. No more than two hundred copies were promised at a subscription price of £3 3s., non-subscribers £5 5s., and had the work been a success this would have produced a good profit. The list of subscribers, however, shows but one hundred and seventeen for one hundred and eighteen copies, and probably there were no other sales.

Mr. Barker also planned the issue of a volume of sketches from Italian peasants, but this was never done. Mr. Barker next issued in folio, in 1814, another volume differing in style, for the purpose of showing how the art could be applied. This work is entitled :—

Thirty-two Lithographic impressions from pen drawings of Landscape scenery. Published at Bath. Printed under the direction of Mr. Barker by D. Redman.

Fifty copies only were printed. The title cover is lithographed, the etched part being by Mr. Barker and the written part by C. Marsh. The plates are landscapes, some from the neighbourhood as Wick Rocks and Mells, others from Wales. They are drawn with a pen as free etchings without shading. Close examination shows them to be good and pleasing. Four numbers was the issue originally planned at one guinea and-a-half each number, but this plan was changed and the whole was put into one.

Several amateur attempts were at this time done at Bath. Mr. Richard Warner did a sketch portrait of Jedediah Buxton. Sir Richard Hoare did a large landscape, and there were others by Mr. Lowther and Mr. W. Hagarth. Mr. Hutchinson did portraits of Capt. Baillie, Mr. Lintern of Bath, John Colston Doyle, and Mr. Geo. Wilkinson. Others were by Mr. Jennings and Mr.

Chas. Godwin. The local activity resulted in the production of a little collection of drawings in small quarto size, undated, but probably 1814, called :—

Eight Lithographic impressions by the following gentlemen artists of Bath :—Mr. J. Hibbert, Mr. Hulley, junr., Mr. West, Mr. Morgan, Mr. Marsh, Mr. Hayes. Printed from stone and published by D. Redman.

The title cover is by Mr. Hayes. Mr. Morgan gives a view at Hampton. Mr. Marsh two views of Hampton ferry, one being in chalk ; and Mr. Lowther also gave one in ink and one in chalk. But after all, Redman's attempt to establish himself and the new art at Bath proved a failure, and he returned to London where he is found in November 1815, at 15, Bishop's Walk, Lambeth. He here issued a card prospectus, which reads :—

D. Redman, Polyautographic printer.

Ladies and Gentlemen may have their original drawings multiplied to any extent on reasonable terms.

100 impressions from a pen drawing, including use of the stone for one week	8/-
50 ditto	6/-
25 or less ditto	5/-
100 impressions from chalk drawing, including prepared crayons and use of stone for one week	10/6
50 ditto	8/-
25 or less ditto	6/-

Larger numbers a liberal allowance. Paper charged extra, but may find their own.

Stones may be purchased for exclusive property at 10/6.

For the execution of drawing and return of stone one week ; beyond that 1/6 a week charged until amounts to 10/6, when the stone will be considered paid for.

Entire strangers will not be offended at a deposit of 10/6 being required from them.

By his zeal and determination and by forcing public attention Redman just kept the thing alive for a short time, but with no successful result to himself, and so he too disappeared. Failing trade support, the appeals had always been made to private artists. This could hardly be expected to produce a great profit, as but few could have any reason except curiosity, for producing their drawings in any numbers. Eventually Mr. Ackerman, a printseller, interested himself, and started a trade press in 1817. An amateur however had the first attempt with it. There were extant in 1851 the following lines by the author of Dr. Syntax :—

I have been told of one
Who being asked for bread,
In its stead
Returned a stone.
But here we manage better
The stone we ask
To do its task,
And it returns us every letter.

(Signed) Wm. COMBE, January 23, 1817.

Underwritten : This is the first impression of Ackerman's Lithographic press.

In 1819 Ackerman printed a book entitled :—A complete course of Lithography, &c. Herein he expressed an anxious wish to see the process naturalized. Some specimen plates, not good, are given, and these were the next issue after the Bath volumes. Thus at last taken up by the trade, slow, very slow progess was made, for yet twenty years had passed before it became thoroughly established. The fears of the engravers have been realized, as at the present time their art has almost ceased to be, ousted by lithography or the various improvements upon it.

This is an age of wonders, wrote one in 1829 ; of gas, steam, and lithography. The writer little dreamed of the revolution and unrest which would result from these inventions. We, too, are


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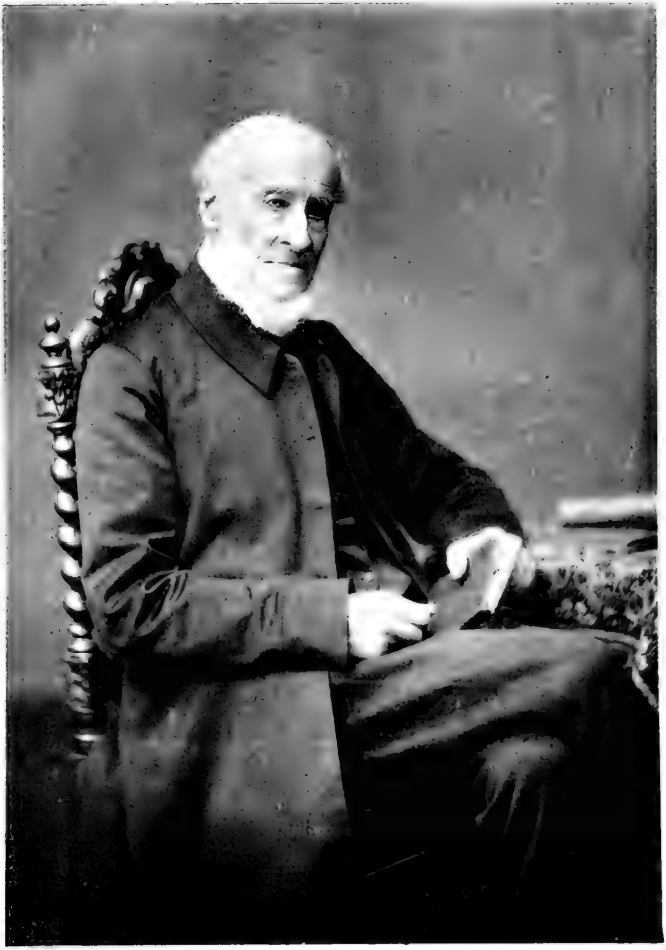

AGED 85.

very truly yrs
L. Bloomfield.

living in age of wonders; of photography, of electricity, and a projected travelling at the rate of one hundred and fifty miles an hour. Yet with all our greater experience and more accustomed, wider, philosophy, we cannot see the result; we must fain acknowledge that we know not whither they will lead us.

Reminiscences of the late President and Founder of the Club.
By H. H. WINWOOD, M.A., F.G.S.

(Read January 10th, 1894).

Mr. President and Members of the Bath Natural History and Antiquarian Field Club—It devolves upon me again to recall to your memories the passing away of another great man from our midst. Some of you may remember that in the year 1891 allusion was made to the fact that the stars which indicated the original Members of our Club were fast disappearing and that only one then remained on the list. Now it is my lot to remind you that this last has gone, and none remain. Our late President and Founder has passed away from us ripe in honours and in years. Were an apology needed for my venturing to attempt any record, however slight, of the work of such a man, my claim rests upon the fact that I have been honoured with his acquaintance ever since the year 1861, and feel proud of being classed among his friends. His example has always been before me, and the wisdom of his advice in all scientific matters wherein I have had to consult him has been my chief guidance and support. Born, as he often reminded his friends, at the end of last century, he sank in "calm decay" on the 1st of September, 1893; having thus passed the allotted three score years and ten, without sorrow yet not without labour, for up to the last fortnight he was busily employed in his accustomed literary work. Indeed it is to be feared that it was owing to the unflagging interest he took

in perfecting the arrangement of the library of Scientific works he had given to the Royal Literary and Scientific Institution, adding fresh books to the valuable store (some 2,000 in number already accumulated there) that his feeble strength of body was overtaxed, and finally giving way under the strain, his long and useful earthly career was terminated. To Leonard Blomefield may the Horatian line be truly applied, "Integer vitæ scelerisque purus."

Leonard Jenyns was born (as he tells us in "Chapters in My Life," printed for private circulation in 1887 and from which I have obtained most of my information) on the 25th of May in the year 1800, at No. 85, Pall Mall, London; adding with his usual accuracy in all minor details, "at 10 p.m."

The youngest but one of seven children—three brothers and four sisters—he attributes what moral and intellectual qualities he possessed chiefly to his mother's side. Daughter of perhaps the most distinguished physician of the day, Dr. Heberden, a scholar well versed in classical and general literature; her mother, the sister of the Rev. Francis Wollaston, an astronomer, F.R.S., and father of Dr. William Wollaston, celebrated for his researches in Chemistry and Optics, and friend of Sir Humphrey Davy, we can understand how this scientific germ developed in Leonard Jenyns into that fondness for Science which he entertained through life. His father, the Rev. George Leonard Jenyns, son of an Alderman of Eye, in Suffolk, Canon of Ely (or Prebendary as then called) and Chairman of the "Bedford Level" and of the London Board of Agriculture, seems to have been a parson of the old stamp, a great farmer, fond of sporting and more addicted to out-door sports than the management of a large parish. His succeeding, whilst young, to the Bottisham Hall property in Cambridgeshire on the death of his second cousin, the celebrated Soame Jenyns, may have been the chief reason for this devotion to country pursuits. Owing to this example before him too we may attribute the son's resolve upon

entering upon his clerical duties to abstain from four things, *i.e.*, *Sporting*, *Farming*, *Politics*, and *Magisterial Business*. His earliest recollection, he tells us, dates from the year 1806, when, between five and six year old, he remembers the funeral of Lord Nelson; a circumstance then occurring calculated to impress itself upon the minds of children. This was the picture of the funeral car being brought up into the nursery and shown to his brothers and sisters. One of the latter, the youngest of the family, has recently deceased in Bath, a few weeks only prior to her brother's death.

At the age of nine years he was sent to a private school kept by the Rev. Wm. Carmalt, at Putney, from Connaught Place, where his father then lived. As some idea of the changes taken place since that time he describes Connaught Place as a street consisting of newly built houses, some still unfinished, and as the last street in London W. of the Edgeware Road, all to the W. being green fields! Tyburn Turnpike was then standing and nightingales were heard in the trees and thick underwood on the Hyde Park side of a high brick wall separating the Uxbridge Road (as then called) from the Park. French seems to have been his speciality at school, rather than Latin and Greek, and at the end of his first year he gained a prize given to the boy who passed his examination best in that language, a small pocket edition of "Robinson Crusoe," now in his library. The boy was father of the man; naturally of a still and quiet disposition he preferred to be left to himself rather than join with his schoolfellows in their games. This he attributes to his weakly constitution showing itself in frequent sick headaches that interfered much in after days with his parochial work, and troubled him till past middle life.

In a book kindly lent me by Mrs. Blomefield containing "Thoughts and Notes" in MS. on many interesting subjects, the following occurs with reference to his health.

"I am unfortunately subject to severe headaches which for a time incapacitate me from doing anything. But when they are fairly over

my head always feels clearer than before. They seem to me like storms which purify the air, rendering it more salubrious after they are passed."

"Neat and tidy in every thing" (as he writes) with a fondness for orderly method and precision, "his clothes, books, &c., being arranged with great particularity" (even to old age being often called "a very particular gentleman") added to all this a taciturn disposition, naturally attracted the attention of the other boys, and gave rise to certain nicknames. Though sensible of the truth of these appellations they were distasteful to him nevertheless.

As regards ordinary conversation he was a man of very few words, but those were always weighty and well considered; the following extracts from "Thoughts and Notes" are well worth quoting as they seem to reflect his matured views on the subject.

"Great talkers are not always wise; nor is every silent man a fool. There are many who talk without thinking; and many who think without talking."

"To converse freely is almost as much an art to be acquired by practice as anything one could name. They who are doomed to live for the most part in solitude and close retirement know how sadly at a loss they sometimes feel in the midst of company. They find a difficulty in expressing their sentiments. And this even tho' perhaps the conversation turns to such subjects as they feel conscious they understand better than anyone else present. We must not always judge of a man's mind from his powers of conversation."

"There are three kinds of persons silent in company. Some are silent because they have nothing in them and have consequently nothing to say; others because they are too shy to speak in the presence of strangers; others again are silent because they are over scrupulous as to what they say and how they express themselves. These last are afraid of being caught tripping, or of making some mistake which, tho' not detected at the time, may be fastened upon them afterwards. Diffident of their own attainments they forbear speaking even on subjects which it is probable they understand quite as well as, or better than anyone else present. Sometimes the

opportunity of making a remark passes by before they can decide with themselves whether they shall make it or not. There is fault in all this; tho', doubtless, the fault is on the right side. We may have too mean as well as too high an opinion of our own knowledge. By never speaking lest we should say something foolish or ill timed society loses the benefit of our conversation, and we lose any improvement we might get by hearing what others say in reply to our observations."

"As there are three kinds of silent persons in company so are there three kinds of talkers; those who talk to the purpose and those who do not, these last being further distinguishable into such as talk what is not worth listening to, and such as talk what they should be ashamed of saying. In the two latter cases the more a man holds his tongue the better."

"'That man thinks,' said I to myself of one in company who had nevertheless taken scarcely any part in the conversation; but from a peculiar cast of his eye arched over by a fulness of forehead,* I felt sure that he had a well stored mind and one habituated to reflection. Some persons think that there is nothing in physiognomy; but what are laughing, crying, and all the other outward expressions of the passions but the impress produced upon the features thro' the action of the mind. The impress is here sudden and more striking but transitory; in the above instance gradual and less striking but permanent. Who cannot distinguish between the vacant stare of the uneducated country-men and the intelligent countenance of a Newton?"

When 13 years old his Eton career commences, and his taste for natural history begins to show itself in his solitary wanderings in the green lanes of Eton after stag beetles; this pursuit, together with "watching birds," seems to have been more congenial to him than cricket or football. To his Great Uncle and godfather, Chappelow, he attributes his taste for natural history, and the following letter, written at the age of 12 years, and the original of which Mrs. Blomefield has kindly permitted me to show you, indicates the bent of his mind at this early age.

* Was Darwin in his mind when these remarks on facial expression were written? (H. H. W.)

"Connaught Place;
"January 26th, 1812.

"DEAR UNCLE CHAPPELOW,

"I have had a great fancy lately to study natural history, and to be a naturalist, as I should like it very much; I have begun by writing out the different genus species and orders of animals, birds, fishes, &c., and I hope as I grow older I shall be able to discover new things in natural history. The books you gave me have been of great use to me in it, indeed, I don't know what I could do without them, as they helped me more than anything else. I am much wiser now in many things than I was before I had the books you was so kind as to give me as they have told me a good deal. The other day I read the life of Linnæus, in which he talks of sitting up all night to study. I liked his life very much, though I do not think I should like to sit up all night by myself to study. I mean if I can to do and act just as Linnæus; therefore I should like to know what you would advise me to do to obtain the knowledge of natural history.

I shall now conclude this letter by remaining
Your affectionate *great* nephew in a *little* compas,
L. JENYNS."

"The above was written when the author of it was *12 years old*."

[N.B.—The last two lines written in a different hand were evidently added by his great uncle Chappelow.]

His fondness for solitary walks at that time acquired and which was one of his characteristics through life fostered that habit of *observing*, *admiring* and *reflecting* so characteristic of the future man. "Nature, (he writes) in its widest aspect, with all its charms—on a still summer's day especially—had a great attraction for me irrespective of natural history pursuits. And it is most necessary to be alone on such occasions in order to drink in as it were, the fulness of pleasure the country yields to the observer apart from company and conversation." Thus led on to the study of Nature the study of the classics was consequently not so eagerly pursued, but we find him alluding with pride to the fact of his Eton Tutor praising a copy of some sixty-six Latin

hexameters (vide MSS. in Jenyns' library) written on the occasion of the first Arctic Voyage of this century under Capt. Ross; Lieut. Parry being the commander of one of the ships which took part in this North Polar expedition. Amongst some of the pleasant acquaintances made during his school days and continued in after life, was that of George Howard afterwards Earl of Carlisle and Lord-Lieut. of Ireland. The two Puseys were also amongst his schoolfellows, the younger of the two not very much above him in the school, not promising in features and general appearance ("an insignificant looking boy" he might be called) and not distinguished for his learning, grew up to be the celebrated Dr. Pusey of after years.

In the year (1817) before going to Cambridge, we hear of him being taken to one of the Sunday evening conversaziones of the President of the Royal Society, at that time Sir Joseph Banks. All the living celebrities of science here met. His introduction to the aged President as "the Eton boy who lit his room with gas," was characteristic.

Such are a few of the earlier incidents of this great man's life; we now follow him to Cambridge.

Entering at St. John's College in 1818 his weak health (the sick headaches he alludes to) prevented him from the study of mathematics, so that he only took an ordinary degree. His becoming acquainted with Henslow, four years his senior, who had taken his degree that same year and who subsequently married his sister in 1823, had a great effect upon his after life and was the beginning of a close and never dying friendship. After his friend's appointment to the Botanical Chair Jenyns added Botany to his other pursuits, and those two remained "*arcades ambo*" in all *Natural History* studies, entomology, conchology and botany till the Professor's death in 1861 (vide Jenyns' "life of Henslow." The result of their combined researches formed the nucleus of what may now be seen in more than forty large folio volumes of phanerogamus plants, besides several smaller volumes of mosses,

sea-weeds and fresh water algæ, deposited in the "Jenyns' library" in 1888—a monument of most laborious and painstaking work!

Besides his botanical pursuits he attended Professorial Lectures on Chemistry, Mineralogy and Geology. The course on the latter subject was being given by Adam Sedgwick recently (1818) appointed Professor, and was probably the first he had delivered. Illustrious names adorn the roll of his acquaintances. Whewell, Julius Hare (thought by Bunsen to be "the most learned man of his age") Thirlwall, Adam Sedgwick, Charles Darwin, Philip Duncan;* who would not be proud of the acquaintance of such distinguished men? Of Thirlwall, who visited him in after life at Swaffham Bulbeck, he relates an anecdote of his jumping over a sunk fence separating the garden from the meadow. "I never thought at that time (he writes) of the jumper rising to be Bishop of St. David's, and less of his ending his days in Bath." This acquaintance seems not to have been renewed, for on the very morning that these two college friends were to meet each other at luncheon the Bishop had a stroke that deprived him of his eyesight and which he survived only a few weeks.

The following remarks on Bishop Thirlwall occur amongst his MS. "Thoughts and Notes."

"I have been reading with pleasure and profit Bishop Thirlwall's letters. After being for some years Fellow and Tutor of Trinity College, Cambridge, he was appointed to a living in Yorkshire before his elevation to the Bench. It does not appear that he neglected his people, but his heart was evidently among his books with which his library—almost his whole house—was filled to overflowing. It was in the retirement of a country village he wrote his "History of Greece," and his studious habits were very remarkable. It was arranged that he should furnish a volume every six months which it seems he had hard labour to effect. He speaks of his whole life as a

* Philip Duncan, one of his most esteemed acquaintances in Bath, died at the age of 93.

struggle with time, reading from morning till night, without feeling any want of relaxation or exercise. It is a marvel that under such a strain he lived so long, dying in the 79th year of his age. We are not surprised, however, when we read that a few months before his death his pen suddenly fell from his paralysed hand, and his eyes lost their sight."

Of the great Whewell, a Master of talk, as of Trinity, we have Sydney Smith's *bon môt* quoted "Science was his *fort*; omniscience his *foible*."

The well known Dean Buckland too was an acquaintance of his, and the following anecdote concerning a visit paid to him, he sent me some time since in his clear hand writing. At the time, 1887, that this was written he was evidently preparing for the press the "Chapters in My Life," printed that same year for private circulation.

"One summer's day, I think in 1844, I was surprised by a call from Dr. Buckland at my vicarage house, at Swaffham Bulbeck. He had come from Cambridge and much wanted to see the Reche Chalkpits, about two miles from my house; well known in that neighbourhood from those pits supplying the greater part of the *Clunch* so generally used about there for building purposes.

"*Clunch* is the local name for the *Lower Chalk* of Geologists, which is well developed in those pits. After Buckland had satisfied his geological curiosity, we strolled into the fen close adjoining, and on finding some of the poor digging *turf*, as it is called there, the chief fuel used for fires—elsewhere more generally termed *peat*—he took a great interest in the matter, asking me to collect all the facts and circumstances connected with it, and to put them into the form of a paper for the British Association. This I accordingly did, reading a paper on the subject to the Natural History Section at the Cambridge meeting of the British Association in 1845.*

"On the return walk to my vicarage, Buckland stopped short at a cottage in the village, where he saw some turf piled up outside the

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* See the paper entitled, "On the Turf of the Cambridgeshire Fens," in the "Report" of the meeting for that year, *Communications to Sections*, p. 75.

door dry and ready for burning. Taking a piece in his hand he stepped in and asked an old woman inside the house what was the price? Bewildered at the sight of the would-be purchaser and the article he wanted, she scarcely knew what to say, whereupon Buckland gave her fourpence, at which she was greatly pleased (its real value being scarce a farthing) and—putting the turf in his pocket, to add to his omnivorous collection of all things having the most remote bearing upon Geology—walked off, leaving the old lady staring and puzzled to think who the gentleman was and what he was going to do with it.

Amongst the MS. notes in the '*τα περι ἐμαυτου*' is the following entry :—

"1887—It was whilst at Clifton that for my amusement and occupation I took up the subject of my *own life* (not likely to be much further prolonged) much after the way in which I had already noted down and printed for private circulation, "Reminscences of Yarrell and Selby" two or three years back. This occupied me till the latter part of the autumn when I placed the MS. in the hands of the printer, and the whole was ready for distribution by the end of the year. I I did this at the suggestion of one or two friends and for other reasons I need not mention here."

Mrs. Blomefield told me that 'Chapters in My Life' originated through a suggestion of Sir Joseph Hooker that every scientific man ought to write his own reminiscenses. Acting on this the daily journal which he kept supplied all the necessary materials.

We must now follow him to the scene of his clerical work at Swaffham Bulbeck. Early in life he consideres he had fixed upon his profession, and relates how he pretended to preach a sermon upon Dives and Lazarus from the upturned seat of a rush-bottomed nursery chair serving as a pulpit—a well known childish love of mimicry familiar to most of us who remember nursery days. Whether this was a true indication or not of his future profession, we know that this was his fixed determination as he grew up. And though once he wavered between the medical and clerical profession, and had a strong leaning towards

the former, yet the state of his health indicated that he was not able to stand the fatigue of medical work. Ordained Deacon in 1823 and Priest the year following, he was launched at once into the cares of a large country parish, whose affairs had been left very much to themselves. Full scope was here given for his zeal, and though left much to himself, and having to rely on his own judgment a good deal, his habits of method and self-reliance soon brought order out of chaos. Alluding to his isolation from his brother clergy owing to their being so few within a walk of his Vicarage, he says, "This being left so much to myself was better in the end. It accustomed me to reflecting more thoroughly on what I had to do, and made me more self-reliant, weighing reasons for this or that course of action, and so gradually arriving at 'a right judgment in all things,' especially in cases in which there was any thought of departing from a beaten track." When owing to his first wife's ill health (he had married in 1844 a daughter of the Rev. Edward Andrew Daubeny of Ampney Crucis, and brother to Dr. Daubeny, of the Botanical Gardens, Oxford) he was obliged, to the great lamentation of his parishioners, to give up his living, which he held for nearly 30 years, he said with justifiable pride that he "never *made*, or *had*, so far as he was aware, a single enemy in the place." It was during his parochial life in this country parish that the following event occurred well known to his friends but perhaps not so generally known to others as it ought to be. Dean Peacock then Fellow of Trinity, and a friend of Capt. Fitzroy was asked by the latter to find him some Cambridge naturalist to go with him in his surveying voyage in the "Beagle." Henslow and Jenyns were immediately thought of as the most fit men. Henslow refused, being a married man with a family and tried to persuade Jenyns to go. This must have been a tempting offer indeed! Jenyns hesitated at first, took time to consider, and finally declined; his strong sense of duty overmastering his evident inclination to accept. He says, "I declined as well on account of my being

engaged in parish work—as Vicar of Swaffham Bulbeck—which I did not think it quite right to quit for a purpose of that kind, as on account of my judging that I was not exactly the right person either in point of health or other qualifications to offer myself for the situation." The following is the allusion to this event in "*τα περι ἐμαυτον.*"

"This year (1831) I had the offer of accompanying Capt. Fitzroy, as Naturalist, in the "Beagle" in his voyage to survey the coasts of S. America, afterwards going round the globe—declined the appointment which was afterwards given to Charles Darwin, Esq., of Xt.'s College, Cambridge, grandson of the celebrated Erasmus Darwin, author of the Botanic Garden."

Consulting with Henslow it was agreed that Charles Darwin with whom he had been acquainted as an undergraduate at Christ's College, Cambridge, and his junior in College by ten years, and who had visited him afterwards at Swaffham Bulbeck, was the right man for the post. Capt. Fitzroy acting upon this recommendation took him—a better man could hardly have been selected as events proved. It was on this voyage that the materials were collected for those subsequent writings of his which may be said to have revolutionized the Science of Biology. This was the beginning of a life long friendship. From the time of his undergraduate days at Cambridge in 1828 (he took his Bachelor's degree in 1832) till his decease in 1882, Darwin and Jenyns were intimate friends. On the 19th April, 1882, he writes, "This day marks the death of my dear old friend *Charles Darwin*, whom I had known ever since he was an undergraduate at Xt.'s College, Cambridge, more than 50 years ago. Very few of his friends—not relatives—now living had known him longer than myself."

Owing to limited means during the first years of his clerical life and the pressure of parochial work he never travelled much. Indeed he mentions that he had never been abroad all his life. But nevertheless there were few parts of his native country

with which, during his long life, he had not made himself acquainted. All his walking and other tours were planned with the object of adding some fresh stores to his Natural history knowledge. Zoology, Ornithology, Flight of birds, Botany, Entomology, Meteorology, Geology and Archæology all came in for a share of attention. On one occasion we find him during one of these home walks and tours arranging with his usual orderly precision to be present at the morning services of six different Cathedrals on six successive Sundays. Architecture was a very favourite pursuit of his for some years. "Rickman's Gothic Architecture" seems to have been his chief guide, by the aid of which he made himself acquainted with, and carefully studied, *every part* of the magnificent Cathedral of Ely. Whatever he did was "thorough." How few there are even of professed archæologists that could truthfully say this of any Church, Cathedral or Gothic building in their own vicinity, that they had studied *every part of it.* Why, only the other day, during a visit of the Field Club to that lovely Architectural gem (Wells Cathedral) several of the members who if not Archæologists are nothing else, thought the masterly exposition of the Dean of Wells not one short hour in length sufficient to make themselves acquainted with its Architectural structure. Such was not the example set them by their former President, whose one object in life was to get at the bottom of everything, not to content himself with a superficial knowledge of things but to investigate the "why" and the "wherefore" to arrive at the reason for this or that, throwing his whole mind upon the subject before him as if there was nothing else to attract attention, until he had mastered it. Golden words are those of his.

"No literary work can attain to excellence if—whilst engaged upon it—the mind wanders away to other subjects it wants also to consider. The train of thought required in one case interferes with the train of thought required in any other. My belief is that no two good books—or even shorter treatises—can be

properly taken in hand at the same time. *Finish one before you begin another is my rule.*"

That this is the great secret of literary success, as of most other successful ventures, we must all acknowledge, but how few there are in this hurrying, feverish, distracting age who can trace up their wills to the needed effort!

Two years after the decease of his first wife in 1860, he married Sarah the eldest daughter of the Rev. Robert Hawthorn, for some years Curate of Swaffham Prior in Cambridgeshire next parish to his own. Mrs. Blomefield, who now survives him, was his companion in many of these home tours. During one of these we find him in his 72nd year ascending Snowdon on foot the whole way there and back—together making a distance of 11½ miles from Llanberis—this was on 24th June, Midsummer day, in the year 1871.

Of the Scientific publications of such a man it is difficult for me to write. A list of some sixty-three or more communications from his pen are given at the end of "Chapters of My Life," (reprint 1889). Of these the two most important in his own eyes were "The fishes of the Voyage of the Beagle" and the "Manual of British Vertebrate Animals."

Of the numerous contributions to the ten Scientific Societies which claimed him as a Member, "nothing" (he tells us) was written "*otherwise than* with a view to the further extension and advantage of those Sciences which had been his study and amusement through life."

Amongst other Societies we find him becoming a Member of the British Association and being present at its first Meeting in Oxford, 1832, when Dean Buckland was president, and Philip Duncan presided over the Natural History Section.

During the long tenor of my office as Secretary of the Field Club many visits were paid to him in his well-known study. Sitting with his back to the light, a small screen sheltering him from the draught of the window, he was ever ready to receive

me, and to talk over matters connected with the Club or with the Royal Literary and Scientific Institution. On this latter subject our intercourse had been recently somewhat restrained; though favourable to them himself, he was aware of my entire disapproval of the alterations lately carried out, and the topic was mutually tabooed. This was the only occasion during a long acquaintance on which I ever differed from him or saw reason for doubting the wisdom of his judgment.

Very few of our Members are aware of the anxious solicitude he showed as to the Club's progress. Many probably have never seen him—he had outlived the present generation,—but those few who still remember the early days can recall to mind his presence at our Meetings and Anniversary dinners; when at the latter his terse and short addresses bore witness to his anxiety lest the social nature of our gatherings should overshadow the scientific object for which the Club was founded in 1855. Those whose memories can not extend so far back might not pass altogether an unprofitable time if they read those Addresses printed in the early volumes of our Proceedings. His strength did not permit him latterly to join our walks and excursions; but I find that after Presiding at the Anniversary Meeting, on the 18th February, 1864, he walked with the Members to inspect the "*Celtic*" *Chambered Tumulus* at Stony Littleton, near Wellow, and if my memory is correct this was the last occasion on which he took part in our out-door pursuits. Our Proceedings bear testimony to the numerous Scientific contributions from his pen. It is difficult out of the 21 communications, beside short Addresses, to make any selection, but probably the following may be considered as the most valuable.

1. The Address delivered to the Members on February 2nd, 1864.
2. Natural History Museums. February 21st, 1865.
3. Phosphatic Nodules in the Eastern Counties. April 12th, 1866.
4. The Bath Flora. December 5th, 1866.
5. Notes on the summer of 1868 : particularly the temperature as

observed in Bath and compared with that of Greenwich and some other places. 1869.

6. St. Swithin and other weather Saints, 1870.

7. Results of Meteorological Observations made at the Institution during ten years (March, 1865 to February, 1875).

8. Gales of Wind. (1877.)

9. The Bournemouth Firs, &c.; was there ever a forest of Firs on the Hills around Bath? (1886.)

10. Continuation of (No. 7) the two together giving results of Meteorological Observations for 20 consecutive years without break.

11. Remarks on the Distribution and Movements of British Animals and Plants in past and present times, as instanced in the nightingale and some other cases.

This was the last scientific contribution made to the Club and shows no indication of failing mental powers. He writes in "*τα περι ἐμαυτου*," under date 1891.

"My health was fairly good during the rest of the year—even allowing me to read *one more* paper (I may *now* say, *certainly the last*) to the Bath Natural History Field Club. This was on the 11th November.

Perhaps I am the only scientific man in England who ever gave Lectures in his ninety-second year."

It was during one of these visits, I think, that he showed me the Lord's Prayer written on a piece of paper the size of a sixpence. This he told me was done by himself after his eightieth year, without glasses. It was one of the many striking characteristics of the man that his sight was so well preserved to the last, notwithstanding the necessary use of high-power lenses in his zoological and botanical researches. But then he had the moral courage to know when to stop and cease from overstraining his eyesight. I remember when he addressed the Field Club in December, 1886, on the death of his friend and old companion C. E. Broome, how he attributed the waning of the latter's strength to overwork, fatigue of mind and body, and then said, "*Work to the*

full extent of your powers, but not to the injury of your health." His life was a good illustration of this precept.

It was, without doubt, the care he took of his health, and his temperate habits, that prolonged his useful life and enabled him to get through such a great amount of literary work. May we not add too that the habit of early rising acquired in his youth and maintained till the last conduced much to this end. It was his invariable custom to rise at six, and only during the last few years of his life, after his eightieth year, did he indulge in an extra half-hour in the morning.

"Early rising (he writes) is a habit to which we should habituate ourselves from our youth. It not only adds to the length of each day, but increases the number of our days by promoting health. It has been observed that long livers have in almost all cases been early risers; and again—

"Life is, and even must be, uncertain; so many accidents beyond our control may bring it suddenly to an end. But barring unforeseen events of this kind, health, upon which life mainly depends, is very much in our own keeping, much more so at least than is commonly supposed. If a man inherit a sound constitution and is free from the seeds of any organic disease, most illnesses arising from other sources may, with a moderate share of prudence be staved off. He may indeed, take the infection of some prevailing epidemic, but if he was previously in good health, he is not liable to do so. Abernethy used to say that half the complaints for which his patients consulted him were due either to *stuffing* or *fretting*. If to these causes of indisposition we add *taking cold* no doubt the three together will account for a very large proportion of the maladies that most commonly occur. Yet temperance, evenness of mind, and avoiding unnecessary exposure to cold, along with warm clothing would generally secure a man from such ailments. But how many pay not the least attention to these precautions. How many, in early life especially, take liberties as it is called with their constitution, and lay the foundation of lasting illnesses in after years. They cannot do this and be morally blameless. If it would be considered an act of suicide for a man to administer to himself a slow poison whereby he gradually shortened his days, it

partakes of the guilt of that crime to undermine his health by courses of intemperance and folly. He may not have self destruction in view, but it as surely follows in the end as if he had at once put a pistol to his head."

On one occasion when I hinted at the inconvenience which must arise from his change of name and dropping out that of "Jenyns" by which he was so well known in the Scientific world; he said that he had taken counsel's opinion on the point, and that if he retained the property which devolved upon him in 1871 he must of necessity take the name of Blomefield and drop that of "Jenyns" entirely.

His literary style was *simple, lucid,* and *explanatory;* by the use of the latter word I mean that he was able to express what he wished and thought exactly and accurately. The words in "The Times" of Oct. 2nd, 1893, descriptive of the late Professor Jowett's accuracy may well be applied to him.

"He had an instinctive abhorrence of anything like confusion of thought, and always expressed himself with the utmost lucidity and precision."

His early scientific habits conduced of course to this facility of writing just what he meant, and in such a way that his readers could see his meaning at once. Though feeling his deficiency as a lecturer, coming far short in this respect of his old friend Professor Henslow, yet his addresses and communications were always listened to with interest and attention. The nervousness which attended him through life was plainly noticeable in his preliminary arrangements; and one could see how his efforts latterly caused much physical exhaustion. There was something about his diction and the way in which he threw his whole soul into the subject before him which arrested the attention of his hearers and imprinted his words on their memory *nihil tetigit quod non ornavit.*

The following remarks from a botanist express very justly his views on this subject.

"You asked me to give you my impression of Mr. Blomefield's papers, many of which I heard.

This was, above all, the extreme thoroughness of the work. Nothing was left vague, but every point searched out and thought out so far as possible.

He seemed to have it at his fingers' ends. No line was drawn with an uncertain hand.

He had not read the subject up for the purpose of the lecture, but he gave the lecture because he was fully read up on the subject, and had digested and assimilated what he had read.

He never spoke to show his learning, but always with a view to the instruction of others.

He was never content with a superficial examination of anything, but must always learn all that he could about it, hence you could not talk about the commonest matters with him without learning something.

I think he was fully aware of the superiority of his powers and information to that of most of those he met. This was inevitable.

Up to the last his papers showed no falling off, but after reading a paper he had not latterly the power to answer questions upon it. He had the necessary information, but he required time and quiet to enable him to recall what he knew. The feeling that the information was there, but that he could not recall it when he wanted it, was obviously a painful one to him.

Mr. Blomefield's range of knowledge was very great, but I think you over-estimate his power as a Botanist. I am sure he would have thought so. I think he once said to me this is not my subject. He had a great knowledge of English Plants and of their classification in the time of Professor Henslow, but he would not admit the division into so many species as now, even according to the most moderate of modern Botanists. The names he has given to many of the plants in his beautiful Herbarium would not *now* be considered right.

I think he had not given much study to the anatomy and physiology of plants, but to the *classification* of *English flowering* plants, alone."

I have known only one other man to compare with him in accuracy of thought and expression ; indeed he was to me *painfully* accurate. But notwithstanding this, an instance of inaccuracy rather surprises me. On looking over the numerous letters I

received from him on various subjects, only three, or at the most five, have the date of the year written.

Ever ready to hold out a helping hand to any student of either branch of Science which he loved, a desire for knowledge or information was the chief passport to his acquaintance. As a friend wrote to me "I have pleasant memories of many years of kindly help in our pursuits, sweetened by an old-world courtesy and goodness all his own."

One of the greatest pleasures which cheered his latter days was the receipt in his 92nd year of a congratulatory address engrossed on vellum from the Fellows of the Linnean Society. The occasion was the attaining the seventieth anniversary of his election.

An event unprecedented in the annals of that or of, perhaps, any other Society; (as the 71 Fellows whose signatures were attached stated). "The Father of the Linnean Society" as they addressed him was not a little proud of being remembered by his children in his declining years, and wrote one of his eloquently simple replies, full of dignity and truthful expressions of his gratitude for present courtesies and touching reminiscences of departed friendships.

The address and reply are printed in the last number of the Bath Natural History and Antiquarian Field Club's Proceedings and I call to mind the nervous anxiety expressed lest in the copy I was permitted to make some mistake should appear.

The last entry in "*τα περι ἐμαυτου*" is peculiarly touching, and may be a fitting conclusion to these extracts.

"1892—Began the year in fairly good health. On May 25th entered my 93rd year. Mind still sound and active; able to write a little essay on '*the Life of the world to come*,' which I considered a fit subject for reflection in the case of an old man so soon to pass 'behind the veil.' In the Autumn of this year I received a striking mark of attention from the Linnean Society, on the occasion of my having been a member for seventy years; viz., a congratulatory Letter or 'Address on Illuminated Vellum' framed and glazed with the

THE HEADSTONE.

(From a photograph taken by T. F. INMAN, F.L.S.)

signatures of all the Members who were present at the Meeting when it was arranged, the same being the Anniversary of my Election, November 19th, 1822."

Such are the few reminiscences of a man whom it was my privilege to know and respect for so many years; to look up to another on a pedestal far above one has an elevating and improving effect. What was mortal of him rests on the summit of Lansdown; the immortal part has gone, whither no man can tell.

A grey Pennant head-stone, surmounted by an elegant cross on a circle near a thick growth of yew, marks his last resting place. On the circle are the words—

"They that sow in tears shall reap in joy,"

and beneath, the inscription—

"LEONARD BLOMEFIELD,
(late) Jenyns,
Born May 25th, 1800,
Died September 1st, 1893.

Father, in Thy gracious keeping,
Leave we now Thy servant sleeping."

It appeared to me not unworthy of the honor you have done me of electing me as your Vice-President to bring these imperfect notes before you, and to ask you to enroll the name of Leonard Blomefield as one of those who might justly claim to be considered as one (and by no means the least) of the worthies of a no mean City.

May he be judged (as his hope was) "to have led not otherwise than a good and useful life!"

How many persons will wish upon their death beds that like him they had not lived in vain!

Summary of Field Club Proceedings 1893—1894.

MR. PRESIDENT AND GENTLEMEN,

The past year has not been uneventful in the Club's annals. True, no great discoveries in the Natural History, Botany, Geology or Archæology of our neighbourhood are to be recorded, but valuable and considerable information in all and each of these sciences has been acquired by the members in the Excursions and at the reading of papers, with the subsequent discussions and exhibition of specimens and objects of interest.

The Excursions were eight in number, and well attended whenever they were least instructive.

All on the year's Programme were carried out except the Bye-Excursion to the Earl of Pembroke's Castle of Wilton. An extra Excursion, however, to Chapel Plaster and Ditteridge was arranged under the conduct of Mr. Thomas Browne, under whose architectural surveillance the ancient shrine, once a chapel for the pilgrims on their way to the Abbey of Glastonbury, has again after many years of desecration been restored to ecclesiastical uses. Mr. Browne's paper read to the Members of the Club in this ancient Chapel is printed at page 9 of these Proceedings.

The Excursions here follow in their regular order :—

Shapwick Moor and Meare.—The excursions of the year were inaugurated on Tuesday, April 18th, by a party of 17 members of the Field Club taking train by the Midland line to Shapwick, in the peat bogs, which extend from Glastonbury to the sea. The object of the excursion was primarily to explore the botany and natural history of the district, but owing to the prolonged drought and the backward condition of vegetation, very few plants peculiar to the heathy bogs rewarded the search of the party. Shapwick and Edington heaths are considered the paradise of botanists, and occasionally some of the rarest of the rare flora reward the diligent searchers for botanical treasures.

Several specimens were found of the diminutive sundew *drosera rotundifolia*, which is said to have carnivorous propensities, and to be able to assimilate the small insects which unwarily stray among the red viscid hairs which covers its fronds. The season for flowering, however, was not yet come, and although the moors were gay with "Ladies' smocks," marsh marigold, celandine and common spring weeds, none were rare enough to tempt the members to further explorations, so a retreat was made to the nearest hotel, the Warry Arms, for necessary restoration, and then, after a two and half mile walk, the village of Meare was reached with its remarkable objects of antiquarian interest. Meare is situated upon a rising ground, in the undrained days of the peat bog, an island about two miles long by one half in width, whither the mitred Abbots of the Monastery of Glastonbury were wont to be rowed. The spot where the Abbot's boats were moored is now called Poolreed. The Abbot's house, now a farm house, was courteously opened to the members of the Club, who were allowed to ascend to the great hall on the first-floor 60 feet long by 22 wide, with windows of decorated tracery, and a fine stone fireplace and open timber roof. The house was built about 1350 by the Abbot Adam de Sodbury, whose statue, or that of one of his successors, now elegantly surmounts the gable of the two-storied entrance porch. About 200 yards eastwards of the house there stood entire, until fire seized its timbers a few years ago, a most interesting and unique building, erected in the reign of Edward III. as a residence for the Abbot's fisherman. The fish ponds on the north of the island, which supplied the Abbey with the necessary provisions, once covered 500 acres, now drained, and a luxurious sward. The walls of the fish-house still stand, but the interior is gutted, and is not kept clean and fit for visitors. The church of Meare, which stands about 300 yards from the latter, contains some decorated windows in the chancel, the eastern window being of peculiarly fine tracery. The nave is Perpendicular, rebuilt by Abbot Selwood in the 16th

century. Time not sufficing to seek out the parish clerk and examine the interior of the church, which contains some ancient ironwork, and the bracket near the pulpit, where in olden days of long sermons the hour glass stood, a retreat was made for Ashcot station, one and a quarter mile distant, and the party soon found themselves back in Bath after a healthy day's outing and pleasurable excursion.

Brockley Combe and Congresbury.—The first of the four regular excursions arranged for the year took place on Tuesday, May 9th, although the second in date, a bye-excursion to Shapwick moor and Meare, having been enjoyed previously. The largest attendance of members on record took part in this truly enjoyable occasion, 21 members starting by the 9 a.m. train to Nailsea, on a pedestrian journey to Brockley Combe, and over Wrington Warren and King's Wood to the hospitable mansion of Col. W. Long, a second party of 20 taking the later train at 10.18 a.m. to Yatton and Congresbury, in order to reach the same goal, Woodlands. The pedestrian party by the early train, arriving punctually at Nailsea, started over the fields for Brockley Combe, taking "en route" the Chalvey pumping station of the Bristol Water-works, where the superintendent courteously allowed the party to view the magnificent steam pumping engine, which forces the water of the vale up to the great reservoir at Barrow. Proceeding onwards by Brockley Elms and the Court, now empty, and let out for flower shows, picnics, &c., the club's host for the day, Col. William Long, met the members of the Field Club at the entrance of Brockley Combe, and up a steep path to the right through the wood, soon brought them to the quaint and ancient lime trees, 15 in number, overhanging Brockley deer park. These extraordinary trees have far smaller leaves than the ordinary lindens of our country, and are confidently reckoned to be from 400 to 500 years old. So little are they known by the natives that a stranger seeking for them would receive little guidance or aid in his search from those living near. The trees are unlike in

growth to common limes, although the alteration of the levels of the ground in forming the deer park may cause the branches now to appear to spring from the main trunks far closer to the ground than was originally the case. The boles of the trees also are not round, as is customary in the *tilia europœa*, but composed of many combined stems, which gives these ancient limes a weird and unusual aspect. The measurement of one of the largest of the trees was immediately taken, and at 2 feet 5 inches from the ground the girth was found to be 19 feet 6 inches, and the circuit of the first branch, which sprang from the main stem at the same level, measured 7 feet 10 inches. If the small-leaved lime be not indigenous in England, these must be some of the first trees planted in our country, and great doubts still exist whether the tree be truly a native of our flora, the large-leaved species now generally grown being indubitably of South European origin. A start was again made by the party under the guidance of their worthy conductor, Col. Long, who being an excellent pedestrian, and suitably shod for this slippery and rocky country, put the pedestrian powers of the members of the Bath Field Club to a pretty severe test. No rain had fallen for over 50 days, and the grass on Wrington Warren and in Gobblin Combe was short and brown, and as slippery as ice, and although many of the pedestrians in descending into the combe and climbing out of it, bemoaned their ignorance of the need of spikes in their boots, and larded the lean earth in their struggles to preserve their perpendicularity, all reached the Wood without abrasion and wound. Then all seemed fair sailing, but unfortunately the natives seemed capable of climbing over Mountain-limestone walls, the protruding stones on each side being highly polished by innumerable iron-shod soles, which gave no little trouble to the stiff-limbed and rheumatic denizens of Bath. But flowers again appeared, long lost sight of on Wrington Warren and Brockley Wood, and soon rewarded the search of the botanists. Three members of the company had started off to the head of Gobblin Combe, in

order to find some unmistakeably volcanic rocks, this being, according to the maps of the Geological Survey, one of the three eruptive vents in Somerset. They were successful in their search, and discovered a melaphyre of plagioclase felspar augite and olivine of the Carboniferous age. Waiting for their return the whole party rested themselves in a rabbit warren, where three little milkworts, pink, white, and blue alone were spared by the coneys. Starting again across fields resplendent with orchids, and through woods decked with *Prunella*, *Asperula*, *Lysimachia nemorum*, and *Euphorbia amygdaloides*, with many spotted and Twayblade orchids, at last the welcome sound of hounds caught the ears of the weary party, and the pleasing thought that the kind host's residence was within appreciable distance, crossed the minds of all, when alongside the woodpath appeared a specious blue flower, pink in the bud, instantaneously recognized as one of the Borage family, but of great rarity in England, although around Woodlands seemingly growing in profusion. This was the *lithospermum purpureo-cæruleum*, very rare in this country according to Bentham and only in some of the southern counties. It is own brother to the common *lithosperms* with inconspicuous white flowers, styled popularly Gromwell and Bastard Alkanet. On emerging from the woods into the grounds of Woodlands, the party examined the windmill and well which supplies the Mansion with spring water. Until the discovery of this spring, the only supply of water obtainable was from the rainfall, but by the aid of Thomas Young and Thomas Day, two noted Dowsers, this perennial source was discovered, and another proof was here seen that however incomprehensible and inexplicable the use of the Divining rod may be scientifically, in practice it is a very useful aid to man. De Quincey twice states in his Collected Works that he had frequently seen the process applied with success, and that whatever science or scepticism may say, most of the tea-kettles in the vale of Wrington are filled by rhabdomancy. In a dry and ill-watered district like this the Waterfinder should receive all

honour, but still the local name given to these professors, "jowsers," derived from a slang verb, "to chouse," betokens some suspicion in the public mind of the soundness of their pretensions.

By favour of Col. Long his own notes on this successful discovery of water are here added.

For many years I have been dependent on rain for my water supply, and those who do the same well know how unreliable this is.

Plenty of rain may fall each year, but (with the exception of thunderstorms) it is seldom that rain lasts long enough, or is hard enough to run off the surface of roads in sufficient quantity to fill tanks.

In 1885, I moved to Clevedon expecting to let this place easily, but the want of spring water prevented my getting a tenant.

In 1888 I returned, and determined to get water if possible.

Higher up the hill, about a mile East of this house on a property named Woolmers belonging to the Trustees of the Queen Elizabeth Hospital, Bristol, is a well that has never been known to be dry, and I hoped that possibly the spring might run this way. I sent for Thomas Young who lived at Rowberrow, and was noted as a successful dowser. I should here state that to "dowse" is defined by Mr. Elworthy in his "West Somerset Words" as "to use the divining rod for the purpose of finding springs of water." His description is as follows: "the rod or twig I have seen used is a fork of about a foot "long, cut off just below the bifurcation, and in size each limb is about "as large as a thick straw. The wood it is said must be either "'halse' or white thorn, and may be used either green or dry. The "operator holds an end of the twig firmly between the finger and "thumb of each hand, with the elbows pressed rigidly against the "sides, consequently the two ends of the twigs are pulled asunder, "with the centre or juncture of the fork pointing downwards. He "then moves very slowly forward, and when over a spring the twig "turns outwards, and twists upon itself into an upright position."

Mr. T. J. Scoones, civil engineer, and Captain Hathway, late 62nd Regiment, were present, and we started for the well at Woolmers. With T. Young the fork twists on *crossing* a stream and commencing at the well we soon had a row of pegs at about 50 paces interval marking the course of the spring down hill, due West, in a line with my house. Proceeding about 800 yards we suddenly lost it, and carefully dowsing

over the last peg marked, we found the stream turned due South under a limestone hill off my property.

I was of course greatly disappointed, and quite hopeless of any result, asked Young to dowse over a field called "Taylor Hill." Almost immediately he struck on a stream and on the side of the hill (exactly 300 yards from my house and several feet above it) the stick twisted considerably.

Here a well was sunk twenty-two feet. This filled in the winter, but soon became dry in the summer, and in September 1889 (Thomas Young had died) Thomas Day, another noted dowser, who also lived at Rowberrow, descended the well with me. The twigs were much agitated and one after the other, if not allowed to twist, snapped off.

Day said, "There is a lot of water under here." He undertook the sinking, and sunk thirty feet more when the water came in so fast he had to leave, and ever since, even during this dry summer (1893) I have had plenty.

Of dowsing itself I can offer no explanation. I am contented with the result. On one occasion the late T. Young was showing his art over a spring when a gentleman who happened to be with me, scoffingly said, "Anyone can make the twig turn." He took the twig, ignorant that he himself possessed the faculty, the twig twisted directly he arrived over the spring, and so startled him, that he dropped it at once!

WOODLANDS,
CONGRESBURY.

The well in question was sunk through the New Red Marl which here rests on the Carboniferous Limestone, and apparently the water was found before the Limestone had been reached. It seemed an unlikely place to meet with a spring. H. H. W.

On arriving at the Mansion of Col. Long the second party of non-pedestrian members of the Field Club was met with after having been most hospitably entertained by Mrs. Long, which same hospitality was now repeated to those who had braved the drought and heat of the day and the seven miles of steep and slippery limestone country. This second party had started by the 10.18 a.m. train from Bath for Congresbury, where the Vicar

of the parish, the Rev. R. H. Maunsell-Eyre had met them and conducted them over the parish Church of S. Andrew's with its richly-carved oak screen, font of the 12th century and elegant monument of the Merle family. The Vicar also showed them the Vicarage built 1465 by the Trustees of Bishop Beckington, with its interesting Porch. One member being very unwell returned to Bath; but the 19 remaining were conducted by the Vicar to Woodlands, about a mile's walk, where they received a most hospitable reception by the ladies of the House.

After the walking party had been bountifully regaled, all the treasures of the House were placed open to the inspection and admiration of the visitors. Besides the valuable collection of articles of "virtu," ancient volumes of maps, biographies, prints, and so on, cases of coins, of cameo and intaglio rings, two with scarabœi on the reverse, inherited from his father, the present gallant owner has added an immense assortment of curiosities and antiquities, so that the Mansion may be fairly styled a Museum. Many more hours would be required than are contained in one short afternoon to examine, even superficially, this extraordinary collection, all so liberally exposed to the view of the Field Club, but time waits not for man, so after a farewell cup of tea with the kind Colonel and Mrs. Long, and many thanks expressed for their hospitality, a retreat was made for Yatton Station, two and a quarter miles distant. On the way many members took the opportunity of viewing the fine parish Church of the Holy Trinity, with its lofty wagon-roofed nave, and beautiful Perpendicular North Chapel to the Chancel, with a fine tomb to an unknown knight and his wife under a canopy. The tower has a truncated spire, and is central in the Church. The North transept has an elegant Monument to a Chief Justice of the Common Pleas, named Newton, who lies arrayed in his judge's robes with collar of S.S., and his wife by his side. Both have under their heads sheaves of wheat. He died in 1449.

The exterior of this Church, restored in 1861, has many choice

architectural details, especially the small turret at the North-East corner of the Chancel aisle and the porches. The visages of the gurgoyles are terrific, and the preaching in this Church must have been exceedingly powerful if the evil spirits on evacuating the interior retained such tortured expressions on their faces.

The old rectory on the North-East of this Church is a most interesting stone building, with mullioned windows and pointed arches over the entrances.

The village of Yatton is a good mile in length, and with many good houses. At the western end lies a good hotel and the railway station. The saloon carriage placed by the Great Western Company at the disposal of the Field Club was soon affixed to the 5.43 p.m. train and brought the 40 excursionists back to their homes and dinners at 6.45, after a memorable day's outing.

Malmesbury and Charlton Park.—An interesting and instructive Excursion of the Field Club took place on Tuesday, June 6th, which was attended by no less than 33 members and seven visitors. Leaving the Great Western Station in a saloon carriage, placed at the disposition of the members by the Company, at 9.4 a.m., the large party were deposited at Malmesbury at 10.25 punctually, and a start was made first for the Abbey Church. There seem to be several origins assigned to the name of this ancient Borough. An Old Book called the "Modern Universal Traveller," printed in London for J. Cooke, at Shakespeare's Head, Paternoster Row, No. 17, MDCCLXXIX., states that it was built by a British Prince, and was of great repute in the time of the Saxons, under the name of Ingelburne. Early in the 7th century a Hebridean Scot, named Maildulphus, settled in the place as a Hermit, and obtained great reputation for his sanctity, and set up a college for scholars, and from him the town obtained the name Maildulfesbury, or Malmesbury by contraction. Among his scholars was a scion of the royal stock of Wessex, named Aldhelm, who in 680 founded the Monastery of great renown. He died in 709, and from his extraordinary

learning and sanctity became the patron Saint of King Athelstan, who endowed the Abbey and town with much wealth, and finally had his body buried near the Saint's, close to the High Altar in the Abbey Church. What remains of the Abbey Church viz., the six easternmost bays of the Nave, formerly comprising nine, is an object of absorbing interest to architectural students. Major C. E. Davis, F.S.A., when all the party had assembled in the Church, kindly explained the beauties and peculiarities of the structure. He stated his opinion that the glorious Northern Porch, unique in our land for its surpassing richness of sculpture and dimensions was a part of a building of earlier date than the remainder of the Church. The angels carved at each side of the inner tympanum, containing a "Majesty," were exactly counterparts of the angels in the "Ecclesiola" of Bradford-on-Avon, attributed also to S. Aldhelm. The sculpture, however, of the Porch is of a far more elaborate character, having scenes from the Old Testament on two boutells, from the New on one, and with interlaced patterns on the five remaining. These, however, are much decayed from age, and require a strong imagination to decipher their meaning.

Major Davis then gave the members a most erudite description of the body of the Church, built between 1115 and 1139 by Roger, Bishop of Sarum. The lower parts of the fabric, consisting of nave and round columns, pointed arches, triforium, and groined aisles are of Transitional Norman architecture of of very early date, decorated with chaste zigzag and other mouldings, and the elegant "T" pattern common to all religious buildings throughout the world, and much resembling at first sight the Greek bend.

The lofty clerestory and groining of the nave are of Decorated architecture with the flying buttresses, and the modern western window, a veritable eyesore in the building, is of debased flamboyant. The fabric requires a large outlay to render it safe, but the whole style of the interior furniture, decoration and

accessories of Divine Worship are of such an unworthy character and so incongruous to such a magnificent and noble structure that a change is earnestly to be desired in the present regime.

On leaving the Abbey the party viewed the Market Cross, an elegant structure of rare architectural interest, octagonal in form with flying buttresses supporting a lantern, and groined. The Historian, Leland, states that it was built by the inhabitants as a shelter in the reign of Henry VII., and it would be advisable for the townsfolk to restore, without delay, such a fair piece of work ere it fall into dilapidation.

Proceeding down the hill to the South of the town, a visit was paid to the Corporation Almshouse, and Manor Court. This was the residence of John Stumpe, the exceeding rich clothier, who entertained King Henry VIII. herein, purchased what remained of the Abbey buildings on the dissolution, and presented the town with the Nave for a parish Church. It was endowed later on by another benefactor as an almshouse for four old men, and the same number of old women, and a quaint inscription is fixed in a walled up arch in the façade, in which a contracted form "Burr" is twice used for Borough. The hall is still used for the the Courts Baron and customary of Lady Northwick, lady of the Manor, and several chests therein contained many most interesting title deeds and manorial records, but were not open to the Club's inspection.

Leaving this interesting Relique of Ancient Malmesbury, the Club was hospitably invited by J. C. S. Jennings, esq., F.R.C.S., to visit his residence, a time-worn Elizabethan house, built on the two-aisled crypt to the N.E. of the Abbey Church, which, in old days formed the foundation of the Mitred Abbot's residence. The talented owner, the author of a Monograph on the History of Ancient Malmesbury, conducted the Club over the interesting portions of his house, with much old oak panelling (the drawing room mantel being of very inartistic execution), and the subterranean crypt, which has now no groining and but few of its

central columns left remaining. The windows are internally cusped very prettily, and the owner has dug down some eight feet in search of encaustic tiles and for further discovery, but without success. There are some tiles of mediocre art in the house, and an underground passage is still in existence leading from the crypt, which would have given the Benedictine Monks an easy escape to William Rufus's fortress on the neighbouring height had the turbulent mobs of the day attacked the Monastery, but which the owner thought would have been more useful for the clandestine admission of jovial guests to the Monks' refectory or dormitory, especially of the softer sex, a common hallucination of the Protestant laity, whenever a secret subway is discovered in connection with a celibate establishment. The worthy owner led the party into his garden to show the exact site of the E. end, and of the original High Altar of the Abbey Church, and stated that he had sunk many feet deep to discover the body of King Athelstan, buried, according to local report, with untold jewels and gold, but without success.

Bidding hearty thanks to Dr. Jennings for his courteous reception and valuable information the party soon found themselves in the King's Arms Hotel, and by no means averse to the bountiful fare provided by the well-known host, Mr. H. Jones. After doing full justice to the luncheon, three brakes carried the party about two and a half miles to the seat of the Earl of Suffolk and Berkshire, who had graciously opened his house and valuables to the inspection of the Field Club. Charlton park has for many generations been the residence of the Protestant branch of the noble family of Howard, represented in its Roman line by the Duke of Norfolk. The mansion, a substantial stone-built structure, was originally built by Sir Thomas Knyvet in the reign of James I., the inner court being now roofed in, the E. front being added in 1773 by the Lord Suffolk of that time, the W. front being the work of Inigo Jones. Three rooms, hung with valuable pictures by English and foreign artists, were opened to the Club.

One long gallery is still in its original condition with its stucco roof adorned with pendants. Two objects particularly attracted the attention of the natural historians of the party in this room. The first a fine golden eagle caught in a trap in a forest on the Charlton demesne ; the second a wren's nest in the carcass of a dead crow. Several handsome cabinets adorned this long gallery, and the walls bore many portraits of the Howard family as well as the well-known picture of King Charles I.'s three children, in half lengths. The works of old foreign masters, Leonardo da Vinci, Caracci, Guido Reni, Gaspar Poussin, W. Vande Velde, Van der Heyden, and Proccaccini, eight pictures cut out of their frames on October the 10th, 1856, by a dismissed servant and afterwards recovered, are restored to their frames, the cuts being concealed by a small gold beading. On the staircase of the mansion hang also many pictures, one being a likeness of Moll Davis, one of King Charles II.'s favourites, a native of the village of Charlton, and numerous copies or originals of Sir P. Lely's paintings of the same monarch's beauties of higher rank.

As his Lordship was absent from his mansion on this visit of the Club, a vote of thanks, proposed and seconded by the two Vice-Presidents, was unanimously voted by the members present, and directed to be forwarded to him for his kindness in opening his grounds and house to the Club, and betaking themselves again to the brakes, a return was made by the party to the railway station. Leaving Malmesbury at 4 p.m., the Great Western saloon was affixed to the main line train at Dauntsey, and after a pleasant delay of 35 minutes at Chippenham, which enabled the members to indulge in their accustomed tea, Bath was again reached at six o'clock, after an Excursion which will leave much in the pleasant memories of the members of the Bath Field Club.

Netley Abbey, Southampton and Romsey.—How many travellers pass through the ancient town of Southampton, a county in itself, in order to start for the West Indies, South America or the Cape, or in returning therefrom, without being aware of the interesting

reliques of antiquity calling for their special notice in the borough and neighbourhood! Few places in our land can rival it in historical interest, in its late decadence from prosperity and its present resuscitation into commercial life.

The Bath Field Club placed this town on its list of excursions for the year and on June 27th ten of its members started viâ the Great Western Railway for Salisbury and Southampton. Three more members of the Club were already at the South Western Hotel awaiting the party which was received at the station by W. Whitaker, esq., F.R.S., F.G.S., H.M.G.S., &c., Past-President of the Hampshire Field Club. Having made their footing sure at the Hotel for 24 hours. This talented gentleman and Mr. H. Abraham, a member of the same Club, escorted the party in a brake to the ruins of Netley Abbey. Unfortunately a heavy downpour of rain commenced at the time of starting and continued incessantly during the three miles drive to the Abbey and back. Regardless, however, of climatic inconveniences, the party soon were transferred by steam ferry over the Itchen to the suburb of Woolston, whence a drive of three miles along the shore of Southampton Water brought them to the ruins of Netley Abbey.

Henry III. is reputed the founder of this Abbey dedicated to SS. Mary and Edward the Confessor. In the Charter dated 1251 it is called Edward-stow, and was filled by Cistercian Monks from the Abbey of Beaulieu. At the dissolution in Henry VIII. reign their number was but 13, and their revenue, according to Dugdale, £100 1s. 8d., while their library consisted of but one volume "Rhetorica Ciceronis." The King granted the place to Sir William Paulet, created in 1551 Marquis of Winchester, from whom it passed in 1560 to Edward Seymour, Earl of Hertford, and at the close of the 17th century became the property of the Marquis of Huntingdon.

This Marquis destroyed the Church, selling the materials to Walter Taylor, a builder of Southampton, who met his death by the fall of the keystone of the east window on his skull, while

engaged in demolishing the place. This accident put a stop to the work of destruction and has left to the present time what remains of this beautiful fabric. The Church was cruciform, 211 feet in length W. to E. 58 feet in width, and in the transepts 128 feet. The S. transept and E. end are the most perfect of the ruins, which comprise also a groined vestibule, chapter house, refectory and kitchen. Several poets have enshrined in verse the elegance of these ruins, and joined in mournful strains over its fallen splendour, Keate, Sotheby and Bowles and even Barham of the Ingoldsby Legends have sympathetically bemoaned the desolation which has overtaken an Abbey, graceful in Early English architecture, and charmingly situated on the shore of Southampton Water. It is said that the very name Netley is a corruption of its original, Letley or Pleasant Place.

Keate thus writes of the dismantled Abbey :—

Now sunk deserted and with weeds o'ergrown
Yon prostrate walls their awful fate bewail ;
Low on the ground their topmost spires are thrown,
Once friendly marks to guide the wandering sail.

The ivy now with rude luxuriance bends
Its tangled foliage through the cloistered space,
O'er the green window's mouldring height ascends.
And fondly clasps it with a last embrace.

While the self-planted oak, within confined,
(Auxiliar to the tempest's wild uproar,)
Its giant branches fluctuates to the wind,
And rends the wall, whose aid it courts no more.

Returning to the Hartley Institute in Southampton High Street, the excursionists were met by Mr. T. W. Shore, the executive officer of the Institute and organizing secretary of the Hampshire Field Club, who had kindly consented to act as cicerone to the party over the ancient walls, gates and towers of the place. The party set forth at once for the site of the watergate removed in 1804 and turning 120 yards to the E.

commenced the circuit of the Walls by the strong tower built to guard the sluices of the broad and deep ditch, which protected the eastward wall of the town, and to act as a gaol. This tower is a very picturesque building, with long oillet windows widely splayed internally. It is now a store house, and the view from the leads, to which the party were graciously allowed to ascend by the owner, over the town and country is fair and extensive. Contiguous to this buttressed tower, another, more ancient, surmounts a narrow pointed archway defended by two portcullises. The archway is composed of three pointed arches of different forms and heights. Passing through this the party were conducted over the "Maison Dieu" and its chapel, which stands close by the inner entrance.

This hospital for old men and women was founded by two merchants, named Gervasius and Protasius in the reign of Henry III. Edward III. presented the foundation to Queen's College, Oxford, which was instituted by his Queen Philippa, and that college still retains its revenues which are said to be considerable, and religiously observes the letter of the original deed of donation which requires it to pay two shillings weekly to four aged men and the same number of old women, who have rooms in the building. The chapel has been altered out of all resemblance of its original condition except that the columns supporting the chancel arch are said to be those of the first structure. A tablet erected by the late Earl de la Warr records the burial therein of the Earl of Cambridge who was executed in 1415 with Lord Scrope of Masham and Sir Thomas Grey for conspiring to murder King Henry V. as he was about to sail from Southampton for the French war against Charles VI.

A French service is held in this chapel of S. Julien now, chiefly for natives of the Channel Islands, and also an English service for the inmates of the hospital.

Continuing the walk round the walls where houses do not impede the view at about 200 yards from the site of the destroyed

watergate, the wall which from this point had its foot washed at high tide, makes a bend to the northward, and reaches the West gate, very strongly defended with grooves for two portcullises and six holes in the roof for pouring molten lead and other weapons on foes.

The wall from this gate is of great height and of very peculiar construction. By the kindness of Madame Maes, of Westgate house, the party were allowed to ascend to the summit of the wall in her grounds, and to mount the towers. Two 15th century guard-rooms with walk on the battlements of the walls are still intact, and most interesting to archæologists. The lofty tower over the west gate is let off as a tenement, and the wall for some distance to the north of it is plastered over, pierced for windows, and forms the façade of a modern hotel. To the north of this the wall is built on arches, 19 in number, very ancient houses forming the inner wall. Turning into a narrow postern at the fourth arcade, immediately to the right stands a perfect Norman house with double windows, purchased by a gentleman two years ago and beautifully restored. This is supposed to have been the palace of the Norman kings. Walking up a narrow lane to a square the most interesting church of the borough is reached, dedicated to S. Michael. The nave and spire are modern, but the tower is supported by four Norman arches, a part of the ancient cruciform church. Over the westward arch facing the nave three arches appear on the surface of the wall, whether structural or subsequently wrought on the plain surface has not been satisfactorily determined. In this church is a fine specimen of the rare black marble fonts, of which only six are known in the country. The best known is that in Winchester Cathedral, bearing the life of S. Nicholas of Myra, in Lycia. Another, evidently sculptured by the same artist, is at East Meon, near Petersfield, and some fragments of this having been chemically tested by acids, effervesced strongly, and proved that the black stone was not basalt, as had been generally supposed, but lime-

stone. Where these black fonts came from is a "crux" to antiquarians. The date of those at Winchester and East Meon is ascertained to be the episcopate of Walkelin, 1070-1107, but the stone is supposed to have been imported from Constantinople, and some think sculptured by Byzantine workmen.

Continuing the walk at the exterior of the town walls, the party were admitted into a large groined storeroom, where formerly the provisions for the garrison of the castle overhead were landed from ships. The ribs of the semicircular roof have been purloined by some unknown builder, who required stone, and the entrance arch has been unfortunately restored lately in Bath stone, which does not match well with the Pembridge stone from the Isle of Wight, of which all the walls and ancient buildings of this neighbourhood are built. The stone is a fresh-water limestone, and is not now worked. A very handsome and strong machicolated tower stands at the north west angle of the castle, of which little now remains, and then running due east 170 yards the wall reaches the Bar gate. The total circuit of the walls is 2,200 yards.

The Bargate embattled and crowned by machicolations is the most conspicuous ornament of Southampton, crossing the High street, and its chambers are used now for the Courts of law. Some parts of it are as old as anything in the town, but it has been so altered and overlaid with later work that it requires the practised eye of an antiquarian to discover the original plan of the structure. One of the leaden lions, which adorn the northern entrance of the Bar, fell lately from its pedestal, but the time being during the night, no loss of life occurred. The legendary hero Sir Bevois of Southampton, and the Giant Ascupart are painted on wood and hung in the Court Chamber on the first floor. The statue of Queen Anne, once standing in the southern front, but now replaced by George III. in Roman military costume, is also in this chamber. Bidding farewell to their talented conductor, Mr. T. W. Shore, the members of the Field

Club had the pleasure of entertaining Mr. W. Whitaker at dinner at the South Western Hotel.

Next morning betimes, after breakfast, the Past President of the Hampshire Field Club, Mr. Whitaker, gave the members a preliminary account of the origin and progress of the Southampton Docks, and at 10.30 the whole party proceeded to the Docks where they were met by the President of the same Club, W. E. Darwin, esq., F.G.S., &c., and the Superintendent of the Docks, who courteously, conducted the party over the whole of the present docks and those in process of formation.

The fine ships of the Royal Mail and Union Companies were being loaded in preparation for starting for the West Indies, South America and the Cape, and the largest of the International Line of the U.S.A. (formerly Inman Company) the New York, exceeding 10,000 tons burthen, was thoroughly inspected by the party, a ticket of admission having been granted at the office for a party of fourteen.

Some 3,000 men are daily employed in these docks, and the South Western Railway, who are now the owners, are laying out a million sterling in graving docks and improvements. In fact Southampton is rising again in importance, and owing to its enjoying a double tide, and easy access at all states thereof, is likely to make other seaports like Liverpool, Bristol and London anxious for their future superiority.

Departing from Southampton by the 1.5 p.m. train the members of the Field Club arrested their homeward journey at Romsey, and visited the magnificent Abbey Church. This has been lately restored, the galleries and loose boxes removed, and is now seen in its pristine glory. The greater part of the structure is of Norman architecture, probably dating from A.D. 1100 when Henry I. visited the town to fetch his bride, Maud the Good, daughter of Malcolm Canmore, King of Scots, who was under care of the Abbess, Christina Atheling. The western bays of the Nave are of Early English style, the four eastern windows

Decorated, and two little windows in the north aisle are Perpendicular. This Nunnery of Benedictines was originally founded by Ethelfleda, daughter of King Edward the Elder, son of King Alfred about the year 945. The Danes burnt the original wooden buildings, and the present church dedicated to SS. Mary and Ethelfleda, was completed when Mary, daughter of King Stephen, was Abbess. From the commencement this Nunnery always had Princesses or ladies of high rank as Abbesses, and was the High School for noble girls during several centuries. The precincts were a sanctuary, and the Abbess exercised the rights of holding courts of justice and of hanging malefactors. The latter power having fallen into disuse Henry III., in the 47th year of his reign, restored it by Charter to the Abbess Amicia.

The last Abbess Elizabeth Ryprose surrendered to Henry VIII. in 1539 when the revenue was £528 8s. 10½d. None of the conventual buildings are standing, except the church, which is peculiar among all large Abbeys as having no west façade or entrance. The Lady Chapel has also disappeared, but the four Decorated windows, now inserted in the eastern end of the Norman portion, are parts of the original extension. There are many coloured windows in the church and monuments to the St. Barbes, and Lords Palmerston and Mountemple, their successors in the ownership of the neighbouring park of Broadlands.

The present Marquis of Lansdowne has erected a handsome monument with recumbent figure over the tomb of his ancestor, Sir William Petty.

The town has erected a statue of the last Lord Palmerston in the market place, and close by is still the Swan Hotel signpost, from which, on March 13, 1644, according to a note in the Abbey register, William Morris, a soldier of Cromwell, was hung for pilfering.

Leaving Romsey at 3.46 p.m., the party reached Bath at 6.55, and it will be long before another excursion can be arranged which will offer as much interesting antiquarian information, or so many objects worthy of scientific observation.

Warwick and Stratford-on-Avon.—Another pleasant excursion of the Field Club took place on the 25th and 26th of July, and 11 members started from the Great Western Station by the 8.7 a.m. express for Leamington. There they were met by two other members, and made the Manor House Hotel their head-quarters, although more than half the party were provided with beds outside the house, which was filled with American tourists. Having done full justice to the luncheon provided by Mrs. Lamplough, proprietress of this hotel and of the Pavilion Hotel, Scarborough, the party of 13 mounted the tramcar, which passes the door of the house, and in a short half-hour were deposited at the East gate of Warwick. Thence a few minutes sufficed to reach the bridge over the Avon, from which the world-renowned view of the Castle, with its two towers, is obtained. Having fully stereotyped this entrancing spectacle on their memories, a start was made for the entrance gateway of the Earl of Warwick and Brooke's castle, each member having previously armed himself with the "open sesame" in the shape of a shilling ticket of admission. Passing through the first strongly-built portal, a walk of some 300 yards between perpendicular rocks of the new red sandstone brought the party to the ancient drawbridge (now a permanent structure) spanning the inner moat, and the entrance tower, giving admission to the inner court of the castle. On the right hand stands the gigantic Guy's tower. On the left Cæsar's, joining the entrance tower by a lofty machicolated wall, with a walk on the inner side, near the summit, for the defending troops. The residential part of the castle, and great hall burnt down December 3rd, 1871, have been rebuilt, the western wing remains as restored by Sir Fulke Greville Lord Brooke, in James I. reign. Being placed under the guidance of a Commissionaire, the 13 members of the Field Club were conducted through all the rooms of the west wing, full of valuable portraits and articles of virtu. Many beautiful cabinets, and tables of inlaid marbles and lapis lazuli, of Florentine workmanship adorn this suite of apartments,

and the views over the park and river Avon from the south windows are lovely. Finally the party were ushered into the great hall, which contains beautiful suits of steel armour, and the sword of immense length and other reliques of the mythical hero Guy of Warwick, who lived a long period before the Conquest, and when satiated with love and war, retired as a hermit to a cave at Guy's Cliff, two miles distant. The lofty tower at the south-east corner of the quadrangle, called Guy's Tower, was subsequently ascended by several members. It was built by Thomas Beauchamp, Earl of Warwick, 1394, and restored, as it now stands, in 1547 by John Dudley, Viscount L'Isle. Rich Earl of Warwick in 1642 was a Parliamentarian, and defended the Castle successfully against the Royalists, commanded by the Earl of Northampton. From this fact we can account for this Castle remaining intact to the present time, and also for the preservation of the monuments in the Beauchamp Chapel and Chancel of the parish church of S. Mary. Before leaving the Castle the party passed through a gateway in the northern side of the quadrangle, and in the park reached the lofty greenhouse, whence a charming view was obtained through a vista of the park over the river Avon artificially expanded into a lake. In this conservatory stands the Warwick Vase, cut out of one solid block of white marble. It was found in a lake at the Emperor Hadrian's Villa, at Tivoli, in 1794, and acquired by the Earl of Warwick of that time.

Leaving this interesting Castle, the parish church of S. Mary was soon reached, and the architectural taste of the party was rudely shocked by the horrible edifice which, after the great fire that consumed more than half Warwick in 1694, was constructed by some local builders, named Smith, at the cost of £4,874 9s. 5d. It is impossible to ascribe the tower and nave to any style of architecture. The former is lofty, and stands on open arches on three sides, forming a porch at the west of the Church, the windows of the nave have tracery, which offends every rule of architecture, and beats the record for ugliness.

Turning one's back on this hideous nave, and looking eastwards soon many redeeming points of beauty met the eye. The fire spared the crypt, chancel and Beauchamp Chapel with its sepulchral side chapel and confessional. All are elegantly groined, and the magnificent monuments of the Beauchamps Earls of Warwick, of Robert Dudley, Earl of Leicester, and Sir Fulke Greville, first Lord Brooke, ancestor of the present noble family who own the Castle, and who are lineally descended from the Beauchamps of Powyk through an heiress, remain intact. The crypt is the most ancient part of the church; it is divided longitudinally by four piers with five bays of vaulting, the three western being semi-circular Norman of the 12th century, the two eastern pointed and built by Thomas Beauchamp, Earl of Warwick, 1392.

In this crypt are what remains of a much-needed article of public punishment for scolding wives, viz., a cucking-stool. It was used in the town up to 100 years ago. The railing virago being securely strapped into the chair fixed at the end of a long beam resting on wheels, was deftly dipped into the River Avon, until peace was restored to the community.

The chancel, with the beautifully groined roof is Perpendicular, built by Thomas Beauchamp, the second Earl Warwick of that name, who died 1401, and afterwards altered by his son Richard Earl of Warwick. The gorgeous tomb in the centre is that of the father of the builder, the first Thomas Earl of Warwick and his Countess, who died 1369. The incised brass effigies of the builder and his Countess, who died 1406, are inlaid in a marble slab at the entrance of the Beauchamp Chapel.

This magnificent chapel is south of the chancel, and is separated therefrom by a small chapel with elegant fan tracery in its roof. It formerly had an altar, at which masses for the deceased Beauchamps were said. It still contains a small squint with a view of the high altar in the chancel, and the most diminutive piscina known, with wooden pipe and bowl to carry off the ablutions. A small chamber in the wall, between this and the

chancel, is called the Confessional. The Beauchamp Chapel was built 1443, in the reign of Henry VI., and completed 1464. In the centre are the gorgeous tombs of Richard Beauchamp, Earl of Warwick, who died 1439, and of Ambrose, the good Earl of Warwick, elder brother to Robert Dudley, Earl of Leicester. Henry Beauchamp, Duke of Warwick, lies also here buried, his body having been brought from Rouen, and also Robert Dudley, Earl of Leicester, with a splendid monument on the north wall. An extraordinary monument stands to the south of the altar, which is inscribed, "The Royal Impe," with a clothed figure of a boy or dwarf. It is said to be Lord Denbigh, son and heir of the Earl of Leicester. The chapel is 58ft. by 25, and 32 high, and with the exception of Henry VII. Chapel at Westminster, is the finest in the kingdom. The cost of its erection was £2,481 4s. 7½d., at the present value of money £40,000. Before leaving the church, the tomb of the founder of the present noble family of Warwick, Sir Fulke Greville, created Lord Brooke by King James I., who died 1628, and built himself a tomb in his lifetime, amused the members of the Field Club by its quaint epitaph and bad Latin :—

Fulke Greville,
Servant to Queen Elizabeth,
Councellor to King James
And Friend to Sir Philip Sidney,
Trophæum peccati.

Time was progressing, and the choir boys robing in the vestry proclaimed the hour of Evensong, 5 p.m., so a start was made for the West gate of the town, over which stands the chapel of St. James, belonging to the Leicester Hospital. This Alms House for wounded and aged soldiers was originally the Hall of the United Guilds of the Holy Trinity and St. George, turned into a Hospital by Robert Dudley, Earl of Leicester, 1571, whose crest, a bear and a ragged staff, is oft repeated in the building, and is worn on the left arm of the blue robe of the brethren. Originally it was instituted for a master and 12 brethren, who were not

allowed to possess of their own £5 per annum. The number is now increased to 22, and each receives rooms and £80 per annum. The Lord De L'Isle and Dudley appoints the master. The buildings are a beautiful specimen of the old timber built houses of the 16th century. The hall still stands wherein Fulke Greville, Lord Brooke, entertained his Sovereign, James I., in 1617, but half of it is used as a coal store. In the kitchen there are several quaint antiquities, including a Saxon chair, King James's arm chair, some handiwork of Amy Robsart and other articles. The conductor of the party, a retired colour-sergeant of the 12th Lancers, was an extremely garrulous and amusing cicerone, and finally suffered the party to view his private apartments, which are reached by a staircase erected in the great hall. Bidding him thanks and farewell the party returned by train to Leamington, and to the table d'hôte at the Manor House Hotel.

On the following day a start was made by the Great Western Railway at 10.35 for the Shakespeare country, and Stratford-on-Avon was reached in three-quarters of an hour. A short walk brought the party to the house where the immortal bard was born in Henley street, and to the most interesting Museum of Shakespearean reliques contiguous thereto. Externally the building is in excellent repair, being vested in trustees, who were incorporated by an Act 54 and 55 Vict., 1891, and make a small charge for admission. Internally the portion of the building which was Shakespeare's birthplace is left unrepaired, the walls, windows, ceilings and every available space being scribbled over with names of visitors. Those of Sir Walter Scott and Carlyle are still visible on window panes, those of Schiller and Edmund Kean on the plaster. The annual number of visitors is over 24,000, a large majority being Americans, who leave many gifts to the church and town, in the way of painted windows and drinking fountains. Since Washington Irving wrote his book, Stratford has become a veritable Mecca to literary Americans, and no trip to the old country would be considered complete

without a pilgrimage to Shakespeare's tomb and birthplace, and his wife's cottage at Shottery.

After thoroughly doing the Museum, the party left for the Church of the Holy Trinity, passing on the way the Memorial Theatre and public gardens on the banks of the Avon. The Church is a magnificent structure, the central tower being the oldest part of the 12th century, the Nave and Transepts next in date, and the Chancel and Clerestory the latest, being the additions when Balsall was Dean of this Collegiate Church, 1445-91. The Eastern end of the North Aisle was the Lady Chapel, and contains now the tombs of the Clopton Family. Sir Hugh Clopton, Lord Mayor of London 1492, brought the wealth to the family, and is here buried. William Clopton and his wife who died in 1592 and 1596, lie on a tomb to the North, and their six children stand in niches above them. The third Joyce married George Carew, Earl of Totness, and their gorgeous altar tomb is against the East Wall, both wearing gold coronets and coloured to the life. He was Master of the Horse to James I., and died 1629. The Eastern end of the South Aisle was the Chapel of S. Thomas à Becket, dedicated in 1333 by John de Stratford, Archbishop of Canterbury. The Choir and Swell Organ are now placed against this wall and the Great Organ over the tower arch in an elegant balcony, the whole being played by electro-pneumatic action from below. The chancel is a beautiful structure of Perpendicular architecture, inclining to the North from the line of the Nave, and contains the well-known bust of Shakespeare and his tomb and those of Dean Balsall, Ann Shakespeare (neè Hathaway), Susanna Hall, youngest daughter of the Poet, and her husband Dr. Hall, Thomas Nashe, who was first husband to their only daughter, afterwards the wife of Sir John Barnard, and the last surviving descendant of Shakespeare, besides the tombs of John a Combe, 1614, his daughter Judith, 1649, John Kendall, 1751, and others. The eleven windows are filled with stained glass, the third, on the North side, being the

American window representing the seven ages of man from "As you like it" in Scriptural characters. The eastern window is poor and is to be removed for another American window, when £500 has been subscribed for its cost, and placed in a transept. The Altar is the ancient "Mensa," discovered beneath the floor of the South aisle, 1892, supported on a stone altar tomb and black marble columns at the ends. The stalls have "miserere" seats with very quaint carvings beneath, and in the nave at the West end of the church are the remains of the old Font in which Shakespeare was baptized, and the Parish Register under glass, showing the entry of his baptism and marriage, with two registers to receive the names of visitors, one being reserved for Americans. There is much beside of interesting character in this fine church, but time did not allow of longer delay, so walking back through Church street, the Chapel of the Guild, and old Oak-built Grammar School whereat Shakespeare was educated, were visited, then in Chapel street "Ye five gables," a charming timber house, was admired, and in the High street another ancient house dated 1596 with a very fine carved Front (the early home of John Harvard's mother), and coming finallly to the "Red Horse" Washington Irving's Inn, in Bridge street, the welcome luncheon awaited the party, some of whom subsequently walked to Ann Hathaway's cottage at Shottery, one mile distant. On the road to the station the fine Fountain and Clock Tower, presented to the town by Mr. George Childs, of Philadelphia, U.S.A., was passed, and at 3.30 the party bid farewell to the Shakespeare country, and before 8 o'clock found themselves back in Bath, with pleasant reminiscences of the historical and archæological treasures of Warwickshire.

Berkshire White Horse and Wayland Smith's Cave.—The last regular excursion of the season of this club took place on Tuesday, the 19th September. Notwithstanding a falling barometer and stiff south-west breeze portending rain, 12 members started by the 10.5 a.m. train on the Great Western Railway, for Uffington,

the nearest station to these interesting reliques of antiquity, which was punctually reached at 11.58. Taking the direct line for the White Horse, which gives its name to this Vale of Berkshire, the chalk down was mounted to its summit, 893 feet above sea level, and the trophy of victory by King Ethelred and his brother Alfred over the Danes commanded by King Bacseg in the year 871, scanned from close quarters. This heraldic beast, styled a horse, is supposed by antiquarians to have been cut in the chalk after this battle of Ashdown, but there are many who pooh pooh this theory, and consider this quaint figure to be the work of shepherds who, having noticed on the chalk slope the rude resemblance of a horse when tending their flocks, reduced it to a more perfect shape for amusement. If in truth it represents the banner of the Pagan Saxons, it must have been designed before the year 883, when King Alfred adopted for his standard the Christian Cross, having received from Pope Martin, as his biographer Asser Menevensis asserts, "a large portion of that most holy and most venerable Cross upon which our Lord was crucified for the universal salvation of men." Formerly the tenants of certain lands in the neighbourhood of the White Horse were by their conditions of tenure obliged to cleanse and repair it, but the obligation is now void, and its periodical scouring is effected by the Dowager Countess of Craven, who lives at Ashdown park. In the vicinity of the White Horse are many tumuli of various shapes, supposed to cover the slaughtered Danes and their King Bacseg aud his Earls. A mile distant is a place called the Seven Barrows, though they are far more numerous, even now when the downs are under cultivation. Between White Horse hill and a Roman road, supposed to be the Icknield street, is a large barrow called Dragon hill, which Aubrey, the antiquarian, conjectured to be the burial place of Uter-Pendragon. About a mile from this barrow, in a copse, are three squarish stones, about four or five feet in diameter, standing upright, supporting another of much larger dimensions. This structure is popularly known as Wayland

Smith's cave, and is described by Sir Walter Scott in his novel "Kenilworth" with its fantastic legend, current from time immemorial in this country. It is said that anyone whose horse has cast a shoe, will find it replaced here by an invisible smith, provided the steed be left on the spot at night with a piece of money to reward the workman. This cromlech has its name evidently from Weland, who held the same place among the Anglo Saxon gods as Vulcan among the Latin. It is doubtless the chambered sepulchre of some ancient chieftain. The rain, long threatening, here came down on the excursionists, and the remainder of the trip was marred by continuous showers, rendering a retreat to some shelter advisable, and all further search for Anglo Saxon antiquities impossible. At the fifth mile from the station at Uffington the first place of refuge was reached, the Rose and Crown at Ashbury, which provided the necessary cover and refreshment. Above the village rises an entrenched camp called Alfred's Castle, but four or five fine specimens of British castrametation lie around. The rain continued pitilessly, so the only vehicle in the village was hired by five of the party to take them to Swindon, eight miles distant, whence an express train could take them to Bath. The remainder of the party found their way to the station at Shrivenham, a two miles walk, and were finally brought back to their homes by a slow train arriving at Bath at a quarter to eight.

Chapel Plaster and Ditteridge.—On Tuesday, October 10th, a bye-excursion was arranged at short notice to visit these interesting relics of antiquity, and 23 members of the Field Club started from the Great Western Station at 10.5 a.m. for Box. Thence a mile walk up a very steep road brought the party to Haselbury Manor, now a farm house, but with many signs of its former grandeur. The first notice of this house is found in Leland's "Itinerary of Wilts." He had received a commission from Henry VIII. to report on the Ecclesiastical and Monastic establishments in the West of England in 1532, and seems to have allowed several years

to pass, while the work of suppressing the greater Monasteries was proceeding, before he set out on his labours. But in 1540 he was entertained on his tour by the owner of Haselbury, a Mr. Bonhome, and mentions it thus in Chapter ii. of his "Itinerary." "The Manor Place of Haselbyry stondith in a little vale, and was a thing of simple building afore that old Mr. Bonhom father did build there. The Bonhomes afore that time dwelled by Lacok upon Avon." It is known that the principal seat of the Wiltshire family of Bonhome (afterwards Bonham) was at Great Wishford from 1315 to 1637, and three members of the family, named Thomas, were Sheriffs of the County in 1395, 1410, and 1531, two named Walter in 1476 and 1514, and one named John in 1549, a daughter of this latter being the wife of "Wild Darell," who threw her newly born babe into the fire at Littlecote in 1577. The Bonham family became extinct in heirs male in 1660, and Haselbury passed to a baronet named Speke, whose arms are still to be seen on the side pillars to the garden gate. He seems to have added to and altered the mansion considerably, but the male line of the Baronets Speke, of White Lackington, Somerset, became extinct in 1682, and the manor is at the present day vested in the family of Northey. At what date the ruin of the old mansion commenced is not known, but what remains of the fine structure is well worth a careful examination. Mr. Fry, the present tenant, most kindly conducted the party over his gardens and house, and stated that formerly carriages could be driven right through the centre of the house, and that within the memory of living natives as many buildings have been pulled down as are at present standing.

Formerly there was a church dedicated to All Saints in the precincts, but no trace is now left of it. The Prior of Bradenstoke was the patron of the benefice. There is still a sinecure Rector of Haselbury (now the Vicar of Box), who receives £10 per annum from the lord of the manor, and is inducted by reading prayers in a room of the old house and having a portion of mould placed in his hands in a ground called the burying place. The names of the

rectors from 1346 to the present day have been duly entered in the Sarum register.

Passing through the courtyard of the manor, and the immense barns still standing, a walk of half a mile brought the party to one of the most interesting objects of antiquarian notice in Wiltshire, called Chapel Plaster, now undergoing restoration to its original condition, under the architectural skill of Mr. Thomas Browne, of the firm of Messrs. Browne and Gill, Fountain buildings. Mr. Browne being a member of the Field Club, and present on this occasion, gave the party a valuable paper on the peculiarities of the structure (*printed at page 8*). The first mention of the existence of this chapel is to be found in Leland's "Itinerary," 1538, wherein he states:—"From Coseham to Haselbyry is about 2 miles. I left on the lift hand on the toppe of a litle hille a heremitage withyn a litle as I turned down to Hazilbyri."

Aubrey, the antiquarian in 1660, mentions it as "The Chapel of Playsters." Tradition has it that it was built in 1460 as a hospice for pilgrims travelling from Malmesbury to Glastonbury. What the origin of its name may be is dubious, as it is built of stone not plaster. Some say it may have been built by an individual named Plaister, others that a pilgrim may have been denominated a plaister in the local "patois," but the more probable derivation is from the Anglo-Saxon "Plegstow" (the village green), and the late talented antiquarian of Wiltshire, the Rev. J. E. Jackson, refers on this matter to the "Plestor Oak," mentioned by Gilbert White in his "Selborne." The same roots may be seen also in the Plaistow marshes in Essex and the village of Plaistow in Kent.

The structure of the chapel is small, 30 feet by 10, with Perpendicular windows, a bell-cot, and handsome niche over the west door, the latter not central, and now covered by a porch added subsequently. When funds come in, the wooden floor still dividing the nave and chancel into two stories, will be removed, and the whole restored to its pristine condition, as a mission room

for the natives around. There is a north transept to the building, which archæologists state to have been originally the residence of the Chantry priest. This chapel in the 17th century, standing close to the junction of five roads, was the haunt of a notorious highwayman, John Baxter, who ended his career by being hung on Claverton Down.

Returning to Box the Field Club restored their energies by visiting the Bear Inn, and thence walked half a mile to the little village of Ditteridge, formerly styled Ditchridge. This little church, dedicated to S. Christopher, is one of the "sights" of the neighbourhood. Restored by the last Rector, Mr. Heathcote, it is now in excellent repair, and has not been transmogrified out of all resemblance to its ancient self. It has the credit of being antecedent to the Conquest on account of its font and piscina which may be Saxon. The south porch has peculiarly sculptured imposts; the western representing a dragon with long intertwined tail beaded the whole length; the eastern is an unknown animal, which may have been improved by later jokers. It has some resemblance in its feet to a camel. There are well sculptured faces on the inner sides of the imposts.

Mr. Edwin W. Godwin, architect, in the "Wilts Archæological Magazine," vol. iv, p. 148, states these carvings are similar to some in Westminster Hall and Canterbury Cathedral, and fixes their date at 1097. The nave of the church is Norman, one original window remaining, the others are of the Decorated and Perpendicular styles. The porch to the south door is Decorated. The chancel arch is but 5ft. 7½in. wide, and bears externally a gable of the 13th century with a bell. On the north wall of the chancel is a quaint epitaph.

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The exterior of Cheyney Court was viewed by the members of the Field Club on leaving this small but interesting church. The Speke arms are carved over the central door of the north façade, and a handsome flight of steps leads up to the principal entrance on the west. The house is of Elizabethan date, one half being used as a gentleman's residence, the rear moiety being a farm house with its bartons and out-houses. The objects of the excursion having been fulfilled, the Great Western Railway speedily brought the members back to Bath, well satisfied with the result of their investigations, and marvelling that with such interesting subjects of antiquarian research in the immediate vicinity, by far the larger majority of the inhabitants of Bath are ignorant of their existence, or have never troubled themselves to see them.

Shepton Mallet and Wells.—The last excursion of the season took place on Tuesday, October 31st, and was attended by a goodly muster of 30 members. Starting by the 10.25 a.m. train on the Somerset and Dorset line, the members were deposited in little more than 40 minutes at Shepton Mallet. This is a busy mercantile town, taking its name from its Norman lords named Malet, one of whom joined the Confederate Barons in extracting Magna Charta from King John, 1215, and two Crusaders of this family are represented by effigies in the Parish Church. From the Malets the Manor passed to the De Gournays by purchase, and of these lords, one assisted at the murder of King Edward II. in 1327, and another fought valiantly at Cressy and Poictiers, 1356, and died, aged 96, in 1406, being buried at Stoke-sub-Hamdon, in this county. The manor reverted to the Crown in 1536, and was granted subsequently to the Prince of Wales as Duke of Cornwall, and still the greater part of the parish, as well as the alternate presentation to the Rectory, is held by the Prince of Wales. The antiquities of the town are not many, but the few that exist are well worth a visit. The Parish Church of SS. Peter and Paul, whose statues stand right and left of that of our Lord

on the West front, has been well nigh rebuilt, the aisles in 1827 and Chancel in 1851, but the narrow nave of six bays remains with a beautiful roof of English oak, containing 350 exquisitely carved panels, no two alike, enriched with figures of angels holding shields, some charged with emblems of the Passion. A pulpit of stone, elegantly sculptured, of the 15th century, is approached by narrow steps passing through the north column supporting the chancel arch. Woe to an obese Rector! There are many brasses in the church recording benefactions, and the decease of members of the Strode and Barnard families. One grand brass under the western tower represents William Strode, esq., of Barrington (who died 1649), in armour, kneeling opposite to his wife Joan nèe Barnard, he with six sons behind him, she with three daughters. Opposite on the wall is a small brass with well sculptured figures, right and left of the inscription, of Death with a scythe and a sexton with a spade. Under the south arch to the chancel is an extraordinary epitaph in vile Latin, composed, too, by the local schoolmaster in days when such wretched scholarship would have brought most severe flagellation on his pupils. The epitaph runs thus :—

M S
Franciscæ Smith
Rev. Thomæ Smith, Scholæ grammaticæ,
in hoc oppido donatæ, magistri ;
Necnon hujus Ecclesiæ, sub Rectore, diu Pastoris
Uxoris quam-plurimum dilectæ.

Fannia chara vale ! semper mihi viva voluptas,
et desiderum mortua semper eris.

Leaving this interesting church, the Market Cross next claims the attention of archæologists. It stands about 100 yards westward of the church, and is an hexagonal structure with open arches and crocketed pinnacles rising above a traceried parapet enriched by smaller pinnacles. In the centre, supported on a basement of three steps, rises a lofty spirelet arranged in three

stages and reaching a height of 51 feet. Each division has canopied niches and crocketed pinnacles at the angles, and the apex is surmounted by a cross. Judge Jeffreys, after Monmouth's rebellion, hung 12 inhabitants who had joined the Duke, at this cross. The Duke himself had twice visited Longbridge house in the parish in 1685. On a brass plate affixed to the central column is this quaint inscription :—

Of your charitye pray for
the Soules of Walter Buckland and Agnys hys wyfe
wh whoys goods this Crosse was made
in the yere of our LORD GOD MD
whoys obytt shall be kepte for ever
in the parishe Churche of Shepton Mallet
ye xxviii day of November.
on whoys soules Jhu pardon.

The Grammar School lies close to the north of the churchyard, and retains much of the original structure, endowed by George Strode in 1699, and the almshouse given by the same family for four old men, now increased in number, and with new buildings close by to the eastward of it. Having viewed thus all the sights of Shepton, the members of the Field Club took train five miles to Wells, where, before renewing antiquarian investigations, Mrs. George, at the Swan Hotel, provided the necessary luncheon. After giving sufficient attention to the repast the Deanery was first visited by invitation of Dr. Jex Blake, who conducted the members over the exterior and interior of his residence. The north front is very beautiful, and still bears the rebus of the builder, Dean Gunthorpe, 1472-88, on several shields, also the Rose in a Sun of Edward IV. The large banqueting hall on the first floor of the house is now divided into several bedrooms, and the original flat leaden roof is now replaced by a lofty slated roof, giving more room for the domestics of the establishment, but dwarfing sadly the handsome tower on the west front of the house.

The Dean of Wells, with great kindness, subsequently conducted the members over the Cathedral, and thoroughly explained the various dates of this structure, one of the fairest of our land, pointed out the various monuments, chantry chapels, and ancient windows in the nave, chancel, and Lady Chapel, and as the curious old clock of Peter Lightfoot, the monk of Glastonbury, of 1325, which is now in the north transept, struck three, the hour for evensong, bid farewell to the party, who returned him many thanks for his personal guidance and attention. A cursory examination of less than an hour of the many objects deserving of close inspection and study in this magnificent fane is naturally but superficial, but the charming book of the late Professor Freeman on this Cathedral will amply prove that visitors will find sufficient to interest them in a daily visit for a month. Another month might well be spent in the other sights of Wells outside the Cathedral. Through a small door in the south transept and up a corkscrew staircase the Field Club next visited the library over the eastern wall of the cloisters. This library was erected by Bishop Bubwith, in 1425, and contains 3,000 volumes of great interest, many having belonged to the saintly Bishop Ken, besides old deeds and charters some with Anglo-Saxon characters. Many chains, which formerly attached the books to the desks, are preserved here, and the beautiful pastoral staff, formerly kept at the Deanery, of exquisite mediæval art, is now exhibited here. The head of Limoges enamel represents St. Michael vanquishing the dragon; it is studded with small turquoises and other precious stones. One member of the Field Club, of long standing, here remembered a peculiar incident which occurred at the club's last visit to Wells, on June 10th, 1873, when the Dean of that day was exhibiting this precious relic to the members, one (Col. Wyndham Baker, now deceased), requested to be allowed to handle the staff, to the consternation of the very rev. gentleman, who gazed long and fixedly at him, and then handed him the staff, saying that he would allow him to hold it, but nothing

would have persuaded him to give the same permission to the Bishop! Leaving the Chapter Library the party were next shewn out of the Cathedral into the cloisters, which, as the clergy here were not monks, were only an ornamental walk round the palm churchyard, an aged yew in the centre having formerly supplied boughs to be carried as palms in processions, whence the name. All the mural tablets formerly attached to the walls of the Cathedral nave, and commemorating "nobodies," are now fixed in the cloisters, which are Perpendicular, built from 1425 to 1464.

Passing out of the S.E. angle of the cloisters the party found themselves on the bank of the wide moat which surrounds the lofty wall and bastions encircling the Bishop's palace. This moat and wall are the work of Bishop Ralph of Shrewsbury, 1337-40, who thus defended himself against the Bath monks who threatened his life. Crossing the water by a drawbridge and passing through a gatehouse of the 14th century, defended by square flanking turrets, a groined entrance with chains of a drawbridge and grooves of a portcullis, the ruins of the great hall met the gaze of the visitors to the south, the restored chapel of Bishop Burnell, 1274-92, of elegant Decorated architecture and three bays, groined very richly, the windows with arches supported on columns of shell marble, to the S.E.; the palace of Bishop Joceline's time, 1239, to the E., with many later additions, as the upper storey with gabled dormers built by Bishop Bagot, 1840. The great hall was the scene of the mock trial of the last Abbot of Glastonbury, Whitinge, who, on Nov. 14th, 1539, was condemned to be hung, drawn, and quartered with two of his monks. It was dismantled by Sir John Gates, who bought the palace for the sake of its materials, in 1552, at the execution of the Duke of Somerset, to whom Bishop Barlow had alienated it two years before. Sir John Gates received his reward by being beheaded in 1553 for aiding Lady Jane Grey. The Protector granted the palace to a puritan, Dr. Cornelius Burgess, who finished the destruction and

finally died in gaol at the Restoration of Charles II. This hall was 115 feet by 60, and of unusual magnificence, with four turrets at the corners, and with a crypt below.

The gardens inside the walls are of charming colour, and the walk on the embattled wall gives most exquisite views of the Cathedral and country around. The perennial spring which supplies Wells with its name and water, rises in the garden, and the well house, built by Bishop Beckington, 1450, still stands, a square buttressed building with mullioned windows. After being conducted by the gardener over these gardens, the members were admitted into the Palace, and found, by the hospitable forethought of the Bishop, in the groined dining hall, the tables laid out with all necessaries for an afternoon tea. Notwithstanding the protests of several members, who knew there was still much to be seen in the town of archæological interest, the majority succumbed to the effeminate charms of tea and bread and butter. So farewell to further antiquarian research. Two brakes took the party to the summit station of Maesbury on the S. and D. line, whence a train more than half-an-hour behind time landed them at 6.25 p.m. in Bath, after a very cold but highly successful excursion.

The afternoon meetings commenced with a paper from the President on "The Weather of the past Season and its Effects on the Garden." 35 members and visitors were present. This paper is published in the Proceedings at page 11. In the subsequent discussion several members took part, and Mr. Skrine, the chairman, regretted that Canon Ellacombe had not extended his paper to Agriculture as well as Horticulture. The Club had as visitors on this occasion several ladies and Mr. J. W. Morris, F.L.S., and Mr. John Milburn the Superintendent of Victoria Park, who exhibited a case of grafting by natural approach in a case of a Portugal Laurel, which he had cut in the Park.

The second afternoon meeting was devoted to a very interesting paper by Mr. Emanuel Green, F.S.A., on "Bath and Early Lithography" (page 23). The Rev. Canon Ellacombe presided, and

24 members were present, and Mr. Bate, the Curator of the Holburne Museum, was a visitor. Previous to the paper the Rev. Wynter T. Blathwayt exhibited to the members a brazen Mace, the Official Wand of the High Bailiff and Feoffees of the parish of Marshfield. It is surmounted by a moveable Crown and bears the letter C.R., showing it to be of the date of Charles I. with the Royal Arms. On the base of the staff nearly effaced are the arms of the Gosslet family, most likely the donors. The chairman, at the conclusion of the paper, said it was always a pleasure to hear Mr. Green, and it was impossible for them to do so without learning something. They were all sensible of the very clever way in which he managed sometimes to connect his subjects with the objects of the Field Club. He had done so that afternoon by drawing attention to the connection of lithography with the city of Bath. He had certainly shown a very strong connection between them, and he, as chairman, could add little or nothing to what he had said. Mr. Green had remarked that there had been an inquiry—by Government he presumed—as to there being any English stone capable of supplanting German stone for the purposes of lithography, and that to make that search more active they put a heavy duty upon foreign stone. It was said that there was no English stone. Then he came back to speak of the white lias at Corston, and it was with reference to the stone of this neighbourhood that he (the Chairman) wished to make a few remarks. As they went from Bath to Bristol by the Great Western Railway they would recollect that remarkable bed of lias which had been cut through just beyond Saltford. When that railway was being made he recollected a conversation between his father, Mr. Freer, one of the engineers of the line, and a member of the family of Pocock, who were at that time rather an important body of lithographers in Bristol. Their conversation was as to the use of this stone, which they were then cutting through, for the purpose of lithography, and if his memory served him rightly, Pocock said they did occasionally get Saltford stone—that is the

blue lias, and that they were occasionally able to use it. It was very good stone, but could not at all compete with the German stone, because the surface was not so good, and it was found impossible to get pieces of sufficient size. Mr. Bate remarked that Mr. Green did not seem to know anything of Hutchinson, who he mentioned. There was, he said, a remarkable miniature, which the artist had executed, of Rossini. The original still existed, and was in the possession of a gentleman living in Queen square. Mr. Shum adverted with satisfaction to the preservation of Barker's stones of rustic figures. Their last disposal was by public auction, when they were purchased by Mr. T. W. Gibbs, who was now, he regretted to say, extremely ill. The collection was a very fine one. He believed that partly the reason why Redman selected Bath was that Bath was so much before other places in the matter of engraving. Mr. Egbert Lewis, with reference to the Chairman's remarks as to the lias from the neighbourhood of Bath, said he did not think it had ever been found satisfactory for lithographing, although experiments had been made with it. The Rev. H. H. Winwood said it had been stated on authority that Corston stone had been used for lithographic purposes. The Chairman moved a vote of thanks to the lecturer, who briefly replied, remarking that lias had been tried for lithography, but it was not successful. The great difficulty was to get the stones large enough. When he came to Bath he intended to have gone to Corston, and having got a piece polished down, to have asked the lecturer to have executed a drawing, so that they might see for themselves how the stone worked. The weather had, however, been so unfavourable that he had not been able to go.

At the third afternoon meeting on Wednesday, January 31st, the Rev. H. H. Winwood read a paper containing some very interesting reminiscences of the Club's late president and founder, the Rev. Leonard Blomefield, M.A. The meeting was held in the conversation room at the Literary Institution, under

the presidency of the Rev. Canon Ellacombe, and there was a numerous attendance of members. As the writer explained, he was largely indebted for the many events of the deceased's long life to that interesting volume written by Mr. Blomefield himself many years prior to his death, and privately circulated, entitled "Chapters in my Life," although the paper contained in addition some valuable observations and reminiscences, which could only have been the outcome of a long personal acquaintance and friendship with the deceased, such as that enjoyed by Mr. Winwood. The paper touched upon the deceased's early life, his parentage, his studies at Eton and St. John's College, Cambridge, where he went through the ordinary courses of a University education, his natural history pursuits, his illustrious acquaintances, and his scientific works, besides detailing many of his personal traits and characteristics. Many of the incidents arising from his long acquaintance with Henslow and Charles Darwin, the celebrated naturalist, were recounted, and an allusion made to the variety of papers and short articles contributed by the deceased at different times to the "Transactions of Scientific Bodies" and other periodicals. Mr. Winwood also read a number of extracts from a book written by the deceased, entitled "Thoughts and Notes," lent to him by Mrs. Blomefield. Speaking more directly of his connection with the Field Club, he pointed out that the deceased, even in his later years, was ever ready to talk over matters connected with its welfare; in fact few members were aware of the anxious solicitude which he showed as to the club's progress. He had to a certain extent out-lived the present generation, but those who still remembered the early days of the club would recollect his presence at their meetings and anniversary dinners. When at the latter, his terse and short addresses bore witness to his anxiety lest the social nature of the gatherings should overshadow the scientific object for which they were held. His strength did not permit him latterly to join in their walks and excursions, but their published Proceedings bore

testimony to the numerous scientific contributions from his pen. On one occasion Mr. Winwood hinted at his change of name from Jenyns, by which he was so well known, to Blomefield, when the deceased explained that he had consulted counsel on the subject, who had pointed out the necessity of his adoption of the latter if he were to retain possession of the Blomefield property. In his literary works the deceased ever expressed himself with the utmost lucidity and precision, and was at all times able to explain what he wished and thought exactly and accurately. All those who had heard his addresses must, he felt, have come to this conclusion, although there was one extraordinary thing in connection with his writing which was somewhat surprising. On looking over the numerous letters which he had received from the deceased on various subjects, only four or five could he find on which he had written the date or the year. One of the greatest pleasures which cheered his latter life was the receipt of an illuminated address engrossed on vellum, on his attaining the 70th anniversary of his fellowship of the Linnean Society. He was then in his 92nd year, having joined the society in 1822. He wrote a most eloquent reply, full of dignity and truth of expression, which was printed in their Field Club Proceedings, and he well remembered the deceased's anxiety lest when he copied the address hanging on the wall of his room he should make a mistake. Mr. Winwood added that he had known the deceased ever since the year 1861, and he felt proud at being enabled to class him among his friends. The notes he had ventured to put before them had been somewhat imperfect, still to look up to another standing on such a higher pedestal had an elevating and improving effect, and he thought he had said sufficient to show that the deceased was entitled to be enrolled as one of the worthies of no mean city. The Chairman remarked that the paper was not one productive of any discussion. He should be very glad, however, to hear from other members any additional facts which might be useful in its completion, though

Mr. Winwood had not read to them the whole of what he had ready for publication. For his own part he could only say ditto to all that had been said in warm appreciation of Mr. Blomefield. He thoroughly endorsed everything written as to the beauty of his character, and the enormous help he had been to all of them, especially the members of the Field Club, and the honour which they felt in having him as their president. Many of the incidents recorded in the paper he recollected personally, for he was now one of the oldest members of the club, and, perhaps, with the exception of Mr. Winwood, had had more to do with it than any of the present members. Mr. Blomefield often used to visit him at Bitton, and he well recollected some of the conversations they had together, and his interesting reminiscences of Darwin, who was one of his most valued friends. Those who read Darwin's life would observe that it contained several letters to Mr. Blomefield. He assumed that Mr. Winwood's paper would be published in the Field Club Proceedings, although before it appeared in that way he believed it would be very much enlarged. He thought they might give the writer permission to include anything that would add to its interest. He took it to be not so much an account of Mr. Blomefield's life as an eulogium upon him, and such it was meant to be. He looked upon it as an excellent eulogium, and it would occupy a considerable portion of their Proceedings. He thought it would be a good thing for them to ask Mr. Winwood to allow the Club to have a copy nicely bound for presentation to Mrs. Blomefield. He thought it would be a very fitting procedure, though he did not know whether it would be taking away from Mr. Winwood the pleasure of presenting it personally. He should be happy to hear any suggestion from the members on the subject. They were all agreed that Mr. Winwood was deserving of their warmest thanks for the great trouble he had taken. It was felt that someone should undertake the task, and no one could have done it better than Mr. Winwood. The Rev. W. W. Martin thought the

Club should request Mr. Winwood to allow his paper to be published in their Proceedings, and to allow one copy to be nicely bound and presented to Mrs. Blomefield on behalf of the Club. The Rev. H. H. Winwood remarked that when he commenced the paper he felt the subject was one almost utterly impossible for him to touch. He had recorded all the reminiscences which occurred to him, and had also put down his personal views with regard to Mr. Blomefield. He thanked the Chairman and Mr. Martin for their kindly expressions, but thought it would be better for the Club to see the completed paper in print before passing any resolution with regard to it. It was possible they might not think it worthy of presenting to Mrs. Blomefield. The Chairman: I think we might leave that to Mr. Winwood, the secretary, and the committee. Mr. Winwood added that he was in possession of some very interesting observations made by Mr. Blomefield with reference to the progress of science in Bath, which he did not believe had ever been published. In them he spoke of the Institution as the fruitful vine, the mother of a happy family, her affiliated daughters being as the olive branches round about her table. He thought the observations were uncommonly good, and should be included in any publication of the kind suggested. The Chairman thought they should give Mr. Winwood a free hand to enlarge his paper as he thought fit. He was sure it would be approved by the committee, who wished for a really good account of Mr. Blomefield.

The afternoon meetings were brought to a close on February 28th by an instructive paper on Church Plate in Devon and Cornwall, read by the Rev. Philip Williams. He stated that in the reign of Queen Elizabeth nearly all the pre-reformation plate had been made to disappear by the connivance of the churchwardens of that day, but a considerable number of flagons, patens and chalices remained of the date of James I. The paper was illustrated by specimens of old silver spoons of Queen Elizabeth's

time, and forks with the Dublin Mint mark, as well as by sketches of various Eucharistic vessels and books relating to the subject. At the close of the paper the President heartily thanked the lecturer for his paper on behalf of the Club, and expressed a hope that some day the paper read might be published in the Club's Proceedings as an introduction to a catalogue of all the Church plate held by the Churches in the immediate neighbourhood of Bath. He advised the Field Club to form a committee as soon as possible to visit the parishes around and draw out a schedule of all plate now in use with its peculiarities, dates and marks. He felt convinced that much more ancient plate would reward the search than was commonly supposed; in fact that he was personally aware of several pieces of pre-reformation date, and he felt sure all the clergy would give hearty assistance to drawing out a perfect inventory of the Ecclesiastical plate of Somersetshire, as had already been done in other Dioceses.

Several other members continued the discussion, and Mr. J. S. Bartrum reminded the members that the late Mr. J. Rainey, of Southgate Street, had a valuable collection of ancient chalices and patens, but that he was unaware who held that collection at the present time.

As to the Walks of the Club during the year. I suppose they were principally taken as constitutionals and for pleasure, as no notes of any have been returned to me for insertion in the Minutes, nor have any records of new discoveries in Natural History, Botany, Geology, or Archæology been added to the pages of the Club's Proceedings. Our respected President, however, notified at one of the afternoon meetings that during the severe weather early in January a large flight of the mountain finch or brambling, *fringilla montifringilla*, had appeared in Beech Wood, adding one to the list of the local fauna. One walk, however, deserves especial mention.

The members of the Bath Field Club assembled to the number of 41 at the Royal Literary Institution on February 13th, in

response to the invitation of one of the Vice-Presidents, the Rev. H. H. Winwood, to accompany him on a water finding excursion. The secret of the spot to be visited was kept till the members met, when Mr. Winwood introduced the "diviner," Mr. Leicester Gataker, and stated that the walk was to a field belonging to Mr. H. D. Skrine, at Claverton. The party then proceeded by way of Bathwick hill, where the evils of barbed wire was evidenced, a dog belonging to a popular member of the Club having its hind leg caught and securely fixed by this cruel contrivance. However, the animal was released fortunately without much damage, but it is clear the recent Act of Parliament has not been enforced in Bath. The scene of the experiments, a field near the Militia camping ground, having been reached without any further excitement, Mr. Gataker commenced his operations and quickly pointed out a spot where the said water would be found, and subsequently several other places were indicated and marked with pegs, the suggested depth of the spring varying in different positions from 25ft. to 40ft. Several members of the party tried, both with twigs and also with a piece of steel wire, but no one was possessed of the necessary power. The ends of the twig in Mr. Gataker's hands were securely held to prevent it turning, but the result was the same, the twig twisting itself round and breaking the bark where held. The bulk of the members were very sceptical, but many of them were convinced by the experiments of the diviner that he had some unaccountable power through which the twig turned in his hands when passing over certain portions of ground. One gentleman, however, remained sceptical to the end, and his explanations of the twisting of the stick created considerable amusement. At the conclusion of the experiments, Mr. H. D. Skrine, who had joined the party on its arrival, and had watched the proceedings with evident interest, entertained the members to lunch on the ground, at the conclusion of which Mr. Winwood moved a vote of thanks to him for his hospitality and for his kindness in allowing the use

of his land for the Club to witness the experiments of the water finder. He testified, from his knowledge of the geological formation of the neighbourhood, that Mr. Gataker was correct in his assertions. He also thanked the latter for kindly affording the Club an exhibition of his powers. Mr. Leicester Gataker has carefully studied the theory of water finding by means of the divining rod, and intends adopting it as a profession. His experiments up to the present have been most successful.

The Obituary roll of the Field Club for the year is marvellously small. Only two members have left us, but one was the only survivor of the Original Members, the permanent President the Rev. Leonard Blomefield, M.A., F.G.S., F.L.S. Full of years and honour he passed away on September 1st, and has left the Club, of which he was joint founder with Mr. Broome and Mr. Charles Moore, a farewell letter, which appears in these Proceedings as a perpetual reminiscence of the care and love he ever had for the Field Club and its members. The second member who departed to his rest is the late Lieut.-Gen. James Burn, an active pedestrian and regular attendant at the Excursions. Four members have resigned during the year, and eleven new members have been elected, so that at this date our Club numbers 99.

The Library, under the careful supervision of Mr. W. H. Barlow, and the increased accommodation afforded by the Committee of the Royal Institution, looks now worthy of our Club, and the continual works of great value which are presented by the Smithsonian Institute of Washington, U.S.A. and private donors, and the annual proceedings of the various learned societies with whom we are on terms of exchange, are rapidly making the Field Club library most useful for reference on all subjects of scientific interest.

The Funds of the Club are in a satisfactory state, and the Treasurer, Dr. Mantell, announces a balance of £31 13s. 8d. in favour of the Club to start the new year, so that we can look

forward without diffidence to the continued success of the Field Club, and to deeper and more extended researches in the scientific objects of its foundation.

WALTER W. MARTIN,

Hon. Sec.

BATH NATURAL HISTORY & ANTIQUARIAN FIELD CLUB.

INSTITUTED FEBRUARY 18th, 1855.

LIST OF MEMBERS FOR THE YEAR 1894.

PRESIDENT.

1861 *Rev. CANON ELLACOMBE, M.A., Bitton Vicarage, Bristol.

VICE-PRESIDENTS.

1861 *Rev. H. H. WINWOOD, M.A., F.G.S., 11, Cavendish Crescent.
1865 *H. D. SKRINE, Esq., M.A., D.L., J.P., Claverton Manor.

SECRETARY.

1872 *Rev. W. W. MARTIN, M.A., 49, Pulteney Street.

LIBRARIAN.

1882 *W. H. BARLOW, Esq., Cleveland Villa, Bathwick.

TREASURER.

1883 *Surgeon-Major A. A. MANTELL, M.D., The Elms, Bathampton.

1865 SHAW Rev. Prebendary W. S., M.A., The Vicarage, Twerton-on-Avon.
,, GREEN Emanuel, Esq., F.S.A., Devonshire Club, S. James, London.
1866 DAVIS Major C. E., F.S.A., 55, Pulteney Street.
,, McMURTRIE J., Esq., F.G.S., Radstock.
,, INMAN H. B., Esq., M.A., Pine House, Batheaston.
,, *CHANDLER Col. J. T., 33, Marlborough Buildings.
1867 *INMAN T. F., Esq., F.L.S., Kilkenny House, Sion Hill.
1868 TAYLOR Col. R. L., C.B., 22, Gay Street.
1870 MENARS Major H., 12, Bathwick Street.
,, HERDMAN J., Esq., 18, Camden Crescent.
,, HARPER C., Esq., Manor House, Batheaston.
,, WATTS J. Onslow, Esq., Warleigh Lodge, Bathford.
1872 SHUM Fred., Esq., F.S.A., 17, Norfolk Crescent.
1873 CLARKE W., Esq., Bath and County Club.
1874 TAGART W. H., Esq., Parkfield, Park Gardens.
1875 TALBOT C. H., Esq., J.P., Lacock Abbey, Chippenham.
,, WILSON Spencer, Esq., 5, Kensington Place.
,, BLATHWAYT Rev. Wynter T., M.A., Dyrham Rectory, Chippenham.
,, EVANS Major J., Ll., 11, Cavendish Place.

1876 LEWIS Harold, Esq., B.A., 1, Royal Colonnade, Great George Street, Bristol.
,, *HENDERSON W. H., Esq., 9, Royal Crescent.
1878 MACKILLOP C. W., Esq., J.P., 14, Royal Crescent.
,, SKRINE Col. H. Mills, J.P. Warleigh.
,, BROWNE T., Esq., 1, Fountain Buildings.
,, FOXCROFT E. T. D., Esq., J.P., D.L., Hinton Charterhouse.
1880 CARLINGFORD Right Hon. Lord, The Priory, Chewton Mendip.
,, GAINE Charles, Esq., M.R.C.S., Weston Lea, Weston Park.
,, WRIGHT Col. A. F. Bingham, Manor House, Southstoke.
,, SHUM F. Ernest, Esq., 3, Union Street.
1881 BYTHESEA Lieut.-Gen. H. F., 97, Sydney Place.
1882 *NORMAN G., Esq., M.R.C.S., 12, Brock Street.
,, PIGOTT Lieut.-Col. A., 7, Cavendish Crescent.
,, TUCKER J. Allon, Esq., 9, Green Park.
,, GRAHAM Thos., Esq., 13, Kensington.
,, POWELL G. F., Esq., Butt Ashe Cottage, Lyncombe Hill.
1883 KITT Benjamin, Esq., C.E., Sydney Lodge, Bathwick.
,, BLATHWAYT Lieut.-Col., L., F.L.S., F. Ent. S., Eagle House, Batheaston.
,, TABUTEAU Lieut.-Col. A. O., F.G.S., Brow Hill, Batheaston.
1885 KING Austin J., Esq., 19, Portland Place.
,, PUMPHREY W., Esq., The Cottage, Lyncombe Vale.
,, BYROM Edmond, Esq., 3, Edgar Buildings.
,, HUTH Captain F. H., 20, Lansdown Crescent.
,, RENDELL Rev. L. T., M.A., Rectory, Timsbury.
1886 BARTRUM J. S., Esq., F.R.C.S., J.P., 13, Gay Street.
,, STUBBS Rev. E. T., M.A., 4, Springfield Place.
,, GEORGE Rev. P. E., M.A., Winifred House, Sion Hill.
,, SKRINE Lieut.-Col. C., Laurel Cottage, Sion Hill.
,, LEWIS Egbert, Esq., 17, Pulteney Gardens.
,, FULLER E. N., Esq., 4, Ainslie's Belvedere.
1887 SCOTT R. J. H., Esq., F.R.C.S., 28, Circus.
,, PALMER-HALLETT T. G. Esq., M.A., J.P., Claverton Lodge, Bathwick Hill.
,, HOLST Johan, Esq., 35, Pulteney Street.
1888 KNIGHT James, Esq., 31, Pulteney Street.
1889 ALEXANDER Patrick, Esq., Experimental Works, Bath.
,, SHICKLE Rev. C. W., M.A., Rectory, Langridge.
,, BALLY Major-Gen. W., 23, Park Street.
,, NIMMO Major-Gen. T. R., C.B., 94, Sydney Place.
,, THOMSON Col. H., The Elms, Weston Park.
1890 FANSHAWE Col. T. B., 24, Park Street.

1890 THOMSON Urquhart G., Esq., Manvers House, Bradford-on-Avon.
„ *DAUBENY W., Esq., J.P., 1, Cavendish Crescent.
„ WEST Rev., W. H., M.A., 25, Pulteney Street.
„ ROSE H. F., Esq., 18, Grosvenor.
„ DAVIS Col. T. Arnoll, R.A., 4, Marlborough Buildings.
1891 SEAGRAM Lieut.-Col. J. H. S., 4, Mount Beacon.
„ RICKETTS Col. Montague, Shelbourne Villa, Lansdown.
„ McCHEANE Rev. R., B.A., 5, Lansdown Place, E.
„ BLAIR Lieut.-Gen., C. R., 37, Green Park.
1892 PIGOTT W., Esq., 25, Circus.
„ BRAIKENRIDGE W. J., Esq., J.P., 16, Royal Crescent.
„ BRADFORD J. E. Goddard, Esq., 16, Marlborough Buildings.
„ BUSH Robert C., Esq., 1, Winifred's Dale.
„ BUSH Thomas S., Esq., Dale Cottage, Charlcombe.
„ DAVIDSON Major-Gen. James, 23, Queen Square.
„ PAVITT Thomas, Esq., 10, Cavendish Crescent.
„ PRYCE Ernest, Esq., 15, Belmont.
1893 BLAKENEY Edward, Esq., 44, S. James's Square.
„ HANDYSIDE W., Esq., 12, Dunsford Place.
„ WILLIAMS Rev. Philip, M.A., 15, Grosvenor.
„ BURMESTER Captain, Bitton, near Bristol.
„ BLATHWAYT Rev. Wynter Edw., M.A., Dyrham, Chippenham.
„ CASTELLAIN Alfred, Esq., 93, Sydney Place.
„ SCOTT M. H., Esq., 5, Lansdown Place, W.
„ HARRIS Major-Gen. J. T., 35, Henrietta Street.
„ SEALY Lieut.-Col. H. H., Elmhurst, Batheaston.
1894 HEATH A. J., Esq., B.A., F.L.S., The College, Monkton Combe.
„ COPPINGER A. W. D., Esq., L.R.C.P., L.R.C.S., 24, Gay Street.
„ MASKELYNE E. Story, Esq., Hatt House, Box, Chippenham.
„ BAYLY Gen. J., R.E., C.B., F.S.A., 13, Royal Crescent.
„ KEMBLE W., Esq., Beechfield, Bathampton.
„ GRAHAM Rev. E., Prior Park.
„ FORBES Gordon, Esq., Upton Cheney, Bitton, Bristol.
„ JEROME Major-Gen. H., V.C., 11, Sion Hill.

* *Members of Committee of Management.*

HON. MEMBERS.

1864 DAWKINS Professor W. Boyd, F.R.S., F.G.S., &c., Owen's College, Manchester.
„ EARLE Rev. Prebendary, M.A., Swainswick Rectory, Bath.
1873 HERIOT Major-Gen. Mackay.

SUPERNUMERARY LIST.

1881 PHILP Capt. Francis Lamb.
1887 HEYWOOD Col.

RULES

OF THE

BATH NATURAL HISTORY AND ANTIQUARIAN FIELD CLUB.

1894.

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.—A President, one or two Vice-Presidents, a Secretary, Librarian, and Treasurer, shall be chosen each year from among the Members at the Anniversary Meeting on the 18th of February, and should a vacancy occur in any office during the year the vacant post shall be filled up at the next Quarterly Meeting.

4.—The Committee shall consist of the past and present 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.

5.—Quarterly Meetings for the election of Members, and for other business, shall take place on the *First Tuesday* in April, July, October, and January.

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 10.30 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, Geology, 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 all, they shall, as far as practicable, be taken in turn.

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.—Gentlemen wishing to join the Club may be proposed and seconded by any two Members and will be elected by ballot at any of the meetings of the Club (three black balls to exclude), notice of their nomination being given in writing to the Secretary not less than fourteen days before any such Meeting. The Committee shall have the privilege of electing Four New Members during the year, provided there are vacancies

11.—Any Member of the Club may invite a gentleman not resident in Bath to accompany him on the proposed Excursions, but when an offer of hospitality has been accepted by the Club, then only one visitor staying with a Member will be allowed to accompany him.

12.—The Secretary shall take Notes of the Excursions and read a Summary of the Year's Proceedings at the Anniversary Meeting; he shall also see that notices of all Excursions and Meetings are suspended at the Institution and posted to every Member at least seven days previously; such notices shall include the names of any candidates to be balloted for, together with those of their proposers and seconders.

13.—The Treasurer's audited accounts shall be examined and passed at the Anniversary Meeting.

14.—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 the Subscription for the current year and the Entrance Fee at the time of their election.

15.—Members whose Subscriptions are in arrear for three months after Feb. 18th shall be considered as having withdrawn from the Club, if, after application, the same be not paid up.

16.—There shall be a Supernumerary List for Members whose absence from Bath does not exceed three years. Such Members, on their return, and on payment of their Subscription for the then current year, may be admitted to the Club at once, or as soon as a vacancy occurs.

17.—Members may borrow Books from the Club's Library, entering their names and title of the volume in a book kept by the Librarian for the purpose, but shall not retain them longer than one fortnight. Members of the Royal Institution can also read them on the premises, but not take them away. Members may also purchase back numbers of the Club's Proceedings at half-price.

WALTER W. MARTIN,

Hon. Sec.

The Honorary Treasurer in Account with "The Bath Natural History and Antiquarian Field Club,' for the Year ending February 18th, 1894.

Dr.	£	s.	d.
Balance from last year's Account ...	25	19	10
99 Subscriptions at 10s. each	49	10	0
1 do. in arrears	0	10	0
12 Entrance Fees at 5s. each	3	0	0
Sale of Proceedings	0	3	9
Interest on deposit of £40 at Bank ...	0	17	0
Total receipts	£80	0	7

Cr.	£	s.	d.
Rent to Royal Institution	5	0	0
Messrs. Powell & Powell for new Book Cases	5	15	0
Messrs. Lewis & Son for Printing ...	22	3	10
Gratuities to Librarian, Porter and Boy at Institution, and Messrs. Lewis's Clerk ...	1	2	0
Entrance fees and tips at Excursions ...	5	1	4
Wreath and carriage to late President's funeral	1	6	0
Expenses of Library (per W. H. Barlow, Esq.)	6	3	7
Do. of Honorary Treasurer (Dr. Mantell)	0	11	1
Do. of Honorary Secretary (Rev. W. W. Martin)	1	4	1
Balance in National Provincial Bank ...	31	13	8
	£80	0	7

A. A. MANTELL, *Hon. Treasurer.*

Examined and found correct, 15th Feb., 1894,
R. L. TAYLOR.

Societies and Institutions with which the Bath Natural History and Antiquarian Field Club is in exchange for Proceedings.

Barrow-in-Furness Naturalists' Club.
Bath Royal Literary and Scientific Institution.
Belfast Naturalists' Field Club.
Berwickshire Naturalists' Society.
Bristol Naturalists' Society.
British Association for the Advancement of Science.
British Museum—
(1) Book Department. (Bloomsbury).
(2) Natural History Department. (Cromwell Road)
Cardiff Natural History Society.
Christiania Royal Norwegian University.
Clifton Antiquarian Club.
Cotteswold Naturalists Society.
Geological Society (Burlington House).
Geologists Association.
Glasgow Natural History Society.
Glasgow Philosophical Society.
Hampshire Field Club.
Hertford Natural History Society.
Holmesdale Natural History Club.
Linnean Society. (Burlington House).
Liverpool Literary and Philosophical Society.
Manchester Microscopical Society.
Norfolk and Norwich Naturalists' Society.
Nova-Scotian Institute of Science. (Halifax, N.S.)
Reading Literary and Scientific Society.
Royal Archæological Institute of Great Britain and Ireland.
Smithsonian Institute, Washington, U.S.A.
Somersetshire Archæological and Natural History Society.
Truro Royal Institution of Cornwall.
Warwickshire Natural History and Archæological Field Club.
Washington, U.S.A. Geological and Ethnological Survey of Territories.
Watford Natural History Society.
Wiltshire Archæological and Natural History Society.
Yorkshire Philosophical Society.

Works presented to the Library of the Field Club, 1893-1894.

By J. S. BARTRUM, Esq., F.R.C.S., J.P.

A Mendip Valley (by Theodore Compton).
The Old Stone Crosses of Somerset (by Charles Poolley, F.S.A.)
Worlebury (by C. W. Dymond and Rev. H. G. Tomkins).
The Domesday Book of Somerset, photo-zincographed.
Gilmore's Map of Bath, 1694.

By J. HERDMAN, Esq.

The Palæontological Society's Volume XLVII.

By W. WHITAKER, Esq., F.R.S., F.G.S., &c.

Pamphlets on the Water Supply of London and Southampton.

By THE SMITHSONIAN INSTITUTE OF WASHINGTON, U.S.A.

The Humming Birds of the U.S.A. and the Hairy Ainu of Japan.
The Hawks and Owls of the U.S.A. (Fisher).
The Fauna of the Death Valley, Dakota.
The Flora of the Dakota group.
Gasteropoda and Cephalopoda of the Raritan Clays of New Jersey.
Geology of the Eureka District, Nevada, with Atlas.
Bibliography of the Cherookian Language (J. C. Pilling).
The Prairie Ground Squirrels of the Mississippi Valley (V. Bayley).
Reports on Ethnology of the U.S.A. and Mineral Resources.
The Bibliography of the Salishan Languages,
and many Bulletins, Reports and Monographs on various topics.

The Annual Reports and Proceedings of the various Societies in exchange with the Bath Field Club.

CONTENTS OF VOL. VIII, No. 1, 1894.

PROCEEDINGS

OF THE

BATH NATURAL HISTORY

AND

ANTIQUARIAN FIELD CLUB.

VOL. VIII., No. 2.

1895.

PRICE HALF-A-CROWN.

BATH:
PRINTED (FOR THE CLUB) AT THE HERALD OFFICE, NORTH GATE.
1895.

Bath Thermal Springs, their supposed Origin and Source. By NORTON TOMKINS.

(Read 16th May, 1894.)

By the kindness of the Secretary I enjoy the privilege of speaking on a subject of the utmost interest, not only to the members of this Club, but also to the citizens of Bath, namely :

1st. The Geological evidence of the origin of our Thermal Springs.

2nd. The fountain head of its waters.

NOTICE.

Any opinions expressed in the Proceedings of the Club must rest on the authority of their respective Authors.

solve that great problem, and now wish to bring forward the result of my research with the hope that if it contains any inaccuracy in principle, or local information, it may be corrected.

I believe no Geologist will think for one moment that the Springs derive their source from any strata of more recent date than the Primary ; and, indeed, it would be useless to attempt to form an opinion, if the existence of a conduit, capable of conveying the water to the influence of heat, cannot be proved, and if this is done it opens the way to the discovery of the origin of its chemical properties.

The formation which provides a water-way for our Thermal

Bath Thermal Springs, their supposed Origin and Source. *By* NORTON TOMKINS.

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1st. The Geological evidence of the origin of our Thermal Springs.

2nd. The fountain head of its waters.

3rd. The course they take before arriving at Bath.

4th. The source of their heat and mineral properties.

Reading Hugh Miller's "Testimony of the Rocks," in my early days, I felt great interest in the study of Geology ; and being subsequently engaged as Land and Mineral Agent on the Ammerdown Park Estates, on which mining was carried on in both the upper and lower series of the Radstock coal basin, great facilities were afforded me for pursuing my favourite study. Stimulated by the fact that the property under my charge was intimately connected with one of the most interesting Geological problems in this country, I set myself the task of attempting to solve that great problem, and now wish to bring forward the result of my research with the hope that if it contains any inaccuracy in principle, or local information, it may be corrected.

I believe no Geologist will think for one moment that the Springs derive their source from any strata of more recent date than the Primary ; and, indeed, it would be useless to attempt to form an opinion, if the existence of a conduit, capable of conveying the water to the influence of heat, cannot be proved, and if this is done it opens the way to the discovery of the origin of its chemical properties.

The formation which provides a water-way for our Thermal

Springs is the Carboniferous Limestone ; and the study of the origin of the Bath Thermal Springs, their course, and source of their chemical properties and heat, involves the study of the disturbances and dislocations of the Carboniferous system. It is undisputed that all those beds were originally deposited in an horizontal position ; but to-day, we find that not only in this county, but throughout England, Wales and the Continent, the Coal fields are lying in great depressions in the earth, usually termed basins. It has been questioned by Geologists and miners, whether this peculiar form is due to the strata at the margin of the basin being uplifted, or by depression of the centre. But when we come to consider the agency which has been the means of producing such results, there can be but little difficulty in finding sufficient evidence to settle this point, and I have every confidence in stating that our county can produce that evidence, of the most clear and conclusive nature.

Probably one of the most remarkable periods of volcanic disturbances (there having been many similar in earlier Primary ages), is that which marked the close of the Carboniferous series. It is significant that in referring to our best writers on the Coal fields of this country, not a single instance occurs, where—in their opinion—the coal beds are found as originally deposited ; on the contrary, it is stated that we are indebted to those great disturbances for the preservation of the comparatively small remnant of coal left to us stored up in those depressions.

Nature has herself revealed to us the machinery with which this work has been accomplished. She has swept off by the denuding power of the sea and other agencies, the superincumbent strata, and laid bare vast tracts of granite and intrusions of granitic or other plutonic rocks. We have an instance of this in the granitic masses of Dartmoor and Cornwall. In those localities we often find the granite (which must of necessity have consolidated from the molten magma at a considerable depth beneath the surface,) forms the base and has given birth to

volcanic intrusions penetrating the overlying strata (see "Geology of England and Wales" by H. B. Woodward, p. 587.)

Messrs. Woodward and Teall, and many other writers, are very decided as to the geological date of the formation of Coal basins. But the mere term of "crumpling," used by those authors, does not appear to do justice to the great phenomena so marvelously developed in our neighbourhood. What the nature of the effect of the igneous intrusion on the stratified or unstratified rocks which lie so deep in the earth's crust could have been, must ever be a matter of speculation, since its operation must have been located probably three thousand yards below the surface. Whether that effect was simply to cause dislocation followed by depression of the upper strata, or, whether, at that great depth, fusion may be the result on a much larger scale than anything of the kind we have discovered at the surface, is a matter of speculation.

We will take the Radstock Coal basin as typical of all other coal deposits in England and Wales. All, more or less, lie in similar basin-like depressions, and are split up with faults and dislocations; they are all accompanied with igneous protrusions usually situated in the upturned strata which invariably forms the margin of the basin. To examine more particularly the example we have chosen; the surface assumes an elongated oval shape, bounded on all sides by the upturned edges of the strata which form the base of the centre at a depth of probably two miles, each succeeding deposit cropping out at the surface, the most recent forming the centre.

It is a remarkable fact that the deepest part of the basin, and its greatest dislocations, are either on the side towards the igneous dyke on Mendip, or they present indisputable evidence that the connection between the two, is a case of cause and result; although the cause as it appears at the surface may itself be the result of deeply seated igneous action in the crust of the earth (see British Petrography by J. J. Harris Teall, M.A., F.G.S., p. 391.)

We learn from this that the dyke is a consolidated vent

connected with a deep seated plutonic root. At the moment of eruption, this vent was the passage through which vast quantities of semi-liquid volcanic material was discharged at the surface. H. B. Woodward (" Geology of England and Wales," p. 569), gives two examples of the discharge of igneous dykes, one in The Cheviot Hills, and the other the great whin sill in Northumberland and Durham. In the case of the igneous dyke on Mendip denudation has removed most of the discharge and a large portion of the rock on which it rested leaving only a portion exposed at the surface.

The origin of the basic rocks of the West of England as stated by Teall, p. 228, and the recognised principles of igneous dykes previously referred to, will place beyond a doubt that the great earth movements which has resulted in the " crumpling," or, the formation of coal basins, is in some way closely connected with intrusions of granitic masses in a similar way as those of Devon and Cornwall, but in the case of Somersetshire the intrusion may have been situated in an horizon 5,000 feet below the level of those of the former counties.

From all the evidence we can gleam of the general form of the Radstock coal basin, and the contour of the under or convex side, it certainly favours the opinion that it has gone down into a semi-fluid substratum. Whether that substratum be a molten magma protruded from the earth's interior; or whether the lower palœozoic rocks have been reduced in a greater or less extent, to a like molten material, the result at the surface would be exactly as we find it; the centre has gone down, breaking away from the districts not affected. The molten material, escaping from the pressure of the centre, was forced to the points of least resistance, the up-lifted broken edges, forming the Mendip range, Wrington Warren, Clifton Down, &c.

Having thus far given a brief outline of the forces which may have laid our Coal fields in their basin like form we will proceed to examine their effect on the interior. In this we have the

advantage of a very able and interesting paper on "The faults of the Radstock coal basin," read before this club, and published in the first Volume of Proceedings.

Reverting to the teaching of science on the origin and action of igneous rocks, and the apparent evidence in the mines and on the surface of the Bristol and Radstock coal basin; there can be but one opinion of the connection of the dyke and those disturbances. As to the nature of that connection the example on Mendip affords us more than ordinary facilities for studying. One of the dykes, or, perhaps, more correctly a part of the dyke (a point which we shall hereafter consider), is now being quarried for road metal and very much opened up. It is a basalt rock containing less than 60 per cent. of silica, much iron and interstitial copper. One remarkable feature is frequently seen proving its original semi-fluid condition; where one plastic mass has been pushed past another in its upward course, a slimy surface is seen similar to the marks produced when a rough surface is drawn over thin plaster. The dyke extends in nearly a straight line from Beacon Hill to Downhead, a distance of three miles, occupying the centre of the anticlinal. There is undoubtedly a very close connection between this, and the great Clandown fault which intersects the Mendips, near their eastern extremity. Striking into the centre of the basin at Timsbury, this fault passes between the Newbury and Mackintosh pits where the downthrow west is 750 feet, leaving the Kilmersdon pit a little to the west, with a downthrow west of 384 feet; from thence it passes on between Ludlows and Middle pits, Radstock, the downthrow being 606 feet, and still increasing to 720 feet at Clandown the centre of the basin. From this point the downthrow west decreases to 120 feet. At Lower Conygre pit, Timsbury, the fault comes to a termination, by connection at nearly right angles with Clutton Union fault. Putting it in more simple terms; the basin has split into two parts through the centre and the western side has gone down below the other to the amount given (750 feet).

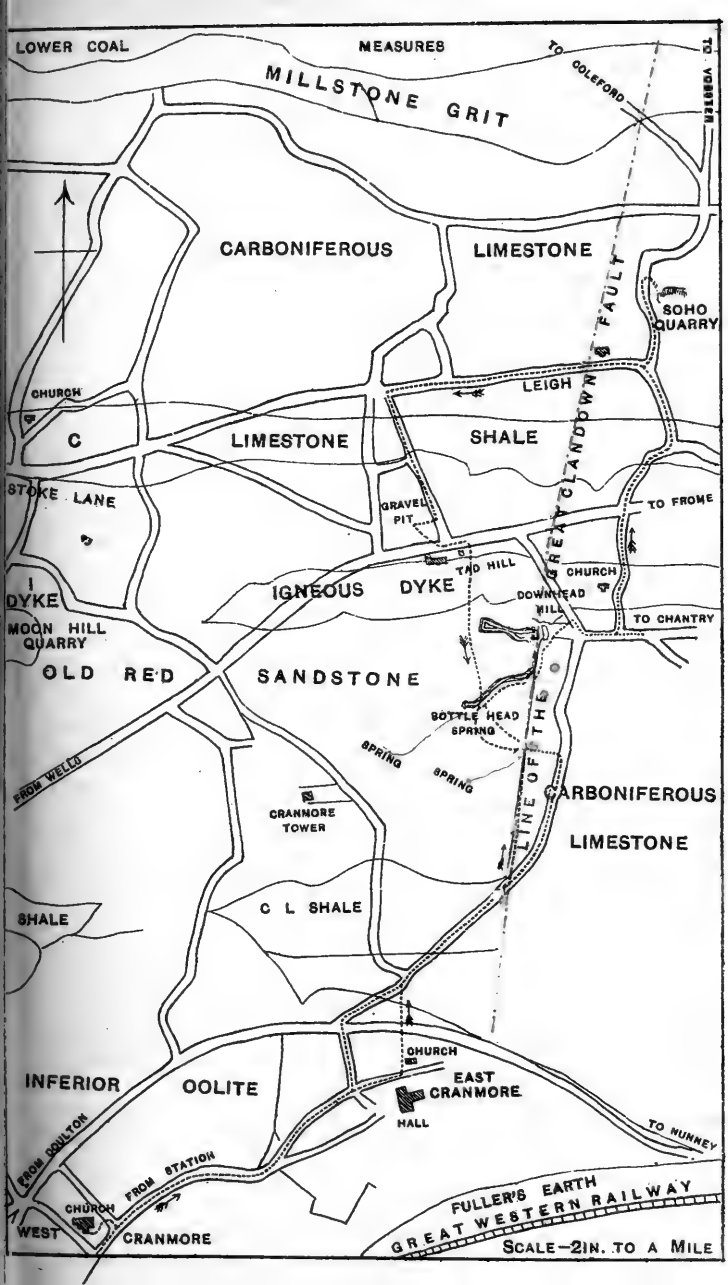
The close relationship between the dyke and this fault is obvious; evidence of the nature of that relationship is abundantly furnished in the colliery workings of Vobster, Newbury, Mackintosh, and Edford, and the numerous workings of less importance which have been abandoned. These are all situated in the very throw of the convulsions, the results of its action. Two ideas suggest themselves as to the nature of their relationship. First, the escape of the molten material may simply have allowed the west side of the fault, the side on which the dyke is situated, to rend away from the east side and subside. If this had been the case, we can scarcely conceive why the subsidence should have been confined to one side only. Or, else, as the Somersetshire Coal fields are an outlying branch of South Wales, from that direction the convulsion might have come which brought the Cambrian and Silurian deposits into contact with internal heat, resulting in the depression of the basin. After the basin had settled down to much the same position it is now in on the east side, a second intrusive shock also coming from the direction of South Wales may have struck the basin, affecting the western side only; causing it to rend away from the east side, subside, and further weaken the line of fracture of the Mendips, allowing the molten material to escape to the surface; that escape or dyke commencing where the fault intersects the Mendips. At the moment of eruption, the north side of the dyke, being the sinking and consequently the weakest, yielded to the tremendous upward and lateral pressure of the escaping material, was lifted and folded over to the north, at the same time thrusting the whole "country" northward in forcing its outlet. The orifice of the dyke at the moment of eruption could not have been less than one mile wide by three miles long. When the sinking strata of the western side of the basin had in due course reached a firm foundation and the discharge and consequent upward and lateral pressure removed, the Old Red sandstone and Mountain Limestone

being thrown into a vertical position, or slightly bent over, fell back against the yielding lava causing it to collapse into its present flattened shape, the old red sandstone which forms the matrix of the dyke meeting in places giving it the appearance of four separate dykes. The Vobster colliery workings, in the very heart of this movement, proves that the overlying Newbury seams were folded over where they now remain dipping south at a high angle. The intermediate Vobster coal strata being in the cleft, and being a very soft shale, fell together into the vacuum. The confusion thus caused was still further intensified by the movement we shall next consider, rendering the Vobster colliery dangerous, expensive to work, and consequently abandoned.

At present, the Newbury and Vobster workings, and the limestone at the quarry at Soho, are situated on the east side of the great fault. At the time of the eruption of the dyke, they composed a part of the fold over on the west side just described; the subsequent action of the Radstock slide fault, was to transfer the strata in which those works are situated from the west to the east side of the fault where they are at present. This movement seems to have been at an early stage of the sinking of the downthrow side of the fault, as indicated by the relative depths of the bends of fold over on either side of the fault; the difference of level amounts to 750 feet.

We will now turn our attention to the fountain head of the water, and the conduit through which it flows to Bath. Having already noticed that the Clandown fault intersects the Mendip range near the eastern extremity of the dyke, and strikes northward into the centre of the basin at Clandown and Timsbury, we find that it also cuts through the south anticlinal as far as East Cranmore. Subsequent denudation has removed the limestone leaving the Old Red Sandstone exposed, and the line of the fault clearly marked by numerous swallow holes, and the severed edge of the undisturbed limestone on the east side. From the line of the fault to Cranmore tower, a distance of a mile, the ground rises 250

feet, from this higher ground numerous springs of water rise. One in particular, the "Bottle-head spring," deserves notice, as the flow of water is very considerable amounting to 200,000 gallons per day of unusual good quality. Its history is soon told, being simply rainfall on an elevated area from 700 to 900 feet percolating through Old Red Sandstone (shale) on the summit of Mendip. There can be no doubt that formerly the whole of the water from those springs found its way into the swallow holes. But with the march of civilization which always utilizes nature for the wants of man, the natural course of this water too has been tampered with for that purpose. First, the water from the large spring has been taken in an open ditch to drive the water wheel of Downhead flour mill; even then, the back water from the wheel immediately enters a large swallow hole at the back of the mill. The next diversion was by Mr. Fussell taking the overflow of the Mill pond to drive the machinery at his ironworks at Chantry; nature too claims her right by taking tithe of the water through its sinking away in the disturbed ground. And thirdly by many of the smaller springs being caught in tanks and the water conveyed away for drinking purposes. Still, a large amount of waste and overflow always has, and probably will, find its way into the fault. It also receives frequent contributions from rainfall gathering on and descending the road leading over the hill to Tadhill, and from springs rising in the hill—notably one rising out of the east side of the dyke—the water entering one of the swallow holes at the back of Downhead mill, by a channel prepared apparently by the employés of the Frome Highway Board. The quantity of water from this source cannot be much less than 100,000 gallons per day. But this is only a moiety of the water from this source; it is most reasonable to suppose, that a like quantity percolates into the course underground from the Limestone and Old Red Sandstone, making up the supply from the Mendip end to near half the delivery of the water at the Hot springs.


LOWER COAL MEASURES
MILLSTONE GRIT
TO COLEFORD
TO RADSTOCK
CARBONIFEROUS LIMESTONE
SOHO QUARRY
GREAT CLANDOWN FAULT
CHURCH
LEIGH
C LIMESTONE SHALE
STOKE LANE
GRAVEL PIT
TO FROME
TAD HILL
CHURCH
IGNEOUS DYKE
DOWNHEAD HILL
TO CHANTRY
I DYKE
MOON HILL QUARRY
OLD RED SANDSTONE
BOTTLE HEAD SPRING
SPRING
SPRING
FROM WELLS
CRANMORE TOWER
LINE OF THE
CARBONIFEROUS LIMESTONE
SHALE
C L SHALE
CHURCH
INFERIOR OOLITE
EAST CRANMORE
HALL
TO MINNEY
FROM DOULTON
FROM STATION
CHURCH
WEST CRANMORE
FULLER'S EARTH
GREAT WESTERN RAILWAY
SCALE—2IN. TO A MILE


BRITISH MUSEUM
NATURAL HISTORY.

The first thought that may enter the mind of a casual observer is the probability of the water, after entering the disturbed ground of the fault, following its south end, along the dip of the strata and slope of the hill, and finding its way out at the surface somewhere near East Cranmore. But, natural laws must be obeyed, water will gravitate to the lowest level. The fault dies out at the surface at East Cranmore, but sinks down through Mendip 8 to 10,000 feet, the water follows the disturbance until it reaches the chasms and caverns on the limestone of the north anticlinal.

Now we have to consider whether the disturbances in the limestone is capable of providing a conduit. Mendip may be said to be full of such instances. The so called bottomless well in the garden of the Bishop's Palace, Wells, which supplies the moat with water, has been traced to the Mendip hills where the water dives underground at the junction of the lower limestone shales with the Scar limestone. Another instance is that of the water sinking into swallow holes at Priddy appearing again at Cheddar a distance of three and a half miles. There can be no doubt whatever that the caverns are large and continuous along the line of fault as it traverses the limestone. The thickness of that formation amounts to 2,500 feet of clean rock free from any layer of sand, marl clay or any substance likely to obstruct the passage of water.

We have traced the Clandown fault to the pit which gives it the name where the downthrow west is 720 feet after this it reduces very much, and at Lower Conygre pit finally ceases at a downthrow of 120 feet, by connection with the Clutton Union fault.

This fault takes an E.E. by N. direction from Clutton Union, passes S. of High Littleton and Timsbury in a straight direction to the edge of the Radstock series at Dunkerton. A mile and half to the north is another arterial fault; starting from Fry's Bottom Colliery, Clutton, it passes Farmborough (from which it takes its name), half a mile to the south, converging towards the

Clutton fault to the east and with it no doubt forming a junction, this fault is downcast south 600 feet. Further than this in the direction of Bath the mines have not been worked, we can therefore have no certain information of the existence of faults. But taking a general view of the last two, and the magnitude of the disturbance they represent, we have a right to think that they do not terminate with our discoveries in the mines; but rather that they continue their course through the limestone anticlinal underneath Bath. In that case we should expect to find that the fracture took the direction of least resistance which would be at right angles with the outcrop of the limestone. In that case it would take a straight course (always characteristic of arterial faults), to the spring at Queen's Bath, to that of Royal Baths and the old mine shaft at Batheaston where the hot water was tapped in 1815.

There is but little probability of the water receiving addition on the way from the Mendip end, by any other means than that which we have considered, except it be another fault intersecting the Mendip anticlinal. From the slopes of Mendip to the suburbs of Bath the whole of the limestone formation is sealed down with impervious beds of lower Coal Measure clay, effectually excluding any water from percolating into the course from above. This I have particularly observed in colliery workings in that series; the beds have the appearance of dry shale, but when they come in contact with water the expansion is great, and being subject to pressure, no water course can exist in it. This peculiarity is a source of continual expense to colliery owners in re-excavating the roadways.

But when we come to the Bath end we have strong reasons to doubt whether the water at the springs is of the same quality and heat as when it leaves its limestone course 207 feet deep. As it rises, the first stratum it passes through is the Dolomitic Conglomerate; a pebble beach on the shore of the sea of the early Triassic age it is exceedingly water bearing, this is proved by

colliery shafts sinking through it. The probability of this being the case in connection with our hot springs is still further enhanced by the fact that it is situated at the lowest point of outlet of a wide expanse of pebble beach deposit, extending over nearly the whole of the Somerset coal basin. And, also, our hot springs having been flowing even before the existence of the beach itself, there can be no doubt whatever that the natural outlet for the hot water, provided also a natural outlet for the cold water from the Conglomerate mingled with it; thereby reducing its temperature by probably 50 per cent. This important consideration gives immense force to a statement made by Sir Charles Lyell in his address, at the opening of the meeting of the British Association at Bath in 1864.

We will now consider, what extent our thermal springs may suffer by the sudden chill occasioned by the influx of cold water from the Conglomerate and the Lias formation through which it passes in its upward course. The heat of the water certainly ought to be very much greater than it is according to all the computations we are enabled to make. When Sir Chas. Lyell delivered his address, the volcanic origin of the formation of Coal basins and other disturbances had not received the attention it deserved; little notice was paid to the water trickling into a course which conveyed it down thousands of yards through rocks which had undergone great chemical and structural change through proximity with volcanic heat. Sir Chas. Lyell in the same address gave us a good idea of what volcanic heat is, he says: "We learn from Bunsen's experiments on the Great Geyser in Iceland, that at the depth of only 74 feet at the bottom of a tube, a column of water may be in a state of rest, and yet possess a heat of 120° Centigrade or 248° F. What then may not be the temperature of such water at the depth of a few thousand feet? It might soon attain a white heat under pressure, and as to lava they that have beheld its issue as I did in 1858 from the south western flank of Vesuvius, with a surface white and glowing like

that of the sun, and who have felt the scorching heat which it radiates, will form a high conception of the intense temperature of the same lava at the bottom of a vertical column several miles high, and communicating with a great reservoir of fused matter, which if it were to begin at once to cool down, and were never to receive further accession of heat might require a whole geological period before it solidified." As a proof of that eminent geologist's extensive knowledge of thermal springs, it is remarkable how close he comes in his ideal description of those at Bath to the opinion we are now able to form by local discoveries, and by the advanced stage geological science has reached during the thirty years which has elapsed since that address was delivered. Throughout the address Sir Charles is much more in favour of volcanic influence as the impregnating power, rather than the normal high temperature of the earth's crust at a great depth; notwithstanding, as he says, "we are at so great a distance as 400 or 440 miles from the nearest region of active or recently extinct volcanoes."

The vast volume of the water moving slowly through rocks at a depth of nearly two miles, those rocks too having undergone such changes through close contact with internal heat at the very seat of its original activity, we cannot imagine that that heat has, or ever will, subside to the normal temperature of the crust of the earth; owing to this we may fairly estimate the heat of the water as it leaves the limestone formation to be not below the boiling point. If we are wrong in our estimation of the heat from that source, the theory of the normal temperature of the earth will give similar results, allowing, the depth from which the water rises to be as we have stated 10,000 feet, Sir Charles Lyell gives the ratio as proved in deep coal pits in the North of England to be 1° in 65 to 70 feet. Allowing the mean temperature at the surface to be 45°F our hot springs should be 207°F. Professor Prestwich found in very deep wells, the water to rise in temperature 1°F in 50 to 60 feet after this ratio the

Bath water should be 226°F. In 1864 W. W. Smyth, M.A., F.R.S., F.G.S., in his report to the Geological department of the British Association, on the Thermal water of the Clifford Amalgamated Mines of Cornwall makes this statement : "An increase of depth of 180 feet in the point of issue of the water had raised the temperature 8°F., showing the remarkable increase of 1 degree in 22½ feet."

This, is a deeply interesting and valuable report ; inasmuch, as the information it contains of the thermal Spring in Wheel Clifford mine, is in many respects applicable to the thermal springs at Bath. The geological conditions under which the Cornish spring rises are almost identical with the geological conditions of our springs.

It is a grand discovery, that a thermal spring at 1,500 feet deep, should be found to increase in heat 8°F. at an additional depth of 180 feet ; if we calculate the heat of the Bath water after this rate, it will treble its present temperature.

I think we shall find but little difficulty in arriving at the conclusion that our hot springs as they issue from their limestone channel are 70 to 100 per cent. hotter than they are at the surface ; that in their upward current the coming in contact with cold ordinary spring water from the Dolomitic Conglomerate has a far more injurious effect on their valuable properties by precipitation, than by its diluting effect. Geologically, there is not the slightest reason why that high temperature should not be maintained to within 207 feet of the surface, and up to that point the water hold in solution as great a wealth of lithium as that found in the Cornish spring, which may be precipitated the moment the water becomes chilled.

The Weather of the past Season and its Effects on the Garden. By the Rev. CANON ELLACOMBE, M.A., President.

(Read December 12th, 1894).

I am glad that our Secretary has put this heading to my paper. It is the same as the heading to my paper this time last year, and it at once suggests that what I have to say on the subject this year is not anything very new, but is a continuation of last year's paper. And this is exactly what I wish to bring before you now, for the condition of the garden this year is so intimately and curiously connected with the weather and its effects on the garden last year that my last year's paper is really quite incomplete without this year's record.

I suppose none of us can remember two successive years so entirely unlike as 1893 and 1894. The one bright, clear, dry and sunshiny beyond all experience, the other dark, cloudy, wet and sunless to a really unpleasant extent; and yet I have little doubt that as the weather of this year was to some extent the result of the weather of last year, so I am sure that the condition of the garden was far more brought about by the weather of 1893 than by the weather of 1894.

Let us very shortly see what the weather has been since the 1st of December, 1893, to November 30th, 1894. Up to the 30th of December there had been but four days of frost, on one of which, the 3rd, the thermometer fell to 19°, but the 31st brought in ten consecutive days of frost, not very severe except on the 5th and 6th when the thermometer fell to 14° and 13°. There was again frost on the 23rd and 24th. The rainfall of December was 2·59, and of January 2·63. In February there were five days of slight frost, and the rainfall was 3·43. In March there were four days of slight frost, and the rainfall was 2·15. April was a fine month; there was no frost, but there was a rainfall of 2·17. In May there was one frost on the 20th; here in Bath and the

neighbourhood it just touched 32°, though in some parts of England it was much more severe. Here it would have done very little mischief, but unfortunately it was followed by a day of bright sunshine and the effects were disastrous and far-reaching; and I shall have more to say about it further on. The rainfall of May was 2·12, of June 2·19, of July 3·46, of August 2·67, of September 3·12, of October 4·30, and of November 5·49,* and there were no autumnal frosts until the morning of December 1st. The total result was that during the twelve months there were but 26 days on which the thermometer was below the freezing point, and the accumulated degrees were 151. That is really a very small amount of frost, and when you add to this that nearly the whole of this was in the early part of January when vegetation was for the most part dormant, and that the low readings probably lasted for a very short time, we may say that the minimum temperature was much above the average. But the rainfall was also much above the average; it amounted altogether to 36·34. This great amount of rain of course implies a great amount of cloud, and that means a small amount of bright sunshine; and even on days when there was no rain the sky was dull and sunless in an unusual degree.

Such very shortly stated has been the weather of the last twelve months; and now we can see what were the effects on the garden, and we shall at once see that the effects were largely brought about by the bright weather of 1893. In my last paper I ventured to make two forecasts. One was that we were not likely to have a very severe winter; and we certainly had not, for we cannot call that a severe winter in which hard frost only occurred on a few days in December, and ten days in January. The other forecast upon which I ventured, was that the long hot

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* I have taken these rainfall amounts from the Record kept by Rev. C. Miles, Almondsbury. They are slightly in excess of the Bath record, but I think they are more accurate for Bitton.

summer had added so much vital strength to all plants that this year would be a good year for flowers and fruit. That forecast was almost but not quite right, and it would have been quite right but for the frost of 20th May. From all parts there came the same record. In my own garden the flowering shrubs were laden with blossoms with a profusion that I never saw before; and from Kew the report was that in every portion of the gardens the flowering was quite phenomenal. Among the early flowering shrubs the Magnolias were perfect pictures of healthy bloom; fruit trees of all sorts were sheets of blossom, and roses were full of promise; and so through all the flowering trees and shrubs, till we arrived at the Tulip Trees and Catalpas which were thickly covered with flowers. Unfortunately in a large amount of this fair promise we were doomed to disappointment. The May frost destroyed all blossom that was in a certain stage; pears, plums, peaches and apricots had passed that stage and were comparatively unhurt; but apples, walnuts, strawberries, raspberries and currants were in many cases so injured in their blossoms that they bore little or no fruit, except in the few cases in which they were so forward as to be beyond injury, or so backward as to have their flowers unformed and so were saved. Gooseberries had heavy crops, and so had pears and filberts, but there were no walnuts. Peaches and apricots also had heavy crops, but owing to the wet and lack of sun the fruits not only ripened badly, where they ripened at all, but to a great extent they rotted on the trees. Bulbs were not as good as I had expected them to be; and I suppose, especially with the Lilies, that they have not recovered the drought of 1893.

The year was marked in a very unpleasant degree by two pests, weeds and earwigs. Among the weeds thistles were especially abundant, and this abundance of thistles was remarked not only all over England, but in many parts of Europe, and to an alarming extent in America. In my own garden I was not pleased to see a great number of thistles of species which I had never noticed before,

and the farmers in the neighbourhood told me the same tale with respect to the thistles in their fields; they were very abundant and not of the common kinds. Grass was another weed that gave great trouble in the gardens; and for both the grass and the thistles we undoubtedly had to thank the hot weather of 1893, which ripened every seed. The thistles will probably disappear, certainly in gardens and fields where they have not been allowed to seed; the grass may give some little trouble in our flower-beds, but it can be easily removed. Of the other pest I mentioned, the earwigs, I am not sufficiently an entomologist to say whether the abundance this year was at all owing to the last hot summer, but everywhere they were very abundant, and their special mission seemed to be to make holes in the wall fruit before it was ripe, into which the wet entered, and the fruit rotted on the tree. I very seldom have been troubled with earwigs in my garden, so if this year's abundance was owing to the bright weather of last year, I may hope that the dull weather of this year will clear them away.

I am afraid that among the effects of this year's dull summer must be mentioned a large amount of grumbling; and certainly it has not been a year in which there was a prolonged enjoyment of out-of-door life. Yet like every year, this year with its peculiar weather has had its uses, and has had its own special lessons. Among the uses must be reckoned the ample supply of rain, which will go far to restore the average, and to make up the deficiency caused by last year's drought; and I certainly have learned more than one good lesson in garden work. I have never before had the lesson brought home to me so closely that all the beauty of our trees, our hedgerows, and our gardens is not produced by the particular weather of the one year through which we may be passing, but that it can all be traced back to many previous years; perhaps it is not too much to say that whatever the beauty of a tree or shrub may be this year, it has got some of that beauty by little and little in every year of its existence. I

have mentioned the phenomenal abundance of flowers this year on almost all trees and shrubs, but I should also have noticed the abnormal growth of this year's branches. I am sure that in many cases the growth of the branches on our trees and shrubs with corresponding abundant foliage, has been quite three or four times the usual annual growth ;* and for this we have to thank not the wet weather of this year nor the bright summer of last year, but the two combined; this year's wet would not by itself have produced the unusual growth, but it has largely helped it; and last year's heat would not have been sufficient to produce the effect if it had not been followed by this year's dripping summer. And I am sure also that we may go back much farther, and trace something, however little, in every year of the life of the tree or shrub that has helped to produce what we have seen this year. The vigour of an old tree or shrub is as much dependent on its vigour when it was young, as the vigour of our manhood and old age depends largely on the vigour of our childhood and boyhood. This may seem a truism not worth notice; but though I am not one of those who think that every plant and animal was created for the use or pleasure of man, yet I do think that it adds something, perhaps much, to the pleasure of our gardens to think how the beauty of our gardens has been slowly growing up for our delight year after year, 'man knoweth not how'; and it surely adds to the pleasure we may have, in planting and carefully tending young trees and shrubs, to think that what we are doing now is to give pleasure or profit in many distant years to those who will then be looking at them when we ourselves are passed away. Perhaps one or two instances of the way in which the vegetation

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* I may mention as instances of the luxuriance of the foliage this year, that on the Paulownia grown as a shrub, I had leaves twenty-two inches in length and twenty-six inches in breadth; and that on the hardy Japanese Banana, Musa Basjoo, I had leaves more than four feet long, and nearly two feet broad.

of one year is provided more by the year or years that went before than by the present year may be interesting. If you take up a grape hyacinth now or a little later, you will often find the flower spike not only perfectly formed, but even coloured some months before it shows above ground. If you bisect a large fern, say a full grown *filix mas* in the summer, you will find no less than the growth of four years strongly shown; there are the outside fronds of last year; there are the full grown fronds of this year; at the top of the throat (if I may so call it) you will find the crown of next year's fronds neatly curled up; and below that you will find the crown of the fronds of the year after next closely packed but perfectly visible. The tulip bulb has something of the same character; each bulb contains the flowering bulb of three years; the old writers said that you could also find the flowers of three years, but that is not confirmed by modern observation. The main fact however remains that no plant and no living organism except annuals, and perhaps not even annuals, contains only the growth or the flower of one year only.

Another lesson which I have learned from the weather of the years 1893-4 is the immense value of a hot dry summer. I knew the value of such a summer in ripening the wood, but I never sufficiently observed that the effect went much further, and especially in warming the ground. Though the frosts of last winter were severe for the short time they lasted they did very little mischief, and I put that down to the large amount of heat which was stored up in the earth during the long hot summer of last year. I am sure that this is one great secret of the way in which half-hardy and even tender plants are grown successfully in one garden and cannot be grown at all in a garden which may be a near neighbour. Soils vary greatly in the way in which they can take in and retain heat, and this partly depends on their position being sheltered or otherwise and well-drained, but far more on their constituent parts; a loose friable loam, especially on sandstone, with a gravelly subsoil will absorb and keep an amount

of heat which a wet clay soil can never acquire, and this heat shows itself not only in the abundant and healthy growth of all plants grown in it, but it shows itself also in the power of resisting frost. People are apt to talk of a frost as if it was something that came down from the skies and caught hold of the earth, whereas the simple explanation of frozen ground is that the radiation of heat from the ground is not equal to the cold atmosphere above it; and the depth to which frost penetrates is largely determined by the amount of heat in the earth; and so wherever means can be found to keep in the heat which exists in the earth, and wherever the earth is so warm that it can retain its heat in spite of all the cold air above, there frost does little or no damage. This explains the difficulty which people who have been in the tropics often speak of, when they have seen beautiful tropical flowers growing in places where there are often sharp frosts; the earth has been so roasted by the tropical sun that a few degrees of frost lasting a very short time have no effect on the plants. It explains, too, how the possibility of growing tender plants does not so much depend on latitude, for there are parts in the north where many things can be grown which we cannot think of. At Castlewellan, in County Down, nearly four degrees north of us, Lord Annesly grows a marvellous collection of plants which we should consider too tender to attempt here, including a large number from Australia, New Zealand, and the Cape. When I tell you that his catalogue of hardy plants contains eleven species of New Zealand acacias and nineteen species of eucalyptus you will get some idea of what can be grown there. The garden is on a granite soil, and within the influence of the Gulf Stream, there very narrowed. It explains also why many things cannot be grown in England. There are parts of Sussex and Cornwall which are in the same latitude as parts of the champagne district of France, but their soil is not warmed by the sun of France, and so they cannot produce champagne. And this explains also the value of mulching of all sorts; any kind of

mulching is simply a device to prevent the radiation of heat from the earth, and so keep warmth at the roots ; mulchings simply act like great coats, there is no real heat in either, but the mulching prevents the escape of the heat of the earth just as the great coat prevents the escape of the heat of the body. I use many devices to serve as mulchings or protections, boards, slates, old casements, bell-glasses, flower pots, &c., &c., and it is wonderful how very little will suffice. You may see that by the way in which even in severe frosts the ground is often soft under trees and shrubs, and in early autumn you may sometimes see every blade of grass covered with cold dew, while there is none on the plantains and daisies. The flat leaves though comparatively small are enough to prevent the radiation of heat and so prevent the condensation which produces the dew ; but the readiest example is nature's own beautiful covering of snow. When the snow lies deep, and the weather is cold, you may send a stick through a thick coating of ice, or frozen snow at the top, but below the snow the stick will go into soft ground ; and even when the weather is cold and there is no sun, the snow is melted from beneath by the warmth of the earth. In America a good protection against frost is found in brown paper steeped in sulphuric acid and made tough and waterproof, and a newspaper spread over a plant when frost is expected is often quite sufficient to protect it.

I must say something on the autumnal tints of this year ; they were very late and very poor. In my own garden I could scarcely see a single specimen that was well coloured, and in many cases the leaves fell green, or just browned ; and in some cases they did not fall at all. This poverty of tints was not at all confined to Bitton. We have in this neighbourhood two places in which very extensive planting has been carried out with a special view to beauty of Autumnal tints, Tortworth and Weston Birt. At Tortworth the trees were very poorly tinted, and the gardener at Weston Birt reported to me that it was the same there ; and I have in my garden a shrub given to me by the late

Mr. Holford, *Euonymus Thunbergianus*, as the shrub which he considered the most beautiful of autumnal shrubs, but this year the leaves are still green in December, and show no signs of colouring. This want of colour may be entirely put down to the want of sun during the summer; leaves require good sunshine to develope their colours as much as flowers do; and that they were unusually late may safely be put down to the frosts of May. The cold weather of the third week in May put back vegetation at least three weeks; and leaves, like the trees they grow on, have their allotted length of life, and if not destroyed by frosts or winds prematurely they run their full course, and if they are three weeks or a month late in the usual time of budding they will be three weeks or a month late in their decay, especially if their life is prolonged, as it was this year, by a mild October and November. The mildness of these two months was one of the chief climatic features of the year, and the effects in the garden were very marked. On the 30th November I noted the following plants in flower, omitting varieties, such as different sorts of roses, &c. :—

Scarlet and other bedding geraniums
Datura Sanguinea
Fuchsia Globosa
——— Corallina
——— Graciliis
Ceanothus azureus
———— Gloire de Versailles
Ivy
Helleborus niger altifolius
Borago laxiflora
Veronica parviflora
Rosa polyantha
—— Involucrata
—— Many hybrids
Meconopsis Cambrica
Hydrangea porphyrocladon
——— Rosalba
Callirhœ involucrata
Achillea umbellata
Eryngium Creticum
Potentilla formosa
Erica carnea
—— Multiflora
Pyrus japonica
Yellow Calceolaria
Yellow Wallflower
Garrya Elliptica
Hazel Catkins
Spiræa Bumalda
Helleborus fœtidus
Lychnis dioica pleno
Anthemis tinctoria
Gaillardia
Erigeron Philadelphicum
Anemone hortensis
Daisies
Coreopsis
Achillea Ptarmica pleno
Ruta crithmifolia
Rudbeckia hirta
Campanula Bourghati
———— Portenschlagiana
Primula polyantha

Primroses
Caryopteris mastacantha
Lavatera adsurgentifolia
Teucrium purpureum
Olearia Forsteri
Aponogeton distachyon
Double Calla
Erigeron mucronatum
Hypericum moserianum
Convolvulus cneorum
Kinphofia triangularis
Doronicum cruentum
——— plantagineum
Iris stylosa
Cytisus capitatus
Genista umbellata
Groundsel
Lamium album
Allium glaucum
Oxalis floribunda
Nandina domestica
Linum flavum
Double Helianthemums
Strawberries
Scarlet Trumpet Honeysuckle
Lavandula stœchas
Tropœlum tuberosum
Nasturtium bedding varieties
Geum coccineum
Pampas grass
Red Pentstemons
Euphorbia characcas
Eupatorium riparium
Geranium Endressi
——— Striatum
——— Robertianum, red and white
Salvia Bethelli
Crocus pulchellus
Dandelion
Sida napœa
Chrysogonum virginianum
Abelia chinensis
Solanum jasminoides
Rubus rosaeflorus
Fatsia japonica
Hypericum patulum
Aubrietia purpurea
Berberis Darwini
Polygonum affine
Hieracium pictum
Achillea millefolium
Cyperus longus

While of fruits more or less ornamental there were the Snowberry, Cotoneasters of several species, Pyrancantha, Rose-hips, blackberries, Diospyros tchi-tchi (this year a fine and very handsome crop, though there were none last year), Physalis Alkekengi, Hymenanthera Crassifolia, Pyrus Maulii, and Iris, and holly berries very abundant. I have no fruit on the Hawthorns nor on any species of Cratœgus, but in the Park Cratœgus coccinea was laden with beautiful fruit, and a collection of the fruit of different species of Cratœgeus was sent to me from Weston Birt, which for richness of colour and size of fruit, exceeded any I had seen before.

Of course I do not mean to say that all these 95 plants that I have named were in their full beauty of flower, and many of them were quite out of their right season, but they were all visible on the 30th of November, and that they were so must be put down to

the mild weather of October and November, aided, I am sure, by the hot season of 1893.

An interesting question remains; what will be the effect of this season on the future lives of our plants? In all trees and shrubs that are completely hardy the result will be nothing but good; it will be a marked season in their lives and add perceptibly to their size and beauty. But in the case of trees and shrubs that are a little tender we must speak more doubtfully. If the winter should be unusually severe and prolonged, the effect would probably be very disastrous; but if the severity should be only average, I do not think we need have much fear. The abnormal growth may be a weakness, and as a general rule we should say that such a growth in a sunless summer must be weak and sappy, but I think it is not so. The wood, it is true, cannot have been much ripened by the sun, but the growth took place so early in the season that I think it possible and even probable, that the wood is ripened by its own natural growth; and so I look forward to the winter with some anxiety but not with much fear.

I must now bring my long paper to a close. It has much exceeded the limits within which I proposed to keep it; and if it has too much taxed your patience, I hope that you will draw the right moral from it, and in future years, when you are looking out for writers of papers for your winter session, take Horace's advice slightly altered,

"Praesidentem fugito, nam garrulus idem est."

Notes on certain Rare Beetles found in a Wasps' Nest. *By* Col. L. Blathwayt, F.L.S., F.E.S.

(Read December 12th, 1894.)

At the end of September I was examining a nest of *Vespa vulgaris*, one of the seven British species of social wasps, in search

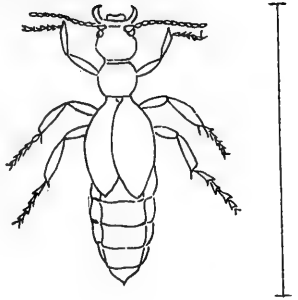

FIG. 1.
Meloë proscarabœus female.

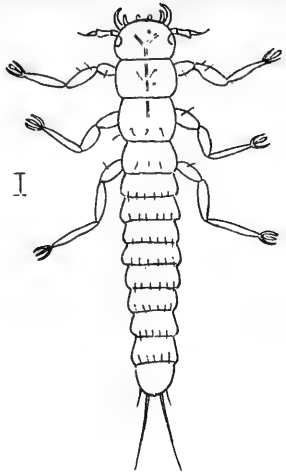

FIG. 2.
Meloë, first larval form.


BRITISH MUSEUM
NATURAL HISTORY

of the larvæ of *Volucella*, a genus of parasitic flies. In this search I was not successful, but I noticed a number of very small beetles, which on examination, I found to be *Cryptophagus pubescens*, a species which, though widely distributed, is said to be rare in most localities. I sent some of them to Canon Fowler who informed me that this beetle had been recorded on the Continent as having been found in the nest of *Vespa vulgaris*, but that this was the first time he had heard of its having been so in this country.

Some of these will be placed in the local insect cabinet in the Duncan Museum.

I thought it might interest the members of the Bath Field Club if I made a few remarks on the association of insects of one species with those of another species; insects as hosts, and insects as guests.

The hosts are chiefly the various communities of social Hymenoptera, but among the guests we find both Insects and Arachnids of various orders.

Of this association there are three kinds:

1st. Where the strangers come as enemies, and are undoubtedly parasitic, and where their intrusion is resented;

2ndly. Where they come as friends, and are protected and sometimes fed by their hosts; and

3rdly. Where their intrusion seems to be a matter of indifference, where they are simply tolerated.

As an example of the first class we have flies of the Genus *Volucella*, which enter the nests of various species of humble bees; and I take this example as it illustrates one phase of that very curious fact known as Insect Mimicry. I have here dimorphic forms of *Volucella bombylans*, a male and female of each, which, though so different in appearance, are absolutely identical as a species, and differ only in their colour; and with them I have placed bees of the species whose nests they are said to invade, and you will notice how closely the one form with the red tail

resembles *Bombus lapidarius*, while the other with the yellow tail is like *Bombus terrestris*. In a note of mine which appeared in the "Entomologists Monthly Magazine" for April, 1890, I said there were no intermediate links between these two forms of *bombylans*, but in this I find I was mistaken, as Mr. Coryndon Matthews, of Ivy Bridge, Devon, wrote to me saying that he had in his collection a female exactly intermediate between the two, that is to say it has the tip of the abdomen clothed with bright orange hairs exactly as in the type, whilst the thorax is covered with tawny hairs as in the variety. I was then able to point out that in the type the resemblance is to the worker of *Bombus lapidarius*, and that the above intermediate variety must bear an equally strong resemblance to the male of the same species.

I have here also another fly *Chrysostoxum bicinctum*, together with a solitary wasp of the Genus *Odynerus*, on which it is said to be parasitic, and you may notice how closely one resembles the other. Also a humble bee, *Psithyrus vestalis*, a species which collects no honey, but which is parasitic on the bee just above it, an insect of another Genus, *Bombus virginalis*, which does.

Most of you must have noticed the common oil-beetle, which in early spring is seen crawling about under hedges, and which if handled exudes a drop, of what looks like yellow oil, from the joints of its legs.

These oil beetles belong to the Genus *Meloë*, and we have seven species in this country. I have watched the female of *Meloë proscarabœus* (the species in the box) dig a hole in the ground and in it deposit a number of small yellow eggs. These eggs do not take very long to hatch, for when the buttercups are in bloom the young larvæ may be found in great numbers congregated among the stamens of the flower. Instead of describing this larva I have put one alongside of the mother beetle together with a photo-micrograph of the same. It is, as you will see, remarkably like a louse, and for this Kirby mistook

it, naming it *Pediculus melittæ*, from the bee on which he found it, and an account of which he gives at pages 168 and 169 of his "Monographia Apum Angliæ."

Mr. Rye sums up all that is known for certain regarding the life-history of this beetle, and this is the substance of what he says—"The young larvæ hatch in from two to three weeks; they appear to remain torpid for some time; but when once roused by sufficient warmth, exhibit extraordinary activity in traversing low plants, chiefly *Ranunculaceæ* and *Chicoraceæ*. From these they attach themselves in great numbers, to the hairy covering of bees, as they settle on the flowers of their temporary lodgings. When carried by the unconscious bee to its nest, the Meloë larva devours the eggs therein contained, changes (without leaving the cell of the latter) into a second larval form, arched, cylindrical, with toothed mandibles and stout legs—and then feeds on the food intended by the bee for its own young. After some time this second form of the larva, sheds its skin, becomes motionless, and is then known as a false pupa. After this it again changes to a third form of larva similar to the second; after this, however, we know no further: we can only judge from the analogy of *Sitaris*, that it changes into an ordinary pupa, from which the perfect insect emerges."

The second case in which the strangers come as friends is well exemplified by the Aphides which are kept by some species of ants and regularly fed by them; the ants themselves feeding on a sweet secretion emitted by the Aphides. There is also the small blind beetle, *Claviger foveolatus*, which is found nowhere but in ants' nest and which has not only lost its eyes, but which seems to have lost the power of feeding itself. This beetle, like the Aphides, acts as a sort of milch cow to the ants.

The third case where the strangers are merely tolerated is more difficult to understand. Sir John Lubbock in "Ants, Bees and Wasps," says: "Various reasons may be imagined which may render the presence of these insects useful or agreeable to

the ants. For instance they may emit an odour which is pleasant to the ants." He says also "Mr. Francis Galton has, I think, rendered it very probable that some of our domestic animals were kept as pets before they were made of any use. Unlikely as this may appear in some cases, for instance in the pig, we know as a fact that pigs are often kept by savages as pets. I would not put it forward as a suggestion which can be supported by any solid reasoning, but it seems not altogether impossible that some of these tame insects may be kept as pets."

In another place Sir John says "I therefore venture to suggest that these insects may, perhaps, act as scavengers."

I think myself that this last reason is the true one.

I have taken the British beetles. Of the Filicornia, the predaceous land and water beetles, which among insects may be compared to the more noble of the Felidæ, the tigers, leopards, &c., we have more than five hundred species, but I have not been able to find any record of a single one of these being found associated with Hymenoptera. But among the Clavicornia, which may be compared with the dogs, jackals and hyænas, I find in the single family Staphylinidæ, five genera, and thirteen species that are found in nests of various species of ants.

Of the Nitidulidæ, so many of which frequent flowers, we have about a hundred species, but none are found so associated.

The Cryptophagidæ are omnivorous feeders, and of these I find four species occurring in the nests of humble bees, three in ants' nests, and one, the occasion of these notes, in a wasp's nest.

Among the Heteroceridæ there are seven species found associated with ants.

The family Coccinellidæ contains about one hundred and forty-five British species, but as they mostly feed on the Aphides, the peculiar pets of the ants, none are found associated with the ants, with, however, one exception, *Coccinella distincta*, which has been recorded as found in an ant's nest. If this was not

purely accidental, I suppose the lady-bird to have been poaching for Aphides.

The family Histeridæ have their habitat in dung, and four of them are found in ants' nests.

Among the Lamellicornia there are none, and although many of these insects act as scavengers, their comparatively large size will quite account for their absence. The larger ones could not get into the nests without breaking a passage, and the entry of even the smaller ones would prove inconvenient.

Among the Malacodermata only one, *Ptinus sexpunctatus*, in the nests of humble bees.

Of the Longicorn beetles, the Chrysomelidæ and the weevils there are altogether more than eight hundred British species; they are all vegetable feeders and none are found associated with Hymenoptera.

I think therefore that until some better reason is forthcoming, we may assume that, where these intruding insects are apparently neither enemies to be attacked, nor friends to be protected, they are simple scavengers, whose presence is tolerated.

Well Boring at Bitton. *By* H. H. WINWOOD, M.A., F.G.S.

(Read January 16th, 1895.*)*

Your President, at the beginning of the past year, called my attention to a well boring in his parish at Bitton. As it is important that every detail of the rocks beneath our feet should be recorded, and as there are some facts of interest, besides those relating to the water question, connected with this boring, I have ventured to bring these notes before the Members of our Club. The site of the bore is in the midst of Messrs. Somerville's Paper Mills, on the 50′ contour line, in the Golden valley at Bitton; the object was to obtain an increased supply of water for manufacturing purposes. During the year I paid several visits

to the spot, and take this opportunity of acknowledging the courtesy of the proprietors in affording me all possible information of the progress of the work commenced in November, 1893, and finished in August, 1894, and permitting me to publish its results.

Mr. Thomas Mathews, of Manchester, was the engineer employed, and the use of a twelve-inch steel drill for the first 200 feet, and a nine-inch drill for the remainder, enabled good cores of the underground beds to be brought up and identified.

The following section gives the series of beds passed through :—

	Section.	Thickness. Ft.	In.	Depth. Ft.	In.
	1.—"Surface to level of Pumping floor" ...	—	—	3	0
	Made ground, &c. ...	6	6	9	6
	2.—"Blue clay" (Lias) ...	23	6	33	0
	3.—"Blue shale" (Lias) ...	27	0	60	0
	4.—"Grey rock" (Lias) ...	—	6	60	6
	5.—"Blue clay" (Lias shale)	23	6	84	0
	6.—"Grey rock" (Lias) ...	1	6	85	6
	7.—"Blue shale" (Lias) ...	21	6	107	0
	8.—"Grey rock" (Lias) ...	1	0	108	0
	9.—"Grey bind" (Lias shale)	15	0	123	0
219′ Lower Lias Clays, Shales and Limestone Beds.	10.—"Grey rock" ...	2	0	125	0
	11.—"Blue shale"... ...	13	0	138	0
	12.—"Blue shale and Grey rock alternate" ...	7	0	145	0
	13.—"Blue Lias rock." Core "154" and "177" contains traces of fossils and fish scales and are dense and crystalline...	42	0	187	0
	14.—"Blue Lias and marl alternate"	24	0	211	0
	15.—"Blue Lias rock" ...	8	0	219	0
14′ Rhætics.	16.—"White limestone and White Lias" ...	11	0	230	0
	17.—"Brown marl" (probably White Lias shale) ...	3	0	233	0

	Section.	Thickness. Ft.	In.	Depth. Ft.	In.
	18.—"Blue marl and limestone" (New Red marl) ...	13	0	246	0
	19.—"Red marl" (New Red)	18	0	294	0
New Red Keuper Marl, &c.	20.—"Red marl and mixed red rock" (variegated marls)	15	0	279	0
	21.—"Conglomerate" (Gypsum)	17	0	296	0
	22.—"Conglomerate and bands of marl" (Gypsum) ...	46	0	342	0
179′	23.—"Conglomerate" (Gypsum)	5	0	347	0
	24.—"Conglomerate and marl" (sandy beds) ...	4	0	351	0
	25.—"Harder conglomerate with calcite" (Gypsum)	61	0	412	0
	26.—Pennant grit ...	5	0	417	0

Notes on the above Section.

No. 3.—On the core of "blue shale," numbered "49," was a small portion of a fish bone or spine.

No. 18.—The core numbered "246," is not "blue marl and limestone," as represented, but the usual red marls of the Keuper, with a patch of grey. So that the top of the Keuper comes in between 233 and 246 feet.

No. 22.—Sandy beds come in about 313′, and water was obtained from them and from the gypsum beds described as "Conglomerate." A core marked "366′" was very sandy.

The following facts appear from this section, translated from engineering into geological language, that the Lower Lias beds are 219′ thick at this place, and consist of the usual blue Lias clays and shales with occasional alternating beds of rock. That the White Lias and Rhætic beds are represented and about 14′ in thickness, and that the rest of the boring was carried through Keuper Marls and Sandstones to the depth of 179′, and that these latter rested on Pennant rock.

The scarcity of organic remains in the cores brought up, or, at least, in those specimens which I had the opportunity of examining, was rather remarkable; however, sufficient evidence was forthcoming in the cores (now on the table before you) to indicate the different horizons passed through, *e.g.*, in the cores numbered "154′" and "177′," and named correctly "Blue Lias Rock," are traces of fish scales, &c., characteristic of the Lower Lias beds. Of the intervening beds between the Lower Lias and the top of the Keuper Marls, *i.e.*, the Rhætic beds, which the late Chas. Moore discovered in our neighbourhood, but very scanty evidence existed; enough, however, to show that they were then in their usual position, the core marked "225" and named "White limestone," being evidently a portion of the White Lias, which is considered as the upper portion of those beds; all traces of the underlying shales and clays with their contained fossils having probably been mashed up into a muddy pulp by the borer and so washed away. On making enquiry, however, whether any of the pyritous bone bed had been found, a little bit of limestone was given me, numbered "233," which was at once recognised as a portion of the bone bed at the base of the Rhætics. A vein of detached sparkling crystals (evidently considered by those who had preserved the specimen as precious metal, probably gold) being characteristic of the iron pyrites so abundant in the bone bed. The remaining 179′ consisted, as the section shows, of "Red Marls, Red rock and Conglomerate," these cores with the latter label on them, are from the Gypsum beds usually found in the Keuper Marls, and running through them in strings and patches. The frequent occurrence of these latter beds through a thickness of 133′ is probably accounted for by the fact of the borer piercing vertical strings or veins of this mineral and thus apparently presenting a thickness greater than usual.

The most interesting geological feature in this boring is the meeting with the Pennant rock at the base. Miners after passing through the "Red Ground," expect to win coal, but in this

instance the whole of the Upper Coal Measures, 1,900′ thick in all, are absent, and to find the Lower Seams a mass of Sandstone (Pennant) proved at the Golden Valley Pit* to be at least 600′, according to Prestwich, and most probably considerably thicker, by some 1,500′, would have to be pierced before reaching the Lower Series of Coal Measures beneath.

The upper series of Coal Measures worked so profitably at Radstock, reaching to a thickness of 1,900′ in all, are therefore absent.†

With regard to the main object of getting a supply of water. After passing through the Lower Lias beds which generally hold up the water percolating down from any pervious beds above, the only chance was to sink through the Keuper Marls to the Sandstones near their base, which generally yield an abundant supply; but so far as I can discover from the cores in my possession, those beds seem to be very thinly if at all represented, and the fact of the sides of the bore hole having fallen in for the last 116′ above the Pennant, seems to indicate that the harder Sandstone beds are absent and that the Marls rest upon the Coal Measure Sandstones directly. Water was obtained, however, from the gypseous beds, amounting to some 5,760 gallons per hour, or 138,240 gallons per 24 hours. When pumps were at work, the water was 12ft. from surface; when stopped, the water rose to level of ground. Analysis shows much sodium chloride or

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* "Golden Valley" Pit, in the valley of the river Boyd, about one mile north of Bitton village.

† Upper series.

(*a*) group.	Radstock and Camerton coalfield...	1,000
(*b*) group.	Farrington, Parkfield and Coalpit Heath	750
(*a*) divided from (*b*) by Red Shale	... ...	150
	Total thickness ...	1,900

Lower series.

Pennant Sandstone	... ...	2,000
(*a*) Kingswood, Newbury, &c.	...	average
(*b*) Bristol, Vobster and Twerton	...	2,000

common salt. The following is the analysis made by Mr. Gatehouse, the City Analyst, November 11, 1894 :—

"TOTAL SOLIDS ON EVAPORATION 53·12 GRAINS PER GALLON, CONSISTING OF—

Water of hydration	6·90
Chlorine 11·9 calculated as Sodium chloride	19·50
Nitric acid ·7 calculated as Sodium nitrate	·96
Sulphate of lime	12·70
Carbonate of lime	9·02
Silica	·14
Magnesia	·92
Oxide of iron	·40
Alumina	2·00
	52·54
Loss and not estimated	·58
	53·12

P.S.—From a consideration of these figures taken in connection with the section of the well sent with the water, I think it highly probable that the bulk of the water is derived from the saliferous Marls . . . . which usually are more or less impregnated with Salt and Gypsum.

Temporary hardness	9°
Permanent hardness	9·5°
Total hardness	18·5°

The temporary hardness is due to the carbonate of lime and similar bodies, thrown down by boiling; the permanent hardness is chiefly due to the soluble Calcium sulphate not thrown down except on very prolonged boiling, and then only incompletely."

Excavations at the Bath Waterworks, Monkswood.

By H. H. Winwood, M.A., F.G.S.

(Read January 16th, 1895.)

The works now in progress near Monkswood, at the N.W. end of the picturesque valley of St. Catharine, for the construction of a reservoir sufficiently large to meet the increasing demands of the inhabitants of Bath on the water supply, are of great importance in more ways than one. I propose in these notes to touch merely upon the geological and antiquarian aspects of the excavations. Some of the Members may remember that an excursion was made there last October, when the object and progress of the works were explained by Mr. Charles Gilby, the assistant-engineer under Mr. W. Fox. The general geological features of the locality were briefly pointed out at the time by myself, and some further details of various "finds" during the progress of the work, being of great interest, are worthy of a permanent record in our Proceedings.

The object being to dam up the valley between Fry's Farm and the S.E. end of the present small reservoir, a trench some 30 feet deep had to be excavated, and filled up entirely with a puddled core.

The width of this dam at the base will be 240 feet, narrowing on the top to a few feet. To insure the stability of this dam, excavations on either side were necessary, called "toes," into which a vast quantity of stone had to be thrown to bear the lateral thrust.

For this purpose the Great Oolite capping the hill formed a very good material, and a tramway was laid down for the trollies to convey the stone to the valley below. It was during the progress of these excavations, both above and below, that many interesting geological features were exposed. The top of the plateau is about 644 feet above mean water level (at Liverpool),

and consists of a capping of Great Oolite only a few feet thick, ranging from 10 feet to 6 feet, and varying very much from the Great Oolite on the S. side of Bath, both in thickness and character. When we compare, for instance, the sections beneath "Brown's Folly," on the Monkton Farley Down, which is on the 600 feet contour line, or those at Box, on the 400 feet contour; both of which in a bee line are only distant, in the former, 4 miles, in the latter, under 6, we are much struck with the change in the lithological character of the beds. The well-known "Freestone," from 10 feet to 20 feet thick, for which both the latter places are so celebrated, are absent or only very thinly represented, and those raggy beds which come in at the base of the workable beds, seem only here to have been deposited; in other words, these were probably laid down in a more shallow sea than those others, and have the facies of the Forest Marble series more fully developed.

According to Lonsdale, the Great Oolite in the Bath district is divided into—

Upper Rags	(*a*) Coarse shelly limestones (*b*) Tolerably fine oolites "Scallet" (*c*) Tough brown argillaceous limestones	20 to 55
Fine Freestones.	"Weatherstone," &c. ...	10 to 30
Lower Rags.	Coarse shelly limestones ...	10 to 40

The following section, on the brow of the hill, was taken on May 1st, 1894, when I visited the works in company with Mr. Inman, and before the cutting had been worked so far back as at present:—

(1) Hunterwick Section.

Nearly E. or E.S.E. of Barn. Sections run irregularly E. and W.

	Ft.	In.
Shelly rock cropping up through the surface covering of grass and mould ...	—	—
Series of more or less fissile beds and coarse shelly limestone	3	0
Softer beds broken up and more oolitic ...	1	0
Coarse shelly limestone	1	1

	Ft.	In.
Solid beds of Oolite rather marly at base ...	1	0
Dense bed patched with blue	0	5
Mottled clay, blue and yellow	0	4
Dense crystalline limestone bed, blue in centre, resting on Fuller's Earth clay, yellow on top, blue beneath, in some places containing nodules of Fuller's earth rock	0	4
	7	2

(2) A Section still further Eastwards gave—

	Ft.	In.
Series of Rag Beds resting on	—	—
Fuller's earth clay (blue)	0	7
Fuller's earth tough nodular limestone ...	0	3
Yellow clay and nodules	1	3
	2	1

This gives a sufficiently accurate general character of the rock on the plateau. Fossils are very scarce, but here and there the characteristic coarse-ribbed Rhynconella (*obsoleta*) was found. The beds are locally termed "bastard freestone," and used chiefly for rough work, such as stone stiles and walling. The line of the Avon valley through Bath seems to be the dividing line between the Great Oolite on the S., with its commercially valuable "Freestones" of commerce on the one side, and the comparatively valueless beds of "bastard freestone" on the other.

The fault which the late Chas. Moore considered ran along the line of the valley and brought the beds down on the S. side, may account for this lithological difference, the deposit on the S. side going on and resulting in the finer oolitic beds and Upper Rags, whilst that on the N. ceased with the laying down of the Lower Rags, owing to the elevation of that side above the reach of the waters; or the absence of the middle and upper

portions, may be accounted for by denudation having removed all the upper beds from the N. side of the valley after they had been deposited.

Passing then downwards from the plateau to the bottom of the valley, about 307 feet above sea level, several interesting features are observable. The tramway runs along the Fuller's Earth, from 180 feet to 150 feet thick, and its wet and greasy nature is only too plainly perceptible to any one walking down the side. At or near the bottom level it cuts through Inferior Oolite rock with the "Midford Sands" at the base. Several trial holes for stone here sufficiently indicate this. At one excavation on the side of the Knoll overlooking the works, the rock immediately resting upon the Sands is simply a mass of shells, Rhynconella *spinosa*, Trigonia and Ostrea Marshii abounding. The top of this Knoll, 163 feet above the valley and 174 feet from the plateau, is therefore, undoubtedly Inferior Oolite. *Some 50 feet below this Knoll, and 300 feet to the E. on the 400 feet contour line, a section facing N. has exposed several beds tilted to the E. and dipping at an angle of 64° in that direction. It was naturally supposed at first that these belonged to the same members of the Oolitic series as those immediately above, *i.e.*, the Inferior Oolite, but, on examination, I discovered this was not the case, for, on looking closely, a portion of limestone in the W. corner, yellow on top and blue in the centre, with a small patch of clay, yellow on surface and blue beneath, was at once recognised as the same bed as that on the top of the plateau, *i.e.*, the lowest bed of the "Rags" resting on the Fuller's Earth. So that we had here a mass of Great Oolite beneath the Inferior Oolite, a most abnormal position. How is this to be accounted for? There must have been a landslip in past times, bringing down a mass of the Upper beds with some Fuller's Earth attached to them, and pitching them down almost end on in their present

* The white cross in Plate No. 1 (from Photograph taken by Mr. George Powell) marks the position of the landslip.

PLATE No. I.

1—LOWER LIAS CLAY. 2—PEAT AND MARL. 3 +—QUARRY OF GREAT OOLITE.


BRITISH MUSEUM
NATURAL HISTORY

position. We are accustomed to small landslips on our neighbouring hills, the clays of the Fuller's Earth lending themselves very readily to the movement of the top beds over their greasy surface after continued rains, but in this case, the magnitude of the slip, the great disturbance of the beds, and the way in which they have come down into the Sands, almost on to the top of the Lias beds, is noteworthy.

SECTION OF GREAT OOLITE JUST ABOVE PRESENT WORKS.

Section runs from N.N.W. to S.S.E.

Beds are thrown down with a dip of 64° to S.S.E., with a patch of Fuller's Earth clay in N.N.W. corner.

Order of succession from N.N.W. to S.S.E.

	Ft.	In.
1.—Yellow clay on top, blue below ...	—	—
2.—Dense blue crystalline limestone ...	0	3½
*3.—Thick bed, brown and oolitic at base, coarse shelly limestone on top ...	1	3
4.—Broken up shelly limestone ...	1	9
5.—Solid shelly limestones	1	5
6.—Ditto	—	9
7.—Shelly limestone	—	8
	6	1½

Below this section we soon come to the Sands resting on the blue clays of the Lower Lias. That these clays are Lower Lias is corroborated by the fact of finding Cardinia Listeri and Am. (Ægoceras) *Capricornus*, which, though a type species of the Middle Lias, occurs, Mr. Edward Wilson says, in the Lower Lias. But the bottom of the valley has been dammed up in former times, possibly by the same cause which brought this mass of Great Oolite down from the plateau above; and evidences are abundant that a large body of water, comparatively stagnant, filled it on the site of the present excavations, from Fry's Farm nearly up to the existing small reservoir beneath Monkswood. In process of time (and this must have been of

* Rhynconella *obsoleta* found in No. 3.

long duration), the water became logged with marsh and other aquatic growth until a lacustrine and peaty deposit was formed to a thickness of 15 or 20 feet, of which the following is a section :—

*Section of Peaty Deposit in Bottom of Valley.
O. D., 307 feet.

Section running nearly N. and S.

	Ft.	In.
1.—Top soil, grass and yellow sandy clay	1	0
2.—Peaty deposit and white marly wash (more peat than marl) ...1 to 1	1	6
3.—A succession of loops of marl and peat, becoming more marly at base, with wood and land and fresh water shells near the top ...	20	0
Resting on—		
4.—Blue Lias clay, greyish on top, becoming bluer at base	—	—
	22	6

The stump of a tree was seen at the base of No. 2, on N. side, resting on Marl, and from its gnarled roots and reddish colour, probably that of a fir-tree. The wood was thoroughly soaked through and rotten.

Many shells, Helix *nemorosa*, Bythinia, &c., were picked out from No. 3, together with hazel nuts. And about the middle of the section, a band of concretionary marly pellets occurred.

The most important find of all was that of the bones of the Urus or Bos *primigenius*, at the base of the Peaty Marl and resting upon the old land surface of the Lower Lias clay. They consisted of two jaws, two thigh bones, a blade-bone and rib of that extinct ox. Since then, near the same spot, have been discovered the skull, with its large and perfect horn cores, some more femora, several vertebræ, a jaw and other bones, so that we have here the remains of certainly two, if not more, skeletons of the Urus.

* Vide Plate No. 2 (from Photograph taken by Mr. G. Norman).

This peaty deposit extends throughout the length of the valley, but is much thicker at the E. end than on the W. The following section, taken on the S. side, just below the present reservoir, during my last visit in December, gives :—

	Ft.	In.
1.—Yellowish clay	1	5
2.—Black peaty earth, with stumps of trees ...	1	0
Light blue clay resting on light coloured Marl with recent shells	1	6

The peaty deposit smelt very badly.

The bones have been named and their measurements kindly given me by Prof. Boyd Dawkins :—

Remains of Bos Primigenius—(Urus).

Monkswood Reservoir, 1894.

Skull Measurement.

	In.
Frontal width between horn cores ...	8·5
Circumference of base of horn cores ...	12·5
External sweep of horn cores	28·0
Occipital (mastoidal) width	11·5
,, ,, heighth	9·0
Occipital width behind horn cores ...	8·0
Heighth of foramen magnum	2·1
Width of foramen magnum between condyles	1·5

	Length	Minimum circumference	Proximo transverse	Proximo vertical	Distil transverse	Distal vertical
	In.	In.	In.	In.	In.	
Scapula	16·7	6·6	2·9	2·4	11·5	0
Ulna ...		8·1	0	0	0	0
Radius ...	14·2	0	4·0	1·5	3·9	0
Metacarpel ...	10·2	5·3	3·3	1·7	3·4	3·0
Sacrum	0	3·5	1·6	0	0	0
Femur	18·5	7·4	3·7	4·9	0	0
Tibia		5·6			3·1	

It was not far from this last section, but a little higher up, nearly due S. of the present reservoir, and just on the 366 feet contour line, that, whilst excavating the present conduit to carry off the water from the valley running down from the W., a most interesting discovery was made. About two or three feet below a tufaceous deposit of carbonate of lime, the wash from the neighbouring slope and containing the usual impressions of reeds, &c., and near the foot of the slope, the workmen came across a *cache* of Bronze implements and ornaments. Mr. Charles Gilby was fortunate enough to secure the greatest portion. Some portions,* however, there is reason to believe, have found their way into Bath under the impression that the metal was gold. This idea is strengthened by the fact that some of the torques and bracelets have been broken across, the bright fracture no doubt giving the impression that they were gold. This find is of great importance, as, according to the opinion of Prof. Boyd Dawkins and Sir John Evans, who have both seen the articles, they are præ-Roman and belong to the late Bronze Age.

Two bronze armlets and two bronze fibulæ were found at Cherrywell, near the Bath Waterworks, in 1857, and are now to be seen in the Institution Museum.

THE SERIES CONSIST OF—

	FT.	IN.
Two twisted Torques—		
1.—Perfect, with hook at either end, measuring outside circumference...	1	$7\frac{1}{2}$
2.—Fractured ditto ditto ...	1	$6\frac{7}{8}$
Another of fine twisted wire, with hook at one end, fracture old. Query, a child's Torque? Outside circumference...	0	9
Two pieces of twisted wire, parts of a Torque, one with hook attached, fracture old.		

* Mr. Gilby informed H. H. W. that a portion of a torque and of a broad band of bronze, probably armlet, was brought to Mr. Callaway by one of the navvies.

	Ft.	In.
Four perfect Bracelets—		
1.—Twisted and perfect. Outside circumference...	0	$9\frac{1}{2}$
2.—Plain, round and perfect Ditto ...	0	9
3.—Plain and four-sided Ditto ...	0	$8\frac{1}{4}$
4.—Ditto ... ... Ditto ...	0	$8\frac{3}{8}$
Flat Bracelet in two pieces, fracture new, five-ribbed outside and much worn, inside surface smooth. Breadth...	0	$0\frac{5}{8}$
Two broken Armlets or Bracelets, fracture on one new.		
A circle, triangular in section, piece broken out. Outside circumference...	0	$8\frac{1}{8}$
Attached to a shaft, bent at the base. Length, including bend...	0	$5\frac{7}{8}$
Query: Was this a hairpin?		
Another smaller circle, also triangular in section, much worn, shaft broken off, fracture old. Outside circumference...	0	$4\frac{5}{8}$
A hollow cone of thin bronze, with hole at top. Circumference at base...	0	$3\frac{1}{8}$
Three Sickles unsocketed and ribbed at the back—		
1.—Almost perfect. Outside circumference	0	$6\frac{1}{2}$
2.—Point broken ditto ditto ...	0	$6\frac{1}{2}$
Greatest width at base...	0	$1\frac{3}{8}$
3.—Smaller, point broken	0	4
Width of base...	0	1
Two Ferrules for spear shafts, with incised lines round edge of socket—		
1.—Length...	0	$2\frac{3}{4}$
Diameter of socket...	0	$0\frac{3}{4}$
2.—Length...	0	3
Diameter of socket...	0	$0\frac{13}{16}$
Base of spear point with two loops for attachment. Length...	0	$1\frac{1}{2}$
Diameter of socket...	0	$0\frac{5}{8}$
Three Knife or Spear blades, flat on one side, three faced on the other—		
1.—Top broken, hole for attachment to handle perfect. Length...	0	$2\frac{3}{4}$
Greatest breadth at base...	0	1
2.—Perfect when found, recently broken. Hole for attachment. Length...	0	4
Breadth...	0	$0\frac{13}{16}$

	Ft.	In.
3.—Base broken off, fracture old. Length	0	$2\frac{3}{4}$
A square borer, rounded and pointed at one end, tapering at the other for hafting. Length...	0	$4\frac{1}{4}$

One's imagination may run riot then, and picture the time when the wild ox, the Bos *primigenius*, roamed about these valleys, and our Celtic ancestors lived on the margin of this morass, hunted the Urus with their bronze weapons, covering themselves with its skin; their women and children adorning their necks and arms with the bronze ornaments only comparatively recently introduced into Britain, and which, as conquerors, they had brought with them. And how would this picture be further verified if we could only find traces in the skull of the death blow inflicted by the bronze spear or arrow-head, before the wounded ox floundered across the morass whilst trying to escape from his active and hardy little enemy, and finally sunk to the bottom, to be uncovered by the men of the 19th century and shown to the Members of the Bath Field Club in the year of grace 1895!

Lansdown and St. Lawrence's Chapel. *By the* Rev. C. W. Shickle, M.A.

(*Read February 13th, 1895.*)

Every sojourner in Bath visits Lansdown, drives perhaps so far as the Grenville Monument, and admires the views to be obtained from Prospect Stile and Peak of Derby, but of the Down itself they see nothing. To them and many of the residents who have for years habitually walked along the "Down," because they consider the Lansdown air better than Bath Physic, the picturesque combs and charming views, which are to be obtained within a few yards on their right or left, are quite unknown, and

to these the two or three houses in the middle of the Down seem to owe their origin to the Race-course. . But to those who threw up the camps and earthworks, who once watched the enemy endeavouring to scale the heights but who have now for centuries lain buried beneath the various tumuli which are to be found there, Lansdown presented a very different appearance.

To them it seemed composed of two broad plateaux connected by a narrow neck not more than 500 yards across. At the western extremity of the northern down is situated the Northstoke Camp whose broad terraces, one below the other, afforded space for manœuvering many thousand men.

The camp eastward of it may be Roman ? But is it not more probable that it is merely the remains of the cattle lagers of the inhabitants of the other fortress ? I do not know whether the two barrows within the camp have been opened or any similar investigation made of those by Battlefield and the Lansdown Cemetery.

Lansdown was from the earliest times intersected by roads and paths.* The Gloucester road crossed it from end to end. From the very middle of Gloucestershire it passed down Frizen Hill and by the present Monument, and through the Roman Camp, which seems to have been constructed to enable its possessors to hold it against all attacks, while from the Chapel it pursued a direct line down Rough Lane and across the Old Bath Bridge to Ilchester. Another road branching off from the Via Julia at Batheaston crossed the brook at Deadmill, came up Collier's lane and thence across the Down to the Chapel and following the present footpath through Fair Close and Hanging Down to Beach joined the Via Julia again at Aust. A third road led from Weston direct to the Chapel, and there were paths more or less used leading in almost straight lines to Northstoke, Cold Ashton Bottom and by the New Bath Waterworks to Marshfield.

The earliest mention of Lansdown I have been able to discover

* Thorpe's Map of Bath, 1742.

is in the time of Bishop Reginald,* the great friend of Bath, who was buried before the High Altar in the Abbey; and of whom Richard of Devizes writes,

> Dum Reginaldus erat bene seque suosque regebat,
> Nemo plus quœrat, quicquid docuit faciebat.
>
> Reginald rightly named, himself and his flock ruled well
> How? What he taught he did; there is no more to tell.

His love for the City was shown by the foundation of S. John's Hospital by which the sick and poor of the city had the benefits of the hotwaters. In aid of this charity he made two grants between A.D. 1180 and 1190 of†

1. One sheaf a year from every acre of domain in the Bishoprick.

2. Of 4 mks per ann "de denariis de caritate in Archid Bath et Wellen percipiendis" of two loads of dead wood each week from the Bishop's Park,‡ of run of two horses and two cows with the Bishop's cattle and for 100 sheep on Lantesdune. This grant was confirmed by Bishop Walter Haselshaw soon after his elevation to the See (A.D. 1302) and commuted for a yearly payment of 100s. on condition that the Master of the Hospital continued to make the same return in masses and prayers.

The years of Reginald's episcopate were years of progress and church building in the Diocese. Prior Hugh of Avalon was laying the foundations of his Charter house at Witham in which Reginald took great interest. Is it possible the Cell was founded by him on Lansdown, as a resting place for weary pilgrims, and a beacon for wanderers on the Down, a kindly office perpetuated perhaps at the Inn well known as the Star and now as the Blathwayt Arms?

A chapel must have already existed, or been erected about this time, because a grant§ was made by Robert, Prior, &c,, to Nicholas de Lamesdun, of a messuage which he had of Peter de Bath, for term of his life, upon condition that, if, by the advice of the Venerable

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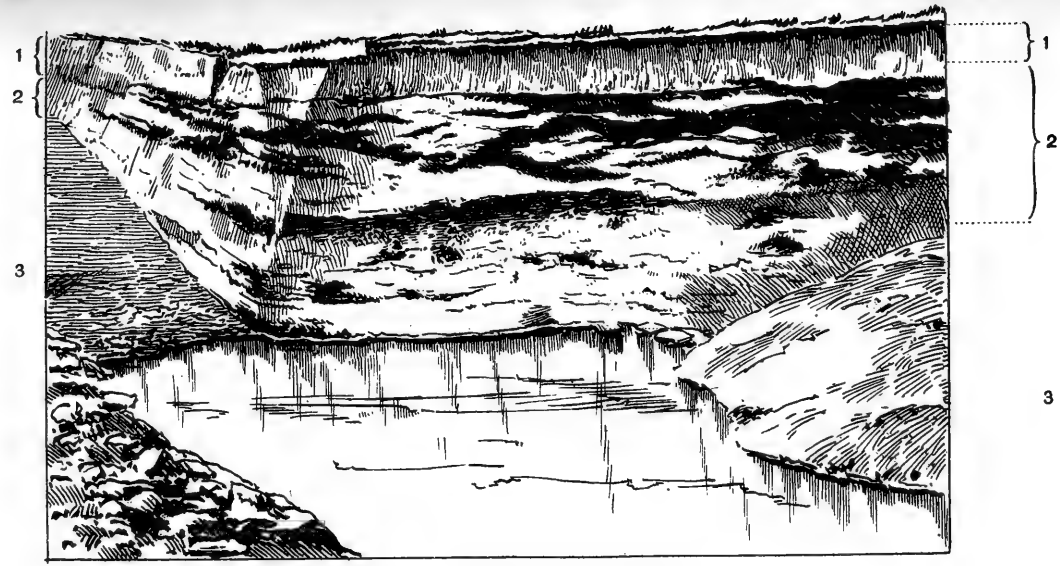
* Well's History, Church, p. 75. † John of Drokenford, p. 99.
‡ One of the fields is still called The Park.
§ Bath Cartulary, 95, p. 20.

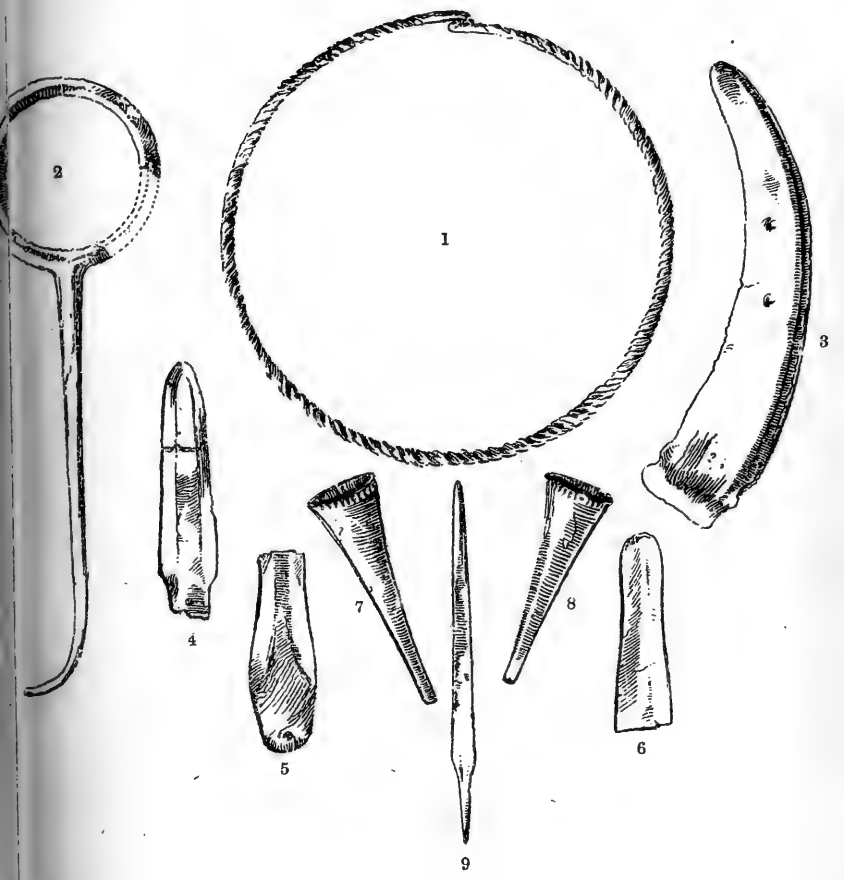


SECTION OF PEATY DEPOSIT.

1.—Top Soil and Sandy Clay. 2.—Peaty Deposit and White Marly Wash. 3.—Lower Lias Clay.


BRITISH MUSEUM
NATURAL HISTORY

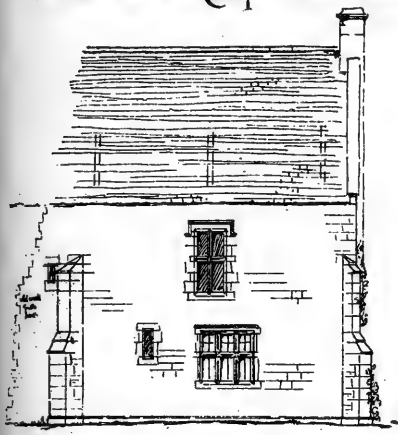
SOME OF THE ORNAMENTS AND IMPLEMENTS FOUND AT MONKSWOOD, 1894.



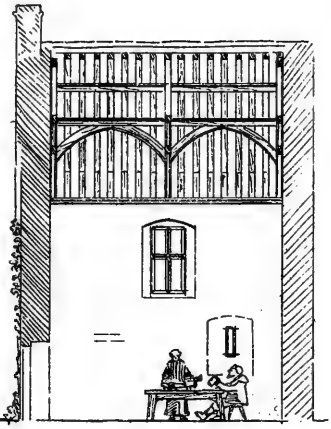
1 Bronze Torque; 2 Bronze Hair pin (possibly); 3 Bronze Sickle;
4, 5 and 6 Bronze Knife blades; 7 and 8 Bronze Spear ferrules; 9 Bronze Borer.


BRITISH MUSEUM
NATURAL HISTORY

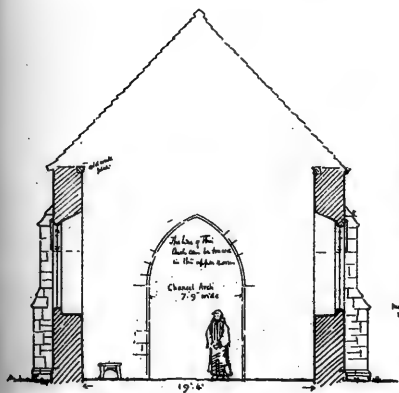
S. Lawrence's Chapel Lansdown



Elevation of West End.

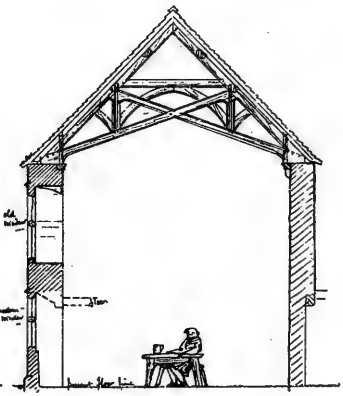


Section thro Hall
looking West.



Section through Chapel
looking East

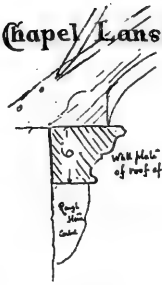
Scale of Feet

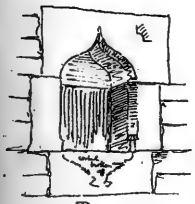


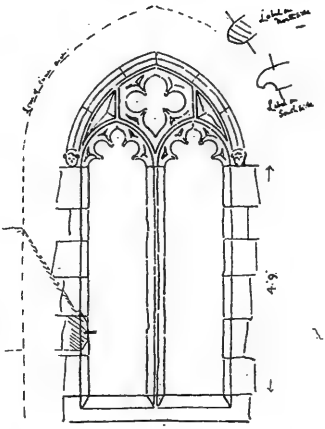
Section thro Hall
looking North

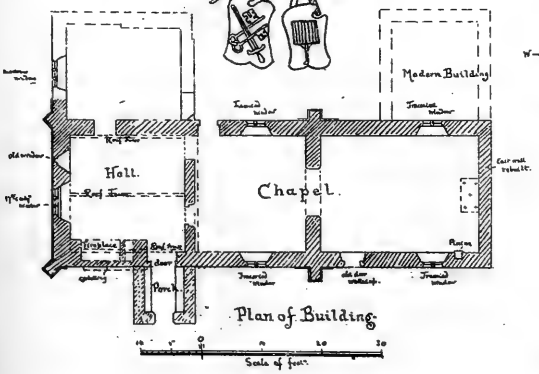
Wallace Gill
Jan 1899.

S. Lawrence's Chapel, Lansdown.





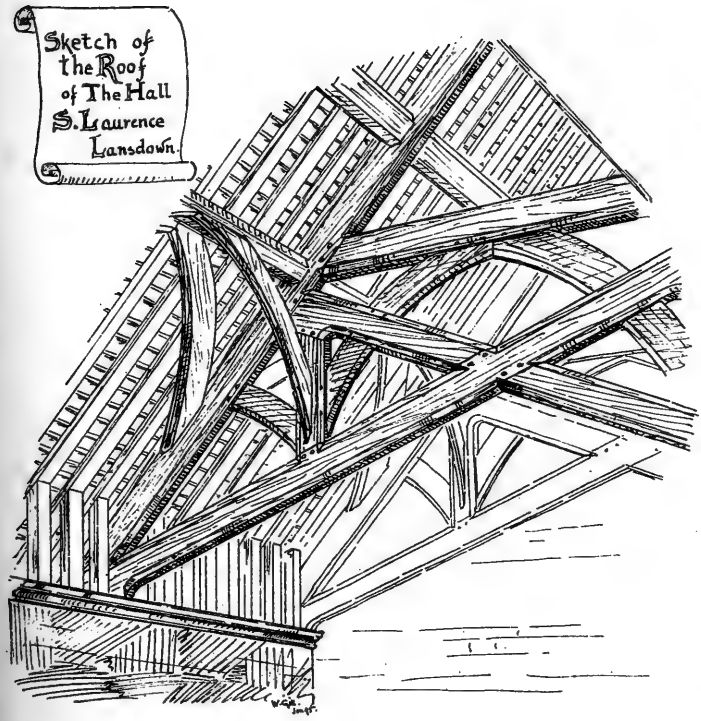




Wallace Gill

4 inch


BRITISH MUSEUM
NATURAL HISTORY


Sketch of
the Roof
of The Hall
S. Laurence
Lansdown


BRITISH MUSEUM
NATURAL HISTORY

Father The Lord Bishop of Bath and Glastonbury, the said Prior should offer a suitable exchange, the said Nicholas should return the said messuage as the right of the chapel of Lamesdun.

This grant must have been made between 1198 when Robert was elected, and 1219 when Jocelin ceased to be Bishop of Glastonbury.

But this is not the only hint we have that the pugnacious spirit of those who fought with bow and shield on Lansdown, entered into the possessors of the chapel, for traces of legal disputes are referred to in the next notice we possess.

A covenant* by Henry de Caumpedene that he will preserve the Prior, &c., indemnified against all suit for the chapel of Lantesdon. Dated the morrow of the feast of St. Peter ad Vincula 1344.

The chapel had an endowment of considerable worth as compared with the Rectory of Langridge for while in the Valor Ecclesiasticus, Hen. VIII, Langridge is returned as worth £vi iij iiij, Launtesdon Chapel is given

	£	s.	d.
Val' in redd' firm mañij ibm unacū terr dnic' ibm p a^{m} cū vjs viiid de exit' nundin' ibm	viii	ix	x

	£	s.	d.
Is worth in the rent of the farm of the manor there, together with the demesne lands there, by the year, with 6s. 8d. of the issues of the fair there	viii.	ix	x

No tithes belonged to the Chapel. One acre of land seems to have fallen into the possession of the Bath Corporation, as a lease of a piece of land "lying neere the chappell at Lansdowne called St. John his Parrock" was granted† to the son of the then Rector of Langridge in 1616 and I think now forms part of the glebe.

The plans and elevations of the chapel have been so accurately drawn by Mr. W. Gill that it is unnecessary for me to describe it. The roof of the chancel and nave was taken down about fourteen years ago, and from what I can learn seems to have possessed

* Bath Cart., 861, p. 172. † Bath Corporation Records.

no marked features; but at some time, anterior to the Reformation, the length of the chapel was considerably diminished by the conversion of the western portion into a hall, and by the erection of another building on the north side of it, the extent of which cannot now be known. This may have been the residence of the Priest in charge. The fine oak roof was then erected, on the original western wall now slightly raised, and with a wall plate on the eastern side resting on rough stone corbels in the wall at this time built across the chapel. This wall had in it a small doorway leading from the Hall into the now much contracted nave. The two small two-light windows close to the roof may have been inserted in the chancel at this time.

At the west end were two two-light square headed windows one above the other with another small window on the same level as the lower one. No trace exists of an east window, and possibly this part of the chapel was in ruins at the time of the grant to Collins (see Infra) when it was called the ruined chapel of St. Lawrence.

On 28 Oct. 14 Hen. VIII,* Prior William Bird and Convent leased to Thomas Richman, of Corston, and Isabella his wife and John their son for their lives at a rent of £6 15s. per ann. "All that Sheaphouse upon Launcesdowne called by the name of Launcesdowne Sheaphouse and one close of meadow and pasture adjacent to the same and also a parcel of the Down called Launcesdowne with all the pastures, commons and sleights in Langridge for the pasture of the Ewe flock of Lansdown of 360 ewes, and on 11 Oct. 21 Hen. VIII a further lease was made, on the termination of the above, to Richard Horsington, husbandman, and Agnes, his wife, for their lives, at rent of £6 13s. 4d., and this property was granted (30 June, 22 Eliz.) to Thomas Kerry, one of the Clerks of the Privy Seal, for ever in consideration of £100, to hold the same in free and common

* [1523 A.D.] Pat: Roll, 20 Eliz., Part II., m 33.

socage as of the manor of East Greenwich. In 26 Hen. VIII, William Holloway, Prior, &c., granted to Richard Chapman* upon the determination of a lease held by John Cogan of all the lands, pastures, &c., except the Sheaphouse, &c., and the pasturing of the 360 or ewe flock, but he was obliged to have 100 sheep going with the ewe flock. "For this lease he paid a fine of £13 6s. 8d. and a rent of £10 per ann. This document also relates to a pasture upon Lansdown called Otelands afterwards the occasion of a long lawsuit, and to a certain grant due for a shepherd by name of a lyverye which is leased to Richard Chapman for 60 years.

In 27 Eliz. a grant† was made to Anthony Collins of tithes growing extra firmann of Lansdown in the parishes of Langridge and Weston pertaining to the free chapel of St. Lawrence late in the tenure of John Macie,‡ clerk, and also of all that ruined chapel of St. Lawrence, late in the tenure of Hugh Ridge.

A lawsuit,§ Pitt *v.* Attwood, occurred (7 James I) concerning the bounds and right of feeding on the Down, and several places are mentioned which I have not yet been able to identify, and among them is a long wall or embankment dividing the two properties which seems to have run from near the chapel to the opposite side of the Down, and this was the spot to which, I imagine, Waller retreated, when forced from his original position.

The Camp on Stoke Down has been called Oliver's Camp from a tradition that Cromwell's Army lay there the night before the battle; but Waller must have been nearly as far from the spot as Cromwell himself. His army during the day had been marching on the right of the Gloucester (Lansdown) Road and Collier's Lane above Woolley, or through the village itself, whilst the Royalists,

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* Harl MSS., 3970, fol. 10a.

† [1585 A.D.] Pat: Roll, 27 Eliz., Part 1, m 39

‡ John Macie was rector of Weston 1549-1596.

§ Excheq.: Bills and Answers, Jas. I., Som., 110203

the enemy, moved up the opposite side of the valley. And to have camped on Stoke Down would have entailed a long march on his tired men and left not only the Gloucester Road exposed, but the road which then led from Cold Ashton to Bath completely open to Hopton. How Waller reached the Lansdown side of the Avon from Claverton is an interesting question of which I do not know the solution. The way by the Old Bridge appears too great a detour. Did he cross at Bathampton, or was there any other ford nearer the city? It was* July, and the river would probably be low.

Waller, in my opinion, after sending a troop of horse to Marshfield to follow up the enemy, rested for the night near the chapel, and prepared the Long Wall at this the narrowest part of the Down, for his possible retreat, and then early in the morning raised his breastworks on the north edge of the Down, and when he finally retreated marched his men across the open down until he reached Rough Lane, or he may have descended the slope where Winifred Lane now runs to the open ground on the Common, the Ring, and the Barton Fields. No general would have shut his men in the Weston Lane down which they could only march slowly and with difficulty when he could retire them quickly out of range on an open plain; in addition to which Weston Lane is far to the right, and would leave the main road open, besides increasing the distance by nearly a mile.

It was too by this main road over Lansdown that Charles I rode into the city in 1644, for no other place answers the following description:—"†His Majestie being met at the bottom of the hill going downe *into the town* by Lord Hopton, Sir Thomas Bridge and divers other gentlemen." And here I believe the Mayor met Queen Anne‡ with a sedan and offered to have her carried down to

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* [5th, 1643.]

† Symond's Diary, p. 20, Camden Society.

‡ Bath Field Club Proceedings, vol. vii, p. 231.

the Northgate. That on her first visit she drove down the Weston Lane (which might even now be called the Queen's Road, on account of its primitive condition), can be accounted for by the desire of the Corporation to show her the wonders* of "Hide Park," This had ceased to exist in 1742. We often see similar detours taken in the present day by Royal or State Processions for the sake of sight seeing.

We hear† of 7 cart loads of slain and of wounded, twenty in one house, after the battle, but it cannot be known whether any were buried in Langridge Churchyard, as the registers are lost, but the twelve skeletons dug up at the Chapel may have been those of the twelve men referred to in the letter of the Mayor of Bristol, July 8, 1648.

One resident in Langridge, I think, took part in the battle on the King's side—George Chapman—as that name appears in a deed of sequestration‡ of the Rectory in the time of John Powe, Rector, 1639, and a pardon was granted, 1646, apparently to the same man, who, "convinced§ of the error of bearing arms against the Parliament," laid them down in 1643 and begged for his discharge, not having real worth of £10 a year. This would agree with his tithe rating.

From this sequestration it would also appear that Arthur Sherston was then living at the Chapel Farm, as he is rated for an amount somewhat similar to that now paid for the part of Chapel Farm in Langridge Parish.

Though the bloodshed was over, a legal contest for Lansdown still continued till 1646, and the lawsuit‖ is mentioned at least fifteen times in the State papers.

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* Wood's History of Bath, pp. 439, 440.

† King's Pamphlets.

‡ Exch : Sp : Com : 5,622, Som. 15, Charles I.

§ Cal. State Papers (Green), p. 1370.

‖ Cal. State Papers Com. for compounding, p. 3,302, &c.

The Manor belonged to a John Winchcombe, the unique possessor in modern times of three battle fields in England—two at Newbury and one here. Sherston and John Chapman had agreed (1641) to pay Winchcombe a rent of £400 a year for the estate on Lansdown and other property, but under the pretence that Winchcombe was a recusant and had removed from Newbury to Wales when the King was likely to lose Newbury they evaded the payment of the £120 a year rent for the farm of Lansdown. But after various delays he petitioned the Protector* and it was shown that undue means had been used to bring him in as a delinquent, and also that his valuable estate had been so managed by Sherston and Chapman that little accrued to the State, whereupon Cromwell restored the property.

On Monday,† August 1, 1659, a party of old Cavaliers and some discontented Presbyterians inclining to the Kingship assembled on Lansdown on behalf of Charles Stuart but soon dispersed, not waiting for the troops sent against them.

In addition to all these disputes concerning the Chapel and the Weston end of the Down, another series of lawsuits, 24, 25, 26, 27, 31 Eliz.,‡ took place between Sir John Seymour, of Frampton Cotterell, natural son of the Protector, Somerset, to whom the land had been granted at the Dissolution, of the one side, and Thos. Lansdowne, Thos. and Wm. Ford and Roderick Llewellyn, Rector of Northstoke, concerning the Queen's Manor of Northstoke and the Down called Home Down, Rights of Commons, Customs and Tithes, late part of the Monastery of Bath, and finally an agreement was arrived at to pay the§ Rector 5 pounds per ann. in lieu of all such claims.

In 1685 Mr. John Sheppard, the then possessor of Lansdown

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* [1656] Domestic State Papers (Green), p. 36.

† Cal. State Papers, Dom. series, Green, vol. cciv., p. 87.

‡ Report Public Records 38, pp. 196, 209, 257.

§ Northstoke Terrier.

Chapel, sold part of the Manor called Gowdies to Mr. Whittington, of Tatwick, and part of it to Mr. Waldron, of Langridge, and in 1701 the rest of the property to Mr. Blathwayt, of Dyrham, who soon after purchased Mr. Waldron's portion.

It is interesting to note that the Weston people charged Mr. Blathwayt with the whole of the Poor Rate and also Mr. Whittington with his share until the error was discovered.

To Queen Anne's visit in 1702 I have already alluded.

The last record I have discovered is a docket of the grant* for two extra days of the Fair on Lansdown to Mr. Blathwayt for 95 years from 1708. That Fair is now fast dwindling away and it is to be regretted Barker's picture in the National Collection gives us so little idea of it and its surroundings.

Summary of Proceedings for the year 1894-95.

MR. PRESIDENT AND GENTLEMEN,

The year opened to the Field Club with a novel duty to perform at the Anniversary Meeting on February 19th. Owing to the decease of the permanent President and Founder of the Club, the Rev. L. Blomefield, after a tenure of office of nearly 40 years, the post of President became vacant, and the Rev. Canon Ellacombe was unanimously elected President, and the Rev. H. H. Winwood and Mr. H. D. Skrine Vice-Presidents for the ensuing year. The funds of the Club were found at this Meeting to be in a very flourishing condition, and the hearty thanks of the Members were voted to Surgeon-Major Mantell, the Treasurer, with a request that he should continue in office and husband the funds as in the past. The balance standing to the credit of the Club at this date was £31 13s. 8d. The first

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* Harl M.S.S., 2,264.

afternoon meeting was held on February 28th, when 19 members attended, and 4 visitors to hear a Paper from the Rev. Philip Williams on Church Plate in Devon and Cornwall. An abstract of the Paper appears in these "Proceedings" as an Appendix to this Summary, and a generally expressed desire was intimated by the Members present that the reader of the Paper should extend his investigations into the ecclesiastical patens and chalices of the parishes surrounding Bath. Several specimens of antique silver, with various hall marks, were exhibited, and the meeting dissolved with a vote of thanks to the rev. gentleman for his interesting Paper.

The second Afternoon Meeting was held on May 16th to receive a communication from Mr. Norton Tompkins on the Supposed Source of the Thermal Springs of Bath. Besides 22 Members of the Club, a deputation from the Baths Committee of the Corporation, and several ladies attended the Meeting. The Paper of Mr. Tompkins, a synopsis of which is published at page 113, created very considerable discussion and controversy, in which the Rev. H. H. Winwood, Mr. J. McMurtrie, and other geological experts, took part. Mr. H. D. Skrine, chairman, thanked the reader on behalf of the Meeting for his Paper, and later on among the Excursions it will be seen that the Club visited the fault on the summit of the Mendips which Mr. Tompkins considers the source of our hot waters, and received further notes from him in support of his theory.

The third Afternoon Meeting took place on December 12th, when the President of the Club gave a Paper on the Weather of the Past Season and its effects on the Garden. There were 25 Members present and 7 ladies. The Paper appears at page 126 of these Proceedings, and its reading gave rise to very considerable discussion amongst those present, at the close of which a cordial vote of thanks was returned to the President for his Paper.

The remainder of the afternoon was occupied by Lieut.-Col.

L. Blathwayt, who gave the Members his Notes on certain rare beetles found in a wasps' nest, which are printed at page 136 with an illustration.

A fourth Afternoon Meeting was held on January 16th, 1895, to receive two very instructive papers (printed at pages 141 and 147) from the Vice-President, the Rev. H. H. Winwood; 23 Members attended the meeting, over which Canon Ellacombe, the President of the Club, presided, and seven visitors, including Mr. W. Somerville, jun., of Bitton, Mr. Norton Tompkins, Mr. Hammond and others.

A Deep Boring at Bitton.—The first Paper related to a deep boring at Bitton. During the past year Mr. Winwood had paid several visits to the well-boring at the Paper Mills at Bitton, and through the courtesy of Messrs. Somerville was enabled to lay the details and specimens of the cores before the members. The succession and depth of the strata were described and a section shown. Several points of much interest were dwelt on, especially the fact that the Triassic Beds were found to rest immediately on the Pennant Rock which was struck at a depth of 412 feet. The whole of the upper coal measures were thus proved to be wanting, estimated to reach in this district a thickness of at least 1,000ft. The boring was abandoned at this depth, very wisely, as the water from the Pennant Sandstone would most probably be impregnated with iron. A plentiful supply of water was found in the harder beds of the new Red Marl, but not so much as might have been expected, the quantity being 5,760 gallons an hour. Mr. McMurtrie, who opened a short discussion upon the Paper, remarked that the same strata as Mr. Winwood had described were met with in the neighbourhood of Radstock. In the Radstock District the water was invariably found immediately above the conglomerate, and they generally had from 600 to 800 gallons a minute. The Chairman mentioned that in the Bitton District the geology was so broken up that they could never rely on finding water. As an illustration he explained that once Mr.

Sommerville sank a well not many yards from where a farmer had a beautiful well in his orchard. The farmer feared very much for the result, but though Mr. Sommerville sank the well he found no water, and that adjoining was not affected in the slightest degree. When Professor Boyd Dawkins visited the late boring he expected that they would find much more water than was obtained in the Sandstone. He thought they were all very much indebted to Mr. Winwood and also to Mr. Sommerville; the observations in the Paper had proved most interesting and would be a valuable addition to their proceedings.

The Discoveries at Monkswood.—The second Paper was on the recent discoveries at Monkswood. Mr. Winwood described the geological features of the district in which the excavations were being carried on for the new reservoir, and said there were many points of peculiar interest worthy of record. In the first place, the Great Oolite on the Plateau was quite different in thickness and character from that on the other side of the valley at Monkton Farley or Combe Down. All the workable Freestone Beds were absent at Hunterwick, and only what was called the "Bastard Freestone" present, used for rough work, walling, &c. He then attempted to explain the reason for this variation. Then, again, the Great Oolite Beds had been brought down more than 200 feet by a landslip (not of yesterday by any means) over the Fuller's Earth and pitched down at a steep dip to S.E. below the Inferior Oolite Beds, a most abnormal position. Evidence of disturbances were abundant; it was probably one of those which had dammed up the valley near Fry's Farm, so that in past days a lake had existed, in process of time by the growth of aquatic plants, this had gradually turned into a morass. Evidence of this was seen in the peaty deposit, 17ft. thick, excavated for the "toes" of the puddle trench. Stumps of trees, land and fresh water shells were found in it, and at the base, resting upon the old bottom of Lias Clay, the remains of more than one extinct ox, the Urus or Bos primigenius. Further up the valley, and just

below the present reservoir, some two feet beneath the surface, and covered with a tufaceous deposit of carbonate of lime, containing impressions of recent plants, a *cache* of bronze ornaments and implements was found. These objects had been seen both by Professor Boyd Dawkins and Sir John Evans, who had pronounced them as being of late Celtic age. They consisted of torques, armlets, bracelets, sickles, spear ferules, dagger-blades, &c., and had been artistically arranged in a case by Mr. Charles Gilby, to whom Mr. Winwood expressed his obligation for much information during the progress of the works. Two bronze armlets now in the Museum at the Literary Institution were found in 1857 at Cherry Wells on the side of Charmydown. And the first *find* of the Urus in Britain was made some years ago near Melksham. From the measurements then taken of the skull and horn cores, the ox must have been about 12 feet long and 6 feet 5 inches high, the skull of the one found near Monkswood exceed this in size and must have belonged to a larger animal. The different bones together with the fine skull which were exhibited to the members may be seen at the Municipal Offices, where they are now kept, as likewise may the bronze implements. Mr. Winwood desired to acknowledge the assistance he had derived during his visits from Mr. White, the clerk of the works, and also his indebtedness to Mr. Hammond for having brought the objects down for exhibition. Mr. McMurtrie said he had it in his mind when Mr. Winwood mentioned the matter that a landslip must have been accountable for the mass of the Great Oolite being found in such a position. They had to assume that the land was at one time all comparatively level, with slight depressions, which gradually deepened into ravines, from ravines into shallow valleys and from shallow valleys into bigger ones. In this process numerous landslips must have happened. The discoveries which had been brought before them that day were the most valuable that had been introduced to the Bath Field Club for many years and well worthy of special record. He

hoped the treasures would be received into a Museum or at least fall into suitable hands. Mr. F. Shum said he presumed these discoveries with the Roman antiquities and the collection at present in the Institution would find a home in the new Museum which it was proposed to provide in connection with the new buildings in the Abbey Churchyard. Mr. Winwood expressed the hope that they would be taken better care of than those at present in the Pump Room. He was reminded by the discussion which had followed his remarks that Mr. McMurtrie some time ago intimated his willingness to read a Paper at some time or other before the members of the Field Club on Landslips in and around the neighbourhood of Bath. He hoped that before long they might have the pleasure of hearing a Paper from Mr. McMurtrie on the subject, which was an exceptionally interesting one. On the motion of the Chairman, Mr. Winwood was very heartily thanked for his contributions and the proceedings terminated.

At the fifth and last Afternoon Meeting, held on February 13th, 32 members and 4 visitors being present, the Rev. C. W. Shickle read a Paper (printed at page 158) on "Lansdown and S. Lawrence's Chapel," Rev. Canon Ellacombe in the chair. In the course of some interesting observations Mr. Shickle remarked that the camp on Stoke's Down had been called Oliver's Camp from a kind of tradition that Oliver Cromwell's army were there the night before the battle, but Cromwell must have been almost as far away as Waller himself. His army during the day had been to the right of the Gloucester Road and Collier's Lane, marching above Woolley or through the village itself as their enemies moved up the valley, and to camp on Stoke's Down would entail a long march on his tired men, and leave not only the Gloucester Road exposed but the road which then led from Cold Ashton to Bath completely opened to Hopton. How Waller reached Lansdown from Claverton was the most interesting question. The Old Bridge appeared too great a detour. Did

he cross at Bathampton Ford before Hopton reached it, or was there any other Ford nearer the city? Waller, in his opinion, after sending a troop of horse to Marshfield to keep touch and prevent an attack, stopped for the night near the chapel where he prepared the wall for his retreat, the long wall spoken of as dividing the two farms in the case of Pitt *v.* Attwood, and, when he retreated, marched his men across the open Down until he reached Rough Lane, or he might even have gone down the slope where Winifred Lane now ran to the open ground on the common Ring and Barton Fields. No General would have shut his men in the Weston Lane along which they would march in narrow line slowly with difficulty when he could retire them in massive columns for two miles out of the three, beside which the Weston Lane is far to the west and would increase the distance 1½ miles. And it was by this same road Charles rode into the city in 1644, as no other place would answer the description, and here the Mayor met Queen Anne with a sedan and offered to carry her down to the North Gate. That she drove down the Weston Lane can be explained by the desire of the Corporation to show her the wonders of Hide Park, which ceased to exist in 1742. It no more proved that no road ran over Lansdown than that London Bridge Station was not opened until after 8th March, 1863, because the Princess of Wales alighted at the Bricklayers' Arms goods station in order to allow the people of Southwark to welcome the Sea King's daughter. At the conclusion of the Paper the President, Canon Ellacombe, said that the thanks of the Club were due to Mr. Shickle for his excellent Paper. He wished Mr. Green had been present as he had made the Battle of Lansdown his especial study. He himself had lived close to Lansdown all his life, and therefore was much interested in the Paper. With reference to the Barrows, Mr. Parkes, of Upton, told him some years since that he had opened a Barrow on Lansdown, and had some of the articles found at his house. Mr. H. D. Skrine remarked it was difficult to follow without closely examining the maps, but with

regard to the march from Claverton, Waller must have crossed by bridge rather than by ferry or ford. There must have been some way without going through Weston. Collinson's account of the Chapel tallied with Mr. Shickle's theory, that it was a house of call for pilgrims. Mr. Brown said the construction of the roof was very clever and worth noting; the date was about the 14th century. Mr. Daubeny referred to the fact of some stone coffins being discovered adjoining the Chapel some years since. One was taken down the hill and used as a water trough. Mr. Austin King considered the Chapel was part of a grange belonging to the monks of Weston. There were signs of an adjoining building which he believed had been a grange. There was no trace of any priest having ever been appointed to the Chapel, and it was difficult to understand that it ever had any parochial position or was under the rule of a Bishop. The discussion was continued by Rev. H. H. Winwood and Mr. R. E. Peach. After which Mr. Shickle briefly replied. The Paper was illustrated by drawings of the Chapel by Mr. Wallace Gill.

Walks and Excursions.

Little Solsbury Hill, April 3, 1894.—At the close of the Quarterly Meeting of the Club, held this day, a numerous party proceeded in carriages and on foot to Little Solsbury Hill, where Mr. W. Chesterman, professional dowser, was awaiting them. After an exhibition of his powers with the divining rod over subterranean and exposed water, its action being reversed at the point of junction, the hill was mounted to a spot where water was known to exist, and the operator with a hazel rod, proved to those who have credence in the automatic motion of a stick when over a spring, that his powers therewith vanished when the contact of his feet with the ground ceased. This he exhibited by walking on a non-conducting stratum of empty bottles, the hazel rod becoming instantaneously sensitive on his feet being again planted on "terra firma." Mr. Chesterman proved with other

instruments than forked hazel and wych-elm twigs his power of finding water, using wires and straight sticks, which exhibited similar sensitiveness when grasped by his hands. Many of the members tried their powers with the rods, some without any results, but others found they were possessed with the dowser's art or knack. Thanking Mr. Chesterman for his interesting exhibition, the party ascended to the summit of the hill, with a view of verifying the presence in quantities thereon of a minute object of great microscopical beauty and entomological interest, of which Col. L. Blathwayt, who was unable to join his brother members of the Field Club through ill-health, had forwarded a written description. When the party were assembled on the summit, the Secretary of the Club read the Paper, and as many visitors to this fortified British earthwork, the original acropolis of the pre-historic city of the goddess Sul, may be glad of the information, we here give the learned Colonel's description of this entomological curiosity :—

If anywhere on the flat top of this hill (Little Solsbury) you will pick up at random a piece of stone and examine it closely, you will probably find upon it some small white spots, which, examined by a pocket lens, look like minute fungi.

One day during the very dry weather of the spring of last year (1893) I first noticed these, and found that they were the eggs of a species of acarus, *Petrobia lapidum.* After several microscopical examinations, I came to the conclusion that the entire top of Little Solsbury, some twelve acres in extent, was covered with these eggs, on an average one hundred to the square centimetre, or not less than four thousand millions on these few acres of ground.

Large numbers of these eggs hatched during the summer, and by this time the remains of their empty shells have probably disappeared, though many were still unhatched in November last, when some stones were brought me from this hill.

These eggs are very beautiful objects and will well repay the trouble of a microscopic examination. The white specks are not the eggs themselves but their covers, consisting of a white, paper-like substance, flat or slightly concave at the top, and tapering below to

a point, with indentations radiating from the centre like the spokes of a wheel. The egg itself is round, the shell like clear glass, and filled with a bright red fluid, which gives rise to the little scarlet six-legged mite, which does not get its full complement of eight legs until after the first change of skin.

I am informed by Mr. Michael, the President of the Royal Microscopical Society, that this mite has the peculiarity that in places where they have not been noticed for years, or not at all, the eggs suddenly appear, sometimes in a single night, covering spaces very much larger than this and as thickly. I found the eggs on Bannerdown and Charmy Down, but in much less profusion.

Mr. Michael also told me that one gentleman has actually described these eggs as a new fungus and called them Craterium pyriforme.

Several living specimens of this red mite were found by the party under the stones which lie about on the turf, as well as the white coverings of their eggs, and shortly afterwards the descent of the hill was made on various sides, and the day's work brought to an end.

Longford Castle, Wilton House and Stonehenge, April 17 *and* 18, 1894.—The Second Excursion of the season took place on the 17th and 18th April, in which 21 members of the Field Club, and two visitors took part. Starting by the 10.18 a.m. train on the G.W.R. Salisbury was made by 12.30 p.m., and the accommodation in the way of single-bedded rooms at the White Hart Hotel was tried to its uttermost by the influx of such a large body of guests, and the "salle-a-manger" proved sadly deficient.

At 2 p.m. three brakes received 20 members of the party for a three mile drive to Longford Castle, the seat of the Earl of Radnor. This extraordinary structure with five towers is situated on the banks of the Wiltshire Avon, and Major C. E. Davis, F.S.A., who was of the party, gave the members a brief history of its construction. Originally built by Sir Thomes Gorges and his wife Helena von Snachenberg, a Danish lady, who are both buried in Salisbury Cathedral, in the form of a triangle, at the cost of £18,000, it was surrendered October 17th, 1645, to Cromwell in

person, by Hugh Hare, Baron of Coleraine, who had purchased it in 1641. The Pleydell-Bouveries purchased it in 1717, and the head of that family, the 5th Earl of Radnor, is the present possessor. The present building is much altered from that of the Gorges' time, a former Earl of Radnor having covered in the triangular inner court, changed its exterior into a six-pointed star, but dying before he completed the plan, left it with only five towers. The Field Club was admitted in two parties, each of ten, and were shown through all the rooms of the castle, full of choice pictures and articles of virtu. An extraordinary steel chair, valued at £40,000, stands in one room. It was presented by the City of Augsburg to the Emperor Rudolphus II., in 1574, and was made by Thomas Ruker. It is covered by delicately worked groups of figures in relief, 130 in number, representing events in the history of the Roman Empire from Nebuchadnezzar's dream of the colossal image, to the landing of Æneas in Italy, and Rudolph's own time. The Swedes carried this chair off from Prague, it was brought to England in the 18th Century, and sold to the Bouveries. The celebrated Holbeins, formerly the glory of this castle and heirlooms of the Bouveries, have been dispersed under the auctioneer's hammer by authorization of the High Court, and the proceeds form the settlement fund of the present Viscount Folkestone and his bride.

Leaving this castle the cars again received the members, and the return journey was varied by passing over the Avon and through the village of Alderbury to the fragmentary remains of the historical palace of Clarendon, situated in the park of Sir F. H. Bathurst, Bart. There remains but a small portion of a flint wall, propped by modern buttresses, and bearing a lengthy inscription stating that the palace was the favourite residence of our kings from Henry I. to Edward III., and saw in 1164 the enactment under Henry II. of the famous "Constitutions of Clarendon," the forerunner of the Reformation under Henry VIII. Here Philip of Navarre, in 1356, did homage to Edward III., as

King of France, and after the battle of Poictiers, in 1357, the captive kings, John of France and David of Scotland, enjoyed here the pleasures of the chase with the same King of England. Charles II., on his restoration, presented this forest to George Monk, Duke of Albemarle, whose heir sold it to Pulteney, Earl of Bath. In 1713 the Bathursts purchased it, and constructed the present mansion, a mile distant from the site of the old palace.

Salisbury was reached again about 6 p.m., and the Cathedral close, and other sights of the city, received due attention of the members until the table d'hôte hour of the White Hart brought everyone together again for refreshment and subsequent rest for the night.

Breakfast next morning saw all the members ready for further excursions, and as soon as that mauvais quart d'heure of settling accounts with the hotel was passed, 13 members started in two cars for the seat of the Earl of Pembroke and Montgomery at Wilton, two other members proceeding to the same by train. At the mansion the party was increased by two further members who had started from Bath by the 8.35 a.m. train. Paying a capitation tax of 6d. on entrance, which fees go to the Wilton Hospital, the immense collection of Roman antiquities, marbles, pictures by Van Dyck, Sir Joshua Reynolds, Honthorst, and of celebrated artists of the German and Flemish schools; the unique collection of ancient armour captured at the battle of St. Quentin in 1557 by the Spaniards, assisted by a body of English under William Earl of Pembroke, and the choice china, mosaic tables, and valuables of the Herberts were examined by the party. On regaining the exterior of Wilton House, a start was made for the Lombardesque Church constructed in 1844 by Lord Herbert of Lea, from the designs of T. H. Wyatt. The marble columns, mosaic pavements, coloured windows, a Venetian chest of wrought iron with many locks, monuments of many deceased Herberts, hanging lamps of brass copied from Venetian examples,

and numerous valuable carvings and foreign ornaments, purchased by the late Sydney Herbert, adorn this remarkable Church, over which the Vicar, the Rev. Canon Dacres Olivier, most considerately conducted the party. Thanking him heartily for his kindness, the party started for a very different sight, and after a six mile drive over Salisbury plain, reached Stonehenge, one of the most interesting relics of pre-historic times, still offering an inexplicable mystery to antiquarians. The Sarsen stones, of which are composed the outer circle and its imposts, the five gigantic trilithons of the great ellipse, the Friar's Heel, and three external prostrate blocks, must have been brought by some means from the Marlborough Downs. The small inner circle of Syenite and primitive rock, 36 to 40 in number, and the inner ellipse of 19 seem to have been brought from North Pembrokeshire and Carnarvonshire, while the altar stone is of micaceous sandstone of doubtful origin. The fact that many of these stones have been hewed and squared proves that Stonehenge is of later date than Avebury (also in Wilts) and Druidical circles in many other parts of Great Britain, Brittany, and elsewhere. The various opinions of antiquarians as to the motive of erecting Stonehenge, the period of its construction and how such enormous rocks could have been moved over valleys and trackless downs could not be considered by the Field Club on the spot owing to a heavy shower, and a feeling that the hour allowed no delay in seeking the George Inn at Amesbury, so remounting the cars in two miles this hostel was reached, full notice being paid *en route* to Vespasian's Camp, and the Mansion of Sir Edmund Antrobus, built by Inigo Jones.

Allowing half-an-hour for refreshment a start was again made for Salisbury, and three miles before reaching that city, the conical hill of old Sarum was passed, until the reign of Henry III. the site of the Cathedral, Bishop's Palace, barracks for the garrison, and a trading population. Leland, writing in the reign of Henry VIII., states that not a single house was left within or without of Old Sarum. The Cathedral was taken down in 1331. The walls

remained as a quarry up to 1608. For 536 years after its evacuation it retained the right of returning two members of Parliament. The election took place under an elm tree still standing, which marked the site of the last house which the memory of the oldest inhabitant had reported that one of his forefathers in past ages had stated to his grandchildren that he had seen.

Again the White Hart, at Salisbury, received the party on their return, and the rain set in as if it meant continuance, so a return to the railway station was speedily made, and after a run of 41 miles, leisurely covered by a Great Western train in two hours and a quarter, in order, no doubt, to enable travellers to study the beauties of the Wylie Valley, and that of the Somersetshire Avon from Bradford, the Field Club was restored at 7 p.m. to its head-quarters stored with many subjects of great interest and obscurity which patient study of archæological volumes, and the works of past historians will enable them to explain hereafter.

Blagdon and Yeo Valley Reservoir, May 22, 1894.—A large number of members of the Field Club assembled on the G.W.R. platform for the 10.18 train to Yatton, the first part of the journey being taken by rail, here brakes were waiting to drive the party to Blagdon. The route taken was *viâ* Wrington and the north side of the river Yeo. The road first passes through the village of Yatton, about half-a-mile from the station, and the Church of St. Mary may be noticed on the right, with its truncated spire, according to some the result of an accident, according to others the want of funds, most probably the latter.

The entrance to the Yeo Valley, which lies in a S.E. direction from Yatton, may be briefly described as bounded on the Bristol side by Wrington Warren and Broadwell Down, and on the Exeter by the Mendip Hills. The first stop was made at Wrington to visit the Church, here the churchwarden and sexton were in readiness to give what information they could. The

tower at once attracts attention by its beautiful proportions and the boldness of its detail, being of considerable height (140 feet to the top of the battlements) it is seen from various points of view, and combines in a most picturesque way with the surrounding buildings. Visiting the interior the screen at once attracts attention as a beautiful example of fifteenth century work, and in an excellent state of preservation. The reredos is modern, being made some 50 years ago, and was the work of a local mason, named White, from a design by Barry, and does him much credit. The capitals of the pillars contained foliage that was considered typical of an Early Perpendicular period. Proceeding to the outside of the Church, Canon Ellacombe drew the attention of members to the beautiful Sanctus Bell cot over the chancel arch, to the sham gurgoyles (which did not act as water-spouts) as typical of the change when "ornamented construction" was replaced by "constructed ornament." Proceeding to the tower, the Canon considered it was later than the other part of the building by its detail and the presence of an ornament known as Henry VII.'s label.

The sexton pointed out from the churchyard the position of the house where Locke was born, which has been pulled down some time since.

Wrington has a special attraction for members of the Bath Field Club, because the late Rector, Preb. Scarth, was for many years Vice-President of the Club, and one of its oldest members, his interesting Archæological works on Bath and other places in Somerset, are too well-known to be mentioned here.

The members having returned to their carriages a start was made for Blagdon. The drive is a very beautiful one. Shortly after leaving Wrington, "Barley Wood," the former residence of Hannah More, is noticed nestling among the trees, and every turn of the road supplied some new beauty in the way of luxuriant vegetation, a splendid crop of "Trifolium Rubrum," rye cut, and the Cheddar Pink in full bloom. Blagdon was soon arrived at,

and the members were not sorry to find the good landlord of the Seymour Arms had fully prepared for their arrival.

Lunch being finished, the members proceeded to a Dolomitic quarry, in the neighbourhood, where the Rev. H. H. Winwood explained the geology of the neighbourhood and said:—

That the Vale of Wrington, watered by the river Yeo, was one of the richest of the many rich valleys of the Mendips. The river, which gushes out in a plenteous stream from Compton Martin, receives many tributary rills from the adjoining combes and valleys on either hand, and finally empties itself into the Severn Sea, a little south of Kingston Seymour. The strata through which it was now cutting its way belonged to the Triassic series, consisting principally in this district of red and variegated marls. These beds had been deposited on the upturned edges of the carboniferous limestone, and are about 200 feet thick on this side of the hills. He then proceeded to give a short account of the present features of hill and valley, how the strata, once horizontal, became upheaved and distorted, how a vast mass of material had been removed from the Mendips by denudation, both atmospheric and aqueous, and that if they asked where had all this gone to, he said that the quarry in which they were then standing gave a partial answer. The four feet of conglomerate, or "pudding stone," now being worked, consisted of the pebbles and débris of the old land, forming the shallower margin of the Triassic waters of that time, while the red and variegated marls were the sediments deposited farther away from the land and in deeper water. Mr. Etheridge, of the Geological Survey, had kindly lent him a section made through the valley from north to south, which he had the pleasure of showing them. From this they would see how the limestone dipped on either side towards the valley, making a synclinal trough on which the new red marls were laid down. They would see there certain patches and tongues of conglomerate some of which occurred in the puddle trench (about which Mr. Ollis, the engineer, would speak) while

others occurred much higher upon the flanks of the hills. This dolomitic conglomerate might be of any age from the base of the new red to the top, and the patch on which he was standing, he (Mr. Winwood) was inclined to think might be of Rhætic age, corresponding with that on the Butcombe side of the valley. He was strengthened in this opinion by the fact that his friend, Mr. Valpy, had found Rhætic fish teeth in a conglomerate close adjoining. If the members would ply their hammers and seek diligently they might settle the question.

The engineer, Mr. Ollis, who had previously joined the party, now conducted them over the new works, which are of vast extent. The river Yeo rises some distance up the valley, near Compton Martin, and the idea has been to intercept its progress by throwing a dam across the valley, in the form of a barrier or retaining wall, running northwards towards Butcombe, thus forming an artificial lake, the area of which will be about 350 acres and the capacity 2,000 million gallons, with a depth in centre of about 36 feet. Of course to retain so large an area of water safely, and to prevent percolation, it was necessary that special attention should be paid to the foundation of the retaining wall; this has been done, and the depth on the Blagdon side is 90 feet, and at Butcombe 180. When the works are finished, it is proposed to pump the water to Barrow, on the other side of the hill, where it will be duly filtered and conveyed to Bristol. The situation of the works at Blagdon is about 110 feet above sea-level. Mr. Ollis pointed out some specimens of the strata through which they had cut, and showed the difference in the conglomerate beds, one being of a very hard nature and six feet thick, the other of a honeycomb character and about three feet thick. The members having thanked Mr. Ollis for his kindness in giving them so much information, returned to the carriages which were waiting a short distance off. A start was now made in a homeward direction taking the south side of the Yeo valley through Langford. A short stop was made at Congresbury to see

the church. After a considerable difficulty in obtaining the key, an entrance was made. The church contains a good screen. The arrangement of the nave is somewhat peculiar, on the north side the columns are clustered, on the south side small columns are engaged around a larger one, the shafts of the small columns are imitation Purbeck marble, and support no part of the superstructure, giving rather an incongruous appearance. The font is of an early character. On the outside of the church, a western doorway of fifteenth century character deserved attention, also the Parvise chamber over the porch. In the churchyard were the remnants of an old cross and a yew tree, of which only the stump remained. Time being precious, the members had to take their seats, and after a pleasant quick drive to Yatton, arrived in good time for the 5.43 train to Bath. The weather was all that could be desired, consequently a very pleasant day was spent.

Castle Combe and Grittleton, July 10, 1894.—With a falling barometer and very threatening aspect of weather 28 members of the Field Club started in two brakes for an excursion to these interesting localities. On the outward journey, however, the weather remained fair, and after mounting Bannerdown the cromlech of four stones, marking the junction of the three counties of Somerset Wilts and Gloucester, was passed, and North Wraxall reached, where the Rector, the Rev. Francis Harrison, received the party at his church. The name of this elevated village is derived from the family who held possession at the Conquest; it is styled in Domesday Book Werocheshalle. The finest remnant of the Norman Church is the south entrance, now covered with an outer porch of later date. It is an elegant semi-circular arch with chevron moulding and beaded. The northern aisle of the interior belongs to the Methuen family, of whom many members are buried in the vault below. Above stands a monstrous tomb of white alabaster, and on the ceiling are the coats of arms of the family and the ladies whom they honoured

by taking as wives. The present Rector has recoloured these heraldic shields. The church is dedicated to S. James, and contains little further of interest. This village is situated on the summit of the Cotteswolds, and being some 600 feet above sea the air is as bracing as champagne, but the worthy Rector would not allow the party to depart without viewing the interior of his stone-built Rectory and restoring their nerves with white and red Bordeaux.

Leaving the hospitable Rector, a start was made for Castle Combe, which lies in a romantic gully scooped out of the west flank of the Cotteswold range. The hills about here make travelling, even by well-horsed brakes, a serious matter; but on arriving at the Church of Castle Combe, the party was met not only by the squire, Mr. E. C. Lowndes, but by a member of the Field Club and his guest, who had managed to reach this pit in the oolite hills upon bicycles, direct from Bitton.

The village of Combe is situated in a deep valley, watered by the rapid brook which takes the name of Box brook and joins the Avon near Bathford. The situation is beautiful and romantic, the stone cottages with quaint gables most picturesque, and a square market cross stands where the three streets meet. The place was a part of the royal domain in Saxon times, and so possessed the "jura regalia" up to the time of the abolition of feudal rights. These privileges were styled in the jargon of the times as "Tol, Them, Sok, Sak, Infangthef," &c., and included the power of punishment by stocks and pillory, pit and gallows. The inhabitants possessed several immunities from taxes and tolls, military service and juries, had their own courts for justice and probate, bye-laws, and many exemptions.

Castle Combe has an interesting history, which has been left to posterity in connected form by the late talented owner, Mr. Poulett Scrope, M.P., who printed 150 copies of his work only for private circulation, but an abridgment of the same has been

offered to the public in Volume II. of the "Wiltshire Archæological Magazine."

At the Conquest the owner of this manor and 26 others was Hunfridus de Insula, who in modern language would be called Humphrey de l'Isle. His heiress, Adeliza, took them to the family of de Dunstanville, who built the castle and made it the "caput baroniæ." In 1270 another heiress, Petronilla, conveyed the baronial castle and its 26 subordinate manors, held by knight service, to the family of de Montfort, who sold the reversion in 1309 to Lord Badlesmere, of Leeds Castle, Kent. He lost his head at Canterbury in 1322 under Edward II., and for four years the King's favourite, Despencer, held the seigneurie, which was restored to Giles Lord de Badlesmere on the deposition of the King in 1326. Dying childless in 1338, his immense wealth, 85 manors, 76 Knight's fees in England, and large Irish property, were divided between his four sisters, and Castle Combe and its subinfeudatories was the share of the youngest Margaret who wed John Lord de Tibetot, or Tiptoft. His son, Robert de Tibetot, was slain in Guscony in 1372 without heir male. His three daughters were young and they were granted for 1,000 marks as wards to the Lord Treasurer, Sir Richard Scrope, of Bolton, who, after the custom of the times, betrothed the infant co-heiresses to his own three younger sons, so as to secure their estates in his own family. In 1385, by a deed still preserved at Castle Combe, the property was divided, and of the Tibetot estates, Castle Combe and its manors passed to the second daughter, Milicent, who was married to Sir Stephen Scrope, Knight. Thus the Scropes obtained the property and retained it through 11 generations averaging 44 years apiece, nearly 500 years, until on the decease of the last of this branch of the great family of Scrope, Emma Phipps, only daughter of William Scrope, esq., of Castle Combe, who died in 1851, and wife in 1821 of the late George Poulett Thomson, esq. (who took her name of Scrope by Royal license), the estates were sold in 1867 to the present owner,

E. C. Lowndes, esq., whose patronymic was Gorst, and who has enlarged the manor house considerably, and beautified the terraced gardens.

The Field Club was conducted first to the church, a very fine structure, nearly re-built by Mr. Poulett Scrope in 1851. Of the original early English church there remains a unique chancel arch, decorated by three figures on each side in carved canopies, and a 4-light east window with a quatrefoil in the tympanum. The church is lofty with clerestory and aisles. The tower dates from 1434 with fantracery groining with central hole to raise or lower the bells. It was built by Sir John Fastolf who was second husband to Lady Millicent Scrope, and after her decease retained possession of the estates on the plea of the custom of England. Thus Stephen Scrope was kept out of his estates for 53 years until the decease of his father-in-law in 1459.

There is an altar tomb in the church to one of the Dunstanvilles, with an effigy in chain mail.

Mr. E. C. Lowndes conducted the party over his charming grounds on leaving the church. The gardens are terraced on the slope of a steep hill to the north of the Manor house, and in the foreground flows the rapid brook, descending from each side of a high hill on which stands a tower, marking the site of the ancient castle and earthworks, covering a space of nine acres.

Time not sufficing to mount to this earthwork and the tumulus and cromlech which lie beyond, the brakes were again mounted and Grittleton was reached at 2 p.m., where the Red Lion Inn offered the necessary repast to support the famine struck party.

Grittleton, formerly Grutelington, was for 600 years a manor of the Abbot of Glastonbury. At the dissolution of the monasteries in 1544, the property was purchased of the Crown by Mr. Gore, of Surrendell and Alderton, from whom, in 1601, it was bought by the Whites of Langley Burrell. Their heiress in 1707, Priscilla, married a Houlton of Farley Castle, and the Houltons, in 1828, sold the property to Joseph Neeld, who built

the magnificent mansion in 1856 and stocked it with the valuable collection of pictures, bronzes and statuary, which the present owner, Sir Algernon Neeld, bart., had kindly opened this day to the view of the Bath Field Club.

Proceeding to the mansion at 2.30. p.m., the party were most graciously received by the worthy baronet and Mr. E. C. Lowndes, of Castle Combe, and were informed that the whole of the interior was open to their inspection with all its art treasures and valuable contents. Many stuffed birds were in cases, the spoils in foreign climes of the owner's gun, and in the park for 20 years a flock of Rhea, a South American species of ostrich, has been acclimatised, and reproduces its species with slight shelter in winter.

The pictures are numerous in the mansion, of the Dutch School, Italian and English. In the drawing-room are a Gainsborough, "The Mall in S. James' Park," and a Constable, "Vale of Dedham," and other pictures by Glover, Etty, Titian, and Reynolds. Many statues are by Baily, including his chef d'œuvres, "The Listening Eve," "Maternal Love," "The Three Graces," "Adam consoling Eve after her Evil Dream;" and others are by Sévere Papworth, Wyatt, Opie, and the original "Venus Victrix" by Gibson.

The bronzes include Flaxman's "Shield of Achilles," "Pluto carrying of Proserpine," and many others.

Bidding farewell and thanks to the most genial baronet, the return journey was made to Bath at 4 p.m., and the rain which had hitherto held up, came down with a pitiless downpour, which rendered the ascent and descent of the steep hills anything but pleasant, as the gradients of the roads demanded continual evacuation of the brakes and progress on foot. Bath, however, was reached at 6.15 p.m., and though marred by rain at its close, an instructive excursion has been added to the Club's Proceedings.

Chelvey, Tickenham, Wraxall and Tyntesfield, August 21, 1894.—A large party of members of the Field Club, numbering 22,

started by the 9.4 a.m. train of the Great Western Railway for Nailsea, stopping an hour at Bristol which gave many an opportunity of paying a hurried visit to the Temple Church with its remarkable leaning tower, In 1576 Braun in his "Theatrum urbium" mentions this tower as being out of the perpendicular in his day, and Abraham Ortelius the geographer, who lived in the 16th century states that he put a stone as large as a goose egg into the chink which opened between the tower and the body of the Church where the bells were rung and saw it crushed.

In 1772 the tower was plumbed and found to be 3ft. 9in. out of the perpendicular. As it was allowed to remain when the church was lately thoroughly restored, its fall is supposed not to be imminent to the damage of the Bristolians resident in its vicinity.

Starting again at 10.40 a.m., with an addition of another member resident in Bristol, Nailsea Station was reached in 20 minutes, where another member from Clevedon joined the party, and the Rev. J. B. Medley, who had kindly consented to conduct the Field Club over the sights of the neighbourhood in which he resides, met the members, who under his direction, mounted the brakes awaiting the train and drove to Chelvey. The first structure here visited was the Church of St. Bridget, where the Rector gave the members his notes on the interesting edifice. The only Norman portion remaining is the arch in the South porch, leading into the Church, which is Perpendicular without Chancel Arch. The North walls are sadly out of the perpendicular, but otherwise the building is well restored, and contains a south aisle with three canopied tombs without figures, several slabs, and a Jacobean pew belonging to the Tynte family. A receptacle for an hour-glass remains over the pulpit. Close to the Church stands a tithe barn which has the buttresses peculiarly supported on circular bases.

Chelvey Court, the remnant of a fine old mansion of the Tyntes, stands about 100 yards further, and the wife of the farmer who

resides in the habitable portion of the old building kindly conducted the party all over the place, which has a fine oak staircase, and it is said a secret chamber behind some sliding panel for a priest in old days of peril, but the owner stated that it once suddenly opened during some cleaning operations and so frightened the domestic that she fled, and on returning with others, found it closed, and it has not been discovered since! However this may be, in the Somerset Archæological Society's Proceedings for 1881, it is stated that many members of that learned body inspected it on their visit to the place.

Bidding farewell to the Rector of Chelvey with thanks for his notes and information, a start was made for Tickenham, which was duly reached at 12.45 p.m., the want of time not allowing a visit to Nailsea old Church and Court passed half way. The Church of Tickenham is a fine structure, well restored, and is dedicated to two strangely named Saints, Quiricus and Julietta.

The Chancel arch is Early Norman. A coloured window of the Crucifixion in the South aisle to the chancel is supposed from the sage green colour of the cross to be Italian glass of the XIII Century. The windows of the North Aisle of the Nave are of Early English Decorated and Perpendicular styles of tracery and beneath them lie three recumbent figures in stone supposed to be Berkeleys, as they held this manor for generations. Two are crusaders in armour, the third a lady in a long robe held up by one hand and with a plain wimple under her chin betokening the date of the statutes, early in the XIII Century. The heads of the lady and one of the crusaders, doubtless her husband, are reproduced as corbels to the fine roll moulding over the entrance door in the South porch. The Early English font, and the arcade without capitals, in this Church are worthy of notice.

To the North-East of the Church stands the remnant of the Court, now with modern additions used as a farm house. The old manor house was of the XV Century, there remains a fine hall with open oak roof and windows with transitional tracery

between Decorated and Perpendicular, and at right angles to its Western end is a finely panelled dining room, and at the rear a remnant of a circular tower, formerly, it may be, a staircase to the bedrooms.

It being past one o'clock no further delay was possible to examine this interesting old Court, so the brakes were mounted and in two miles the welcome hostel of "The Battle Axes" at Wraxall offered the members the necessary refreshment. It is a fine new Inn, erected, it is supposed, by the munificent owner of Tyntesfield, at whose charge the parish church is now undergoing a thorough repair, but accommodation is not provided for such a party as 27 hungry men. However, full justice was done to the repast in spite of the lack of room, and a start was made on foot for the magnificent Church, with its lofty pinnacled tower, sanctus-bell turret, and Churchyard Cross.

The interior of the Church is exceedingly fine, and contains a handsome monument to Sir Edward Gorges, and his wife, Agnes, of the date 1512. Formerly it stood in the centre of the Chancel, now in a recess to the North of the Altar. Both figures are highly coloured, and the lady lies to the right of her husband, a very unusual position. In the will of this lady there is mentioned the recent building of the North aisle, which is of massive Perpendicular work; only one capital has carving, but that seems to have been the work of some amateur parishioner. This Church was lately endowed by the late Richard Vaughan, esq., of Elms Lea, Bathwick Hill, with £40,000, and with another £20,000 for a Curate's stipend. The Rectory before was worth £500 per annum with a house.

Leaving this Church the whole party walked through the Rectory grounds and the Glebe to Tyntesfield Park, the magnificent seat of Anthony Gibbs, esq., passing by the lawn of a lady's private residence, in order to see the extensive view of the Bristol Channel with the Steep and Flat Holms, Crook's peak and the Mendip range, Dundry tower, and Breandown, and Worlebury.

Arriving at the Park dairy, a pause was made to view the well-arranged stock houses and circular dairy, the Alderney cows and calves. The Mansion of Tyntesfield, with its sumptuous green-houses, pictures and fittings, and beautiful Chapel was open to the Field Club, and a hour was quickly passed in viewing the numerous rooms of the house, the fine pictures, rare books and exquisite bindings in the library, and the coloured windows, mosaic floors, and perfect adornments of the groined Chapel.

Passing from the house, a walk of a mile through the Park brought the party to the Lodge gates, where many thanks were given to the Rev. J. B. Medley for his kindness in conducting the members during the day's excursion and obtaining the sanction of the owner of Tyntesfield to their viewing his mansion, and of the tenants of Chelvey and Tickenham Courts to examine those old places. A short walk from the Park brought the whole party to Flax Bourton station, whence a train restored all to their homes in Bath at 6.45 p.m.

Marlborough and Savernake, September 11, 1894.—Twenty-three Members started by the 9.52 a.m. train on the Great Western Railway for Swindon, and thence continued their journey to Marlborough by the Midland and South Western Junction Railway. Arriving nearly half-an-hour late, a start was made for the College fully a mile distant, but "en route" the Churches of St. Mary and St. Peter were passed and the main street of the town with its picturesque gabled houses on its North side, the sole remnants of the ancient borough after the destructive fire of 1653, was much admired. This town was visited by Pepys on his way to The Bath in 1668, and he mentions in his Diary that he thought it "a pretty fair town for a street or two. On one side the pent houses supported with pillars, which make a fair work." Arriving at the College, which has grown immensely around its nucleus, the Old Castle of Marlborough, afterwards the Castle Inn, long the best-known hostel on the Great Bath Road, where 42 public Coaches changed horses daily, the first object of interest which

merited inspection was the Chapel. A truly noble building, with beautiful frescos, painted windows and sculptured reredos, it gives sufficient accommodation for the teaching staff and 550 boys in the College. In 1848 it was consecrated, being built from Blore's designs, and contains a great Western window as a memorial of Bishop Cotton, of Calcutta, the second Head Master. Marlborough College was only opened in 1843, and has gained a high place among the great Public Schools of the country. The round of the new Jubilee buildings, classrooms, concert hall, library, and museum, was afterwards made, two old Marlburians in the company revisiting the old "cubicula" of their college days, and as time was progressing, a return was made to the welcome lunch at the Ailesbury Arms. At ha f-past two the party separated into two parties, 14 proceeding in brakes to drive through the best parts of Savernake Forest, nine pedestrians setting forth for a six mile walk through the same woodland track by the "King Oak" and the Ailesbury Monument to Savernake Station. This beautiful Forest is the only one belonging to a subject in the Kingdom. Sixteen miles in circumference, it contains a beech avenue four miles long, which is unequalled elsewhere, and large herds of red and fallow deer. The picturesque beauty of this sylvan tract and the magnificent scenery of the beechen glades and aged oaks must be seen to be thoroughly appreciated. The mansion of the Marquis of Ailesbury, commenced in 1781 and completed by the third Marquis who died in 1886 takes the place of the former Savernake Lodge destroyed by fire, a hunting seat of the Seymour family. The whole property was originally vested in the Crown, but on the death of Henry III. in 1272, it formed part of the dowry of Queen Eleanor, and afterwards was held by several Queens and Royal favourites until the Seymours became the owners temp. Edward VI. By marriage it passed with an heiress to the Bruces in 1676, descendants as Earls of Elgin of King Robert de Bruce, of Scotland, 1306-29. An heiress again in 1746 carried the

property to a Brudenell, of the family of the Earls of Cardigan, who was created in that year Baron Bruce, of Tottenham, by George II., and Earl of Ailesbury by George III. in 1776. His descendant at the coronation of George IV. was made Marquis of Ailesbury, Earl Bruce and Viscount Savernake and the third Marquis on the death of his kinsman, of Crimean and black bottle fame, the Earl of Cardigan, succeeded to his patronymic title created by Charles II. in 1661. The fourth Marquis, lately deceased, added no lustre to the title, and well nigh squandered the whole wealth and property of the family, but dying suddenly without issue the transference of the Forest to Lord Iveagh, who offered three quarters of a million for it, remained unaccomplished, and the present Marquis succeeded to the ancestral estates, and it is to be hoped will soon restore them to their former flourishing condition. The pedestrians of the Field Club arrived after their long walk through the forest glades at Savernake Station, where the 14 who preferred to view the beeches and drives from brakes were already assembled, having by some mistake been deposited by their drivers at this little station instead of that at Marlborough. But the weather was perfect for the excursion, the autumnal tints had not yet altered the verdant hues of the trees or bracken, but the foliage was still thick, and the vistas along the avenues arched over by gigantic boughs, were charming, and Bath was reached by the whole party at 7.46 p.m. after a thoroughly enjoyable trip amidst enequalled sylvan scenery.

Monkswood Reservoir, October 2, 1894.—A visit was paid by 24 Members to the new reservoir of the Bath Waterworks, at Monkswood, in the parish of Cold Ashton. Sixteen of the party reached the summit level, 672 feet above the sea, at the fourth milestone on the Gloucester Road by brake, and proceeding across some fields, reached the quarry in the great Oolite, which here takes a very different structure to the fine building stone whereof Bath is constructed. On this spot also the whole thick-

ness of the great Oolite strata is scarcely 12 feet, having thinned out in a very extraordinary way from the 105 feet of excellent freestone at Box, and materially altered in its structure and appearance, being harder and more siliceous. The stone quarried at the summit of this hill is carried by an inclined tramway down to the new reservoir, to form a basement on which to lay the flooring. Mr. Charles Gilby, Assistant-Engineer to the Bath Waterworks, here met the party, and, standing on the brow of the hill overhanging the vale, explained the various excavations, buildings, and embankments now under construction. The stream which runs at the bottom of this combe is a small feeder of the larger stream, which, following the sinuosities of the deep and picturesque valley of St. Catherine, finally disembogues into the Avon at Batheaston. The water of this brook, however, is not to be used for filling this storage reservoir, but is carried round the same in an artificial bricked channel, and finally led into its former course. The large storage reservoir will be filled by the purest water from springs which are conducted first into the small Monkswood reservoir now existing, and thence will overflow into the larger reservoir now under construction. A farm and eight acres of land were purchased for this purpose from Earl Temple, who is building a new farmhouse and bartons on the hill above. Messrs. Neave and Son, of Paddington, contracted to complete the work for £18,278, which, with the purchase of the land and tenants' compensation, iron work, salaries, and contingencies, reached the total of £30,000, a loan for which amount the Local Government Board sanctioned. With this great storage reservoir, capable of holding some 50 million gallons, it is to be hoped that Bath will be long spared a water famine. The bottom of the reservoir is in the lias clay, and a thick layer of peat is found upon it in certain parts, which has to be dug out. On this being done, a number of bronze ornaments were found in one spot, torques, rings and other articles, which Mr. Charles Gilby has at present in his office in the temporary Waterworks Offices in

Winchester House. A head of *bos longifrons*, a tooth of a wolf, and some vertebræ have also been discovered during the excavations. The Members of the Field Club heartily thanked Mr. Gilby for his explanation of all the works, and returned to Bath well pleased with their visit to Monkswood.

Cranmore and Leigh-on-Mendip, October 16, 1894.—Braving a biting north wind and low thermometer, eighteen Members started from the Great Western Station by the 10.18 a.m. train, under the personal conduct of Mr. Norton Tompkins. The object of this excursion to the Mendips was to receive from Mr. Tompkins a proof in the examination of the geological features of the district, of the thesis laid down by him in a Paper read before the Field Club on May 16th, 1894, on the origin of the Bath hot waters, and the danger of their diminishing considerably in outflow, if the waters which rise on the summit of the Mendip range and disappear in the numerous "swallet holes" which follow the line of the "Clandown fault," are drawn upon to supply Radstock and other places. The theory of Mr. Tompkins is that this Clandown fault is continued beneath all the coal series, New Red, Lias, and Oolite in a direct line to Bath, below which it passes at a depth of 300 feet. The waters it swallows at its beginning on the Mendips follow its course among the igneous rocks, whose vent at Beacon Hill on the Mendips caused this disturbance in the strata, and obtaining their supply of minerals and heat in the bowels of the earth, rise to the surface at Bath and Clifton. This theory is vehemently opposed by the most talented local geologists, but will hold good until a better is suggested by themselves or others. The saloon carriage placed at the disposal of the Field Club by the Great Western Company deposited the party at West Cranmore at 12.20, and a start was made for the summit of the Mendips. A visit was first paid "en route" to the Church of St. Bartholomew with Early English tower, pinnacled and bearing many masons' marks. The beautiful building stone from Doulting, the mother parish, which supplied the material for this

tower, Wells Cathedral, Glastonbury Abbey, and well nigh every mansion and church in the neighbourhood, withstands the climatic changes of the country wonderfully, and retains the most delicate carvings unimpaired for centuries. It is still quarried and belongs to the "Inferior Oolite" series. The Church contains coloured windows and several mural tablets to the Strode family, who own the Manor and also an ancient oaken bier with no date thereon, but only "Richard Dole, churchwarden." A fine Cross 15 feet high adorns the churchyard, and some aged yew trees. Proceeding on their walk, the Field Club passed the picturesque mansion of Sir Richard H. Paget, Bart., M.P., at East Cranmore, with a small church built by his father in 1846 at the Park gates, and on a hill to the left, 800 feet high, the Paget tower, erected 1862. The Cranmores derive their name from the abundance of cranes which in ancient days, when drainage was unknown, inhabited the meare or marshes here about. Doubtless they supplied the Monks of Glastonbury with dainty food on festal days, this manor having belonged to the Abbey, by gift of Aelphege, a domestic of King Edwy, from 956. The Bishops of Bath and Wells coveted the manor much, and finally were suffered by the Abbot to hold it, in order to pacify them. A curious deed, given in London on the 28th April, 42 Henry III. (1258), is handed down to us in an ancient book of 1654, "Upton, de Studio Militari," wherein Henry de Fernbureg engaged for the sum of 30 marks sterling to be always ready to fight as the Abbot of Glastonbury's champion, in defence of the right which he had in the manors of Cranmore and Pucklechurch, against the Bishop of Bath and Wells, the Dean of Wells, and all other his champions whatsoever. Bishop William de Bitton II. (1267) got hold of it notwithstanding, and it remained in the Bishoprick until Edward VI., when it passed to Edward, Duke of Somerset, until his head was required. Scarcely a mile further up the Mendips the Farm of Heale was reached by the Field Club, opposite to which commences the Clandown fault; carboniferous limestone on the East, old red

sandstone on the West, well exposed to view here to the most casual observer. In the coal country a few miles to the North on this fault a subsidence of 700ft. perpendicular on the West can be proved in the mines. "Swallet holes" abound in this fault, and fine springs disappear into them, afterwards according to Mr. Norton Tompkins, to reappear at a temperature of 120°, and charged with various minerals, at Bath in a direct line, and at Clifton by a transverse fault. Here Mr. Tompkins read a paper to those Members who were possessed of sufficient strength or bravado to despise a bitter northern wind, and the Vice-President of the Club, the Rev. H. H. Winwood, declined to accept this source for the Bath hot springs. The Members were profoundly interested in the subject of the controversy, but feeling the pangs of hunger, speedily walked through Downhead, with a little church, rebuilt by Viscount Portman, to the Bell Inn at Leigh-on-Mendip, where the necessary luncheon repaid the toil of the 4-mile walk to this elevated village, said to stand 884 feet above the level of the sea. This village also belonged to the Abbey of Glastonbury in olden times, now to the Horners, of Mells Park. Originally called "Lantocai," it is mentioned in Domesday book as Lega, and as the property of the Church. Hedda, Bishop of Winchester, 681, gave it to Glastonbury, and the grant was confirmed by the pagan King, Cedwalla, who oddly signed the deed with his own hand with the sign of the Cross. The Church of Leigh is most worthy of examination. The majestic tower of Henry VII. date has 20 pinnacles on the battlemented summit, and several additional ones on buttresses below. It contains six ancient bells and the luffer lights are fitted with elegantly perforated slabs of Doulting stone. The height of the tower dwarfs the body of the Church, which is peculiarly built in three elevations. The Nave of four bays with Norman font and some old carved bench ends, the chancel of two bays considerably lower in elevation with good oak roof, the Sacrarium lower again with an altar surmounted by a beautiful polished slab

of Purbeck marble, discovered in 1884 when the Church of St. Giles was restored, 18 inches below the floor. The elegant pierced parapet to the higher part of the nave has a date 1650 on one of the shields, a tombstone with the date 1690 is in the churchyard. A very peculiar view of the Church can be seen from the churchyard looking West over the three portions of different elevation, with the fine tower rising above them. There is a stoup for holy water in the South porch, a priest's door in the North wall of the nave, a piscina in the Eastern chapel of the South aisle, and two peculiar carved corbels in the chancel walls, North and South, which can only have been intended for lamps. From Leigh some Members continued their walk to Soho quarry in the line of the Clandown fault, to view the exposure of uptilted limestone strata. All found their way back to Cranmore station by 5.15 p.m., and by 7 o'clock were landed again in Bath after a bracing and instructive excursion.

Thus all the excursions fixed on the programme of the year took place, except that to Wimborne and the New Forest, arranged for June 19th and 20th, which did not attract sufficient responses to enable the party to obtain the reduction of fare offered by the Railway Company to parties of ten.

The Field Club lost not a single Member by death during the year, but six Members retired for various causes and six new Members took their places. The roll of Members now numbers 97, and shortly the full quota of 100 at which the bye-laws limit the number of Members will be complete. The list of societies in correspondence with the Field Club for exchange of Proceedings has been augmented by the Royal Cornwall Polytechnic Society, the Physico-Geographical Institute of Costa Rica, and the Royal University of Upsala, Sweden, and the Library of the Club has received many valuable additions during the year from the Smithsonian Institute of Washington, U.S.A., and private donors. Several photographs have also been presented by Members to the Club's Album, and Members who are expert with

kodaks and larger photographic apparatus will kindly remember that copies of the photographs they take during the excursions will always be thankfully received and acknowledged by the Secretary.

A new year dawns on the Field Club with every prognostication of a successful course, and the coming visit of the Somerset Archæological and Natural History Society to Bath for its annual week on July 23rd and following days will demand the energetic assistance of the Members of the Field Club to render the meeting a success.

WALTER W. MARTIN,
Hon. Sec

Abstract of Paper on Church Plate of Devon and Cornwall, by the REV. P. WILLIAMS.

(Read 28th February 1894*).*

With the view of obtaining accurate returns of the Church Plate in the Diocese of Exeter (where I was then beneficed), so as to show what specimens might be found of pre-Reformation art, I consulted the Exeter Diocesan Architectural Society, of which I was a member of committee, there being no County Archæological Society then existing either in Devon or Cornwall. The Society took up the subject very warmly, and assisted me by printing and circulating a descriptive paper prepared by me, containing questions to be answered by the Incumbents. But it was first decided that as it would cost very little more to take in the Diocese of Truro also (as forming part of the old Diocese of Exeter) our operations should extend to that Diocese as well—a great mistake, as I afterwards discovered. But I was given as a coadjutor Mr. F. T. Deprée, the principal silversmith in Exeter, who undertook to receive and tabulate the returns for the Diocese of Exeter, I myself being responsible for Cornwall. During the course of the next year or two we had received replies to something short of half the circulars—but some of them were very short and of not much use. Nevertheless, we had some very good drawings sent, and elicited some interesting particulars. But after I had been at work some time I found that my eyes would not stand the close and minute attention required, and I was prohibited from doing anything for a long time, and I have never been able to take it up again, my eyes having become much weaker. Meanwhile, a similar work had been begun in several different directions, and though the progress made is necessarily slow, yet the perseverance and energy of Miss Goodwin, the daughter of the late Bishop of Carlisle, enabled her to be the principal agent in bringing out the first volume on the subject, viz., "Church Plate in the Diocese of Carlisle." This was followed by a similar volume for the county of Kent, by Canon Scott-Robertson; and after an interval, by one on the "Church Plate of the Archdeaconry of Worcester," by the late Archdeacon Lea. I have not yet noticed the publication of any others. I also had occasion to correspond with the Secretary to the Somerset Archæological Society, who was undertaking a similar work for this Diocese, or County; and it is some consolation to my feelings to find that the difficulties in this case appear to have been as great as in ours, inasmuch as no volume has

yet been sent out by them. In fact, the difficulties are very great, and are well pointed out by Miss Goodwin in her preface.

In the first place, it is not worth while to publish such a work at all, unless it is thoroughly well done ; and the first thing must be to get satisfactory accounts of the vessels used in each parish ; and to do that well it is quite necessary that some one well up to the subject should personally inspect every piece, and such persons are not easy to find, and when found might not have the necessary leisure to carry out the work. From the experience gained so far, it is probable that there are very few specimens of silver plate earlier than the time of Queen Elizabeth, which could be discovered by the most rigorous search, beside those which are already well known ; perhaps there may be one or two in each Diocese, not reckoning the specimens belonging to Colleges at Oxford and Cambridge and Cathedrals. Mr. Cripps says in his 3rd and last edition of "Old English Plate," p. 159 : "We are now in a position to say what the antiquary may expect to find around him in Church or Cabinet. It may be summed up very shortly : he will find a few—a very few—gothic chalices and their patens, remains of pre-Reformation art. The writer does not know, after extensive enquiry, of much more than a score, and these have, no doubt, owed their preservation in each case to some favouring local circumstances. He will find, here and there, a communion cup with its cover of the reign of Edward VI., made, no doubt, of the materials afforded by some more ancient chalice. Of these there are still fewer than of the chalices which preceded them. And next in order he will find broadcast over the whole country a multitude of examples of the communion cups provided in the first years of Queen Elizabeth, each with its paten cover ; and he will find flagons of shapes varying with their date and other circumstances to be further mentioned."

Now, how has this scarcity come about? For, at first sight, there does not seem any adequate reason for their almost total disappearance. It might be supposed that the times of the Civil War are responsible for this, as we know that many private families melted up their old family silver for the use of the King ; and perhaps that might have been the case also with the Church Plate, if it had lasted down to that date ; but Mr. Cripps shows by undoubted testimony that the greater part of it had already disappeared at the time of the Reformation. Before the Reformation, the cathedrals and larger parish churches (and, in a measure, many of the smaller churches also) were handsomely furnished with everything that was necessary for the due celebration of the Mass. This is shown by the lists of Church furniture which have come down to us from various quarters.

Of course, on the dissolution of the Monasteries, all *their* treasures fell into the hands of the King (not without authority of Parliament), under the name of "Church-stuff:" but a large quantity of the riches of cathedrals were also bestowed upon him. However, it is not fair to charge King Henry VIII. and his advisers with the *whole* of the spoliation which the Church suffered at this time. The Parish Plate remained untouched. Large quantities of silver were returned to the Commissioners of Edward VI., as in the possession of the parochial authorities, and when the returns had been received, it was decided in the last year of his reign (1552) that the Parish Plate, if not previously disposed of, should be seized and confiscated. And though, on the death of the young King and the accession of Queen Mary, these proceedings were suspended, yet the Protestant reaction which followed the accession of Elizabeth soon dealt with what remained of these old testimonies to the devotion of our ancestors. And it is not wonderful that parish authorities should take full advantage of the excuse offered them by the necessity of having to alter their churches to more simple forms of ritual, and to repair the damage caused by the destruction of images and stained glass figures as "monuments of superstition," and should dispose of a portion of their more valuable property by way of meeting their extraordinary expenses. This process made such rapid progress that another Commission had to be issued with the view of stopping it and preserving all that was left. And the returns from many places honestly state that, "by the consent and agreement of the parishioners," the Churchwardens had sold much of their plate and other property, and had spent the proceeds on necessary expenses, so that large quantities of "Church-stuff" came into private hands at this time. Parlours were found hung round with altar cloths, tables and beds covered with copes, carousing cups were made of chalices, and it is said by Keylin, "It was a sorry house, and not worth the naming, which had not some of this furniture in it." But the uncertainty as to what might become of the remainder, and how much they might be allowed to keep for the use of their parishes, seems to have weighed much on the minds of many of them and to have suggested a short cut whereby they might be able to keep their own. If the returns of the Churchwardens can be trusted, almost every church in many counties was broken into and robbed of its Church Plate at some time or other between 1540 and 1553! This was found to be the simplest way of accounting for missing articles.

So matters went on until the last year of Edward VI.'s reign

when the Commissioners were authorised to seize all that remained unsold. But perhaps it would be safer to say *nearly* all, for their orders were even then to leave "one, two or more challices or cuppes according to the multitude of the people." And we need not be surprised to find that even these few have disappeared also, if we consider that, although the instructions given to the Commissioners directed them to leave two or more chalices or cups, there was a final general clause that "all monuments of feigned miracles, pilgrimages, idolatry and superstition were to be taken away and destroyed." Now, of course, any vessels that had been used at the Mass, especially such as contained any representations of saints, &c., or even of the events of our Saviour's death, might easily be classed under the head of "superstitious monuments," and Mr. Cripps estimates that about half of the parishes might already have changed their chalices into cups, though from the inventories of St. Saviour's, Southwark, it seems that the exchange of four chalices weighing 54 oz. for two new ones weighing 52 oz., resulted in a balance against the parish of 17s. 8d. A few of these exchanged cups are still to be seen. I have not come across any myself, but there are two at St. Margaret's, Westminster, mentioned by Mr. Cripps, but far the greater part of them (we may suppose) were destroyed on Queen Mary's accession as unfit for the restored ritual, and any of the old relics which remained were very promptly dealt with under the rigour of the renewed Protestant zeal which burst forth on the accession of Queen Elizabeth. The "Injunctions" of King Edward were re-inforced almost word for word, and the proscribed goods were followed even into *private* hands, lest any should keep them in their houses for the purpose of adoration. The Articles of the Archbishops of this period enquire into these matters, viz., those of Parker, in 1569, and Grindal, in 1576, and the latter shows the origin of the cover made to fit on the cup, which is nearly always found with the Church Plate of this period. The enquiry is: "Whether you have in your Parish Church or Chapel a fair and comely Communion Cup of silver, and a cover of silver for the same, which may serve also for the ministration of the Communion bread." There is a very curious unanimity in the *pattern* of these Elizabethan cups and paten-covers, though they are not always the same size, but no Royal or other orders can be found prescribing any pattern or anything of the sort. Mr. Cripps has discovered a great many in the neighbourhood of London which bear the date of 1562, and in the Diocese of Norwich many of the cups which remain bear the date 1567 or 8. But in the West of England, Archdeacon Lea, in

his small volume upon "Church Plate in the Archdeaconry of Worcester," assigns the date 1571 (not earlier) to all the Elizabethan plate which he has found, and the same rule will hold good of the chalices and patens in Devon and Cornwall (and probably in Somerset also), and, indeed, all over England. Archdeacon Lea says (Introduction, p. 13): "They are all nearly of the same pattern, and have the same ornamented band, though they vary in size from five to nine inches high, and they all seem to have been made in 1571. There are 84 cups of this date in the Archdeaconry of Worcester, and though they are found of the same pattern and with the same ornament and hall-mark in every part of England, yet no order for their pattern has ever been discovered. And this uniformity, as compared with the great variety at other dates, seems to make it quite certain that there *was* a pattern. Now, was the new pattern prescribed by the Queen herself? or was it given by Archbishop Parker, or by Convocation? or was there a monopoly granted for the provision of cups? . . . It was early in 1571 that the Queen was formally excommunicated by Pope Pius V.; might not this great issue of cups in that year, and the inscription of 1571 upon them, have some connection with this? It might be looked upon as a practical answer to the Pope's Bull. It is this 1571 cup which is known in some places as 'the £5 cup,' from an old tradition that £5 was granted to poorer parishes for its purchase. In confirmation of this, it may be said that this sum would have been about the price of the larger size of this cup at that time." I have thus traced the origin of the dearth of ancient Church Plate.

The Honorary Treasurer in Account with "The Bath Natural History and Antiquarian Field Club," for the Year ending February 18th, 1895.

Dr.

	£	s.	d.
Balance from last year's Account ...	31	13	8
97 Subscriptions at 10s. each	48	10	0
7 Entrance Fees at 5s. each	1	15	0
Sale of Proceedings	0	16	3
Interest on Deposit of £40 from February 23rd, 1894, to February 2nd, 1895 ...	0	18	5
	£83	13	4

Cr.

	£	s.	d.
Rent to Royal Institution from January 1st, to December 31st, 1894	5	0	0
Messrs. Lewis and Son, for Printing, &c. ...	30	13	4
Gratuities to Librarian, Porter, Boy, and Messrs. Lewis's Clerk	1	2	6
Donation—Somerset Record Society ...	1	1	0
„ John Storrie's Memorial ...	2	2	0
„ Glastonbury Antiquarian Society	2	2	0
Messrs. Lambert for Collotypes	3	18	5
Expenses of Honorary Secretary ...	1	4	8
„ „ Librarian ...	2	10	10
Balance in the National Provincial Bank ...	33	18	7
	£83	13	4

Examined and found correct, February 9th, 1895,
R. L. TAYLOR

A. A. MANTELL,
Hon. Treasurer.

BATH NATURAL HISTORY & ANTIQUARIAN FIELD CLUB.

INSTITUTED FEBRUARY 18th, 1855.

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1882 *NORMAN G., Esq., M.R.C.S., 12, Brock Street.
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1889 SHICKLE Rev. C. W., M.A., Rectory, Langridge.
„ BALLY Major-Gen. W., 23, Park Street.
„ NIMMO Major-Gen. T. R., C.B., 94, Sydney Place.
„ THOMSON Col. H., The Elms, Weston Park.
1890 FANSHAWE Col. T. B., 24, Park Street.
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„ ROSE H. F., Esq., 18, Grosvenor.
„ DAVIS Col. T. Arnoll, R.A., J.P., 4, Marlborough Buildings.
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„ RICKETTS Col. Montague, Shelbourne Villa, Lansdown.
„ McCHEANE Rev. R., M.A., 5, Lansdown Place, E.
1892 PIGOTT W., Esq., 25, Circus.
„ BRAIKENRIDGE W. J., Esq., J.P., 16, Royal Crescent.
„ BRADFORD J. E. Goddard, Esq., 16, Marlborough Buildings.
„ BUSH Robert C., Esq., 1, Winifred's Dale.
„ BUSH Thomas S., Esq., Dale Cottage, Charlcombe.
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„ PRYCE Ernest, Esq., 15, Belmont.
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„ HANDYSIDE W., Esq., 12, Dunsford Place.
„ WILLIAMS Rev. Philip, M.A., 15, Grosvenor.
„ BURMESTER Captain, Bitton, near Bristol.
„ BLATHWAYT Rev. Wynter Edw., M.A., Dyrham, Chippenham.
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Bath Miniature Painters. *By* PERCY H. BATE.

(Read March 13th, 1895).

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NOTICE.

Any opinions expressed in the Proceedings of the Club must rest on the authority of their respective Authors.

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The status of this delicate and beautiful art is expressed in this last sentence. Producing his work for the delectation and admiration of wealthy and cultured patrons, the miniaturist appealed to but a limited *clientèle*, and the art could not be expected to flourish in the provinces, away from the court beauties, whose charms the artist immortalised, and the rich connoisseurs, who could afford to encourage his work; and the fact that miniature painting has flourished for so long in Bath is due to the circumstance that the city was, during so many years, the centre of the gay and fashionable life of the country. In fact, the earliest trace that I have discovered of a miniaturist working here is curiously synchronous with what Professor Earle so well calls the "Rise of Fashion," and synchronous also with the commencement of the vogue of Bath as a resort for the *beau monde*: the same first quarter of the eighteenth century that saw the erection of the Parades saw also the first miniaturist

following the lead of his patrons and bending his steps westward, for it is in 1727 that we find Bernard Lens painting in Bath.

Bernard Lens, of whom Horace Walpole speaks in terms of high commendation, was the third of the name, and coming of a family of artists, he appears to have been superior both to his ancestors and to his children. He held the office of painter to the Crown, and produced (as well as original portraits) copies in miniature of the works of the great masters, and though I have not been able to trace any portraits from his hand that can be definitely assigned to Bath, we have in this very Institution a most interesting signed and dated work by him, I mean the framed drawing of the Roman bronze head of Minerva, hanging on the wall. In addition to this he made at the same time drawings of the hypocausts discovered in Stall Street, which are preserved at the Bodleian.

I must here explain that though one knows from various authorities that a certain miniaturist has at one time or another worked in Bath, it is in many cases quite impossible to decide whether any individual miniature from his brush was painted in the city. Many artists did not sign their miniatures, very few dated them, and it is on dates that we must rely in the case of those artists who were not permanently domiciled here, such men as Ozias Humphrey, Samuel Collins, and Richard Cross. Of course if one has a known portrait of a person who was in Bath at the time that the artist was here it is a not unwarrantable assumption that the portrait was painted here, for it was a pleasant and fashionable method of filling the ample leisure of the Bath season. But with regard to the artists who lived here for long periods, such as Daniell, Jagger, Hutchisson, and Ford, the case is different, and it may be safely assumed that any miniatures of theirs were painted in Bath.

Besides the miniaturists whose names I have definitely traced as working here, more than thirty in number, there are a few who I expect to find also made their début in Bath. Among these

was Miss Biffin, whose portrait I am able to show you, engraved by Sievier, after her own painting. Born at East Quantoxhead in 1784, it seems to me extremely probable that before going to London to be taught by a Mr. Dukes, she tried her hand at Bath. I say "tried her hand," but that is purely a *façon de parler*, for as the portrait shows, she was born with neither hands, arms, nor legs, and is said to have painted with her mouth; though this seems to be contradicted by the print I have, which shows a brush fixed to the stump of her right arm. She seems to have attained some proficiency as a miniaturist, being carried about the country for some years, and charging three guineas for a portrait. If I could definitely include her as a Bath artist I could furnish many more particulars of her which I at present omit.

The two Plimers, Nathaniel and Andrew, were also born in Somersetshire, and it is not at all unlikely that their first portraits were painted here. Little is known of their lives, but the work of the younger brother, Andrew, is most excellent, in fact second only to that of the prince of miniature artists on ivory, Richard Conway, and his works are very eagerly sought after by collectors now-a-days. In his time he painted many celebrities, in fact rank, beauty and fashion alike delighted in posing as subjects for his pencil, and among others who sat to him was the famed beauty, Georgiana, Duchess of Devonshire, whose handsome face has also been handed down to posterity by Reynolds and Gainsborough. Some of my hearers may be able to tell me if she was in Bath in 1785, the date of one miniature of her by Plimer, the year before he exhibited at the Royal Academy for the first time. The unhappy Mrs. Fitzherbert he painted in the same year, and the famous miniature of three ladies of the Rushout family, which was one of the attractions of the "Fair Women" exhibition, at the Grafton Galleries, was from his brush.

Miss Catherine Andras, who was not a miniature painter, but a practitioner of the sister art of portrait modelling in wax, was born in 1775 in this locality, and worked for some time either in

Bath or Bristol, perhaps both, before going to London in 1799. She had many distinguished sitters, including several members of the Royal family, and I shall be specially glad to hear of any wax portrait of the period which may be by her.* The one I have here, of a rather earlier date, bears no signature, but is believed to be an autograph portrait of Joseph Plura, an Italian modeller and sculptor, who married the daughter of Ford, the sculptor: it belongs to Mr. J. S. Bartrum, who is a direct descendant of theartist.†

Leaving the field of conjecture and turning to the safe ground of facts, the first artist of whom I can give you any definite particulars is Thomas Worlidge, a painter and etcher, who flourished in the middle of the eighteenth century. Neither the year nor the place of his birth is ascertained, though it is stated that he was born in 1700. He practised both in Bath (where he was much in vogue), and in King Street, Covent Garden, dying at Hammersmith, Sept. 23, 1766. During the greater part of his life he painted portraits in miniature, and he also attempted them, seemingly with less success, in oils and crayons, and many of his portraits are engraved, notably George II. (engraved both by Houston and Spooner), and John Evelyn, the author of "Sculptura, or the History and art of Chalcography," 1769. His reputation is based upon his highly finished miniatures on vellum, etc., in pencil and Indian ink (which Walpole alludes to as having grown astonishingly into fashion), and his work with the etching

* Since this paper was read I have been so fortunate as to find a most beautiful portrait of Charles James Fox by this lady. It is both bold and delicate, a good portrait and a fine piece of modelling, and is signed "C. Andras, 1801."

† A suspicion I had that Bone, the enameller (who, before finally abandoning the minor art for the greater, was a flower painter at the porcelain works of Plymouth and Bristol), might have painted portraits in Bath, was confirmed by Major C. E. Davis, who showed a most interesting example of his work, a fine enamel portrait of a Bath lady. Bone's work, it is needless to say, ranks among the very best ever produced in this country.

needle, in which he endeavoured to base his style upon that of Rembrandt, finishing his plates with the graver or drypoint. This has been designated the "scritch-scratch" style, but some of his etchings are marvels of delicacy and softness, and his prints, which consists chiefly of heads and portraits, are very numerous, and many possess great merit, though the comparison which he challenged by posing as the English Rembrandt is ridiculous. He copied several of Rembrandt's plates, and advertised one in the *Bath Chronicle* of 1757 thus :

> "To be published by subscription an exact copy of the celebrated "etching of Rembrandt, the Hundred Guilder print, the "same size as the original, by Thos. Worlidge, Painter, "Bath, residing at Mrs. Wicksteed's, in the Grove, where "can be obtained several new pieces after the manner of "Rembrandt, by Thos. Worlidge."

This print I am enabled, by the courtesy of Mr. Fredk. Shum, to show you to-day, but I fear that the "exactitude" with which Rembrandt is copied would deceive but few. He also etched a large number of antique gems, which were published after his death in a volume, consisting of a hundred and eighty plates, and two extra ones. Prefixed to this volume (which also by Mr. Shum's kindness I am able to show you) is his portrait of himself posed as Rembrandt, which was re-engraved for Walpole's "Anecdotes of Painting." The gems are beautifully etched, notably the two extra plates of "Medusa" and "Hercules struggling with a lion," and the first state of the prints on satin is of considerable rarity and value. I noticed recently about a hundred of the original coppers for sale at a very moderate price, and it would have been gratifying to see them obtained for the city.

Worlidge married the daughter of a toyman of Bath, who was gifted with great beauty and was able to assist him in his art, while she herself practised the then fashionable art of reproducing pictures in woolwork. Worlidge himself seems to have been of a happy-go-lucky disposition, taking "no care for the morrow," for we are told that when in want of a dinner in

his early days he luckily found half-a-guinea, and then, instead of purchasing some beef steaks and a pair of shoes as his wife wished, he chose a feast of early green peas! Of his pupil W. Hibbart, who made many etchings and engravings for local publications, it is scarcely the place to speak here. His work with the needle is inferior to Worlidge's, and so far as I know, he neither drew nor painted portraits in miniature.

Another somewhat remarkable painter of miniatures was Charles Sherriff, a deaf and dumb artist, who practised in Bath, and gained a great reputation. He exhibited at the Royal Academy in 1774 for the first time, and in 1785 the celebrated Mrs. Siddons writes that he was more successful in her portrait than any other miniature painter she had sat to. Whether this portrait is still extant I know not; it would be a most interesting item in the exhibition of Bath miniatures that I have dreams of arranging, and it would be delightful to compare Sherriff's rendering of Mrs. Siddons's stately beauty with that of Sir Thomas Lawrence, who at this very time, as a young lad, was painting small portraits here. I hope some day to be able to speak at length on the work of Lawrence in Bath—not the least interesting chapter in the fascinating volume that might be written on the connection between our city and the arts.

It is very annoying to find such scanty notice of many artists, and it requires much patience to piece together a few facts to form even a disconnected whole. It is still more annoying to find just the mention of a name, and not to be able to trace any of the artist's works. Of such miniaturists as Dixon, Langdon, Mrs. Phillips, Raines, Vaslet*, Wilkinson, Spornberg†, Sanders, Bell,

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* Vaslet's portrait of Mason the poet (A.D. 1771) was etched by C. Carter, and published in 1785. He practised first at York, and then at Bath, and occasionally exhibited at the Royal Academy.

† Recently I have seen a very beautiful portrait of a lady of the Metcalfe family and a silhouette of her father (?), painted about 1790. They are in the same locket, and the latter is signed.

Pack, and Ogle, I can tell you nothing—of each it may be said, "stat nominis umbra." It is equally exasperating when one finds a miniature such as the one on the table signed, "Browning, Bath," of the artist of which one can trace nothing (the portrait is of the early years of this century, and belongs to Mr. W. H. Stephens, of Clifton): and another aggravating instance is that of Sir Walter Scott, who came to Bath as a boy in 1777, and had his miniature painted. This is engraved as a frontispiece to his life, but there is no record of the artist's name, and as there were several capable miniaturists in Bath about this date, guess work is quite unprofitable.

To Mr. J. S. Bartrum I am indebted for the miniature by Lacon which is on the table. I had a note of the existence of this artist, but scarcely expected ever to find any of his work, till I was shown, quite by chance, this portrait of a member of the Ford family. The artist appears to have combined miniature painting with the keeping of a puppet show; it may perhaps be concluded that he also modelled portraits in wax.

Of the work of John Beauvais, who practised in Bath, I have not been able to trace any example. It is recorded of him in the life of Nollekens, that though noted for his dirty person he regularly presented himself at court. The two miniatures by John Hodges Benwell, that are lent by Mr. Thos. Harding, are of great interest, as his work is very uncommon; for born in 1764, the son of the under steward to the Duke of Marlborough, he died at the age of twenty-one in 1785. Had he lived he would probably have gained great reputation, even as it is several of his works have been engraved by Sharp, Bartolozzi, and others. He was the pupil of an obscure portrait painter named Saunders (there were many of the name, and I cannot say whether this was the artist who is mentioned in the New Bath Guide at the end of the last century) and also studied at the Royal Academy schools, where in 1782 he gained a silver medal. He then for a time taught drawing and painted miniatures in Bath, among others

the two very clever portraits I have here, which show well his peculiar mode of using crayons as water colours: it may be that there are others remaining in the locality, the medium is so unusual that they should be easily recognised. Among the engravings after Benwell, by Bartolozzi, are, "The Beggar Girl," "The Return of the Sailor," "The Soldier's Farewell," "The Soldier's Return," "The St. James's Beauty," and "The St. Giles's Beauty," the latter two being portraits of two of the daughters of James Burrough, of Alton Priors, Wilts.

The New Bath Guide, of 1780, gives me another name, that of Thomas Redmond, who practised in the Orange Grove. He was the son of a clergyman at Brecon, and is *said* to have been apprenticed to a house-painter in Bristol; going thence to London he studied a short time at the St. Martin's Lane Academy, and in 1863 was a member of the Free Society of Artists. He then settled in Bath, where he practised his art with success, exhibiting at the Royal Academy from 1775 to 1779, and dying in this city in 1785, at about forty years of age.

A little earlier than this Samuel Collins, who stands high in the ranks of English miniaturists, was practising in Bath. The son of a clergyman at Bristol, the date of his birth is not recorded, but he flourished between 1750 and 1780. He left the profession to which he had been educated—that of an attorney—to embark on the more congenial career of an artist, and settling in Bath he gained a large and lucrative practice, and a great reputation, which secured him many pupils, among them the celebrated Ozias Humphrey, to whom he is said to have relinquished his connection when he removed to Dublin. I should much have liked to show some of Collins' delicate, strong, faithful and beautiful work, either on ivory or in enamel, but I found it impracticable, and I could not obtain any of Ozias Humphrey's brilliant portraits either, though I have a print of Mrs. Sheridan after him, which is of extreme interest to Bathonians, for it was with the Linleys that he lodged in Bath when he succeeded

Collins. Born at Honiton in 1742, he studied art in London, where, after some years spent in Bath, he returned, and succeeded in increasing his reputation. Later, with Romney, he went to Italy, and then to India, where his eyesight failed, and he was obliged to return and abandon miniature painting. This was in 1788, in 1791 he was made a Royal Academician, and for some time, until blindness overtook him, he wrought portraits in crayon of great merit.*

Another bird of passage was William Armfield Hobday, who was born in 1771, at Birmingham, where his father had realised a good property in manufacture. Redgrave gives the following account of him: "An early talent for drawing was encouraged, and he was placed under an engraver; but he did not like the art, and left his master in the sixth year of his time, and at once commenced painting small portraits in water colours and miniatures, which he exhibited at the Academy in 1794-96. He came to London, and though he met with good encouragement, and added considerably to the allowance made to him by his father, yet he rushed into society and expense, to the neglect of his art, and in his falling fortunes married, and increased in extravagance. He went yearly to Bristol and to Bath, where he found much employment, and eventually, about 1802, settled at Bristol, where he painted during fourteen years, was well supported, and made large gains. But in 1818 he returned penniless to London, and took a large house. His art could not, however, maintain his extravagance; he sold pictures by commission and engaged in other speculations, finishing by bankruptcy in 1829; but his property did not realise a dividend,

*The Chairman, Canon Ellacombe, showed a very beautiful portrait by Humphrey of the notorious Col. Francis Charteris; and the Holburne Museum contains one of Mr. Cussans, most probably by this artist. Many fine works by him and his master, Collins, were shown at the Burlington Fine Arts Club Exhibition of Miniatures, in 1889.

and, ruined in fortune and in spirit, he died, Feb. 17, 1831. He painted many portraits and portrait groups of large size, and some subject pictures, and he received large prices for his pictures. Several of his works are engraved."

Before passing to a review of a group of miniature painters who were more closely associated with Bath than these last, I must mention Gahagan, who in the early part of the century was a well-known modeller here, and who drew a very good portrait miniature. Among the engravings on the table there are a couple of portraits of Queen Charlotte, taken by him during her stay here, and he was the author of a very ghastly production, the model of the body of Maria Bagnell as she was found murdered in Marlborough Buildings. He also drew and lithographed caricatures à la Rowlandson, and he modelled a medallion of John Arthur Roebuck, M.P., a meritorious performance: one would like to know more of his work in this line.

One would not expect Robert Montgomery, the poet, to be included in the list of Bath miniaturists, but it is known he lived here for some time, and the portrait of him in the Holburne Museum is said to be by his own hand. It is not of great artistic merit, but it is interesting, and had the following autograph verse attached:

> "Impassioned, proud, enthusiastic wild,
> Too soon a man, and yet too late a child,
> Beloved by some, misunderstood by more,
> And rich in feeling as in fortune poor."

I have now to pass to a group of artists who were more nearly connected with Bath, in that they were not birds of passage, who stayed for a less or a greater number of years, but were permanent residents, who laboured here each for a lifetime, and who carried on the tradition of a local school (if that is not using too strong a word) of miniature art, that has existed for considerably over a century. One of the earliest of these was Abraham Daniell, who died in 1802; his work is highly esteemed, and justly, judging by the one miniature by him in the Holburne

Collection, which is painted with a truth and simplicity, a reserve and a dignity that are beyond all praise. His portraits are not, I believe, common,* nor are those of his contemporary, Hutchisson, and I shall be glad to know of any work by either of these artists, or by a third, S. T. Roche, who also worked here at the end of the last century. The only miniature of Hutchisson's that I know, I am enabled by the kindness of Mr. J. D. Harris to show you, it is a portrait of V. Rauzzini, the musician (well-known as a Bath worthy), which was engraved by Hancock—then residing at Bristol—and published in Bath in 1800. Other plates were engraved after Hutchisson, among them being a portrait of the Rev. Wm. Jay, by Hancock, and portraits of Michael Kelly, and Mrs. Crouch, by Ridley; but of the artist himself I know nothing save that he lived on Westgate Buildings, and that his work is good and dignified. Either he or his son drew lithographic portraits, as mentioned by Mr. Emanuel Green, which are clever and characteristic.

Of Sampson Towgood Roche again, I know little. He exhibited at the Academy only in 1817, but he was painting miniatures in 1782, and his reputation appears to have been high, though it is said that his practice was purely local. However, Royalty sat to him, and miniatures by him were exhibited at South Kensington in 1865, and at the Burlington Fine Arts Club in 1889, but not having seen these I am unable to speak of his style.

Daniell, of Bath, may be said to have been succeeded by Charles Jagger, also known as "of Bath." His portraits are numerous and unequal in merit, and many of them have been engraved, including (as well as the one on the table†) the Duke of Clarence and Sir John Grey Egerton. It was while sitting to Jagger that the Duke asked "Why are my portraits always so thick about the chops?" a poser for the unfortunate artist!

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* Daniell's miniature of Dr. Falconer was engraved by J. Fittler.

† The Rev. Harvey Marriott, of Claverton, a mezzotint.

Jagger's fine work is *very* fine; the portrait of General Donkin, in the Holburne Museum, is as good a miniature as one can wish to see—the artist must have had a keen grasp of character to paint such a likeness, and technically both the breadth and delicacy of the painting are admirable. He died in 1827, and Scovell, a self-taught artist, who was the son of an umbrella maker, in Wade's Passage, was ambitious of filling his place. He was, I believe, an able artist, and a clever musician, and he drew life-size portraits very well in addition to miniature painting, but his miniatures are not in the same rank as those of Daniel and Jagger, they lack the breadth and dignity which those artists at their best were masters of; still, as will be seen from the portrait kindly lent by Mr. John Stone, and from the small sketches I show, he was a clever draughtsman.

The work of Miss Tylee, about this time, is pretty, and is obviously based on the then fashionable Books of Beauty; the three examples Mr. Harding has lent me show the quality of the work she did—two are local portraits, drawn with delicacy, the third a fancy head. Of the work of "Mr. Rosenberg, profile painter to their Majesties and Royal Family," as his card describes him, who painted at the beginning of the century, I had hoped to say a little:* the examples of his work that I had hoped to obtain were not, however, available in time, and with a passing allusion to Theweneti, I must finish by speaking of the two last miniature painters of Bath, Charles Ford and Charles Foote Tayler.

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* Charles Rosenberg and his son, Thomas, were jointly the artists of many miniature portraits, engraved by Stadler and Freschi, of members of the Royal Family and others: Louis XVIII. of France, George III., the Prince Regent, the Dukes of York, Sussex (Masonic Grand Master), and Northumberland may be mentioned. These portraits are good as likenesses, but they are not very artistic. Miss Ethel Rosenberg, Charles Rosenberg's great grand-daughter, who is herself a miniature artist of recognised talent, has kindly shown me the collection from which these notes are made

Charles Ford was born in 1801, and died in 1870. Of a local family, he settled as a miniature painter in Bath, and though friends thought that he, a pupil and friend of Sir Thomas Lawrence, would have done better to seek a larger reputation in London, his retiring disposition made him disinclined to take such a step. A man of large mind and great artistic ability, he was the associate of such distinguished folk as Hannah More and Wordsworth, and many sitters of note came to his studio. The copy in the Holburne Museum of the famous Herschel portrait shows his art well, strong, dignified and rich, and the examples on the table, kindly lent by his son, Mr. C. Lawrence Ford,* will give a good idea of his powers; and though they cannot be said to be his finest work, even on a cursory inspection they show that he must have been a true artist, a colourist of great merit, a fine draughtsman, and a painter whose reputation should not be suffered to fade. He died in 1870, seventeen years later than his contemporary, Charles Foote Tayler, who was a few years his senior, having been born in 1797. Thanks to the great kindness of Mr. J. W. Morris and Mrs. Hunt I am able to show you a representative collection of Mr. Tayler's facile work. As you will see, no artist among the many who have worked in this city has surpassed him in richness and brilliancy, and his miniatures (many of which have been engraved†) are most lifelike. A good example is the portrait of Haynes Bayley, which is mounted in the binding of a copy of the poet's works, a miniature of great beauty and interest. For many years Charles Tayler exhibited at the Academy. He painted both Mrs. Siddons and Fanny Kemble, and when he died, in 1853, Bath lost an artist of distinction, whose portraits, painted with extreme care and delicacy, can best be described in one word—brilliant.

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* Among Ford's engraved portraits that of John Warren Howell should be mentioned.

† Mrs. Siddons, Miss Fanny Kemble, Sir Wm. Carroll, Rev. James Rudge, Dr. Barlow, Mr. John Morris, etc.

I spoke of Ford and Tayler as the two last miniature painters of Bath; this is, of course, scarcely correct, for, as we all know, the city boasts more than one living practitioner of the art, and though to speak critically of their work would be beyond the province of this paper, which deals entirely with byegone artists. I can allude, in closing, to the delicacy and daintiness of the work of the ladies who are the living representatives of a long and able line of miniaturists.

I have come to the end of my paper, and I must leave the examples on the table to speak for themselves. I have tried to give you the cream of the knowledge that I have collected, omitting uninteresting details, and I shall be very glad to receive even the smallest scrap of additional information; every detail fits sooner or later into its place, and often an unconsidered trifle puts one on the track of fuller particulars. This paper can in no way be considered as final, it is admittedly tentative and incomplete, and I hope that there may be many residents in the city who will lend me a helping hand towards perfecting the collection I have got together in this small, unworked, and most interesting section of the wide subject of Bath art.

The Great Frost of 1895. *By the* Rev. CANON ELLACOMBE, M.A., President.

(Read 18th December, 1895.*)*

It is a common saying that Englishmen are never tired of talking about the weather. I must hope that the members of the Field Club are not easily tired in listening to talks about the weather, for this is the third year in which I have spoken about the weather of the preceding twelve months and its effect upon the garden. Had the weather of the twelve months beginning

with December 1, 1894, and ending with November 30, 1895, been at all of an usual character, I should not have ventured to have returned to my subject of the two previous years, but there has been so much that is not usual, and the effects have been so very remarkable, that I agreed with your Secretary and others, who thought that there should appear in our Proceedings some record of such a season; and in a sketchy way I will now make the record.

That it was a season marked by very unusual weather is well known to you all; it was a season in which the weather went into extremes, and it seemed almost to bear out the statement that was made a few years ago by a great meteorologist that the tendencies of our seasons for some, perhaps for many, years to come, would be that the weather would be in extremes; extreme heat and cold, and extreme drought and wet.

What the actual weather was is best shown by a short account of the rainfall, the heat, and the cold, during each of the twelve months that have passed. December, 1894, was a mild month, with seven days of slight frost never lower than 28° and reaching as high as 55, and with nearly 3½ inches of rain (3·35); but in the morning of the New Year a period of severe cold set in, which lasted with slight intermissions for three months. In January there were 18 days of frost, and on the 26th the thermometer fell to 18°. There were some bright intervals, so that on the 20th the thermometer reached 53 and there were over three inches of rain (3·16), but the character of the month generally was a low thermometer throughout. But in this respect it was far surpassed by February, which was not only the coldest month of the year, but the coldest February that had been recorded for many years. There were 27 days of frost, and for the most part very hard frost, the thermometer on the 8th falling to 10°, and only rising as high as 45° on the last day of the month. The wind was in the North all the month, and there was very little rain. It was a month to be remembered for its

extreme severity and its consequent discomfort to man and beast and plant. March was a little better, but could not be considered a genial spring month. There were frosts on ten days of the month, but not very severe; the lowest reading was 26°, and towards the end of the month it reached as high as 60°, but only for a very short time, and the general character of the month was a low thermometer and about two-and-a-quarter inches of rain (2·32). But when March was past we had seen the end of the frosts; April was a mild month throughout, with a fairly high thermometer, and over three inches of rain (3·12); May, too, was a beautiful month, with a high thermometer all through, reaching as high as 82° on the 30th, and with scarcely any rain (0·44); June, too, was a brilliant month, with the thermometer every day above 60°, and with less than half an inch of rain (0·44) spread over four days; July also was a bright month with a high thermometer all through, but with four inches of very welcome rain; August was as fine, with less rain (2·28), and September was a very warm month, with 1·46 of rain only, and reaching to great heat in the last days of the month and the first days of October, which showed remarkable heat at the beginning and unusual cold at the end, the thermometer falling to 25° and frost continuing for more than a week, commencing from the 26th of October and reaching into the first week of November. Since that we have had very little frost, except a very slight frost on November 18th, but during the month of November there were nearly six inches of rain (5·94).

The notable points of the weather of the year then were three months cold, and for the most part very cold weather; three months drought; exceptional heat at the end of September, and exceptional length of cold in October; and it is the combination of these different points in one year rather than the particular nature of each point that is so remarkable. There have been many frosts of greater severity and length than the frosts of January, February, and March of this year; there are records of

greater heat and longer drought than this year's record shows; and it is not the first time that we have had great heat at the end of Autumn, and great cold at the commencement of winter; but it is the combination of all these in one year that makes the weather of the year remarkable. But it is not altogether exceptional; and by way of showing how very similar our present seasons are to those that our forefathers went through, I will give a short record of the weather of a season more than 500 years ago. In the 14th Century there was a William Merle, who was Fellow of Merton, and Rector of Driby, in Lincolnshire. He was a close observer of the weather, and has left a record of every week of the weather at Oxford during the seven years between 1337 and 1344. Of course, not having our modern instruments, his observations could not be very minute, but he has done his best to mark the differences. The rain record is either *pluvia magna* and *maxima*, or *parva* and *minima*, and for the cold his distinguishing marks are *gelu*, *pruina* and *glacies*. The record is called "Considerationes Temperiei per 7 annos per Magistrum Willelmum Merle, socium Domus de Merton—1337-1344." It is preserved in the Bodleian Library, and a few years ago was published in facsimile by Messrs. Stanford. Now the record for 1338-9 shows hard frosts during nearly the whole of December, January, and February, followed by a very hot June, July and August, but with slight interruptions of rain, and very mild throughout after the cessation of the frost. So far it is curiously like our record of this year—three months frost and three months drought; but the likeness does not altogether hold further, for in 1339 the whole of October, November and December were very mild but with much rain. I think this is a good answer to those who are fond of maintaining that the climate of England is different in this our 19th century to what it was in former centuries; it may be changed in some few parts where extensive tracts have been reclaimed from marsh and fenland or forests, but in the main it is absolutely the same; and so it always must be as

long as Great Britain continues to be an island washed by the Gulf Stream, and forming part of the Globe which travels round the Sun in the same course that it does now.

So much for the weather of the year; I now come to the question, what have been the results in the garden of the great frost, and what are its lessons? Whether the frost was exceptional or not it was very severe and very prolonged, and every gardener must have watched its results with anxiety. Certainly I did, and the thing that has struck me most forcibly is the very small injury that has resulted from it. Of course I had losses, and severe losses, and it may be well to name a few. I lost nearly all my Kniphofias and Cisti, and when I have said that I have exhausted my list of total losses. But among all plants, and especially among the shrubs, there was great disfigurement; there was a loss of many years' growth, and in many cases plants were killed to the ground. But there were some very curious exceptions. I have a fine specimen of the Californian Bay (*Umbellularia Californica*); it grows in a sheltered place, near my entrance porch, but in the winter of 1880-1, after standing uninjured for many years, it was killed to the ground, and was apparently so lifeless that many advised me to grub it up; but I was patient with it, and after two years it showed signs of healthy life, and is now 10 or 12 feet high, and during this winter scarcely a leaf was injured. All the Bamboos not only survived without injury, but seemed even to have acquired an increase of strength and vigour. Most of the New Zealand and South American plants, which we grow as hardy plants, but which are all more or less doubtful, stood the cold well; the Palms were very little injured; the Myrtles survived but had a hard fight for life; and even such tender things as the Jalap, the *Rhyncospermums*, *Solanum Jasminoides* and *Penstemon Cordifolium* were very little hurt. The curious thing is that in former bad winters, and in many winters which by comparison might be called mild winters, all these plants were very much more injured, and their escape

during the last winter may be attributed to three reasons. First, during the whole time of the frost the air was very still; there was very little wind; and I have always found that wind does more mischief to plants, especially to shrubs, than hard frosts. Secondly, the frost was continuous, with very few alternations of frost and thaw. The mischief done to plants is generally after a thaw, when plants begin to put out shoots and leaves, and if the frosts come back then, the results are disastrous. This was shown very strongly in an unexpected way—I found that many plants under a South wall or in sheltered places suffered more than the same plants in more exposed situations. I had three healthy plants of the New Zealand *Senecio Greyi*, all slightly protected against wind, but two of them in very sheltered spots, the third in the open garden, and of the three the two in the sheltered spots were entirely killed, the third was uninjured; and the same thing occurred with other plants. The third reason was that the frost did not come till the plants were well at rest. I am sure that a frost coming when the plants are still green, and their vessels full of sap, does far more harm than if it comes when the plants are all comfortable in their winter sleep. To me these reasons sufficiently account for so many of our plants coming unscathed through such a frost, but whether I am right or not the fact remains the same, that, though our plants had very little of nature's own protection of snow, they showed themselves well able to take care of themselves, and did take care of themselves far better than in some other winters which were far milder and much more destructive.

The great frost has taught me some lessons. I think the chief lesson that I have learnt is that I am more ignorant about frost and its effects than I thought I was; at any rate it presented to me a lot of fresh puzzles which I cannot answer. Another thing that I have learned is that to divide plants into hardy and tender is a most uncertain division, because, of many plants of the same species in the garden, some were killed by the frost and some

survived, and it would puzzle anyone to say whether for the future they should be ranked as hardy or tender. The instance I have just cited of *Senecio Greyi* is a case in point, and there were many such. In my own garden the New Zealand *Veronica Traversi* was injured but not killed; at Kew every plant was killed, while on the high land of Caversham, not very far from Kew, I saw many large bushes with not a leaf injured. An old vigorous plant of the *Indigofera* is probably quite dead, though I am not sure of it, but seedlings near it an inch or two high are uninjured, and it was just the same with *Euphorbia Characias*, and a strong plant of *Aristotelia* was quite killed, while a few feet away a half-struck cutting in the open ground lived and has been a flourishing bush. Another puzzle was this. Several shrubs put out good shoots but soon died entirely; and in that case I fancy that the shoots were living upon some reserve store of sap but the roots were dead and the supply could not be kept up.

And besides these puzzles the frost brought with it some pleasures, and some practical lessons. It is surely something to have seen the very worst winter that most of us are likely to see; something to be able to feel that whatever discomforts from the weather are in store for us we have left the worst behind. And it was a real pleasure when the frost once completely broke up, and the flowers began to come again, to see day by day the reappearance of some favourite of whose life you felt you had good reason to despair. This reappearance of lost plants went on all through the year, even to the end of October, and I believe it is not yet at an end. I shall not be surprised to see next year many plants again in their usual places, of which there have been no signs this year.

Another lesson is not altogether a new one; but I have had additional proofs to my old belief that the grand thing to provide, if we want to ensure the lives of tender plants, is to do all we can in keeping warmth at the roots. I consider mine a warm soil, and to that I largely ascribe my success in growing many plants

that will not grow in other gardens. This warmth of soil has been very severely tested this year. I have never taken the earth temperature of my garden at any time of the year, but very accurate records of earth temperature have been kept for many years at Regent's Park, which is a cold, clayey soil. There Mr. Sowerby has recorded that the coldest night of the year was February 7—when the thermometer stood at 7·5—but on that night at one foot below the ground the thermometer was 31°, and it was not till seven days after, that the earth temperature was as low as 28·2, when the air temperature had been steadily rising for some days, and all through the winter the earth never froze lower than one foot. The experience of the gas and water companies throughout the kingdom showed that the freezing of the soil depended less on depth than on the situation and nature of the soil. It was found that pipes laid at three feet below the soil on an incline facing to the North would freeze sooner than pipes laid one foot but with a Southern aspect; and pipes laid in a porous light soil were much less injured than those in a hard and heavy soil; and the pipes that were most injured were those laid under concrete. We may be quite sure that what is true of underground pipes is equally true of the roots of plants, with, however, this qualification, that the power of roots to withstand frost depends not only on their depth, or the warmth of the soil, but also on the rich or poor character of the soil. It was an old observation of Humboldt's, "In general it is remarked by cultivators that the trees which grow in a fertile soil are less delicate, and consequently less affected by great changes in the temperature than those which grow in land that affords but little nutriment."—Personal Narrative, vol. i, chap. 2. This seems natural, for it is the same in all animals; a healthy, well-fed man or animal can fight against cold far better than a weakly one, and there is a strong likeness between animal life and plant life; but this year's great frost has shown me one difference. In any animal, say especially man, there is a great centre of life in the

heart; if the heart is dead, the whole man is dead. But a plant seems to be, if I may say so, all heart, or a collection of hearts. Half or more of a plant may die, but if one good branch remains we can propagate a new plant from it, or, if it is killed to the ground and nine-tenths of the roots are destroyed, the remaining tenth is sufficient to renew the plant in full health and vigour. I have been much impressed with this this year. I have seen many plants coming to life again, and I know certainly that the new life has sprung from a mere thread, and the plant that comes is not a new plant, it is the old plant that has fought a brave battle against tremendous odds.

These are not the only lessons that the year's frost has taught me, but I must leave the rest, for I have still one or two things to note that I must not leave out. So on the subject of the lessons of the frost I will only add that I have learned more distinctly than ever that we really know nothing about the frost so far as plants are affected by it; I mean that on the initial question as to what are the chemical or structural or other constituents of a plant, which determine that it will be tender or hardy, the answer to that question seems as far off as ever.

The year was remarkable for the great abundance of flowers and fruits, but whether that was in consequence of the great frost, or in spite of it, I cannot say. There can, however, be no doubt that the long rest, followed by an absence of late frosts, was very beneficial to all plants. In my own garden I had a complete failure of all wall fruits, and I attribute this to the fact that from time to time the rest was broken from the sunshine on a South wall, when the trees were tempted to begin their growth, and then the frosts had full power over them. With me the great failure of the year was in Irises; but I am inclined to think that this failure was quite as much, if not more, due to the drought than to the frost.

I cannot say much of the effect of the frost on animal life. In

some severe winters I have seen numbers of birds lying dead ; this year I saw none, and I cannot help thinking that in the wonderful way in which birds are able to forecast the weather far better than we can, they had notice of the coming severity, and migrated in larger numbers than usual before the frost came. I do not think the extreme cold had much effect on the slugs and snails, I do not think it ever has ; their innate wickedness is a complete shield. But I think it had an effect on the insects ; I have had no such plague of earwigs as I noticed last year ; and butterflies were certainly much fewer than usual.

With one marked feature of the year I will conclude this long paper. We had literally no autumnal tints this year ; up to the middle of October the trees on the lawn were quite green, but the frost of the 22nd brought them all down, so that on the morning of the 23rd my lawn was thickly strewn with leaves, all green. A few retained their leaves, especially the elms, and for two days they put on a beautiful, golden appearance, but the heavy gales at the end of October stripped them all. To me this was a real loss in the beauty of the year ; I think a tree or shrub, however beautiful it may be in summer foliage or flower, only half fulfils its allotted task if it fails to show the beauty of its autumnal tints. I was more especially disappointed this year because I was hoping to watch the tints, and see how far our English experience would agree with the experience of American observers. You are aware that the Americans pride themselves on the beauties of their autumnal woods, and many good observers among them have done their best to find out the causes of the tints, and something of the laws which govern them. At present the conclusion seems to be that the tints are produced by the action of oxygen on the chlorophyll, acting in different ways at different times of the year, but in the autumn, when the strength of the tree is diminishing, producing a discolouration something analogous to the action on

metals by oxygen. They have also observed that the tints are far finer after a wet summer than after a hot and dry summer and the explanation is this :—

> "During a moist summer the cuticle of a leaf remains thin and its colours are vivid. In a dry summer this cuticle becomes thicker and harder, in order to prevent an injurious loss of water from the plant; and while bright colours may form within the leaf, they appear dull because seen through the opaque skin or epidermis."—*Garden and Forest, October 2nd*, 1895.

This certainly held true in my own garden, but I had several reports from other parts where the autumnal tints were reported to have been of exceptional beauty. At Dodington Park the colours were so brilliant that I received a special invitation to go and see them, but unfortunately I was not able to go. I got the same report from the Wye Valley; but I think both these cases rather prove the American rule. My garden, and especially the trees from which I look for autumnal tints, are fully exposed to the sun, while Dodington Park and the Wye Valley are not; and so in both those cases the hot sun of this year may not have had the same effect that it had on my garden. I cannot follow this subject further now, but I think it worth fuller observation in future years.

I am painfully aware that my paper has reached an abnormal length; but for that you must blame the abnormal character of last winter, its length and severity. I hope better things from this winter; I am not a weather prophet,—I can only hope and give no reasons for my hope. If any member would like to prophesy a severe winter, he is at full liberty to do so; if he can give a reason for his prophecy so much the better— or worse.

Notes on the Collection of Fossil Fishes from the Upper Lias of Ilminster in the Bath Museum. *By* ARTHUR SMITH WOODWARD, F.G.S., of the British Museum.

(*Read January 15th, 1896*).

The distribution of fossil fishes in the stratified rocks is very remarkable. With rare exceptions, good specimens occur only in certain definite thin layers where they are discovered in great shoals. Fragments are also often curiously swept together to form a veritable "bone-bed," perhaps not more than a few inches in thickness though extending over many square miles of country. Hundreds or thousands of feet of sediment certainly deposited in a sea well-tenanted with fishes, are not uncommonly destitute of all traces of their skeletons except an occasional tooth or scale; while a local layer in the midst of one of these series may unexpectedly reveal a rich and varied fauna. On examining specimens from such layers, it will often be observed that they exhibit a gaping mouth or some signs of contortion at death; there are also geological reasons for supposing that they have been quickly covered up with sediment. The general conclusion is, therefore, that whole shoals of fishes have been suddenly destroyed at these spots, either by an escape of noxious gases into the sea, or by a cloud of mud in some current, or by another unfavourable change in their surroundings. The various samples of the fish-life of different periods have thus been preserved by mere local accident; the discovery of them by us depends again merely upon accident. Hence our knowledge of the fishes of past ages consists almost entirely of little disconnected items culled from widely-separated zones scattered through the rocks of different parts of the world.

The period of the Upper Lias happens to be represented by

one of these instructive zones in at least six districts. There is one in Würtemberg, another in Bavaria; two are known in France (Departments of Calvados and Vassy); a fifth occurs in the cliffs of Whitby, and a sixth in the nodule-bed of the Upper Lias at Ilminster, Somersetshire. The careful exploration of the latter was undertaken by the late Mr. Charles Moore, whose unique collection is now arranged in the Bath Royal Literary and Scientific Institution; and it is to this beautiful series of fossil fishes that the following brief notes refer.

Fourteen genera and an uncertain number of species are found in these Upper Lias fish beds in Germany, France, and Yorkshire; but as yet only five or six genera are represented in the nodules from Ilminster. Of these few forms, all except *Pachycormus* are rare.

Lepidotus.

The first fish to be mentioned is no better preserved at Ilminster than in the other localities; and it has already been so thoroughly investigated by Quenstedt in Würtemberg, that the Moore collection does not add anything to our knowledge of its skeleton. It is a rhombic-scaled fish shaped much like a carp, and was originally mistaken for a species of this genus by the French naturalist, H. D. de Blainville, who named it *Cyprinus elvensis* in 1818. When Agassiz determined the existence of the primitive group of "ganoid" fishes about ten years later, he rightly removed the species from the bony fishes to this group, making it the type of his genus *Lepidotes* (1832) or *Lepidotus* (1833), but entirely re-naming it, *Lepidotus gigas*. Since Quenstedt's memoir in 1843, most writers have correctly described it as *Lepidotus elvensis*. The first specimen recorded in England is figured in Baker's "History of Northamptonshire" (1830), and was obtained from the Upper Lias of Stowe-Nine-Churches in that county. A closely allied species, *Lepidotus semiserratus*, occurs at Whitby.

Dapedius.

The fragment of *Dapedius* from Ilminster, like those from Whitby, is too imperfect for specific determination. Fine complete examples, however, occur in Germany, and a few are known from France.

Caturus.

The Moore Collection comprises one very fine and apparently unique specimen of a species of *Caturus*. Fragments either of the same or a closely-allied species from Whitby, are preserved in the Museums of Whitby and York; but no undoubted member of this genus has hitherto been described from the Upper Lias, although it is common in the Lower Lias below and in the Upper Oolites above. It is typically represented in the lithographic stone (Lower Kimmeridgian) of Bavaria, by the species of which the skeleton is shown in the accompanying Fig 1.

The interest of *Caturus* consists in its being almost identical in the head, internal skeleton, and fins, with the rhombic-scaled *Eugnathus*, though covered with thin deeply-overlapping scales. The only thick scales are retained on the little obtuse upper lobe of the tail (as well shown in the Ilminster specimen). Whereas all the scales of *Eugnathus* are thick and mostly united with peg-and-socket joints, those of *Caturus* unite solely by overlap, tend to lose their enamel, and become almost cycloidal. There can be little doubt, indeed, that the two fishes belong to one and the same family, and that the thin-scaled *Caturus*, which becomes "dominant" much later than *Eugnathus*, is a true link between the latter and the modern *Amia*, which now lives in the fresh-waters of North America.

As regards the specific determination of the Ilminster fish, it seems inadvisable to suggest a name for it without making detailed comparisons. Some of its principal characters, however, may be enumerated as follows:—

The length of the head with opercular apparatus is about equal to the maximum depth of the trunk, or perhaps slightly less, and

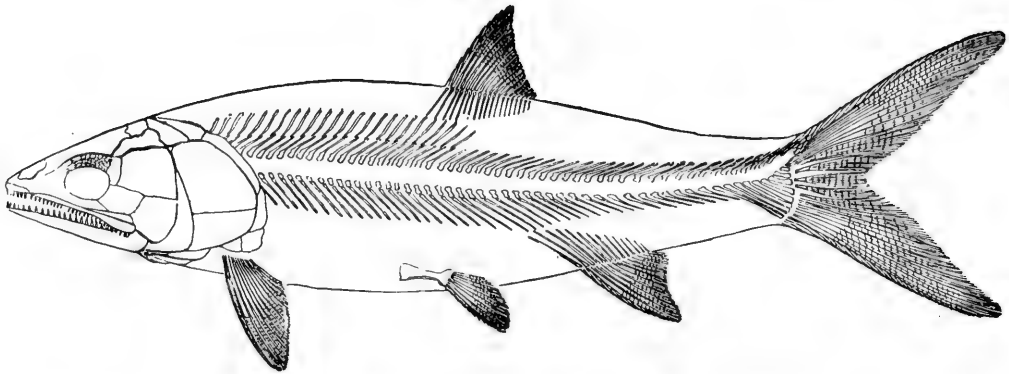

Fig 1. *Caturus furcatus, Ag.*

Skeleton with scales removed, much reduced in size.—Lithographic Stone, Bavaria.

[*From Brit. Mus. Catal. Foss. Fishes, Part iii, 1895.*]

contained nearly four times in the total length of the fish. The outer layer of the head-bones is much destroyed, and no tubercular ornament can be seen. Very stout, closely-arranged teeth are observed in the mandible. The operculum is somewhat deeper than broad, and the preoperculum exhibits a wide expansion; the width of the operculum equals that of the lower suborbital plate. The paired fins, the anal, and the lower lobe of the caudal fin are too imperfect to show the fulcra; but these are observed on the front border of the dorsal, and the upper lobe of the caudal fin. The pelvic fins arise almost exactly opposite the origin of the dorsal, and are much nearer to the anal than to the pectorals. The dorsal fin arises in advance of the middle point of the back, and comprises about 17 rays; the anal fin is twice as far from the caudal fin as from the pelvic pair; the caudal fin is not very deeply cleft. There are the usual enlarged postclavicular scales; and the exposed area of the middle flank-scales is slightly deeper than broad. All the scales are smooth, only very feeble traces of crimping at their hinder border being observable in the lower part of the abdominal region. The thicker scales on the atrophied upper caudal lobe have already been mentioned. The "lateral line" is marked only by notches in the scales. The total length of the fish is about 0·38 m.

Pachycormus.

It is noteworthy that among the ganoid fishes of the Mesozoic period, there are many forms which curiously mimic in outward aspect certain groups of modern bony fishes. Some have great pectoral fins and might be called "flying fishes;" others are armoured much like the "box fishes;" some are ribbon-shaped and with elongated snout like a modern *Belone;* others are almost eel-shaped. A detailed examination of the skeleton, however, shows that these are mere parallel forms of life and are not intimately related to the existing fishes which they mimic. They obviously belong to a much lower grade of their class, and

were only adapted to perform the same office in the economy of Nature in Mesozoic waters as their successors in the seas of the present day. The fundamental duties of life always remain the same ; fashions alone change.

There is no more striking illustration of this fact, than that presented by the family of Pachycormidæ, to which most of the Ilminster fishes belong. To all outward appearance they are "sword-fishes." The bones of the snout consolidate and form a prominent rostrum, comparatively short in the Liassic *Pachycormus*, a little longer in some species of the Upper Jurassic *Hypsocormus*, longest and forming a veritable "sword" in the Cretaceous *Protosphyræna*. To give power to this rostrum, the body becomes rigid and spindle-shaped, and the tail forks into two long slender lobes. The pectoral fins become elongated, narrow, and stiff, to assist exclusively in balancing ; the pelvic fins almost or completely disappear. Now, the modern "sword-fishes" (Xiphiidæ) possess a completely bony skeleton and the mechanical difficulties are readily overcome by the growth in size of the vertebræ, by their more firm union, and by the fusion of some of them to form a rigid fulcrum at the base of the powerful tail-fin. The Mesozoic *Pachycormus* and its allies, however, had a feebly ossified skeleton ; they were destitute of vertebræ, having only a persistent notochord with the usual slender arches above and below. The basis for the "sword-fish" type of trunk was thus entirely different, and the modifications for the required mechanical purpose are very interesting. The difficulty of the absence of vertebræ is overcome by the extreme multiplication of the arches above and below the notochord. The failure of all fusion of parts at the base of the tail-fin, is compensated for by the wide fan-shaped expansion of just one of the arches below the end of the notochord.

These features are shown in the accompanying restored sketch of the Upper Jurassic *Hypsocormus* (Fig 2) ; and they can be especially well observed in the fine series of specimens of

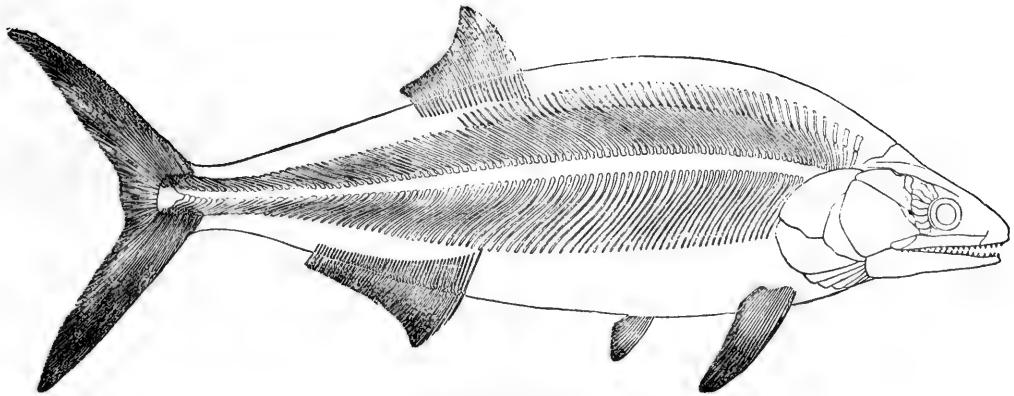

FIG 2. *Hypsocormus insignis, Wagner.*

Skeleton with scales removed, much reduced in size.—Lithographic Stone, Bavaria.

[*From Brit. Mus. Catal. Foss. Fishes, Part iii, 1895.*]

Pachycormus in the Moore Collection. No example is perfect, but nearly every specimen exhibits some point of importance.

Several specimens display the remarkable median ridge at the top of the back of the skull, which meets the high and arched trunk of the fish; and one detached example shows that the greater part of this ridge is formed by the frontal bones, the parietals being small and only meeting in the middle line for a very short space. This and other skulls are filled with calc-spar in such a manner as to suggest that there was a good deal of unossified cartilage in the cranium. One specimen, however, proves that the basioccipital, supraoccipital, exoccipital, and a hinder pair of otic elements were well ossified; though there is a gap between the supraoccipital, as preserved, and the cranial roof. The exoccipitals do not meet above the foramen magnum.

The fan-shaped hæmal spine at the base of the tail is also seen in several specimens, and distinctly shown to represent only a single segment of the vertebral column. A detached example of the tail exhibits three radiating grooves in this expanded bone; but they appear to be merely superficial, and probably do not imply its compound character.

The other features are so obvious in most specimens that no further reference need be made to them. It only remains to note that owing to the original shape of the fish, the fossils exhibit an extraordinary variety of contortion and dislocation, and it is difficult to ascertain their proportions. Without more detailed study and comparison than has hitherto been bestowed upon them, it is thus impossible to determine how many species are represented. In fact, the naming of the species of *Pachycormus* is still almost chaotic. The Moore Collection probably includes the typical *Pachycormus acutirostris*, the smaller *P. curtus*, and a new small-scaled species.

Saurostomus or Pachycormus.

The gem of this collection of Pachycormidæ, however, is a large fish about a metre in length with wide skull and comparatively

blunt snout. More fragmentary examples of the same species are also associated with it. This form seems to have been first known merely by the mandible, which was discovered in the Upper Lias of Baden and described under the name of *Saurostomus esocinus*, by Agassiz (1833-44). Fragments from Whitby received the MS. name of *Pachycormus latirostris*, Agassiz (1844). An imperfect skeleton from Würtemberg was at the same time named *Eugnathus gigas* or *Pachycormus gigas* by Agassiz, though again without description. A still finer skeleton from the same locality was briefly described and named *Pachycormus bollensis* by Quenstedt in 1858. Another skeleton probably of the same species from Würtemberg, was acquired by the Teyler Museum, Haarlem, and described as *Pachycormus westermani* by T. C. Winkler in 1878. Finally, a similar skull from the Upper Lias of Yonne, France, received the name of *Caturus gigas* from Sauvage in 1891. The species is thus well supplied with names, defined and undefined; but according to the ordinary laws of nomenclature, it must be termed either *Saurostomus esocinus* or *Pachycormus esocinus*, the specific name just mentioned being the earliest.

The unique specimen in the Moore Collection proves that the fish belongs to the Pachycormidæ as now understood; but one conspicuous feature suggests doubts as to the correctness of referring the species to the genus *Pachycormus* itself. It will be noticed that the roof of the skull is quite flat, not raised into a median ridge at the back, while its constituent bones are less completely fused together than in the typical *Pachycormus*. The same peculiarities may be very distinctly seen in the skull from Whitby. The scales also have a singularly curly appearance in the fossil; and the "lateral line" on the tail is supported by a row of somewhat enlarged scales, such as have never been observed in any undoubted species of *Pachycormus*.

Pholidophorus.

No other genus is represented in the Moore Collection from Ilminster, but it may be added that there is one specimen of the

head of *Pholidophorus* from this locality in the British Museum (no. P. 3704). The external bones and scales in this fossil exhibit a very fine and delicate rugose ornament, much like that of *Pholidophorus germanicus*, which occurs in the Upper Lias of Würtemberg and Whitby. It may even pertain to a variety of the species just mentioned.

Notes on some of the Court Rolls of the Manor of Forde. By the Rev. C. W. Shickle.

(Read January 29th, 1896.*)*

Manors, although as ancient as the Saxon constitution, are considered as of Norman introduction. The tenants at first resembled the Spartan Helots, and were either annexed to the soil or to the person of the lord.

They held their land at their lord's will, and if they purchased any without his consent, the lord could seize it unless they effected a sale, and in many places a fine was payable if a villein married his daughter, or a widow took a second husband without the lord's consent.

Though holding at will, the custom of each manor preserved and made known to us by the manor rolls, afforded them some protection, and as the tenants had nothing to show for the title of their estates but these customs and entries, they were called tenants by copy of court roll or copyholders.

These courts were generally held twice a year, when a register was made of all changes which had taken place within the manor since the last court, and an account rendered of the fines levied for breaches of custom and trespasses into the defended places of the manor.

A perfect collection of all the Court Rolls would therefore give us the history of every family of the lower class throughout the kingdom, and those which have been preserved are not only interesting but valuable.

The Court Rolls of the Manor of Forde, preserved at the Record Office, range from 3 Ed. II. to 1 Hen. VI., during which time the liberties of the lower orders were considerably augmented and consolidated.

The first paper is the record of the Halmote, or Court leet, held Thursday after the feast of S. Alphege, 1309, and is by far the most voluminous, giving the names of the various villeins on the manor who seem at that time to have already commuted all or a part of their forced labour for money payment.

The names which appear in the rolls are interesting, and many of them are well-known at the present time. The families of Lippiatt, Neate, Horsman, Germaine, Gerrish and Gill, all appear to have had ancestors at Bathford; not to mention the commoner names of Duke, Palmer, Fox, Fowler and Fisher.

Court Rolls, Portf. 198, No. 27.

Ford.—Halmote held there on Thursday next after the Feast of St. Alphege in the third year of the reign of King Edward [ii. 24 April A.D. 1309].

The whole vill gives to the lord for the ancient and accustomed gift	vij*s.*
For works of the vineyard	xiij*d.*
Roger Hereward	vj*d.*
Geoffrey Feraunt. With the lord	
Richard Feraunt	Dead
Philip de Ecclesia	vj*d.*
William Moyon	vj*d.*
Nicholas his brother	vj*d.*
Roger Gyl, 2 capons and he owes 22 of arrears	
John atte Wyth	vj*d.*
John Cole	vj*d.*
Adam Fisher (Piscator)	vj*d.*
Richard atte Wall	vj*d.*
Thomas Cole	vj*d.*
Roger atte Lupezete	vj*d.*

Forde.—Roger Bynethweye. With his father
William Otlegh. With the lord
John le Fowelar. With the lord
John Fisher (Piscator). With the lord
Henry Germayn. With his father
Richard atte Lupegate. With his mother

Walter Germayn	...	...	...	...	j*d.*
John atte Wall	...	...	...	...	iij*d.*
Thomas atte Lupezete		...	...	...	vj*d.*
Thomas Pochon	...	...	...	...	vj*d.*

Geoffrey Herebard. With his father

John Miller (Molendinarius)		...	...	...	vj*d.*

Richard atte Lupezete. He has lands
Thomas Pochon, the younger. With the lord

John Corbyn ...	...	...	...	...	vj*d.*
Adam Pochon	...	...	...	...	vj*d.*
Walter atte Lupeghate		...	...	...	iij*d.*
John Otlegh ...	...	...	...	...	vj*d.*

Richard Scarlet. With the lord
Henry Feraunt. He has lands
Richard Upyntoun. With his father
William atte Walle. With his father

William Le Hert	...	...	...	...	iiij*d.*
William Le Fox	...	...	...	...	Dead

John Le Hert. With his father

William Le Fox	...	...	...	...	iij*d.*
Ralph Le Fox	...	...	...	...	iij*d.*

Walter Le Fowelare. With his father

William Upyntoun	...	...	...	...	iij*d.*
William Cole ...	...	...	...	...	ij*d.*

Attach.—John Upehal puts himself in the mercy of the lord for 5 sheep iij*d.* in defended places.
ij*d.* William Le Fowel for 18 sheep in defended places.
iij*d.* Thomas Bigge for 5 pigs in defended places.
ij*d.* Henry atte Tounesend for same.
ij*d.* Thomas le Crop for 6 sheep in same.
Respite.—The prior of Ferlegh for 4 foals in the wood.

ij*d.* Nicholas Vendebole for 2 horses in the pasture.

ij*d.* The rector of the church of Ferleigh for one horse in defended places.

ij*d.* Nicholas Vendebole for one pig in defended places.

iij*d.* Thomas Le Baynset for one horse in same.

iij*d.* William Parsen for 20 sheep in same.

j*d.* Roger Le Duke for one cow in same.

ij*d.* Robert Godron for 10 sheep in same.

j*d.* Thomas atte Wall for one cow in same.

ij*d.* William Le Palmare for 3 sheep in same.

ij*d.* John Feraunt for 15 sheep in same.

j*d.* Robert Le Carpenter for one cow in same.

ij*d.* Richard Hereward for 10 sheep in same.

ij*d.* Thomas Le Duke for 10 sheep in same.

iij*d.* Walter Herevard for 20 sheep in same.

ij*d.* Roger atte Lupezete for same.

j*d.* Robert Le Carpenter for one cow in the meadow.

ij*d.* Walter Goole for 3 pigs in defended places.

ij*d.* Roger Clerk for 5 sheep in same.

ij*d.* William Germayn for same.

j*d.* Robert Godron for two cattle in same.

j*d.* John Scarlet for 3 sheep in same.

Condoned by order.—The lady of Batheneston for 4 pigs in same.

iij*d.* Geoffrey Upehul for 4 pigs in same.

ij*d.* William Le Fowel for same.

Respite.—The prior of Ferlegh for 6 foals in the wood.

ij*d.* Nicholas Vendebole for 3 sheep in the wood.

ij*d.* Richard Douere for 4 oxen in defended places.

j*d.* Nicholas Le Fowelare for 6 sheep in same.

ij*d.* William Smith (Faber) for same.

j*d.* Walter Gyle for 10 sheep in same.

vj*d.* William Smith (Faber) for trespass committed in the wood.

* * *

Be it remembered that Richard Le Tylere of Heysindon and Reginald of the same bought a certain messuage which Richard Le Vox of Ford at one time held for the term of their lives. And they give to the lord for entry 10*s* and for rent every year 2*s* 6*d.*

Be it remembered that William atte Putte bought land formerly of Richard atte Putte, and he gives to the lord for entry 54*s* 4*d*. And he has a day for payment, &c., by the pledge of Thomas Zely.

Court Rolls, Bundle 198, No. 29.

Forde.—Halmote of the tourn of Hokeday, held there on Wednesday, viz., the 27th day of the month of April, in the first year of the reign of King Richard ii [A.D. 1378].

Henry Palmere ... ... vj*d*.
Richard Goudron ... ... vj*d*.
Henry Sely ... ... Fled.
Roger Churcheman, Henry Walman, Richard Goudron, Thomas Oteley ... ... With the lord.
William Neet, John Goudron, Roger Duke, William Selye ... ... Fled.
John, son of Robert Herbard, Joan and Felicia his daughters.
John, son of John Scarlet ... ... Fled.
Robert Boryet has John (13), Thomas (8), and Matilda (5)
Richard Goudron has four daughters and John of the age of five years.
Henry, son of John Walman; John, son of the same John ... ... Fled.
John, son of William Churchman; John Gyle, son of John Gyle ... With the Lord.
Thomas Lupeiate has Robert of xvj years.
The same Thomas has Katherine (she is dead) and Agnes.
Roger Churchman, dwelling at Aysshton, has Walter and three sons, and they dwell there.

* * *

Joan Wheler and Sibilla Urpyngton are widows. But Sibilla married by the licence of the Lord.

Forde.—Nicholas Acton in mercy because he did not cause one stage to be removed.

Henry Sturge took from the lord one messuage and one ferdell of land, which John Urpenton formerly used to hold, by taking to wife Sibilla, relict of the said John, &c.

John Kelueston, who held one messuage and fardel of land which John Ferraunt formerly held, surrendered into the hand of the lord. Whereupon there fell to the lord for a heriot one ox of the worth of 15*s*. And the said ox is lent to the same by the chaplain till the Feast of St. Michael, so that he produced the said ox or 15*s* at the same Feast by the pledge of Robert Boriet and John Sely, &c.

Walter London took the said tenement, with the appurtenances, to hold in villeinage, performing and rendering all the works, rents and services which are incumbent on the said tenement from olden time, and as Henry Feraunt at one time was wont to render and do, &c. And he gives for a fine 1*d*, and he did fealty.

It is presented that the tenement formerly of John Bonde, which Geoffrey Pert holds, is in great damage.

The tenement of John Hoke is uncovered, Therefore he is ordered to cause it to be repaired.

COURT ROLLS, PORTF. 198, No. 29.

Forde.—Halmote of Mich. term held there on Saturday next before the Feast of St. Luke the Evangelist. 2 Richard ii [22 Oct. A.D. 1379].

The whole homage present for the certain rent 6*s* 8*d*.

Thomas Herward for the whole homage presents that Thomas Oteley (iij*d*), Henry Sely (iij*d*), William Sely (iij*d*), Roger Duke (iij*d*), William Neet (iij*a*), and John Godroun, who are bondtenants of the now lord, &c., formerly made default, &c.

COURT ROLLS, PORTF. 198, No. 30.

Fourde.—Halmote of Hokeday term held there on Friday, 25th May, 9 Ric. ii [A.D. 1386].

Fourde.—The homage present for the certain rent 6*s* 8*d*.

Roger Churchman has Walter (25), Robert Boryet John (21), Thomas (13), John (3).

Richard Goderon for headsilver, 6*d*.

Headsilver 18*d*.—John, son of William Churchman, for the same, 6*d*.

Robert, son of Thomas Lupyzate, for the same, 6*d*.

Also the homage present that Walter Umfrey (2*d*), Henry Palmere (licence) make default, therefore in mercy. And that Walter atte Fenne (12*d*), William Horsman (12*d*), Walter Goderon (12*d*), Henry Duke (he paid) refused to present the certain rent. Therefore they are in mercy. And nevertheless it is ordered to distrain them to pay, &c.

Walter Umfrey allowed his tenement to be ruinous. Therefore in mercy.

John Gyle with the whole homage in mercy because they have not John, son of John Gyle, a bondtenant by blood, as they had in command.

The whole homage in mercy because they had not Roger Duke, Henry Sely, William Neet, William Sely, John, son of John Scarlet, bondtenants of the lords by blood.

William Churchman, a bondtenant of the lord by blood, got from the prior of Farlegh one toft and one close with the land adjacent, called Foliett, against the custom of the manor. Wherefore it is ordered to seize the said tenure into the hand of the lord until, &c.

Henry Walman, a bondtenant of the lord by blood, got from the prior of Farlegh one croft of land for the term of his life. Wherefore it is ordered to seize the said croft into the hand of the lord.

John Honk puts himself in mercy for licence to agree with William Coumb in a plea of withholding chattels.

William Vybery gives to the lord for a fine 10*s*, as well for having entry into a tenement with land adjacent, which Thomas Harewode formerly held, as to take to wife Agnes who was the wife of the said Thomas. To hold

and to have as an ancient hearth in villeinage according to the custom of the manor. Paying 8*s* therefore by the year, &c. He shall do all the chief works as the other tenants of the same manor do, and he shall give church-silver and the Pence of the Blessed Peter, &c. By the pledge of John Germeyn. And he has seisin thereof. And he did fealty to the lord.

COURT ROLLS, PORTF. 190, NO. 30.

Fourde.—Halmote of Mich. term 3 Oct. 10 Ric. ii [A.D. 1386].

Richard Berkele permitted his tenement to be ruinous at the mill, therefore in mercy.

It is granted by the lord the prior to Richard Bridde and Margaret his wife that they may have entry into a messuage and one fardel of land which John Bonde formerly held. To hold and to have in villeinage according to the custom of the manor. Paying 8*s* therefore by the year, &c.

Fourde.—Halmote held penultimate day of Oct. 11 Ric. ii [A.D. 1387].

John, son of William Churchman, Henry Sely, John son of John Scarlet, William Neet, William Sely, bondtenants of the lord, made default.

William Churchman permitted a cottage, called Colehous, to be ruinous to the damage of the lord, therefore in mercy, &c.

COURT ROLLS, PORTF. 198, NO. 33.

Forde.—Halmote held there 3 Sept. 1 Hen. vi [A.D. 1422.]

To this court came William Geryssh and took from the lord one messuage and one fardel of land of the ancient hearth, which Robert Geryssh formerly held. To hold in villeinage according to the custom of the manor, &c. And he did fealty to the lord.

To this court came John Samford and surrendered into the hand of the lord one messuage and one fardel of land of the ancient hearth. Whereupon there fell to the lord for a heriot one red cow of the worth of 4*s* 6*d*, &c.

Forde.—To this court came Thomas Pert, and surrendered into the hands of the lord one messuage and one fardel of land of the ancient hearth. Whereupon there fell to the lord for a heriot one sheep of the worth of 14*d*, &c.

To this court came John Lupeyate and surrendered into the hands of the lord one messuage and one fardel of land of the ancient hearth. Whereupon there fell to the lord for a heriot 10*s* in the name of a heriot, for which the reeve is charged. And thereupon came Richard Tournay and gives to the lord for a fine 13*s* 4*d* for having entry into the messuage and land aforesaid. To hold in villeinage according to the custom of the manor, &c. And he has seisin. And he did fealty to the lord.

To this court came Richard atte Fenne and surrendered into the hands of the lord one messuage and one fardel of land of the ancient hearth. Whereupon there fell to the lord for a heriot 10*s* in the name of a heriot. And thereupon came Thomas Bugley and took from the lord the messuage and land aforesaid. To hold in villeinage according to the custom of the manor, &c.

Parish of Cold Ashton, Gloucestershire. *By* THOS. S. BUSH.

(Read 29th January, 1896.*)*

Time will not permit me to give more than an outline of the history of this parish. The following notes commence from the earliest record, A.D. 931, to the beginning of the 17th century, besides these I have many extracts from Documents, Court Rolls, Lay Subsidies, Chancery Inquisitions, Wills, &c., at the Record Office, British Museum, Somerset House and elsewhere, relating to the parish and its people. The first record will be found in the Bath Abbey Chartularies, some of these documents being in possession of Corpus Christi College, Cambridge, and others at Lincoln's Inn, and referred to as C.C.C.C. and L.I. These Chartularies have been published by the Somerset Record Society, so that it will not be necessary for me to give them in full.

In C.C.C.C. Dated 931 will be found a grant by King Athelstan of lands at Pristun and Cold Ashton to the Bath Monastery, "Deo omnipotenti, et Sancto Petro Apostolo, ac venerabili familiæ quæ sita est in low celebri ubi ruricolæ appellativa relatione nuncupantur æt Badum, . . . decem mansas in qui dicitur Prisctun, et quinque in alio loco qui dicitur Æsctun . . . His testibus conventientibus quorum inferius nomina recitantur. Anno dominicæ in carnationis dccccxxxi acta est hæc præfata libertas. Ego Æpelstan rex totius Brittanniæ præfatam donationem cum sigillo sanctæ crucis confirmavi." Then follows in Anglo-Saxon the boundaries, under "Divisiones Aesctona" will be found several names that are in existance now. The next record CCCC is the restoration by King Edwy of the Convent lands at Olveston and Cold Ashton, previously granted by Athelstan and taken from it unjustly, there is no date to this, but it must have been from 955 to 958, the years Edwy reigned. "Quo circo ego Eadwig basileus, Albioni Monarchis viris ecclesiastesis præ cæteris operam impendere curabo, quatinis meritis et precibus sanctorum corum numero merier congungi in cœlis. Unde et mansas v æt Ælvestone et alias v mansas æt Æsetune quas patruelis meus Æpelstanus rex obtulerat ecclesiæ beati Petri apostolorum principis, quæ sita est Bathonis civitate, &c." In C.C.C.C. is a confirmation by King William of the Grant by King Edward to the Convent of Bath of 5 hides each at Olveston and Cold Ashton, with the concession that 2 hides at either place should be exempt from payment. In "an analysis of the Domesday survey of Gloucestershire" by the Rev. C. S. Taylor, published by the Bristol and Gloucestershire Archæological Society, will be found very interesting matter relating to the whole of that county. In Domesday survey, under the head of Terra Eccle 'de Bade, it is mentioned that this church holds Esctone in Pulcrecerce (Pucklechurch) Hundred. There are 5 hides, of which 2 are quit from geld by Grant of Kings Edward and William, but three are taxed. In Demean is one plow tillage and 2 Villium and 3 borders and 1

radchemister having amongst them 3 plow tillages. There is one colibert and a mill of 50 pence and 6 acres of meadow, it is worth and was worth £4. The following are some further extracts from the Chartularies. In A.D. 1156 Application by Bishop Robert to Pope Hadrian for confirmation of the estates held by the Monastery of Bath, a list of the estates is given. Dated at Benevento per manum Rolandi.

Grant by Prior Robert and the Convent to Richard Burel, his clerk of the Church of Aixton. Witnesses Henry Hosat de Tatwick, Henry de Cherlcumb, &c. There is no date to this but Robert was Prior of Bath from 1198 to 1223, when he was appointed Abbot of Glastonbury. This appears to be the first record of an appointment to the Church of this Parish.

Another Grant by Prior Robert is to Robert Launcestone, of the office of farm bailiff in the Manor of Hameswell, together with the Chamber in the said Manor which the farm bailiffs are accustomed to have.

On page 152 will be found a lengthy document, the first part of it gives the rites and customs to be observed on the death of a brother of the house—the Monastery—next is given the commemoration of benefactors and their gifts.

There are several documents bearing date A.D. 1330, one being a Writ by the King to the Barons of the Exchequer to search the Records to see if the Prior of Bath holds the lands of this parish in free and perpetual alms and not by Knights service, that is to say that he is not bound to pay an aid for the eldest daughter of King Edward. Another Writ to make inquisition concerning the same, and a further Writ to the Sheriff of Gloucester to supply a jury. The Inquisition was held at Sodbury. The jury say that the

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NOTE.—Hadrian or Adrian IV. was Nicholas Brakespeare, the only Englishman who has held the Papal chair. Pope from 1154 to 1159. Robert was Bishop of Bath, and Rolandi, a Cardinal Priest, became Pope as Alexander III. in 1159, died in 1179.

lands were not held by Knights service. Then follows another Writ from the King to the Sheriff not to distrain the Prior, &c. In A.D. 1357 there was a Writ by the King to acquit the Prior from payment in aid of making the King's son a Knight if the lands are held free.

There is a Conveyance, A.D. 1345, by John, Prior, &c., to Master Stephen Maler and William Partchay, of the custody of lands, &c., of Simon Torney, viz., moiety of the Manor of Tatwyk which said Simon held of the Priory by Knights service and also the wardship of John, son and heir of the same Simon within age.

The earliest record of this family—Torney, Turnay, Tornay, &c.—in connection with this parish is 18 years earlier than this conveyance, viz., in a Lay Subsidy A.D. 1327, wherein Simon is mentioned. Other members of the family are referred to in various documents up to A.D. 1467.

When the members of this Club visited Torner's Court last year —1895—they assembled in a building locally called the Chapel, this building is about 78 feet long by 28 feet wide, with a good roof, the general consensus of opinion being that it was built for a barn, probably in the 14th century. In the Chartularies there is an Agreement, A.D. 1302, that Elias de Sancto Albano should enfeoff the Prior, &c., of his moiety of the Manor of Tatwick in Counties Gloucester and Somerset for two chantries. One monk to celebrate at the altar of S. Martin's, and one a secular Priest, to celebrate in the Parish Church of Cold Ashton in the Diocese of Worcester, in the Chapel of Tatwick within the Parish aforesaid (this Parish was in the Diocese of Worcester up till about A.D. 1540). This is the first record of this Chapel that I have met with, the last being in A.D. 1629.

There are three Manors in this Parish, viz., Cold Ashton, Hameswell and Torner's Court, these continued to be held by the Abbey of Bath till the dissolution of Monasteries by King Henry VIII. Warner in his History of Bath says, that the King in 1535 appointed Commissioners to enquire into the value of Monasteries,

they were for Bath, Henry Cassell, Knt., Henry Covell and John Browne. Henry VIII. granted these Manors with the advowson of the Church to Walter Denys, he to pay £760 11s. 8d. for the same. On the 26th May 2 Elizabeth (1560), Sir Walter Denys grants a lease of this property with the advowson of the Church to his son and heir Richard. He to pay to Sir Walter £50 at the Feasts of St. Michael, the Nativity of our Lord, the Annunciation, and the Nativity of St. John the Baptist. In 1564 Walter Denys, Knight, Richard Denys, Esq., and Anne his wife, sold these Manors with the advowson of the Church to William Pepwall for £840. Notes of Fines. Trinity 6 Elizabeth. Some of the County Historians state that the Manors passed from the Denys family to the Stratfords, John Stratford held Cold Aston or Aston Blank. See fines 18 and 32 Elizabeth. William Pepwall, in his will 1 Feb., 1571 (Orphan Book of Wills published by the B. and G. Archæological Society), of the Cyttie of Bristoll, Alderman, leaves to his son Michael and his heirs the Manors, &c., at Coldashton, Hamestwell and Tatwicke, purchased of Sir Walter Dennis, Knt., deceased, and Richard Dennis, Esq.; but wife Elizabeth to have this property for her life as being jointe purchaser thereof with me. She is also to enjoy the parsonage there with the mansion, lodge, &c. To said Michael the property at Tatwicke purchased of Edward Teinte in the tenure of Guninge. To son Timothy the advowson of the benefice of Coldashton after the decease of the parson there, &c. This will was proved in June, 1574. His widow Elizabeth Pepwell made her will 10 June, 1591 (also Orphan Book of Wills) of the Cyty of Bristoll. She leaves £10 for the repayringe of the highe wayes betweene Bristoll and Coulde Aisheton, Forty shillings to the repairing of the Church of Colde Aishton. Legacies to the parson of Colde Aishton John Tayler and Thomas Gunninge "Baylye of Coulde Aishton." To John Gunninge, "nowe my servaunte and apprentyce," who is to tarry and abide in the "howse and shoppe" of testatrix by the space of two years next after her decease, "to

thintent" to gather her debts, and make sale of her wares, she gives "for his paynes" five marks in money at the coming forth of his apprentishippe, &c. This will was proved 24 July, 1591. Michael Pepwell succeeded his mother and died seized of these Manors on the 18th October, 1596, as shown by an Inquisition held at Bristol 4th May 40 Elizabeth, 1598, before John Webbe, Mayor of that City. Michael Pepwall, of Bristol, Alderman, in his Will 4th June, 1596, and proved 29th Oct., 1596, by son John, desires to be buried near his father and mother in the Church of Cold Ashton. He leaves all lands, &c., to son John, he to be exor., failing him to son Michael. To son Mathias the reversion of the farm of Hamswell, provided he shall not sell any of his estate to any of the kindred of the Whitingtons, for that my father gave me in charge in his death bed to the contrary. To son Samuel the reversion of Gounings living my tenant during his life.

William Pepwall was Mayor of Bristol in 1558-9 and 1568-9, and his son Michael was Mayor in 1593-4.

John Pepwall succeeded his father Michael.

In 1546 Robert Whittington, who married Eleanor, daughter of Richard Murselys, of Dyrham, co. Glos., leased Hamswell of Sir Walter Denys and Richard his son. Robert was buried at Cold Ashton, 25 April, 1578, and his wife buried there 14 June, 1590. Their son and heir John Whittington, who married Anne daughter of John Chambers, of Marshfield, lived there, he was buried at Cold Ashton 13 July, 1616, and his wife buried there 4 April, 1629, their son William Whittington purchased Hamswell of John Pepwall in 1622. Recovery Roll. Mich 20 Jas. I. This William married Joyce, daughter of Wm. Blanchard, of Batheaston, he buried at Cold Ashton 5 Oct., 1649, and his wife buried there 25 Feb., 1650. Their son William, who married Mary, daughter of Wm. and Susan Blanchard, of S. Katherines, predeceased his father, viz., was buried at Cold Ashton 25 Aug., 1643, and their son William Whittington first

lived there and then at Stapleton, near Bristol. He settled Hamswell upon John, son of William Whittington, of Weston, he was buried at Cold Ashton 20 September, 1715. This John died intestate and was buried at Cold Ashton 25 Nov., 1743. The next of this family who appear to have lived there was Thomas, who married Ann, daut. of Henry Fisher, of Limpley Stoke, he died in 1792 and his wife in 1813. Their second son (but heir) Robert first married Mary, daughter of Wm. Croome, of Pucklechurch, she died in 1813, he secondly married Elizabeth, daughter of Robert Bush, of Tracy Park. She died in 1835, he died in 1839. I believe this was the last of the family who lived there, but the property has continued in possession of the family to this day. This Robert Whittington's brother John was Rector of Cold Ashton from 1795 until his death in 1842, aged 70, he first married Rachael, twin sister with Mary Croome, and secondly Elizabeth, daughter of James Joyce. John Pepwall sold the advowson of Cold Ashton to Sir George Farewell, of Hilbyshope, for £120, Ind. 10 Aug., 1629, and Sir George sold it to Susan Blanchard, of S. Katherine, widow of Wm. Blanchard for £310, Ind. 20 Sep., 1636. Susan Blanchard sold it to William Whittington, of Bath, who married her daughter Mary—mentioned above—in consideration of her love for her daughter she sells for £100. Ind. 8 January, 1636-7. The many Court Rolls that I have extracts from, ranging from A.D. 1309 to 1506, are all dated at Hameswell, that is the "Halmotes" were held there.

In A.D. 1629, John Pepwall sold the Manors of Cold Ashton and Torner's Court to John Gunning, senior, and John Gunning, junior, both of Bristol. In the Apprenticeship Book at the Council House, Bristol, is an entry 24th August, 1583, John Gunninge, son of Thomas Gunninge, of Cold Ashton, co. Glos., apprenticed to Elizabeth Pepwall. Earlier in these notes it will be found that this John is mentioned in her will. Thomas, the father, was no doubt the same as he who had lease of Torner's Court of Elizabeth Pepwall, his will is dated there in 1602. John,

senior, married Joane Whisonson in 1593. He was buried in the crowde (crypt) under S. Nicholas Church, Bristol, 28th May, 1645. His son John (mentioned above), one of many children, was baptized in 1599, he married on the 13 February, 1625, Elizabeth, daughter of John Barker, Merchant, of Bristol. This John lived in one of his father-in-law's (John Barker) house in Small Street. He was buried in S. Werburgh Church, Bristol, Nov., 1662, and his widow buried there in December, 1669.

John Gunning, senior, was Sheriff of Bristol in 1613, and Mayor in 1627-8, John, jun., was Sheriff in 1631 and Mayor for three quarters of a year 1645-6. The Commons Journal of 1st Nov., 1645, says, "An ordnance for removing of Francis Creswick, now Mayor, from the place of Mayor, and for admitting and swearing of John Gunning in his place, &c., was this day read the 1st and 2nd time upon the question, passed, and ordered to be sent unto the Lords for their concurrence." He was again Mayor in 1654-5. He had eight or nine children, three or four died young. At his death his son Robert—afterwards Sir Robert—who was born in February, 1630, succeeded to the property. He married Ann Cann. He died in Oct., 1679, leaving one son Robert, who only survived his father about 2 years, the property then went to Sir Robert's two surviving sisters Joane and Elizabeth, his brother John having died in 1677, and his sister Mary in 1679. Joane was born in Feb., 1638, and married in June, 1659, Edward Strode, of Shepton Mallet, one portion of the property with Torner's Court remained with this family for some years and after several changes was a few years ago purchased by Sir Robert Blaine. Elizabeth was born in June, 1641, and married in Dec., 1658, Thomas Langton. His first wife was Hester Cam, whom he married in 1654. This portion of the property—Cold Ashton Manor—has remained with that family, now Earl Temple, to this day.

With reference to the Gunning Family—the name is spelt in many ways—Gonewyn, Gunwyn, Gonwyn, Gonning, &c.—the

first record of them is in a Court Roll, A.D. 1437, so that their connection with this Parish commenced at least 450 years back, and apparently it has continued throughout that time. The arms granted to the Gonnings, of Bristol, in 1662, Gu, three cannons barways per pale arg, may be seen on the Manor House, which is close to the Parish Church of Cold Ashton. This house might have been commenced building by John, junr., and completed by his son Sir Robert, or more probably built entirely by the latter. Hamswell House would appear to have been rebuilt early in the 17th century. Over the porch are the Whittington and Blanchard arms (the latter do not seem to be quite correct). It is difficult to fix a date to Torner's Court, tradition says that it was partially burnt down in the last century. At the beginning of this month, having been kindly granted permission by Sir Robert Blaine to take particulars of the building at Torner's Court, now used as a barn, Mr. Wallace Gill accompanied me there, he took measurements and afterwards favoured me with a drawing of the building and of the roof as seen from the inside.

Summary of Proceedings for the Year 1895-96.

MR. PRESIDENT AND GENTLEMEN,—

The Field Club inaugurated its forty-first anniversary on Monday, February 18th, at the Royal Literary and Scientific Institution, and all the officers of the preceding year were re-elected. The number of members stood at 96 and the Treasurer announced that the balance of the funds in favour of the Club was this year £33 18s. 7d. against £31 13s. 8d. the year previous.

The first paper read before the Club was contributed by Mr. Percy Bate, Curator of the Holburne Museum on "Bath and its Miniature Painters." *(Printed at page* 209.*)* Canon

ELLACOMBE presided, and there was a numerous attendance of members including Mr. H. D. Skrine, Rev. C. W. Shickle, Rev. P. Williams, General Bally, Col. Fanshawe, Major Davis, Major Evans, Mr. Holst, Mr. W. Handyside, Mr. F. Shum, Mr. E. G. Bradford, Mr. Barlow, Mr. Egbert Lewis, Mr. F. Inman, and others.

After a few introductory remarks on the art of miniature painting in general, the lecturer went on to say that, as was to be expected, the rise of miniature painting in Bath was contemporary with the commencement of the vogue of Bath as a fashionable resort, and the first quarter of the 18th century, which saw the growth of the city in the esteem of the beau monde, saw also the earliest trace he could discover of a miniaturist working here. 1787 is the earliest absolute date, being that of a drawing by Bernard Lens in the Royal Institution. He was succeeded by Thomas Warlidge, an artist who lived for many years in Bath, and married a girl of great beauty, who was the daughter of a toyman of the city. Warlidge drew miniature portraits in pencil, and gained great reputation for them, and for his very beautiful etchings of portrait heads and gems. Before passing to consider the work of the artists, more than 30 in number, who painted miniatures in Bath, the lecturer spoke of the possibility of others of local birth having commenced their careers here, notably Miss Biffin, who was born at East Quantoxhead without either hands, arms, or legs, but who, by great perseverance, succeeded in becoming an artist. The two Plimers, Andrew and Nathaniel, whose reputation stood deservedly high, and Miss Andras, who practised the sister art of modelling portraits in wax, about the end of last century. After alluding to the portrait of Joseph Plura, modelled by himself in this material which was exhibited, Mr. Bate spoke of the work of Lacon (who also kept a puppet show here), of Samuel Collins, and of his pupil, Ozias Humphrey, who lodged with the Linleys, and painted miniatures of great delicacy and charm. The miniatures of J. H. Barwell, who

died in 1785, aged 21, were remarkably good, and painted in a peculiar manner, the medium employed being wet crayon. The lecturer also spoke of the work of Charles Sheriff, a deaf and dumb artist, who painted Mrs. Siddons here, and said how interesting it would be to compare that version of Mrs. Siddon's stately beauty with the portrait drawn about the same time by Sir Thomas Lawrence, who was then as a boy producing small portraits in Bath. The difficulty of tracing the work of some miniaturists was alluded to, many artists being recorded in Bath books whose portraits are quite unknown, and the converse instance was also given of Sir Walter Scott, who as a boy had his portrait painted in Bath, in 1777, though the artist's name was unrecorded; and the lecturer alluded as well to the miniature he showed, by Browning, Bath, 1820, stating that all his endeavours to trace any particulars of the artist had been vain. The miniaturists who worked here fell perhaps into two classes, the one including those who like Collins and Humphrey were only temporary residents, the other comprising those who made Bath their permanent home. Among these last were Roche and Hutchisson, whose interesting portrait of the composer Rauzzini was shown, and many others of merit, such as Abraham Daniell, the producer of reserved and dignified work, and Charles Jagger, who at his best painted portraits in a strong yet delicate fashion that was beyond praise. Succeeding to these was Scovell, an able draughtsman, and Charles Ford, whose carefully drawn and richly coloured work was well represented on the table, and whose reputation should not be allowed to die out. The portraits of Charles Foote Tayler, almost the last of Bath miniaturists, were best described in one word as brilliant, and the examples shown confirmed the lecturer's opinion. After an allusion to the dainty work of Mrs. Harbutt, the lecturer concluded by expressing the hope that his paper might be the means of bringing to light other particulars in this most interesting and little known section of the larger field of Bath art.

The CHAIRMAN remarked that Mr. Bate promised to read a paper to them on the connection of miniature painters with Bath, last year, when Mr. Green gave them an account of the connection of Bath with lithography. He confessed when he asked Mr. Bate to undertake such a thing, he had no idea it would involve so much trouble as he had evidently taken. A paper of the character they had listened to necessitated a great deal of labour, and he trusted the result would be to lead persons possessing miniatures to give Mr. Bate all the information they could on the subject, so that, in time to come, he might be enabled to bring it into a more complete and perfect form than was at present possible, simply from the fact of his not having the material before him. As far as Mr. Bate had gone, he had done admirably; for his own part, he had heard a great deal on the subject of miniature painting which previously he had no idea of. One knew that in almost every city at one time, miniature painting was a very fashionable art, everybody was painted in miniature, and he supposed most towns had their miniature painters. According to Mr. Bate, however, Bath possessed some very fine painters, and they had been all very interested in the manner in which Mr. Bate had worked out the connection of the city with them. Previously he had no idea that Bath was so mixed up with good miniature painting. He felt they would all join with him in thanking Mr. Bate for the great trouble he had taken in the matter. The paper constituted one more interesting addition to the history and connection of art with Bath.

Major DAVIS remarked that no mention was made in Mr. Bate's paper of the name of Bone. He was a man who painted miniatures in Bath some time before the year 1790, and was made a Royal Academician in 1811. Major Davis produced an enamel of a great aunt, painted by Bone. He mentioned that Bone was born at Plymouth, and was apprenticed to the china factory at Bristol, a great deal of china being painted by him. He painted the portrait produced some time before 1790. Major Davis put

in another of his great grandfather, painted in Bath by the same artist. Whether Bone merely stayed here for a few months of the season, he could not say. He was a very fine painter, and though not positive about it, he believed one of his miniatures was sold during his lifetime for £2,000. He had a good many miniatures in his possession, though none others by Bone.

Mr. SHUM mentioned that there was a very clever artist who was in the habit of coming to Bath for the season from Jersey, named Le Capelain. His works were chiefly water colours and landscapes, and he had a wonderful facility for picturing the very peculiar atmospherical effects found round the Channel Islands. He was patronised by a gentleman here, who recommended him very much both for teaching and occasionally to take portraits, but he had not been able to meet with any specimens. He had a collection of letters in his possession, however, between Le Capelain and his patron, he should think as many as fifty. He should think he painted Prince Albert and the Queen when they visited Jersey, for he was a man of wonderful power, and his water-colour landscapes were very much after the style of Turner. He had seen some of his works in the Channel Islands, and one of Le Capelain's last surviving relatives gave him a few, but they were simply water colours and no portraits. Mr. Bate was heartily thanked for his paper.

By the courtesy of Mrs. Hunt, Mr. W. H. Stephens, Mr. J. D. Harris, Mr. John Stone, Mr. Harding, Mr. J. S. Bartrum, Mr. G. Woodiwiss, Mr. F. Shum, miniatures by and engravings after Warlidge, Lacon, Plura, Humphrey, Jagger, Scovell, Ford, Tayler, Miss Tylee, Mrs. Harbutt, Barwell and others were exhibited.

The members of the Club assembled on Wednesday, December 18th, to the number of 24 at the Royal Literary and Scientific Institution to hear an interesting paper on "The great Frost of 1895" from their President, the Rev. Canon Ellacombe, of Bitton. The paper commenced with an account of the rainfall and the registered heat and cold of the year, showing the unusual

combination in the year of three months extreme cold, three months drought, a remarkable wave of great heat at the end of September, and of extreme cold at the beginning of October. It was shown by many examples that in spite of the extreme cold gardens had suffered far less than could have been expected; that many things such as palms and bamboos had been quite uninjured, and that many half hardy plants, especially those from New Zealand and South America, had been much less injured than in former years, when the cold has been much less severe. The escape from more injury was attributed to the absence of high winds, the continuance of the frost without alternations of thaw, and that the frost did not commence until the plants were mostly in their winter rest. Many curious instances were mentioned of plants being killed in one position and being quite intact in another, so that it was difficult to say whether the species should be ranked as hardy or tender. Proof was brought that one great secret of preserving plants in extreme cold is to take every possible precaution to preserve warmth in the roots. But the year had shown a great abundance of flowers and fruits, and it did not appear that animal life had suffered much from the great cold. The great lack of the year was the complete absence in many plants of Autumnal tints, the leaves having fallen quite green, owing to the frosts and gales of October, and in connection with this an account was given, chiefly drawn from American observers, of the causes of the Autumnal tints and their dependence on the weather of each year.

A varied discussion followed the President's paper, on the various observations made in different parts of the country and abroad on the destruction of plant and animal life through the hard frost, particularly on the extraordinary damage wrought on the gorse throughout England and Wales.

At the proposal of the Rev. H. H. Winwood, vice-President, a hearty vote of thanks was returned to Canon Ellacombe for his

paper, with a general request that having now for three years given the members an account of his observations of the effects of the weather on the fauna and flora of the neighbourhood, he would next year repeat the subject.

At a meeting of the Field Club on January 15th, 1896, presided over by Canon Ellacombe, some notes were read on the collection of fossil fishes from the Upper Lias of Ilminster, which had been communicated by Mr. Arthur Smith Woodward, F.G.S., of the British Museum. The Rev. H. H. Winwood, who read the notes, prefaced them with a few introductory remarks, in which he said the collection was not sufficiently known. It was one of the greatest treasures they had in the museum upstairs. His friend, the late Charles Moore, collected these fishes very early in his life; in fact, he began in his early boyhood. Moore related that as a boy he was engaged like other boys in collecting those "curly whirly" stones called ammonites. One day as he was playing with other boys, and workmen were pulling down the old school-house, some of the nodules like those on the table were taken from the walls. The boys were rolling them down the hill, when one of the nodules split open, revealing a fish. This first of all created Moore's interest in these fishes, and he was very careful about collecting them. He took very great care that nobody else should know where they were. He took him (the Rev. H. H. Winwood) down to see them many years ago, and he would point out the locality as well as he could on the map of the district. The bed was now covered up, and no more of these fishes would be discovered unless it was re-opened. The ground had been opened up to obtain a kind of stone used for the roads, called marl-stone, and in digging down, a remarkable bed about six inches thick was revealed consisting of these nodules. Ever since Moore had discovered them they had remained upstairs waiting for someone to describe them. He had asked people repeatedly, and ultimately Mr. Arthur Smith Woodward, on being applied to, had kindly furnished the notes which he proceeded to read. In these notes

Mr. Woodward commented on the remarkable nature of the distribution of fossil fishes in the stratified rocks. With rare exceptions, good specimens occurred only in certain definite thin layers where they were discovered in great shoals. Fragments were also often curiously swept together to form a veritable "bone-bed," perhaps not more than a few inches in thickness, though extending over many square miles of country. Hundreds or thousands of feet of sediment certainly deposited in a sea, well tenanted with fishes, were not uncommonly destitute of all traces of their skeletons except an occasional tooth or scale; while a local layer in the midst of one of these series might unexpectedly reveal a rich and varied fauna. On examining specimens from such layers, it would often be observed that they exhibited a gaping mouth or some signs of contortion at death; there were also geological reasons for supposing that they had been quickly covered up with sediment. The general conclusion was, therefore, that whole shoals of fishes had been suddenly destroyed at these spots either by an escape of noxious gases into the sea, or by a cloud of mud in some current, or by another unfavourable change in their surroundings. The various samples of the fish life of different periods had thus been preserved by mere local accident. The discovery of them depended again upon mere accident. Hence their knowledge of the fishes of past ages consisted entirely of little disconnected items culled from widely separated zones scattered through the rocks of different parts of the world. The period of the Upper Lias happened to be represented by one of these instructive zones in at least six districts. There was one in Würtemberg, another in Bavaria; two were known in France, the departments of Calvados and Vassy; a fifth occurred in the cliffs at Whitby, and a sixth in the nodule bed of the Upper Lias at Ilminster, Somerset. The careful exploration of the latter was undertaken by the late Mr. Charles Moore, whose "unique collection" was arranged in the Bath Museum. "This beautiful series of fossil fishes" was then dealt with by the writer in detail. The

Rev. H. H. Winwood, in reading the notes, pointed out that a great many of the saurians such as those represented in the lecture room, had perished also with their mouths wide open. He exhibited some very interesting specimens which included a new species, if not the representative of a new genus of lizard, relating the manner in which the discoverer had found half the specimen but had been unsuccessful in his search for the other. Two or three months afterwards, however, the geologist renewed the search for the missing half among the débris, and, strange to say his search was successful. This specimen had also been suddenly overtaken by death, for it had not had time to digest its food, as a kind of small sprat which was taken from the interior conclusively showed. The rev. gentleman also related several anecdotes of Moore, showing how jealous he was of his discoveries, more especially when others succeeded in anticipating him. The Chairman, in the course of a few remarks, said the paper had been exceedingly interesting. He supposed most of them had often looked, as he had, at the collection, and admired these beautiful specimens of fossil fish, but he had always admired them in extreme ignorance, and therefore he felt much indebted to the Rev. H. H. Winwood and Mr. Arthur Smith Woodward for what they had told them. He did not quite understand why these fishes were so strictly confined apparently to this one place because they had there, about Bath, exactly the same formation. Something was said about these fishes congregating together, and they seemed to have been destroyed there, but it was curious that they could not find any about Bath. Were they in any way the same as existing fishes, and did any of their species exist at the present day? They were very beautiful in every way, and he was glad they had learned what they had from them. After further observations by the Rev. C. W. Shickle and Alderman Bartrum, &c., the Rev. H. H. Winwood remarked that the conditions of the place seemed to be strictly suitable for their preservation. The particular strata in which they were found did not exist in

many places. The peculiarity of fish congregating in particular places was well-known at the present day, as, for instance, at the Dogger bank. If there were any sudden incursion of sediment, the fish would drop down there, and those who came afterwards might find their remains in a similar condition to the specimens before them. The fishes in the collection were all extinct, but they were allied to the shark and the mud fish. After further discussion the Chairman said it only remained for him to thank the Rev. H. H. Winwood and Mr. Woodward in the name of the Club, and this he did very heartily.

At a meeting of the Field Club held on January 29th, 1896, at the Royal Literary and Scientific Institution, very carefully prepared papers were read by the Rev. C. W. Shickle and Mr. T. S. Bush. The former contributed a sketch of the feudal system, and dealt with some of the Court Rolls of the Manor of Forde. Some time ago, when the members of the club were searching for a chapel near Tadwick, Mr. Bush gave them a few interesting notes on the neighbourhood, and these having been amplified, were the subject matter of the second paper, entitled, "Cold Ashton and its people." They extended from an early period to the end of the 17th century. The Rev. H. H. Winwood occupied the chair, and subsequently invited discussion. He remarked how great had been the labour bestowed upon the papers. The Rev. R. Sayres, rector of Cold Ashton, with regard to the question of the boundaries of the parish, mentioned that an old description had been sent him, but the names were so different that he was not able to trace them at all. He was not prepared to say whether the barn there with ecclesiastical doors was originally a chapel or not. After further observations, the Chairman referred to an admirable address given in 1873 by a very active member of the Club, Dr. Hunter, which had given a remarkable stimulus to topographers. Topography was then described as the very essence of history. The author said, "Collect, collect, collect; possibly your labours will not be rewarded, but the time will come when

they will form a very interesting page in our history." These gentlemen had been collecting. The result of their labours was manifest, and he hoped that some portion at least of these collections would appear in their proceedings, where they would form a page of local history to which future historians would refer with pleasure and delight. With regard to the Manor of Forde he reminded them that a model paper on the subject had been written by Mr. H. D. Skrine, who had thoroughly beaten the boundaries and worked them out the best way he could. The Rev. T. D. Whale also joined in the discussion. The Chairman thanked both gentlemen for their papers and for the enormous amount of trouble they had taken.

The excursions during the year were well-attended, and of a very interesting character. The first excursion took place on March 5th, when a large number of ladies and gentlemen, at the invitation of Mr. Robert Bush, assembled near the pretty old church of St. Mary, Charlcombe, to witness Mr. Leicester Gataker's experiments in water-finding. Mr. Gataker has now become so well-known an adept at the art, and has been so successful, that his visit was anticipated with much interest. The first trial was made in Mr. Bush's garden. On the south side, or that furthest from the church, Mr. Gataker declared water could be found at 20 feet, and that the volume would probably be about 130 gals. per hour. On the northern side of the garden he considered the spring was 27 or 28 feet from the surface, and the volume might be 180 gallons per hour. Rods at these places were driven in to note the discovery.

The next trial was made in the churchyard, where a spring was easily found, and on the pathway leading eastward from the Church Mr. Gataker declared a spring to be quite close to the surface, about 10 feet. This was interesting, as the close proximity of the Monk's well in an adjacent building was then pointed out. Rather a good test was given to Mr. Gataker in taking him over a spot where Mr. Chesterman had previously been. Mr.

Chesterman had given it as his opinion that water could be found there at 16 feet. Mr. Gataker (who was unaware of the fact) gave the depth at 15 to 20 feet. The situation of the ground would suggest that these springs are the lower springs, or those that lie below the Fuller's earth.

The usual forked twig was used in these experiments, but rhabdomancy, like other arts, seems progressive, as Mr. Gataker showed after these experiments were over, that it was not necessary to have a "dowsing rod" at all, but he could equally well perform his task without any apparatus whatever, the muscular movement of the hand placed in a certain position being sufficient to show the presence of a spring.

Box Quarries, March 26, 1895.—The next excursion of the Field Club for the season took place on March 26th, when about 20 members assembled at Box quarries. Some of the party drove to the workings, others preferred the railway as far as Box station and the extra amount of pedestrian exercise. Mr. Hancock, one of the directors of the Bath Stone Firms, Limited, met the Club at the entrance, and some little time was passed explaining by plans how the workings ramified through the hill, the position of the railway tunnel, and the time that some of the quarries had been worked. One called Hazlebury quarry had provided the stone for the building of Lacock Abbey. Preparations were then made for going into the quarries, the members being handed neat little paraffin lamps, mounted on wooden handles of convenient size, that were most suitable for the work. The entrance on the Box side of the hill is on the level, a short distance from the roadway. After proceeding some distance tram tracks branch off in different directions following the beds of the building stone, which runs from 10 to 20 feet thick. As progress was reported, Mr. Hancock pointed out some of the features of the Box ground stone, and an interesting discussion took place of the mode of telling the bed of the stone when taken away from the quarries as, of course, it is especially necessary for good work that the

stone should be laid in building as it originally lay in the quarry. It appears that by veins, and other markings, the lay of the Box ground stone can soon be learnt; but some of the other quarries that have a very fine grain considerable difficulty is experienced. Mr. Hancock mentioned what he considered a good test is sprinkling the surface with water and the direction the damp runs shews the bed of the stone. The grit of the Bath stone varies considerably, some kinds being more coarse than others, and each quarry has its speciality. Thus Box ground is what is called a good weather stone, that is suitable for outside work, while Corsham and Monks' park are more suited for inside work, and carving, being of a finer grain and free from veins. It might be added that Corsham stone was first discovered in making Box tunnel; the depth of this bed is about 16 to 24 feet. As the party proceeded onward a beautiful sight came in view, a shaft, called by the workmen the Cathedral, delighted all beholders. From an artistic point of view nothing could have been finer, the light from above catching the various faces and edges of the beds from the ground above, to the workings below, a distance of about 90 feet. From a geological point of view it was interesting as giving a section of the hill, from the building bed to the surface. It was a cause of great regret that a photograph could not be taken of this beautiful and romantic shaft. The party proceeding into the regions of gloom again came upon a working party who were in the act of moving a large block of freestone from its original bed and Mr. Hancock explained thoroughly the process, and the tools used. There was also an enormous block of stone, estimated to weigh six tons, being scalped (a kind of rough facing, done with marvellous accuracy) by two workmen. In winter as building operations generally cease, the store of stone increases, as the work can go on continually in the quarries summer or winter, as there is little change of temperature. The Bath stone firms frequently have 2,000,000 tons on hand ready for disposal. Proceeding onwards the party were shown some faults in the

beds, in some instances, making a difference in level of 10 feet, one being especially interesting, as it showed the junction of the Corsham and Box beds. Time becoming precious, the Club had to hurry onwards, and eventually a dim gleam of daylight appeared, and the party soon found themselves at the bottom of a place inclined about 45°, with 149 steps to surmount. This being accomplished in due course, the party were on the surface again. Unfortunately, business prevented Mr. Hancock from lunching with the Club, so the President (the Rev. Canon Ellacombe), in suitable words, thanked Mr. Hancock for his courtesy and kindness in giving so much detailed information to members, initiating them into the mysteries of stone quarrying. A hasty move was now made for the Methuen Arms, where lunch was anxiously awaited. This having been thoroughly attended to, the horses rested, and the members refreshed, a new start was made for Monks' Park quarry. On account of the coachman not ascertaining the proper route at starting, a large detour was made, and at last almost in despair, the party discovered the whereabouts of this quarry, when another descent was made into the bowels of the earth, this time down 150 steps. The workings here were much the same as in the Box hill, with the exception of the grain of stone being of a much finer character. Home was now the order given to the coachman, and, as the weather was glorious, the party much enjoyed the drive in the brisk air over the hills towards the valley of Bath.

Dunster and Cleve Abbey, Apirl 30th and May 1st, 1895. A fair number of members were prepared to start by the 8.34 train for Dunster, and S. Mary's Abbey of Cleve. The last visit of the Club was in 1876, when the late Rev. Preb. Scarth, Vice-President, wrote an interesting account of the visit (B.N.H. and A.F.C., vol. 3.) Many well-known faces have since then passed away, and as new members join old places have to be re-visited.

At Taunton a considerable wait took place, as the trains for Dunster are few and far between: however, in due course the

branch train wended its way through the beautiful part of North Somerset that lies between Taunton and the Bristol Channel.

After lunch at the Luttrell Arms the programme commenced. The Church was first visited, Mrs. Bearne, a lady residing in Dunster, who takes an interest in art and archæology, was kind enough to show the Club over the building. Much has been written on the Priory Church of Dunster. On account of a dispute between the monks and the parishioners a decision had to be arrived at, and in 1499 the Church was divided into two parts, eastward of the tower was to be devoted to the monks, westward to the parishioners, with a wall between. Professor Freeman (Somerset Arch. 1855, vol. vi) says other Churches were divided in a similar way, Wymondham in Norfolk, and Ruthin in Denbigshire. The Chancel was restored about 20 years ago. There are two good screens in the Church, the smaller one, in the South Transept, being specially beautiful, and the pointed arch over it, with the eccentric shaped shafts (forming a kind of trefoil shape) make a most picturesque combination. Mrs. Bearne having been thanked for her kindness, the party retraced their steps to the main street.

The Castle was next visited. Mr. Davies, an agent to Mr. Luttrell, showed the Club over the grounds, and house, and pointed out many objects of interest. The situation of Dunster Castle is perfect, standing on an eminence, or tor, it commands the most lovely views of the surrounding country, and the Bristol Channel. The Manor of Dunster was originally granted to William de Mohun, at the Conquest, and here stood a Norman, if not, pre-Norman edifice, the property subsequently passed, by purchase, into the hands of the Luttrells, who have held it since 1404. In the time of Elizabeth a good deal of the Castle was built, and about 25 years ago large additions were made. Mr. Davis pointed out a glass case in the hall which contained many ancient seals and documents, one, the receipt for the purchase of the property by the Luttrells. The hall and staircase are very

beautiful, and the elm carving beneath the handrail worthy of note. The ceiling on the staircase representing scenes in hunting is a beautiful piece of work, as indeed is the dining-room ceiling with date 1681. It is thought this Jacobean work was performed by Italian artists. The inhabitants of Dunster and neighbourhood evidently appreciated designs in plaster, the curious mantelpiece at the Luttrell Arms, and similar work at Marsfield House testify to the fact. There were many other objects of interest in the Castle but time was progressing, and it was necessary to go through the beautiful grounds. The park is wooded with lovely trees, near the Castle are some splendid yews, and every now and then the view of the distant moorland between the branches was really delightful. It was a relief to know that the celebrated lemon tree had survived the arctic winter through which we have passed.

Lower Marsh House was next visited, Mr. Davies kindly walking across the fields with the members to show the way. The route lay by a trout stream which suggested the application of the May fly. Marsh House is at present uninhabited, and the principal object of interest is the little room over the porch, formerly used as a Chapel, containing piscina, and an oak roof with a most charming remnant of carving representing holly and berries. This part of Somerset seems specially given to pretty bits of carving, and it would be very interesting if these could have been either sketched or photographed for the benefit of the Club.

The Yarn Market, a curious old octagonal building, situated in the main street, date about 1600,* suggests the time when Dunster was celebrated for its woollen goods that were called "Dunsters," and no doubt busy prosperity reigned around. It requires but little imagination to transport oneself in thought to the middle

* There seems to be some doubt about the date G. L., 1647, on vane, see Somerset Arch., 1889.

ages, and from thence to more remote times. The Luttrell Arms with its handsome fixtures, and oak roof of the prevailing style. The Yarn Market in full swing with a rapid business being transacted in Dunsters. The Church, recently rebuilt, the dispute between the monks and the laity being still the topic of conversation of the day, and the busy trade in iron ore carried on from the neighbouring hills to be shipped at the little port of Minehead.

A curious old custom prevails at Dunster and Minehead. The 1st of May is called "Hobby Horse Day," and the performance consists of a man dressed up much in the style of the stage hobby horse, but in this case the head of the man (masked) only appeared through the body of the animal, a long tail like a cow is appended to the creature. The hobby horse is accompanied by a boy with a drum, and performs some curious antics. It appears to be that many years ago a wreck of a cattle-ship occurred off Minehead, the cargo was salved, and the proceeds invested for the benefit of the poor; these proceeds have become of some value of late years. Some time ago the Hobby Horse demonstrations at Minehead seemed to have been attended with a certain amount of intimidation, and those who did not contribute were roughly handled, now it is merely a masquerade. Before leaving Dunster, Mr. Davies was thanked for the store of information he had given the Club, and space would prevent noting much of interest connected with Dunster and the neighbourhood that he mentioned.

Wednesday morning opened very wet, and it almost seemed as if a bad day's work had to be encountered. However, a start was made in the rain. The first stop was made at Carhampton Church, which contains a screen very similar to Dunster, but restored some years ago to represent the ancient colouring, making the present appearance very gaudy. The party next proceeded to the Alabaster Rocks at Blue Anchor, but few of the members could be induced to leave the carriages and trudge, in the wet, over a long stretch of rough beach to the rocks; however, those who did were well repaid by the sight of this curious geological

deposit, and many excellent specimens of alabaster were obtained. Unfortunately, the Rev. H. H. Winwood (who intended to give the Club some geological account of the neighbourhood and the local deposits) was unable, through indisposition, to go to the rocks, so Mr. Barlow said a few words on the probable cause of the alabaster deposit on this part of the coast, and read a letter from the Rev. H. H. Winwood, addressed to the members, of which the following is an extract:—"At Watchet, west of the harbour, was the place where Professor Boyd Dawkins found the earliest trace of a Mammal, in the shape of a Molar tooth, which once belonged to a Marsupial rejoicing in the name *Hypsiprinopsis Rhœticus*, thereby gaining the blue ribbon of geology from our late member, Charles Moore, who found his Mammalian tooth in a remanié and not in situ as Dawkins did."

The carriages soon took the members to Old Cleve, where Mr. Herringham kindly showed them over the Church, and pointed out the Monks' walk through the Churchyard from Chapel Cleve to Cleve Abbey. The tower of Old Cleve is good, and of the Perpendicular style, as indeed is most of the Church. There is some particularly pretty tracery in the West window of the South Aisle, and a similar pattern appears at S. Decuman's, subsequently visited. A little bit of carving placed as a cornice to the South Aisle, which is supposed to be the remnants of an ancient screen, is well worth attention. A recumbent figure in the Church caused some difference of opinion as to whether it represented a male, or female figure, the majority considered it that of a female, but being much obliterated, it was difficult to decide; it had probably been removed and placed in its present position. Mr. Herringham having been thanked for his kindness, a start was made for Washford. The weather now began to improve, and by the time the hotel was in sight, the sun was shining brilliantly.

After lunch a start was made for Cleve Abbey. The entrance gateway, perhaps the latest part of the work, contains (on the inner side) three niches, in the centre one is a crucifix in

wonderful preservation, the carving is in high relief, and is placed beneath a canopy; the other two are untenanted. It is very rare that such a carving has escaped mutilation, and doubtless its position has been the cause of its being unnoticed. It is a most delightful ramble among the ruins of Cleve Abbey, picking out the more ancient buildings from those of the 15th Century, when the Cistercians had become rich and powerful. The beautiful roof of the dining-hall, 15th Century work, is a delight to all beholders. Nothing remains of the Church itself but a few remnants of pillars and some tile flooring, which is most carefully preserved, by being covered with sawdust, and does great credit to the owner of the property, Mr. Luttrell. The caretaker was good enough to uncover certain of the most interesting portions for the inspection of the Club, and one of the members, Mr. Maskelyne, pointed out many of the crests.

The members now retraced their steps to the Washford Hotel, where the carriages were in readiness, and started for Watchet. A short stop was made at S. Decuman's Church, and it was regretted that more time could not be spent on so interesting a building. There are several monuments here to the Wyndham family, two of the 16th and 17th Century, containing inlaid brasses, the latter embossed, which are very rare.

A short drive took the members to Watchet Station in time for the 5.13 train, a delightful visit having been spent in West Somerset.

Stoke Lane and the Mendips, May 28, 1895.—A large party of the above Club, numbering twenty members and three visitors, started from the Midland Station by the 10.25 a.m. train for Shepton Mallet. Arriving there at 11.9, without intermediate stoppage, the whole party mounted brakes and started for Doulting, where the renowned quarries in the Inferior Oölite are situated, from the beautiful hard stone of which the Cathedral of Wells, the ruins of Glastonbury Abbey, and nearly all the churches in the neighbourhood are built. First, however, a halt was made at

the finely restored Church of S. Aldhelm, over which the venerable Vicar, the late Rev. James Hamilton, and his Curate, conducted the party. The lintel of the North door is about the only portion of the original Norman Church left "in situ." The Octagonal tower is good of the 13th Century, and stands at the Junction of the Nave Chancel and Transepts. The Spire which crowns it is of later date. An oak and iron screen separates the chancel from the body of the Church, and an elegant Malachite cross is over the Altar. The aged Vicar next conducted the party through his garden to S. Aldhelm's well, situated in a pretty little dell, shaded by trees and adorned with flowering saxifrages. S. Aldhelm was stricken unto death at this spot, and at his last request was carried to the little wooden Church which stood in 709 on the site of the Chancel of the present Church dedicated to his memory, whence his body was afterwards conveyed to the Abbey of Malmesbury, his place of education, and buried in S. Michael's Chapel. S. Aldhelm was of the Royal blood of Wessex, and was appointed first Bishop of Sherborne by King Ina in 705. He built the ecclesiola of Bradford-on-Avon, the first stone Church in England, and was regarded as a Saint even in his lifetime, from the peculiar power he possessed of drying his clothes by hanging them on a sunbeam.

Thanking the Vicar for his kindly reception, the great barn of the Abbot of Glastonbury, built early in the fifteenth century, was next visited, and its vast dimensions, strong buttresses and oak roof duly observed.

Mounting the brakes again, a start was made for Messrs. C. Trask and Sons' quarries at Chaylinch, and the geological part of the day's excursion commenced. The Vice-President of the Club, the Rev. H. H. Winwood, here explained to the members the nature of this freestone, strongly represented by three substantial beds here, but only thinly near Bath, in a broken-up form near Midford. This stone is not so oölitic as the Great Oölite used as building stone at Bath, but of far harder texture, and so more

expensive in the working. Messrs. Trask have other quarries to the South of Doulting, and are always much gratified by receiving visits at their works by learned societies.

Starting again on the way to the summit of Mendip in a short half-mile, the great quarry of the Carboniferous limestone at Waterlip was passed on the right. The limestone here dips steeply to the South from the flank of the Mendips, as on the Northern side of the range of hills it dips steeply to the North, the highest ridge being formed of Old Red Sandstone with here and there an exposure of the igneous rock, erupted in remote ages through the Old Red Sandstone in this range of hills. A company which worked this Waterlip quarry, and still works quarries round Shepton Mallet, absurdly styles the metal it supplies for mending roads "Mendip granite," the truth being that not an atom of granite exists in the Mendips. The nearest approach to such a rock, although not at all resembling it in structure is the igneous outburst quarried for road metal at a quarry on the right hand of the road descending Moon's hill, which is reached a short half-mile above Waterlip. This rock is an extremely hard altered lava, and until our fellow citizen, the late Mr. Charles Moore, discovered it cropping out to the surface here and there through the grass, was absolutely unknown, and in the geological maps of the Ordnance Survey of 1817, drawn up by Sir H. de la Beche and others, is not noticed. Formerly there were only known three vents of igneous rock in Somerset, at the top of Goblin Combe, at Hestercombe on the Quantocks, and in the Uphill Cutting of the Mendips. To the late Mr. C. Moore is due the glory of discovering this fourth exposure, and painful as is always the acknowledgment of error among talented geologists, as among humbler folk, her Majesty's Board of Geological Survey had to acknowledge the defect in their maps, and bestowed on an amateur geologist the praise of the discovery which was to him justly due.

At this igneous exposure the Vice-President addressed the

members of the Field Club at some length, explaining the composition of the hard doleritic rock, and many of the members provided themselves with specimens. It is not unlike the Dhu stone of the Titterstone Clee Hill in Shropshire, also much quarried for road metal, and the external surfaces of the joints are coloured in various hues by infiltrations of mineral matters.

At the close of the learned Vice-President's remarks the brakes were again mounted, and a short drive brought within sight the signboard of the Knatchbull Arms at Stoke S. Michael, commonly called Stoke Lane. There a welcome repast met the party, after doing full justice to which the return drive by Old Down was taken to Shepton Mallet, and thence a train brought the whole party back to Bath before six o'clock, the weather having been everything that it should be for a geological excursion.

Abbey Dore and Hereford, June 11th and 12th, 1895.—Twelve members of the Field Club left Bath on Tuesday, June 11th, by the 8.34 a.m. train on the Great Western Railway, and changing at Bristol and Pontypool road, arrived punctually at the little Herefordshire village of Pontrilas, which lies at the mouth of the Golden Valley, and at the junction of three tributaries to the Usk. After viewing the charming old Manor House, seventeen years ago known so well to anglers as the Scudamore Arms Hotel, now a private residence, luncheon was duly appreciated at the Village Hotel, which offered a fine and airy hall for the repast in the large Court-room of the local "Foresters." At 1.45 p.m. a start was made in such vehicles as the Pontrilas Hotel afforded, *i.e.*, four pair-wheel gigs, to the Abbey of Dore, situated in a sequestered nook of the Golden Valley 2½ miles distant. Here the Rev. A. Phillips, Vicar, met the Field Club, and conducted the members first to view the exterior of the building, which consists in its restored portion of a North and South Transept 94 feet from end to end, a Chancel 55 feet in length now used as the Parish Church, North and South Aisles to the same and an Ambulatory to the East. A massive tower stands in the angle of

the Transept and South Aisle, which is of later date than the remainder of the building, built upon old arches. This was a Cistercian Abbey, dedicated to the B.V.M., but the name of the founder is doubtful, as well as its date. Cooke, Clarencieux King of Arms, mentions Walter de Scudamore in the 14th year of King Stephen as giving "Fulke's mead" to the Abbey of Dore. Dugdale states that in the days of Edward the Confessor was Ralph, Earl of Hereford, whose son Harold, after the conquest, had two sons, John, Lord of Sudley, and Robert, of the Castle of Ewias, a mile distant from Dore, who founded the Abbey. The date therefore must be about 1147, and the architecture of the remnant of the Abbey agrees with this year, being of the Transitional style between Norman and Early English.

Externally there is very little left of the Abbey buildings, only an arch and one column of the Nave, formerly of eleven bays, but the elegant carving on the capitals betokens the early magnificence of the whole structure. Internally the building deserves a minute examination in all its parts. What remains of the building was restored to its present condition by John Viscount Scudamore in 1634, and a large slab of slate giving full particulars of the restoration is affixed to the North wall of the Transept.

At the dissolution of the monasteries under Henry VIII. the site of the Abbey was granted to John Scudamore, of Holm Lacy, an ancestor of the restorer, the Viscount Scudamore, who was English Ambassador at Paris in the reign of Charles I., and who on succeeding to the property found the parson reading Divine service under a ruined arch, which alone preserved his book from the rain. The Viscount re-roofed the Transepts, Chancel, Aisles, and Ambulatory, and built the Tower, the whole of his work, according to Sir Gilbert Scott, being "so noble and spirited that all he had done should as far as possible be respected and preserved."

The present Vicar is quite of this view but finds it difficult to carry it out, funds being very scarce, and the height of the wall plate

from the ground, 45 feet, being such, that only one man in the village will venture to mount the lofty ladder kept inside the Church for the purpose, and repair the elevated roof.

The floor of this Abbey Church is reeking with damp, being composed of old tombstones laid on the surface of the soil. The Chancel is now used as a parish church, and its floor is equally damp, but its architecture is superb, the carving of its capitals very rich, three open arches at the East opening into the Presbytery, three lancet windows above filled with glass of Viscount Scudamore's time 1634. The Altar slab, recovered from a farmhouse at the same time, is 11 feet in length, supported on three clustered columns of stone, and there are ancient green-glazed tiles of the 13th century beneath.

In the Presbytery there were originally five Altars under the five Eastern windows; now dilapidated monuments stand here. To the North a diminutive effigy of a Bishop, 15 inches long by 9½, containing the heart (there can be no doubt from the Lombardic inscription on its sides) of John de Breton, Bishop of Hereford 1269-75. At the Eastern ends of the Aisles are two knights in chain armour, supposed to be the founder and Sir Roger de Clifford. A door opens from the North aisle into the Cemetery, and bears some 13th century ironwork with leaves and scrolls.

Leaving this beautiful remnant of Abbey Dore, sadly disfigured with whitewash and requiring much repair, the Vicar conducted the members through his grounds, and received the hearty thanks of the whole party for his kindly reception and imparted information on his Church.

At 4.25 p.m. the train took the party from Pontrilas to Hereford, where the Green Dragon Hotel became their headquarters for the stay. Having made sure of their rooms, a start was made at once for the Church of All Saints, lately well restored. The lofty tower and spire, 212 feet high, are much out of the perpendicular, and the same may be said of much of the

North wall. In the North column of the Chancel arch, open spaces left in the modern stonework reveal the remains of an elegant clustered column of an earlier church. A carved wooden pulpit, seemingly of Jacobean age, stands at the foot of the South column, and above, at considerable height, is the opening of a winding stair to the former rood-loft. The ancient oak stalls with miserere seats are now fixed to the South of the Sacrarium as "sedilia." A new Reredos and Altar are in the Chancel, with a handsome floor of encaustic tiles, the former Reredos and Communion table are in the North aisle, which presumably serves for week-day celebrations and services. Externally this Church shows a very patchy structure, an ugly brick parapet stands on a very weather-worn substructure of old red sandstone, but an elegant porch on the South side has a prettily cusped arch.

Proceeding directly North of this Church, the Coningsby Hospital was soon reached, and a red-coated veteran conducted the members over this building, founded 1614 by a philanthropical member of this name for eleven worn-out soldiers and superannuated faithful servants, each of whom now receives 5s. a week and a domicile, a quaint scarlet suit of clothes with a breast ornament containing the coat of arms of the founder, three rabbits or coneys, and an annual dinner in a common room kept in a very dirty condition and unlike that of St. Cross, Winchester, a similar but better endowed hospital. The Chapel in which the "Chaplain" conducts services has the various heraldic quarterings of the Coningsby family on the walls, but is otherwise very plain. Behind the Hospital are the ruins of the Monastery of the Black Friars, with a restored pulpit or Preaching Cross of six cinq-foil arches open on all sides and standing on a flight of steps. The centre shaft passes through the groining and terminates at its apex in a stone cross.

Of the Monastery itself, founded 1276, very little remains, but the base of a font said to have belonged to an earlier Circular Church of Knights Hospitallers, whose Monastery was removed

for the structure of the Black Friars 1276, stands amid the ruined walls of the Refectory and Cloisters. The patronage of this Hospital and the members is now vested in the Arkwright family, as holders of the property of Hampton Hall, in the County of Hereford. Remunerating the red-vested "cicerone," the Field Club then returned by the black and white house, now a well restored office of a Bank, the sole remnant of the ancient "Butchers' row," to St. Peter's Church, which also has a lofty tower and spire and internally elegant 15th century stalls in the Chancel. This Church has also been well restored, but the stone tracery in the new windows is of a very plain and unworthy style. The pulpit is an open platform surrounded by a brass rail, so as not to obstruct the view of the Altar, and the East window is filled with Munich glass. Some of the party wandered to the Castle Green and banks of the Wye, but all found themselves, at 7.30 p.m., at the Green Dragon for the needful "table d'hôte" and subsequent night's rest.

The following day after breakfast, the second great object of the excursion was sought, and some attended the 10 a.m. service of the Cathedral, at the end of which the Hon. and Very Rev. the Dean of Hereford personally conducted the members over his Cathedral, and explained the various historical tombs, the styles of architecture, and other interesting objects to be seen in this ancient building. The styles of architecture range from the Norman to the Perpendicular. Time did not suffice to see the Crypt, but the treasures of the library were duly viewed, and the attentions of the Dean were most graciously bestowed on the Members for the space of two hours, for which they rendered him on their departure the most hearty thanks. The 1.42 train rapidly covered the 72 miles back to Bath and restored the Members to their domiciles, after an excellent excursion.

Tewkesbury, October 8th, 1895.—A small party of eleven members of the Field Club started by the 10 a.m. Midland train for this interesting old town, which was reached some time before

12.30. After a stroll through the main streets to view the picturesque old black and white timbered houses, some of which seem in rather a perilous condition, a visit was paid to the Swan Hotel, which supplied the party with an excellent luncheon. An instructive paper was read by the Rev. C. W. Shickle on the decisive battle of Tewkesbury, fought between the Yorkists and Lancastrians on May 4, 1471, after which Edward Prince of Wales was literally hacked to pieces by the Dukes of Gloucester and Clarence, and all the Lancastrian nobles were hung, drawn, and quartered, including the Duke of Somerset, Lord John Seymour, the Earl of Devonshire, and Lords Wenlock and St. John. The Prior of St. John of Jerusalem, Sir Thomas Tresham and Sir Gervais Clifton, with many other Knights and Esquires who had sought the sanctuary of the Abbey, met the same fate. Queen Margaret was subsequently apprehended in a monastery near Worcester, and carried prisoner to London.

A start was then made for the famed Abbey Church, opposite the North entrance of which stands a large black and white house, called the Bell Inn, which has a shield attached to the front stating that it was the house described in "John Halifax, Gentleman" as the residence of a tanner, and at its rear is an ancient bowling green.

Admission to the Abbey is obtained by the North porch, and after payment of the usual capitation tax, a Verger, who had the whole Abbey, its tombs and history at his finger ends, conducted the Members round the Ambulatory of the Abbey with its "chevet" of chapels and magnificent tombs.

Much of the Norman structure of Robert Fitz Hamon still remains in this Abbey. He rebuilt the whole Abbey in 1102, the previous structure, erected by Dukes Dodo and Odo of Mercia in 715, being very insignificant. The good fortune of this Abbey was in having a succession of wealthy and noble patrons. The manor was successively held by Robert Fitz-Roy, created by his reputed father, Henry III., Earl of Gloucester, on his marriage

with Fitz Hamon's heiress, and his son William. Gilbert de Clare, Earl of Hertford wed this William's second daughter and eventual heiress, and was created Earl of Gloucester. Gilbert de Clare, the third Earl of this line, was slain at Bannockburn, and the estates passed by his eldest daughter into the influential family of the Le Despencers, with whom they remained until 1411.

Hugh Le Despencer's heiress carried the estates into the wealthy family of Beauchamp, first marrying Richard Beauchamp, Lord Abergavenny and Earl of Worcester, and then his cousin-german the fifth Earl of Warwick of that line. She was an immense benefactress to the Abbey and died 1439. The son was a prodigious favourite of King Henry VI., who crowned him at the age of 19—King of the Isle of Wight, and declared him Duke of Warwick, and premier Earl of England.

His sister and heiress married Richard Nevil, Earl of Salisbury, afterwards Earl of Warwick, the King-Maker, slain at Barnet, 1471. Edward IV. reluctantly allowed the inheritance to be divided between his two daughters, in 1473. Isabel, the eldest, got Tewkesbury among her share, and married the unfortunate Duke of Clarence, who chose to die by immersion in a butt of malmsey, while their only child, Edward Plantagenet, was afterwards removed in the Tower of London for attempting to escape, Henry VII. knowing well that he was the sole surviving heir male of the house of York.

Nearly all these historical characters are buried in this Abbey, besides several Abbots, and it is claimed the remains of the young Edward Prince of Wales, slain May 4, 1471, were collected and laid to rest in the Chancel.

The groining of this noble Church is exceedingly handsome, with numerous carved bosses. It is the gift of the Le Despencers, in the 15th century, together with the Clerestory of Chancel and all its chantries.

The exterior of the Abbey has two notable features, a central Norman tower, with three tiers of elegant interlaced arcades, and

a lofty Norman arch in the West façade, filled in, very incongruously, with a Perpendicular window in 1656.

At the dissolution of the Monastery, 1539, the revenues were valued at £1,595 17s. 6d., and vast quantities of plate, the sacristy alone containing 1,421 ounces. For surrendering all this comfortably to the King, the last Abbot, John Wakeman, was created by Henry VIII. first Bishop of Gloucester, and the ghastly tomb which he had prepared for himself in the Abbey with an emaciated body lying at full length, with worms and other devouring creatures crawling over it, remained for ever uninhabited.

After the Lady Chapel, Chapter House and Cloisters had been destroyed by fire, the inhabitants purchased the Abbey Church proper from the King for £453, and it became the parish church, which by munificent gifts and careful restorations is now one of the most magnificent as well as instructive ecclesiastical edifices in the kingdom. This town of Tewkesbury is subject to heavy floods at times, being situated on four rivers, Severn, Avon, Carron, and Swilgate. A fine iron bridge, by Telford, was erected over the first in 1824. It is of 176 feet span and cost £35,000.

There are as many theories as to the origin of the name of the town as there are syllables in it. Domesday Book calls it Teodeschesberie. A Saxon inscription was found in the Church of Leominster which calls it Deotisbyrig, which rather strongly goes for the theory that the name of the town is derived from a holy recluse named Theoc who is said to have settled here at the end of the 7th century.

William of Malmesbury, however, assumed far higher origin for the name, "Theotocos," the Mother of God, merely because the Abbey was dedicated to the B.V.M. Baxter puts aside all these theories and maintains that the town was the Roman Etocessa, which was merely a Latinized form of the British "Etoc iscue," the swallow of the waters. All these theories were suffi-

cient to give the members much food for reflection on their return journey, which was speedily effected, after a delightful and instructive excursion.

Torney's Court and Monkswood, October 15th, 1895.—Twenty members of the Field Club were prepared to take part in this excursion. The route taken was by the Gloucester road. Pedestrians who are accustomed to scour the surrounding country know this road as being one of the most beautiful, of the many picturesque exits, from the city. The slope is gradual, and as the road is made on the side of the hill, the peeps in the valley below, and the distant views of Langridge, Woolley, and Lansdown are charming, not to mention the retrospective view of the vale of Bath. Unfortunately the weather being a little foggy, the distant view was somewhat obscured.

Having arrived at the top of the hill the guide was soon noticed, who, by the kindness of Sir R. S. Blaine, was to conduct the party to Torney's court, which lies in the valley below, in the direction of Tadwick. The first building inspected went by the name of the "Chapel," but is most probably a barn, and contains an excellent open timbered roof, in good preservation. There are some doorways and windows partly built up, from their general style the work appears to be about 15th century.

Here Mr. Thomas Bush was good enough to read a paper giving an account of the ownership of this property, from which it appears that it formerly belonged to the Priors of Bath, after the Dissolution to Sir W. Dennis, in the middle ages to John Gunning, Mayor of Bristol, and after several changes passed into the hands of the present owner, Sir R. S. Blaine.

Mr. Bush having been duly thanked for his interesting paper, the members proceeded to inspect the surroundings. Outside the barn a piece of ground still goes by the name of the burial ground, and that a chapel existed hereabouts is mentioned in 1302 and as late as the 16th century; however, nothing could be positively made out of its actual position. Torney's court farm-house was

next visited. The mullions of some of the windows at the back of the house show a favourite local moulding, that at all events is Jacobean if not earlier. The party having returned to the Gloucester road a start was made for Monkswood. This is the second visit of the Field Club to these extensive works, their last visit being on October 2, 1894. Mr. Gilby was kind enough to walk round with the members and show the progress that had been made. The works are now so well advanced that it is hoped they will be completed in about a year's time. The sides are being paved with blocks of concrete, beautifully fitted together, the compound being made from oolitic crushings mixed with Portland cement. Here the Rev. H. H. Winwood gave the members a short account of the geology of the valley, in which he said the site of the present works was formerly a lake, the foundation of which was blue lias clay, on this rested the peat bed, and this again was covered with the washings from the neighbouring hills forming the present surface soil. The land around shows landslips and a curious fault in the Oolite strata, but this has been gone into fully in his paper (read before the Club, 16th January, 1895).

Some very interesting finds have been made from time to time at Monkswood. Recently the bones of the horse, goat, deer, and the upper half of the jaw of the wild boar. In addition to this a curious iron implement has been recently discovered, resembling the old-fashioned bill-hook, the handle of which is the tibia bone of some animal. As these matters are now exercising so much interest it would be a great advantage if the Corporation would allow the finds to be deposited, for the present at all events, in the Museum, so that visitors passing through Bath could have the advantage of a view of them. Mr. Gilby having been thanked for his kindness to the Club, the members proceeded up the hill to the Stone Quarry, from which the building stone for the works has been obtained. This interesting quarry was described in the last visit of the Club. The Bastard Oolite is here a mass of shells,

and a beautiful specimen of *rhynchonella obsoleta* was obtained The weather now became somewhat lowering, so the members made a short cut across the fields to the Gloucester road and the carriages soon brought them safely to Bath.

This concluded the excursions of the year, two in the original programme to Shepherd's Shore and Calne, and to Littlecote in Berkshire having necessarily been given up.

Subsequently on December 14th a small party of members of the Club were invited to mount Bathwick Hill and view the pictures of Col. H. C. B. Tanner, at Fiesole, photographs of which afterwards, by the courtesy of the Bath Literary and Philosophical Association extending an invitation to all members of the Field Club were viewed by limelight at the Royal Institution. The pictures mostly in sepia and white were painted by the Colonel from his own sketches taken in his travels when conducting the trigonometrical survey of the Himalaya range for the Indian Government. He was able to bring to bear an experience of 40 years in describing the many snow-capped mountains, cascades, glaciers, and other characteristic scenery of this part of the world.

At the close of the year under the direction of Mr. W. H. Barlow, a small party of members proceeded to view an old house in Claverton Street, Lyncombe, which bears the date 1704 on its façade. He has supplied the following notes.

The old house in Claverton street is called on Wood's Map of Bath (dated 1735) "The Cold Bath," and in his history of the baths the following account appears, describing the position of the house accurately :—"The Cold Bath, being the last natural bath of the city, the cistern is supplied by a spring of water which issued out of the ground at a place where the rays of the sun could never reach till after surmounting the Equinox. This bath is made in a house erected on the beach, by the side of the river Avon, and that house standing about 120 yards eastward from the city bounds, and at the South end of the bridge. It belongs to a private person, who on that account keeps the bath in it, in very good order, and treats the bathers with respect and civility."*

*Wood's description of Bath, vol. ii, p. 268.

The party first went to view the river-side of the house, which abuts on the towing-path that leads from the Old Bridge to the Canal. Here some of the mouldings of the windows were examined, which are a very good specimen of 18 century work, and it was pointed out that mouldings in high relief round doors and windows were quite a feature of 18 century work in Bath.*

A start was now made for the other side of the house in Claverton street. The front here is of a much more imposing character and the doorway and pediment are a very characteristic piece of work, and the mouldings and pannellings of the whole front are picturesque and effective and from their good preservation an excellent specimen of Combe Down stone.

The tenant, Mr. Otridge, kindly showed the members the position of the Cold Bath, which lies below a room now used as a workshop, it evidently had a handsome moulded edge, and some carving ; but from its position this could only be seen with difficulty. The spring that formerly supplied the bath is now used for household purposes by the tenant, and is excellent water. The Rev. H. H. Winwood considered it came from the lower system of springs, which are little affected by the weather. The following interesting letter was read to the members present.

32 Cambrian Road,
Richmond, S.W.

DEAR SIR,—

The old house in Claverton Street about which you inquire was built by one of my Greenway ancesters ; who was probably his own architect, and for several generations Greenways lived in it. In the front of the house which faces the old bridge was formerly a pleasant garden, and before the Great Western Railway was made there was a delightful view down the river from the front windows. The chief feature of interest about the house is that it contained the first cold swimming bath made in Bath. Probably at first this was a private bath but in the latter part of the last century, it was used by the public, and in old maps of Bath you will find the house marked as

* Vide Chapel Court, Bladud's Head (near Theatre).

"The Cold Bath." The water used was not drawn from the river but from a spring of very cold water on Lyncombe Hill, which spring with the house now belongs to my brother, Henry Greenway Howse, other land having been long since sold.

I know of no celebrated person who ever lived in the house. The site may have been chosen for the convenience of loading barges with stone, as the Greenways had quarries on Combe Down, or on account of some supposed virtue in the cold water spring. The Greenways of that time were all engaged in stone work, and some of their carvings are still scattered about Bath I believe.

The embanking of the river and other causes such as the Great Western Railway buildings have made the floods of this century so serious, that the old house in spite of its being built so strongly has been sadly wrecked, but it pleases me that, even in its fallen state you can recognise its merits. I regret its not being worthy the attention of the Antiquarian Field Club, but it has no public interest.

Yours faithfully,

Jan. 10*th*, 1895. ELIZABETH W. HOWSE.

On the present position of the Field Club I have great pleasure in recording its extreme prosperity in funds and in numbers. At the close of this year the balance in favour of the Club had arrived at the respectable sum of £44 4s. 9d., and the number of members was 98. In the obituary list of the year appear three members; one Lieut.-Gen. H. F. Bythesea dating from 1881, the second Lieut.-Col. C. Skrine from 1886, and the third the Rev. C. R. Tollemache only from 1895. Three members retired from the Club and eight new members were enrolled on our list. The library has been greatly augmented both by private gifts and the Proceedings of the various Clubs and Institutions in correspondence with the Field Club. Amongst these the contributions of the Smithsonian Institute of Washington, U.S.A., the New York State Museum at Albany, and the United States Geological and

Ethnological Survey of Territories, are of immense importance as books of reference, the cost of publication being defrayed by a vote of State funds, and so carried out without stint or parsimony. Two new societies have been added to our list of contributory Clubs, the Royal University of Upsala, Sweden, and the Physico-Geographical Institute of S. Josè, Costa-Rica. Many photographs have also been added to the Field Club's Folio Volume, and the new year opens with an altogether propitious prospect and with the fairest hopes of further progress.

WALTER W. MARTIN,

18*th Feb.*, 1896. *Hon. Sec.*

The Honorary Treasurer in Account with "The Bath Natural History and Antiquarian Field Club, for the Year ending February 18th, 1896.

Dr.

	£	s.	d.
Balance from Year 1894-1895	33	18	7
99 Subscriptions at 10s. each	49	10	0
8 Entrance Fees at 5s. each	2	0	0
Sale of Proceedings	0	6	3
Interest on Deposit of £40 at National Provincial Bank	0	16	0
	£86	10	10

Cr.

	£	s.	d.
Rent to Literary and Scientific Institution...	5	0	0
Messrs. Lewis & Son's a/c for publishing Proceedings and other Printing ...	32	1	9
Gratuities to Librarian and Porter at Royal Institution, and Messrs. Lewis's Clerk ...	0	15	0
Donation to Somerset Record Society ...	1	1	0
Expenses of Honorary Secretary	1	1	8
,, ,, Librarian	2	5	8
Cheque Book...	0	1	0
Balance in Bank to Year 1896-97	44	4	9
	£86	10	10

Examined and found correct,
R. L. TAYLOR.
Dated February 14th, 1896.

A. A. MANTELL,
Hon. Treasurer.

BATH NATURAL HISTORY & ANTIQUARIAN FIELD CLUB.

INSTITUTED FEBRUARY 18th, 1855.

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Bath Royal Literary and Scientific Institution.
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Bristol Naturalists' Society.
British Association for the Advancement of Science.
British Museum.
(1) Book Department. (Bloomsbury).
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Glasgow Natural History Society.
Glasgow Philosophical Society.
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Holmesdale Natural History Club.
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Liverpool Literary and Philosophical Society.
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Warwickshire Natural History and Archæological Field Club.
Washington, United States Geological and Ethnographical Survey of Territories.
Watford Natural History Society.
Wiltshire Archæological and Natural History Society.
Yorkshire Philosophical Society.

CONTENTS OF VOL. VIII., No. 3, 1896.

PROCEEDINGS

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AND

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1897.

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BATH:

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

1897.

The Great Drought of 1896. *By the* Rev. CANON ELLACOMBE, M.A., President.

(Read December 9th, 1896).

If the great frost of 1895 was the most notable feature of the year, certainly the great drought was the most notable feature of 1896, yet neither the frost of the one, or the drought of the other, stood alone in the two years; they were preceded and followed by other conditions equally noteworthy, and it is the story of these conditions which will be the subject of my paper.

The twelve months that have past between December 1st, 1895, and December 1st, 1896, divide themselves into three well-marked periods; a very mild winter, a very dry spring and summer, and a very wet and cold autumn. It may be convenient to say something of each of these separately.

The mild winter comes first, and how very mild it was can be seen at once by this short record. Leaving out the previous Decembers, because they were almost alike, with seven days of slight frost in the one year, against six days of slight frost in the other, and confining ourselves to the three months of January, February and March, we find that there were in those three months of this year, twenty days in which the thermometer fell below 32°; in the same months of 1895 there were fifty-five such days; and this was not all; the frosts of 1895 were unusually severe, the frosts of 1896 were very slight. The thermometer in 1896 was seldom below 30°, and the lowest reading was 26° on February 3rd. The thermometer in 1895 was often below 20°, and was as low as 10° on February 8th; and to put the matter shortly, the winter of 1895 was one of the coldest, and the winter of 1896 one of the mildest on record.

Now, what were the results of this mild winter? They were very marked, and in some respects very unexpected. The most obvious result was that plants which had been weakened by the

cold weather of 1895, but not killed, and which had made a struggle for life during the summer and autumn of the year were largely helped in the struggle by the mild winter, and were able in Spring to come on with their usual vigour. That was a real gain; and another gain was that many plants which were apparently quite killed by the winter, and put in no appearance at all during 1895, came up well in 1896, and so taught us a lesson of the extreme vitality of all vegetable life, and a lesson not to despair or be in too great a hurry to root up all that have been injured, but to be hopeful and patient. Among the plants that so reappeared in 1896, after having disappeared in 1895, I may mention these; the sweet-scented Verbena *(Aloysia), Vitis striata, Allium giganteum, bulbine annua, hypericum coris, böehmeria nivea* (the Himalayan nettle), the Japanese Yam *(dioscorea batatas),* the Indigo *(indigofera dosua), Azara microphylla,* and others. The mild winter also brought a very early flowering, especially of flowering shrubs, which was partly the cause of many shrubs flowering twice; this is a doubtful benefit, but a more certain one was that the plants were able to make good and healthy growth, which have had full time to mature, and so are better fitted to face the winter.

On the other hand there was one result of the winter which was rather unexpected, and that was that some plants which were uninjured during the severe winter of 1895, were much injured, and in some cases killed during the mild winter of 1896. At first, this was a surprise, but a very little thought soon gave the reason: the plants were not killed or injured by the mild winter, but by the severe weather of the previous October and November. You may remember that we had a great wave of heat in the latter part of September and the beginning of October, followed by an unusual wave of cold in the end of October and beginning of November; and it was these two combined that brought injury to many plants. The warm wave had unduly stimulated the plants in many cases into new growth, and

in many more by arresting the natural decay or change that plants go through in the late autumn. Herbaceous plants prepare themselves for winter by gradually dying down, and preserving their life by underground life only; if the frost comes too soon, much of the nourishment which would have been carried down to support the underground life during the winter is lost, and the plant is so much the weaker, and so much the less able to resist cold. With shrubs the case is of course different, but the result is the same. In the normal state the leaves fall leaving the buds for next year fairly protected by their own well ripened coverings, "the plant has time to become a chrysalis slowly, in preparation for the winter" *(Kerner)*, and the sap or what botanists call "the water of imbibition," is gradually withdrawn to the roots to remain there till it is wanted for the new life in the Spring, and so the branches are said to be "ripened"; but if there comes an early frost while the plant is still growing and full of life, the buds are injured, and, if not killed, they fail to produce flowers, and the sappy branches are easily frozen, and either die altogether, or are rendered quite useless for the next year's growth. I entirely put it down to the early frost of last October and November that my Japanese Persimmon *(diospyros Kaki)* which had been quite uninjured by many previous severe winters, was cut to the ground last winter. *Fatsia Japonica* also was more injured than I ever knew it before; my Palm had no flowers, the first time for six years past; *Halesia hispida*, though a very healthy tree and always a free flowerer had no flowers this year; and so with other plants.

Before leaving the subject of the mildness of the winter, I should like to call your attention to one thing connected with it. You may remember that two years ago I quoted to you an observation of Sir Robert Christison, that when frost occurred on the last week of October or the first ten days of November, it was always followed by a mild open winter; this was certainly the case this last winter to a very remarkable degree, and I mention

it again because I have been looking into the forecasts of other observers to see how far the same thing had been noted by others. Sir R. Christison was a thoroughly scientific man, a man who was content to make accurate observations and to record them; but not a man likely to say that because A followed B, therefore A was caused by B. This was, and is still the error of most weather prophets, they note in some years that a warm January has followed a cold October, and they prophesy for all time that a cold October is sure to bring a warm January; they argue from the particular to the universal, which is absurd. The error shows itself in the common belief that abundance of holly berries are a sign of a hard winter to come. They are a proof that the previous seasons have been favourable to the formation of holly flowers and berries, but they can tell us nothing of the weather to come. Yet, though a mild winter is not a consequence of a previous cold October and November, it is a coincidence which may be well worth noting, and it is curious how universal has been this forecast of a mild winter from a cold beginning. The turning point in the weather of November has been from time immemorial fixed to All Saint's Day, and S. Martin's Day, November 1st and 11th; and no doubt that has arisen from the observation that fine warm weather so often comes, though for a very short time, at that time, making the "All Halloween" summer and the "S. Martin's summer, halcyon days," that Shakespeare notes. There are several old proverbs grounded upon this common observation, but I need only mention one or two.

"If there is ice in November that will bear a duck, there'll be nothing after but sludge and muck."

"If it's fair, dry and cold at Martinmas, the cold in winter will not last long."

"If the geese on S. Martin's Day stand on ice, they will walk in mud at Christmas."

There are many such proverbs used in many European countries; and without attaching much importance to them as universal

rules, they are worth attending to and testing; because they are the result of many years observations both of scientific and unscientific men; and looking again at Sir R. Christison's remark, limiting the time to be noted to the last week in October and the first of November, it is curious to notice how almost all weather profits profess to attach great importance to such weeks. The idea is at least as old as Aratus who gave weather forecasts in the third century before Christ; he said

"It deeply imports
To mark the last four days of the dying,
And first four of the nascent month—of meeting months
They join the edges when most changeable is the atmosphere
Wanting eight nights the mild rays of the moon—
Such notes, collated with the calendar
Shall furnish solid forecast of the sky."

Phænomena, 1146—1152.
Poste's translation.

Of course he was speaking of lunar months, but regardless of this, weather observers and weather prophets have repeated his rules and applied them to calendar months, with which they cannot possibly have any connection.*

I have spoken at some length about the autumnal cold, followed by a mild winter; not only because last winter was such a marked example of it, but also because we have been passing through a cold Halloween and Martinmas of more than usual length, and it may be interesting to note whether the same result will follow this year, but I am afraid we must at present content ourselves with hoping only. But before I quite leave that part of my subject I must ask you not to suppose for a moment that I consider the mild winter of 1896 as the result of,

* On this subject of weather forecasts, and their connection with special days, see an excellent paper by our late President, in Vol. II., page 161, of our transactions entitled, "St. Swithin and other weather Saints."

or in any way *caused* by, the severe cold of November, 1895. The weather of any month we may be passing through, is not caused by the weather of any preceeding month, nor can it have any effect on the weather of any month to follow. The weather of each month is caused by atmospheric and climatic conditions which may have existed hundreds of miles away, and, perhaps, many weeks or months that may have long past; and it is only when the conditions draw near our Globe, and our portion of the Globe, that we are able to make a poor weather forecast of four and twenty hours: a forecast which, as we all know, is often far from the reality.

I have said quite enough about the mild winter, and it is time to come to the other marked feature of the year, the great drought. During January and February the rainfall was below the average, but during March it was above the average: and then from the first of April to the end of July the total rainfall was only $3\frac{1}{4}$ inches, of which more than half fell on a few days in June. Since that time we have had enough rain, especially in September and the first half of October, to bring the total rainfall of the year almost up to the average. We may say that for four months there was no rain; and what was the result in our gardens?

We may put out of the question all the newly-planted shrubs and other plants; of course they would suffer more or less in such a drought and they called for a good deal of labour and watering. But the point that most forcibly struck me was that with well-established plants the injury was very small indeed. My own garden has a rich deep soil, and so is able to contend against a long drought better, perhaps, than some others; but during the summer I visited many other gardens, and everywhere I met with the same surprise at the little amount of suffering that the plants had to bear, and I had not much difficulty in finding the explanation of this, which is so interesting that I must speak of it at some little length.

The first factor in the inquiry is, I think, the good rainfall of March, by which the ground, which was by no means dry before March, got an ample supply; and owing to the mild weather the plants were sufficiently forward at once to take advantage of the supply. Now, you are probably all aware that water is of no use whatever to plants except at the roots, and plant life is full of all sorts of devices to gather in a good supply of water to the roots, and to keep it there. Almost all the water that comes to the leaves of plants finds its way down to the roots, by gravitation chiefly, but in no case through the leaves or the stems. The skin of the leaves of plants, and the rind, or bark of their stems, are almost like the human skin, able to exude moisture, but in very few instances—some botanists say in none—can they imbibe water. Their function is to give out water, and there are many instances in which the water that has been drawn up from the roots is given out so largely by the leaves that it flows down again from the leaves to the roots, not, of course, the same way it came, but through the air, almost like rain. Familiar instances of this are found in our common teazle and in the Alchemillas; but as the subject is not perhaps familiar to you all, and is very closely connected with the provisions made in nature to provide against drought, I will venture to give you two or three well-marked examples.*

One of the best examples of the extreme provisions made to prevent access of water to the leaves or stems of plants, is to be found in the Bamboos; and any of you who grow the common hardy Bamboos can test it. Not only is there a general provision of rings of hairs on the stems, which effectually prevents any lodgment of water that may come from rain by throwing it off, but the leaves are so made that every provision

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* On the absorption of rain and dew by leaves, see an excellent, and very clear, account in "Kerner and Oliver's Natural History of Plants," Vol. I., pp. 225—230.

is made to prevent the entrance of water, and to facilitate its fall from the leaves to the roots. If you will take a leaf from the Bamboo and plunge it into water, and hold it there, you will find on drawing it out, that the underside of the leaf is absolutely dry. Now Bamboos are great pumps; they consume much water, but instances are found where they absolutely weep, and keep the ground beneath them quite moist. M. Carriere has noted this in Algiers, and in Gregory's account of the Great Rift Valley in Tropical Africa, he tells of some thickets of gigantic Bamboos, whose "upper foliage interlocks into an impenetrable thatch, which is always sodden with moisture," and amongst them would grow nothing, "except mosses, but in places the soil was covered with Iceland Moss (selaginella) and the Maiden-hair Fern," and "a mist hung over the Bamboos and kept the vegetation sodden with moisture, and made the soil as saturated as a sponge"—*Great Rift Valley*—1—290. That is one way in which "the wilderness is made into a standing water, and water-springs in a dry ground," and is an instance of the way in which thirsty plants can supply themselves with water in a dry, tropical country. I will give you another example from a very different climate. In the Death Valley of California, the rainfall does not exceed five inches in the year, yet the district has really an abundant vegetation, chiefly, however, of low trees and shrubs, with Cacti and Yuccas. The problem is how this five inches can be made to answer for the support of the vegetation, and the problem is thus solved by nature. The trees and shrubs are low and far spreading, and so the evaporation from the earth is reduced as much as possible; the roots spread to enormous distances, and so are able to suck up every particle of moisture; and the transpiration is reduced to a minimum partly by some leaves not transpiring at all, partly by the leaves being clothed with a thick, and in many cases a woolly epidermis; and partly by the leaves falling very early, and so stopping at once the leaf transpiration. This is a most curious example of the way

in which difficulties are met in plant life; but, really, we have in our own gardens many instances as curious, which were especially notable this year. There are many plants which we may fairly call Resurrection Plants; plants which apparently die during a drought, but which come to life again at the first approach of rain. A very familiar instance is found in the pretty fern that is so abundant in many parts of this district, though very rare in many parts of England, the *Ceterach officinarum*. As soon as the dry weather comes, and *sometimes almost before it comes*, the leaves shrivel up, showing only the under part of the fronds, and looking like so many shreads of brown paper; but on the first approach of rain the fronds go back into their proper position, they regain their full colour, and carry on their life as if they had had no check. To those of you who grow Alpines, the pretty *Ramondia Pyrenaica*, will be almost as familiar; and in that, too, you will see the same power of resisting a long drought. After a week's drought the leaves will be shrivelled and brown, and almost reduced to nothing; it will remain in that state for weeks, and then when the rain comes the leaves regain their colour, and the plant is as happy as ever. In these two plants there is a mystery which I cannot explain. I can understand a plant losing its leaves by drought and then getting new leaves, but I cannot understand how leaves can lose all their colour and then regain it, as these two plants, and many others are able to do, and it seems as if plants had the power on the approach of danger to part with their chlorophyll not entirely, but to store it in a safe place, their roots, from whence they could draw it again when the circumstances were favourable. But there is another still more common instance, which I do not mention with these two, because I am not sure whether or not the result is produced in the same way. Many of you must have been distressed at the state of your lawns this year. My own having a deep soil stood the drought well for a few weeks, but the battle was too long, and at last it was almost the same colour as my gravel walks;

yet before we had a week of rain it was a brilliant green, as green as the freshest growth of spring. I do not class this with the other Resurrection Plants, because I think it likely that the fresh green arose from young leaves freshly grown, and not from the old leaves recovering their colour. But it was really marvellous how soon everything responded to the rain; the lawn was perhaps the most conspicuous example, but it extended in a very pleasant way to our fruits. I had a good crop of peaches on the wall, and a good crop of apples, but both peaches and apples were very small, and the peaches, at first, were dry and flavourless; but as soon as the rain came both peaches and apples became visibly, and very rapidly plumper, and I had no cause to complain of their size or flavour. And, indeed, smallness, either of fruit or leaves, is one of the many provisions that Nature uses to prevent the bad effects of drought; and you will have noticed many such cases this year. With me the willow-leafed Gentian (*G. asclepiadea*) grows very well, and is often more than a yard high; this year it was about half that size, and that meant about half the usual quantity of leaves, and that, again, meant that the plant had only to part with one half the amount of moisture that it does part with when in full leaf. That shows why, in a wet summer, there is always an abundance of foliage; a greater quantity of leaves is required to carry off the moisture that the plant sucks up by its roots, and leaves are provided accordingly. The conclusion, then, at which I have arrived, is very shortly this: that there was never a complete failure of moisture at the roots during the long drought, and that, in one way and another, Nature economized the store, and so the plants were saved.

I might say more on the drought, but I must leave myself room to say something on some other aspects of the year. I think the drought has confirmed what I said last year as to the value of rich suitable soil to enable plants to stand against frost. That statement was objected to by some of my friends, though I gave

it on the high authority of Humboldt; but I am sure it is right, and this year's experience has taught me that plants cannot stand against either drought or frost, unless, they are strong and healthy, and that a good rich soil is the best way to make them so. I think my own garden, is to some extent, a proof of this; with its deep alluvial soil it gives many plants all that they ask for, but I saw it more fully proved in another, and far grander garden. I went in October with your Vice-President to Abbotsbury, in Dorsetshire. Though I had often heard of the beauty of the garden, I had never seen it, and when I did see it I could scarcely believe my eyes. There were trees and shrubs, and other plants from Australia, New Zealand, the Cape, Mexico, Brazil, and other parts, not merely living, but flourishing as if they were in their own native countries. Then came the puzzling question, how do these plants grow at Abbotsbury with a luxuriance that is almost unknown North of the Riviera? The garden is near the sea, facing the South, with the low hills of the Chalk Downs behind sheltering it from the North, and is well sheltered by walls, fences, and other artificial protections; but this will not explain it. There are hundreds of places round our coasts as well situated for aspect and protection, but with no such gardens; and I have been driven to the conclusion that the secret must lie to some, perhaps to a great, extent, in the soil. As we walked to the garden from the village we passed a small roadside cutting, showing a section, which at once attracted the attention of my geological companion. It was a ferruginous oolitic brash, and I should have considered it as bad a material for a garden as could be found; yet the Abbotsbury garden is almost entirely on this. There is no doubt that iron in the soil is a great help to many plants; gardeners like it for their hydrangeas, and in my own neighbourhood I have a good example of its value. I have never succeeded in growing the beautiful *Tropœolum speciosum*, which, in many parts, especially in the North, grows like a weed. I know of one place where it is even

a troublesome weed; but I do not know of it growing well anywhere in this district, except at Iron Acton, where the soil is strongly charged with iron. Yet I do not say that good soil by itself will enable plants to resist drought; it can only be a great help, and on whatever soil plants are growing, a long drought will test the skill of the gardener. Perhaps the skill, or no-skill of a gardener is shown in nothing more than in his way of watering his plants. Plants soon show when they are thirsty, and a good gardener will at once quench their thirst by a plentiful supply of water at the roots; the unskillful gardener loves to water the drooping foliage; it looks pretty and is of no use; and if he has a plant drooping by the side of a gravel path, he is rather surprised to be told that he had better soak the gravel path well than wet the foliage only. There is an advantage in watering leaves when they are choked with impurities, and in some places, as at Kew, where they have to contend with an atmosphere charged with blacks, constant and copious syringing is useful; but this is cleansing, and not watering, and is the same use to the plant that a good washing is to a dirty man, opening the pores by cleansing them of their choking impurities.

Very shortly I will mention two other features of the garden this year. I attach a high value to the autumnal tints as one of the chief ornaments of the garden, and this year I had none. We are now told that it is wrong to speak of equinoctial gales, but this year we had very strong gales at the time of the autumnal equinox, with the unpleasant result that the trees were stripped bare long before their time, and so there were no leaves to be tinted. The only compensation that can be had for this loss is in the old weather forecast that if the leaves fall before Martinmas the winter will be mild. I hope this forecast may come true.

The year was not so remarkable for abundance of unusual fruits and seeds as I should have expected. The Catalpa, some Magnolias, and the Koelreuteria fruited well, and I had fruit on

Œnothera macrocarpa* and berries on Solanum Crispum which I never saw before; but I did not notice many others out of the common; but the hollies and the hawthorns are beautifully set with berries, and the berries on the privets were, this year, quite remarkable from their number, and the intense depth of the black colour. I think, however, that the mild winter, dry summer, and wet autumn of this year will have a marked influence on the vegetation of next year. Fruit trees of all sorts are well set with fruit buds; the spring-flowering shrubs such as the Magnolias and Calycanthus are full of promising flower buds, and though all November was cold and had an unusual amount of frost, plants, even tender plants, seem to have been very little affected by it, which shows that they have made strong and healthy growth, and are well prepared for the cold, when, and if, it comes.

The animal life of the year requires a short notice. I do not know whether the mild winter was in any way the cause, but I think that the number of our immigrant birds was much below the average. I noticed this especially with the swallows and redstarts. Of redstarts we had very few, though we generally have them in abundance; we had a great many swifts, but the swallows were certainly few in number and arrived very late; I did not see one in my garden till the last week in April. But this may have been a purely local occurrence, for the number of swallows in the autumn was as large as usual. Of course, there are always more in autumn from the accession of young birds, but the great addition must have been from the Southward rush, which always swells the numbers in our Southern counties, and the full number that we had in the autumn probably shows

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* The fruit of *Œnothera macrocarpa* is most curious. From a central line spring four wings each about an inch wide, each wing being the pod containing the seeds. The length of the fruit is from three to five inches.

that in other parts the number was not below the average. Wasps were rather plentiful for a short time, but it was a very short time; and I believe it was a good honey year; but there was a sad lack of moths and butterflies. I always consider that one of the most beautiful things in the garden in autumn is the swarm of Peacock butterflies on the Michaelmas daisies; this year there were scarcely any.

But I must bring my paper to a close, and I must close it in the same lame way in which I have felt obliged to finish my papers in other years; by apologizing for its length. I am very conscious that I have allowed myself to wander from the straight road of my subject into many bye-paths, but you will pardon me for doing so when I tell you that I have been tempted to wander much more than I have done, but I had to think of my hearers and I spared you. I may, however, say as some excuse for my wanderings, that however much I have wandered I have kept one point steadily before me. In my last paper, and in this, I have tried to show you what I feel myself that frost and drought are not the dreadful visitations that heartless gardeners make them out to be. More than that, I am sure, that though unpleasant while they last, they have their uses, and are as necessary as mild winters and the fruitful rain in its season. We may, in fact, feel quite sure that they are absolutely necessary; and though we may not understand how it should be so, they do fill their proper allotted parts in the grand scheme under which we live; the scheme that has for its great object the well-being of all organic life.

On a Rhætic Exposure at Boyce Hill.

By the Rev. H. H. Winwood, M.A., F.G.S., Vice-President.

(Read January 13th, 1897.)

It will be necessary for me first to explain the locality of the Rhætic exposure to which the following notes refer:—

In 1871, now 26 years ago, I had the pleasure of placing

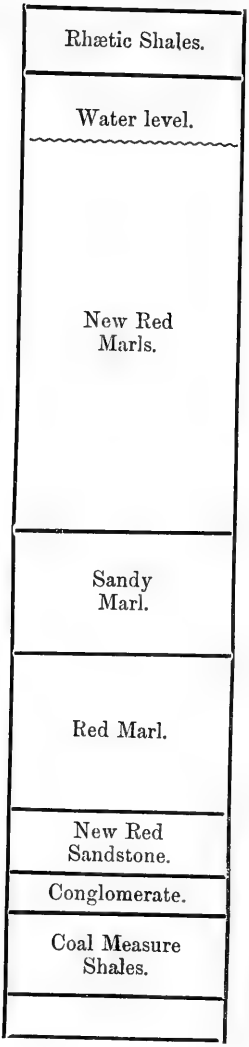
before the Members of this Club (but few of whom now remain amongst us) some details respecting a section opened up on the Midland Railway near Weston Station. Ten years previously, (1861) Mr. Charles Moore had briefly alluded to this section, then just being exposed, in a note to his paper on "Abnormal Secondary Deposits" (Q.J.G.S. Vol. XXIII. p. 495). Adopting his name for the excavation the title of my paper was "Notes on a Rhætic Section at Newbridge Hill" and therein a description of the beds below the Lower Lias was given. The White Lias beds were then, and are still well seen on the N. side of the line, and show the best exposure of those debatable beds in this part of Somerset. Since then the Bath Brewery Company, a large and important commercial undertaking, have been excavating for the foundations of their new establishment to the S. of the line and between it and the river on a site given on the Tithe map as "Boyce hill," hence the name adopted for these remarks.

I need hardly remind the Members of a Club, who once had the honour of having enrolled amongst its list the name of Charles Moore, that the term "White Lias" is used in the sense in which he applied it, and includes only those cream coloured limestones with conchoidal fracture forming the top of the Rhætic series, and so different in lithological character and fossil contents from the Lower Lias beds immediately above them.

Early in the year 1896 my attention was called by the Rev. E. W. Leir to a boring then proceeding in the W. corner of the section described in my former paper (1871). By the kindness of the Directors of the Brewery (and here I wish especially to mention the name of Mr. Ayton who has placed every information at my disposal) leave was given me to watch the boring and to take notes of the character of the beds passed through. The specimens of boring were preserved in two long boxes duly labelled, and the following are the notes taken at the time.

SECTION OF BORE HOLE ON LEVEL OF MIDLAND RAILWAY, W. OF WESTON STATION.

Scale 10 feet = $\frac{1}{4}$ inch.



	Thickness.	Depth.
Rhætic Shales.	14	14
Water level.		25
New Red Marls.	106	120
Sandy Marl.	25	145
Red Marl.	39	184
New Red Sandstone.	16	200
Conglomerate.	6	206
Coal Measure Shales.	16	222

The section on preceding page has been reduced from the "Vertical Scale of 10 feet to one inch,"—made by Messrs. Timmins and Sons, May 12th, 1896, and kindly lent me by Mr. Ayton—to a scale of 10 ft. to $\frac{1}{4}$ inch.

PUNCH BORING BY THE BATH BREWERY CO., AT THE LEVEL OF THE RAILS IN W. CORNER, S. OF THE WHITE LIAS SECTION NEAR WESTON STATION.

No.		Ft.	Ft.
1.	Surface to black micaceous shale, containing *Avicula contorta, Cardium Rhæticum, Axinus, Pleurophorus, &c.* ...	7 ...	0
2.	Grey marl ... ... from	7 to	14
3.	Red marl with grey spots ... from	14 „	20
4.	Ditto ... ... from	40 „	120
5.	Red marl, more arenaceous, with quartz grains and small pebbles	120 „	145
6.	Ditto	145 „	184
7.	Sandy marl almost loose, sandstone very moist, with rounded quartz grains and subangular pebbles	184 „	200
8.	Ditto, coarser grained and moist, grains separated	200 „	206
9.	Close grained sandstone passing into fine conglomerate, pebbles ferruginous, coloured black	206 „	208
10.	Coarse grained ferruginous sand ...	208 „	212
11.	Ditto	212 „	219
12.	Black shale	219 „	222

When the boring had reached the "Black Shale" which was labelled "Coal Shale" further work was stopped.

From the above section the following inferences may be drawn :—*(a)* That the new Red Marl was met with about 14 ft. from the level of the rails ; *(b)* that the whole thickness of the

New Red Marl was about 106ft., of the more arenaceous Marls passing into sandstone and fine Conglomerate 99 ft. Total of New Red 205 ft. *(c)* Though the water level was found 14 feet below the surface, yet the chief supply of water at a temperature of from 53° to 54° was reached at the first appearance of the arenaceous beds, i.e., about 130 ft. below the surface, and yielded 2,000 gallons per hour. *(d)* That most probably the Coal Shales which succeed the New Red beds were touched at 219 ft. below the surface, and that the boring was judiciously abandoned at this point, and the bore hole covered over.

Another trial hole has been sunk subsequently to the above at a spot much lower down and nearer to the river. Owing to the numerous step faults which abound in this district and the consequent Southerly dip of the strata, the Black Rhætic Shales alone were reached without touching the New Red Marls. After passing through the Grey clays and piercing a band of White Lias, the true "Cotham Marble" resting upon the *Avicula contorta* Shales, a plentiful supply of water was tapped. This seems to have been found just at the junction of that band and the Black Shales. This well has been for the present stopped at the depth of 33ft.

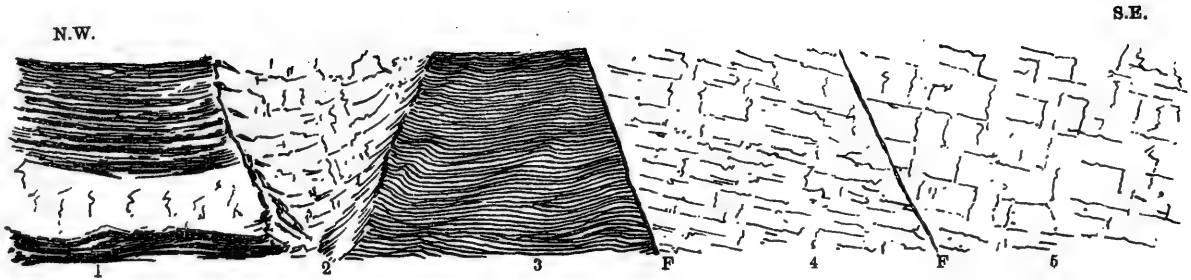
So far as to the succession of beds proved by the well boring and sinking. Now for the sections exposed in the various excavations carried out for the roads and the foundations of the buildings to be erected.

The best section of the White Lias and Rhætic Shales was exposed in a square pit at the N. side of the ground not far from the rails excavated for the chimney stack, and 22ft. higher than the surface of well on S. side. This gives the clue to the true succession. The following section shows the White Lias and succeeding beds to a depth of about 14ft. 6in.

SECTION AT THE N. SIDE.

No.		Ft.	In.
1.	Broken up beds of White Lias and yellow clay...	1	7

PLATE No. 1.



1. Rhœtic Clays.
2. Lower Lias.
3. Rhœtic Clays.
4. Rubbly White Lias.
5. Lower Lias.
F. Faults.


BRITISH MUSEUM
NATURAL HIST.

No.		Ft.	In.
2.	Yellow clay	0	4
	White Lias band	0	7
	Yellow clay	0	3
3.	"Cotham Marble"? irregular	0	5
4.	Light blue or grey clay, with band of yellow clay at base	3	0
5.	Marly White Lias, yellow outside, blue inside, divided by yellow clay	0	10
6.	Grey clay	0	5
7.	Light blue or grey clay resting upon	1	7
8.	Irregular beds of light blue or grey marlstone ...	0	7
9.	Light blue clay	1	5
10.	Dark blue or black clay, Rhætic shales, crowded with fossils	3	6

If this section is compared with that now exposed on the N. side of the rails it will be seen that there is a great difference in the thickness of the White Lias beds; whereas in the latter section they are from 10 to 12ft. thick, in the former they are reduced to some $3\frac{1}{2}$ ft. including the "Landscape stone" or "Cotham Marble" as the base of the White Lias proper in each section. This may be accounted for by the S.E. dip of the beds, the faulting and the great amount of denudation that is evident throughout. That the same disturbance and faulting which occurred on the N. side of the rails continued Southwards was plainly visible in a trench cut parallel to the rails to a depth of about 4ft. 6in. Plate No. 1 taken at the time shows the faulting.

At the N.W. end were the dark Rhætic Clays with a band of Grey Marly limestone in the centre 1ft. 6in. thick. Many black specks in this softish limestone appear to be Carbonaceous. Next to this comes an infilling of reddish brown Lower Lias, running downwards in a V shape to a string, succeeded by Black Rhætic Clays, then again by Rubbly White Lias beds upon which rest still further on in S. Easterly direction Lower Lais, whilst at the end

"Cotham Marble" formed the bottom of the trench followed in one spot still further on by the top bed* of the White Lias, William Smith's "Sun bed" dipping 14° S.E. The remaining portion of the trench is excavated in White Lias. An illustration, No. 1, taken at the N.W. end of the trench, shows but imperfectly the squeezing and disturbance to which the beds have been subjected.

N. and S. Section.

A road cut level with the rails for purposes of communication with the siding has opened up a section running N. and S. which is of some interest especially in relation to the more superficial geology. Plate No. 2 gives a very fair idea of this. It is taken from the N. end where the cutting is from 10 to 11 ft. in depth of which the following is a section.

Section Running N. and S.

No.		Ft.	In.
1.	Turf and mould	0	5
2.	Disturbed mass of White Lias and yellow clay ...	2	1
3.	Yellow clay	0	10
4.	Sandy clay, more sand than clay, with pebbles throughout, White Lias pebbles prevailing near the top, Mountain limestone nearer base, &c., &c.	3	6
5.	Rubbly beds of White Lias at base with intercalated grey clay bands, basement beds of White Lias	4	0

The gravels resting on the W. Lias had a black band of sand and pebbles at the base, and thin out Southwards to a thread.

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* Recognised by the presence of the thin brown arenaceous band invariably separating the White Lias from the Lower Lias in this district. (vide "No. 20" in "Newbridge Hill Section" of my former paper.

PLATE No. 2.

S. N.

1. Turf and Mould.
2. White Lias and Clay.
3. Lenticular patch of Sand and Gravel.
4. Rubbly beds of White Lias.


BRITISH MUSEUM
NATURAL HISTORY

The six foot rod, in Plate No. 2, rests on a square subangular block of quartzite.

Continuation of above Section on S.

A series of little step faults occur all along, but are scarcely seen in the Plate. The following details are very similar to those on the N., though the section is not so deep owing to the slope of the ground towards the river.

No.		Ft.	In.
1.	Turf and mould	0	8
2.	Reddish loam and burnt earth	1	4
3.	Clay, resting on	0	4
4.	Gravel	1	0
5.	Rubbly White Lias	2	6
6.	White Lias, solid bed	0	7
7.	Yellow clay	0	4
8.	"Cotham Marble," irregular bed ...	5 to	6
9.	Yellow and grey clay at base		

Some features in the above section are worthy of note. The sandy clay and gravel No. 4 is lenticular and thins out S. into a wedge shape.

Just above the six foot rod in Plate No. 2 were indications of a burial. An excavation had been made through the top soil and reddish loam to a depth of 1ft. 6in. and the cremation of some animal had taken place. Above the burnt clay at the bottom were pieces of calcined bones, remains of charred wood, and a broken flint, the bones probably belonged to some domestic animal.

Plate No. 3 gives a section of the S. side of the trench. The hammer is resting upon the grey clay below the "Cotham Marble," the irregularity and concretionary nature of which is plainly seen; just above comes some yellow clay on which rests a

solid bed of White Lias some 6in. thick succeeded by Rubbly White Lias to the top nearly. At the base are the Black Rhætic clays.

One other section may be given showing a larger development of the gravel beds, and is of interest as indicative of the great amount of denudation that has taken place and as marking the spot where Mammalian remains have been found.

SECTION OF GRAVEL BEDS, S.E. END, NEAR PRESENT RAILWAY BRIDGE.

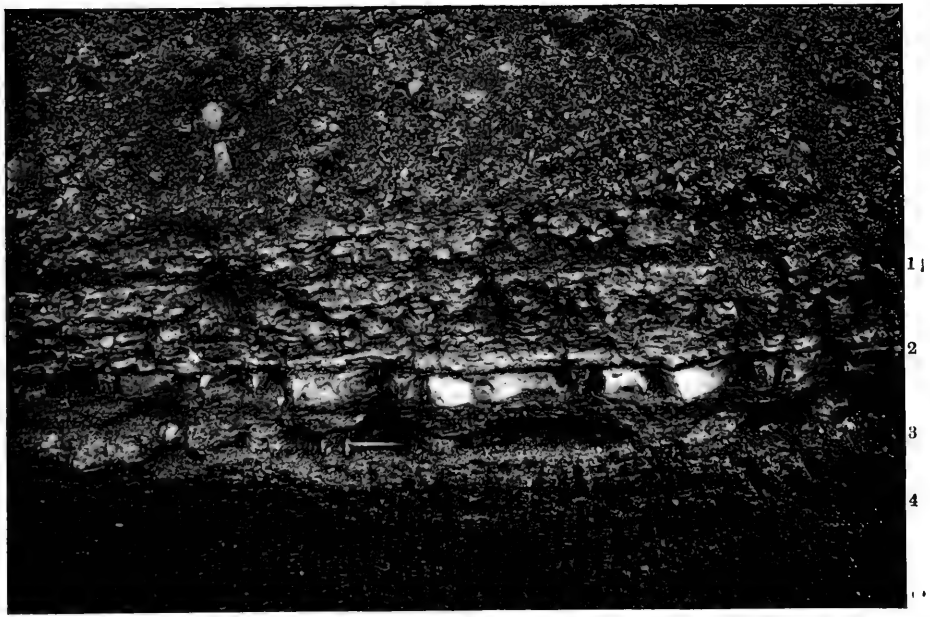
No.		Ft.	In.
1.	Beneath top turf and soil removed, clay with stones and subangular blocks of Lower Lias, reddish brown at base and resting on irregular wavy surface	1	5
2.	Mottled grey and reddish marl, graduating into	1	3
3.	Sandy marl streaked brownish red and yellow, with small pebbles, gradually passing downwards into gravel, with large blocks of grit at base, resting on White Lias	5	0

In one of the bands of yellow clay portions of Elephant's tusk and the plates of Rhinoceros teeth were found. The gravel beds here about 37ft. above the present river level are therefore proved to be the usual Mammalian gravels, and correspond with those on the left bank of the river at Twerton, and are similar in composition and contents. They are made up of Mountain Limestone, Old Red, Oolitic Coral *(Isastræa)*, Greensand, Lias, reddish Grit with white quartz pebbles, Old Red Conglomerate and Dolomitic Conglomerate, Flint, Chert, and a reddish Quartzite. Some of the latter were of considerable size. One block seen in Plate No. 2 near which the six foot rod rests, measured 4in. by 3in. by 3in. nearly square with the angles rounded off, another of reddish grit 10in. long.

One large block of Mountain Limestone well smoothed, with

PLATE No. 3.

E. W.



1. White Lias.
2. "Cotham Marble."
3. Grey Clay.
4. Black Rhætic Shales.


BRITISH MUSEUM
NATURAL HISTORY

angles rounded off and triangular in shape, weighing about 2 cwt., measured by myself during my last visit yesterday, was 1ft. 7in. on its longest side and 6in. thick. There were many others, not much smaller, all lying near the base of the gravels. Could water alone have brought these so far from their site, or was it water in the form of floe ice?

Whence did all these come from?

What a tale of great physical changes does this unfold, of changes which have taken place in our valley in geologically recent times!

Gravels, consisting of rounded pebbles, indicate a considerable amount of abrasion by rolling, and that the former water flow must have been of vastly greater volume than at present. The contents of the gravel beds bespeak their distant home whence they have come. Old Red Sandstone, Mountain Limestone and Flint did not come from the hills which immediately girdle our Bath basis. Their source lies far away at the back of these hills. We must go to the Mendips to find the parent rocks in that direction. The transporting agent must be sought in water of some form. We have then the Avon to look to as the agent, but not the decrepid old dirty stream that slowly and sluggishly winds its devious way through the alluvial flats to its mouth. But looking back through the corridors of time we must picture to ourselves the former Avon in all its youthful vigour cutting its frolicsome way from the water shed, probably much higher than at present, through the Old Red Sandstone, Mountain Limestone and Jurassic gorges, and rolling down in its course its burden from those formations, bursting its way through the Frome and Warleigh Valleys into the Bath basin. Rollicking away through the valley and depositing its contents now on this side now on that, until it emptied its waters through the Avon gorge at Clifton into the Severn Sea. Finally reducing the level of the land to baselevel, when its work is finished, and its energetic young life nigh extinct.

Rivers have their youth, manhood and old age, our river has reached the latter stage, and can no longer carry its burden of abrasion aud atmospheric weathering seawards.

Such, gentlemen, are some of the facts and inferences gathered by an old geological bee in his short flights. Whether they are of interest to anyone else but himself he knows not. But this he does know, that like an old drone he now and again flutters around the hive where in past times lived some working bees, but he finds the hive empty and all the young geological brood absent. Food is abundant but where are the gatherers ?

Summary of Proceedings for the year 1896-97.

Mr. President and Gentlemen,

The Anniversary Meeting of the Field Club on February 18th, 1896, was held at the Royal Literary and Scientific Institution, and the Members present were greatly pleased by the information of the Honorary Treasurer, Surgeon-Major Mantell, that his accounts had been audited by Col. R. L. Taylor, C.B., and that a balance of £44 4s. 9d. in favour of the Club enabled them to look forward to the work of the year without fear of bankruptcy. The Rev. Canon Ellacombe was re-elected President, the Rev. H. H. Winwood and H. D. Skrine, Esq., vice-Presidents, Surgeon-Major Mantell, Treasurer, W. H. Barlow, Esq., Librarian, and Rev. W. W. Martin, Secretary, a hearty vote of thanks to all those Officers being returned for their past services. Messrs. T. F. Inman and W. H. Henderson, and the Rev. C. W. Shickle were the three members elected to serve on the Committee for the ensuing year.

The Bath Literary and Philosophical Society having arranged in their rota of proceedings a soiree for February 28th, whereat Col. H. C. B. Tanner, F.R.G.S., one of our Members, was to lecture

on "Certain atmospheric and terrestrial Phenomenon observed in the Himalaya Mountains," graciously forwarded an invitation to the Members of the Field Club to attend freely the meeting, of which many Members thankfully availed themselves. The lecture was illustrated by a large number of beautiful views thrown on a screen, the greater proportion of which had been photographed by the lecturer from sketches he had made in the Himalaya, when engaged in the trigonometrical survey for the Indian Government. The lecturer brought to bear a personal experience of 40 years in describing the many snowcapped mountains, cascades, glaciers, and other characteristic scenery of the loftiest range of mountains in the world, and the audience was charmed with the persevering labours and exactitude of these talented Surveyors, who certified that Mount Everest had been found to be the loftiest mountain in the World, and to be exactly 29,002ft. in altitude.

The Bath Natural History and Antiquarian Field Club was pleased on March 18th to be able to reciprocate the civility of the Literary and Philosophical Society by extending to its President and Members an invitation to another interesting lecture on the Egyptian Exploration and discoveries. The well-known lecturer, Dr. Hills, of the Egyptian Exploration Fund, was invited by the Field Club to give his lecture on "The strange story of an Ancient Queen B.C. 1600, being the results of the most recent explorations and finds in Upper Egypt on the site of the Great Temple of Queen Halshepset," illustrated from the original photographs of Mr. Howard Carter.

The attendance at the Royal Literary and Scientific Institution was excellent, and the Rev. Dr. Hills stated how the ruins had been discovered on the left bank of the Nile in the neighbourhood of Thebes by some French explorers in the year 1798. The city of Thebes was peculiar in this respect, that all its Temples were on the Eastern side of the Nile and its tombs on the Western. The Temple was covered with débris until the year

1893 when the Egyptian Exploration Fund took the matter in hand, and the removal of the superincumbent rubbish was commenced. The work proved a most costly and laborious one, but was completed by the assistance of the Egyptian Government, and now the whole of the structure has been restored to daylight. The Queen Halshepset reigned in the 18th dynasty, or during the dynasty of the Theban Kings, a time when Thebes and its neighbourhood was the ruling power of the world. The Queen, according to the custom of the country, had been united on the throne with her father Thothmes I. At his death she married her brother Thothmes II. and later married once more, this time choosing her nephew who became Thothmes III. For some reason her last husband became embittered with hatred towards her, and after her decease took immense pains to obliterate every record she had made throughout the country. It was during the life time of her second husband that she had erected a splendid Temple to his memory. It was built on three platforms, a lower, a middle and an upper. On the upper platform had been found many shrines dedicated to different deities, the chief shrine being dedicated to the Sun God Amen-Ra. There was also a magnificent altar dedicated to Harmachis the Sun God of the Horizon. The rev. lecturer exhibited many photographs and sketches thrown on a screen from a lantern, which proved that the beautiful hieroglyphics and sculptures of the Queen had been subsequently defaced and altered by Thothmes III. whose name was always substituted for his late wife's. In some cases Dr. Hills showed how the efforts of the defacer had failed in entirely removing the hieroglyphics, the original meaning of which was still decipherable.

The Rev. H. H. Winwood, Vice-President, heartily thanked the lecturer for his most interesting paper, and hoped that any of his audience whose means allowed would assist the invaluable work of the Egyptian Exploration Fund.

The four regular excursions for the year were arranged for

Clevedon, Wareham and Corfe Castle, Llanthony Abbey, and Nunney Castle and Vallis, all of which took place, and were well-attended. An extra excursion to Siston Court was subsequently added, but was poorly attended owing to the heavy rain.

Clevedon, April 14th, 1896.—The first excursion of the season took place on Tuesday, April 14th, when a large number of Members met at the G.W.R. Station in time for the 10.17 train to Clevedon. The first place visited was Coleridge's Cottage which lies on the road to the Parish Church, an old pine tree marks the cottage sufficiently well, and there still appears to be a jasmine over the porch, so that things are little altered since the poet's time, although the surrounding buildings now hardly bear out the lines—

> It was a spot you might aptly call
> The valley of seclusion.

At the Parish Church Mr. Hancock, one of the Churchwardens, was kind enough to meet the Members and go round with them. This Church (dedicated to St. Andrew) has a great deal of interest attached to it. It was originally of late Norman construction, the remains of which are well seen, outside in the Tower to the Corbel Table, and within in the Chancel Arch, which is a remarkably good example of Transition work, and unlike many other specimens does not seem to have been tampered with. There are two hagioscopes, one on each side of the Chancel, and an opening in the wall over the Chancel Arch that may have been approached by a flight of steps from the Chancel, and have led to some Rood chamber beneath the Tower. This point caused some discussion, and was left an open question. The aperture, as well as the squints, are now glazed to prevent draught. There is a curious slab on the W. side of the entrance Porch with incised cross in circle, this was discovered at the recent restoration of the Church, and would be worth paying some little attention to. The W. window of this

Church is almost unique, the tracery forming a cross, and this is specially noticeable from the inside with the Western light shining into the Nave. Time prevented Members lingering longer in this interesting Church, which will well repay individual Members paying a longer and careful study of the details of the Transition and Decorated work, and deciding points that a hasty visit merely raises. The lovers of Tennyson, too, have a special regard for the Building, as it is referred to in "In Memoriam," and here the Hallams, father and son, are buried. A start was now made for the Walton Park Hotel, where lunch was prepared. In due course, the Members being refreshed, the next place visited was Ladye Bay (so called from the former proximity to a Church dedicated to the B.V.M.). Here an interesting geological section appears, the Old Red Sandstone cropping out on the Beach.

The Rev. H. H. Winwood, with the Geological Map spread out on one of the Boulders of Old Red Sandstone, explained the position of the Somerset and Gloucestershire Coal Basin, pointing out the fringe of Carboniferous Limestone running down like a tongue to the S.W., and enclosing patches of Coal Measures within its Borders. On passing from the Station to the Old Church in the morning the Members may have observed how sharply the Limestone dipped to the S., and were tilted up almost on end. This was the case with the Palæozoic Strata generally in this district. With regard to the strata of Ladye Bay the feature of peculiar interest was the fact of the yellowish looking Limestones which they saw on their right hand resting nearly horizontally on the Red Beds of Sandstone dipping landwards at a high angle on their left; in other words, rocks of Mesozoic date resting on the upturned edges of the Old Red Sandstone of Palæozoic age. Between these two ought to come the whole of the Carboniferous Limestones and the true Coal Measures, many thousands of feet of strata being unrepresented, a good specimen of Unconformity. These yellow beds on

the left were the finer deposits of the same waters which left behind them those coarse Conglomerate beds which may be seen resting on the Carboniferous Limestone of the Avon Gorge, and everywhere on the flanks of the Mendip Hills. While the Conglomerate in some places was deposited in shallow water and consisted of larger pebbles, the débris of the old seashore of the period; the deposit which fringes the Coast line here is much finer and the pebbles very small and almost imperceptible in some places, showing that it was laid down in much deeper waters and further from the Coast line of the period. The Beach on which they were standing was composed of the Red and Greenish Grey pebbles of the Old Red Sandstone cliffs before them with some of the softer pebbles of the Magnesian Limestones.

The carriages now drove Members to Clevedon Court through the picturesque gap in Dial Hill, to the other side of the Gordano Valley, passing Walton Castle on the left. Clevedon Court is situated in a most charming locality, sheltered from the cold winds by the lofty hill at the back, and with a beautiful view over the Valley in the front, a situation where all delicate plants would have a chance of surviving an English winter.

Sir Edmund Elton most cordially received the Members in the beautiful Old 14th Century Hall. This Room, and its surroundings, is the oldest part of the House; now it is covered by a ceiling, but formerly the open-timbered roof showed signs of where the smoke used to escape, when the fire was in the centre of the Hall, before the fireplace was in its present position. Such an interesting account of Clevedon Court has been written by Sir Arthur Elton in the Somerset Proceedings of 1881 that it would be useless to give a detailed description of this beautiful place, but the charm of the residence is that in the old Hall and surroundings one is able to imagine, to a certain extent, the civilization of the Edwardian Period, and there are not many instances in which this can be studied in the form of an unfortified

house. Next comes the Elizabethan Period when windows were larger, and life more secure, and entertainment, too, was carried on to a larger extent.

Sir Edmund Elton is the originator of the Clevedon Pottery, and a skilled potter himself. The works are situated in the grounds, and he was good enough to show the Members over them, and explain how the work was carried on. The Elton Pottery is a very handsome ware, the colour adopted being very dark, and a deep maroon slashed with red had a magnificent effect. The clay used for the manufacture is found almost anywhere in the neighbourhood, but the preparation is both arduous and difficult.

Time prevented Members staying longer among these interesting surroundings, so Sir Edmund was heartily thanked for his kindness and the Members took their carriages for the Railway Station, and were soon safely landed in Bath, having spent a very enjoyable day.

Corfe Castle, Isle of Purbeck and Wareham, May 12th and 13th.—The second excursion on the rota of the Field Club took place on May 12th and 13th, but was not attended by many Members. The weather was all that could be desired, clear and hot, but the tedious railway journey to and from Swanage, 83 miles, and the necessity of passing a night away from their homes seemed to have deterred many from joining this highly instructive and interesting trip. Leaving Bath by Somerset and Dorset Railway at 12.18 p.m., Corfe Castle was reached, after twice changing cars, at four o'clock, and a start was immediately made for the famous old Castle about a quarter mile distant. This magnificent ruin was the site of many interesting events recorded in English history, but Cromwell's cannon and gunpowder have most effectually wrought destruction of the noble fabric. Had not the tenacious mortar of the early ages defied the mines and levelling efforts of the Parliament, hardly one stone would have remained on another to tell the original arrangement of the Castle.

The island of Purbeck in the time of the Heptarchy was a Royal forest belonging to the Kings of the West Saxons, and King Edgar built at Corfe a hunting box, part of which still remains in the walls built in herring-bone fashion to the W. of the second ward. In this building, A.D. 978, the second Queen of Edgar, Elfrida, committed what the Saxon annalist styles "The foulest deed ever committed by the Saxons since they landed in Britain," viz., in handing a stirrup-cup of wine to her step-son King Edward, she either personally or by the hand of a servant drove a poignard into his back, and so succeeded in obtaining the crown for her own feeble son, Ethelred II.

The body of Edward the Martyr was buried at Wareham in a wattle Church, but three years subsequently was carried to the Abbey of Shaftesbury, where many miracles were wrought on the faithful who visited the Royal relics.

Curiously enough no mention is made of this Castle in Domesday book, but it was seized in the reign of King Stephen by Baldwin de Rivers, Earl of Devon, for the Empress Maud.

King John, 1200, made this Castle his head-quarters and deposited his Regalia therein for safety against the lawless Barons. In 1203, after slaying his nephew Arthur in Rouen, he brought to this Castle his niece Eleanor, "the damsel of Brittany," and 24 Poitevin nobles whom he took prisoners at Mirabeau in Poitou, the former was sent to Bristol in 1216 by Henry III., and died after 40 years' imprisonment, 22 of the latter were starved to death at Corfe. Peter of Pomfret, a mad Monk, was also a prisoner here, and was dragged by horses' tails through Wareham, and hung and quartered.

On King John's decease and accession of Henry III., A.D. 1216 Sir Peter de Mauley, Governor of the Castle, handed over the keys and Regalia to the King. The Norman Keep of the Castle is a lofty building of Henry I. time, the S. annexe is allotted to Henry II. but most of the towers and the whole of the outer ward and its gateway to Henry III. The inner gateway, which defied the

attempts of demolition in 1645 and exhibits such marvellous cohesiveness of good mortar, is a fine work of Edward I. The miserable King Edward II. was a prisoner here in 1326, and was removed by his keeper, Sir John Matravers, hence to Berkeley Castle to be murdered on September 21st. From this time to the reign of Edward VI., 1547, the annals of the Castle were very uneventful, but this King granted it to his uncle the Duke of Somerset, and on the Duke's attainder it reverted to the Crown and was granted by Queen Elizabeth to her favourite Sir Christopher Hatton. In A.D. 1635, it was purchased by Lord Chief Justice Sir John Banks, whose descendants still possess it. Under Lady Banks in 1643 it sustained the ever memorable siege of six weeks against Sir Walter Erle and 600 rebels and 150 marines from Poole. Lady Banks, her daughters, women, and five soldiers defended the inner ward, Capt. Lawrence and about 80 men the two outer, and on August 4th, 1643, delivered the Castle with the loss of only two men. They had killed and wounded in the siege and assault over 100 men of the enemy. The siege was raised by Sir W. Erle on an alarm being raised that the Earl of Caernarvon was at hand with the Royal troops. Two years later Col. Bingham took the Castle after a gallant defence through the treachery of Lieut.-Col. Pitman, who admitted a troop of the besiegers in disguise, and it was subseqnently "slighted" by order of Parliament.

The present town of Corfe is built entirely out of the materials of the overthrown Castle, except the Tower of the Church, which is ancient. It had the privilege of returning two Members of Parliament up to the first Reform Bill. Sir C. Hatton obtained all the rights of a Cinque Port from Queen Elizabeth, besides other liberties, and it was incorporated in 1576 with a Mayor and eight Barons, who must have borne the office of Mayor. The constituency of voters paying scot and lot numbered 80. After 1832 it returned one M.P. conjointly with Wareham and Bere Regis, and since 1867 is merged in East Dorset.

A short run in the train brought the Members of the Field Club to the Town of Swanage, where quarters for the night were obtained at the Royal Victoria Hotel. The Town of Swanage itself contains nothing of interest, but it is a centre of many excursions, and the Isle of Purbeck offers an inexhaustible field of exploration to Geologists and Botanists. The well-known Purbeck Marble, which is so much used in Salisbury Cathedral and other Early English Churches, and is almost entirely composed of a small freshwater shell, *Paludina carinifera*, cemented by lime, seems to have been entirely worked out.

The following day, after visiting Durlston Head and the Tilly Whim Quarry, a start was made at 12.20 for Wareham, a town lying between the Rivers Frome and Piddle, surrounded by an immense vallum 30 feet in height on all sides but the S. in the form of a long parallelogram. This town is supposed by some to be the Roman *Morinio*, but the name is derived from "Var," the Celtic name of the River Frome, and the rampart is supposed to be of Saxon age, and became the head-quarters of the piratical Danes in their frequent invasions, until in the Conqueror's time the town can hardly be said to have existed. Athelstan gave this town two mints and mint masters, in which it was only equalled by Shaftesbury.

From the Railway Station a quarter of a mile brings one to the River Piddle, immediately after crossing which the huge Northern rampart is pierced for the road. On the left hand stands elevated S. Martin's Church, containing Saxon remains, and said to have been built by S. Aldhelm, Bishop of Sherborne, who died A.D. 705. Beohrtric, King of Wessex, was buried in this Church A.D. 800, but a search for his body has not been successful. In fact the interior of the Church has been used for interments for many years, and is now entirely gutted of all accessories for Divine Service. The Church is well worth a careful study by Antiquaries. In the May number of the

Illustrated Art Journal, 1896, contemporaneously with this visit of the Field Club, it is well described and pictured.

Proceeding from this interesting Church the welcome shelter of the Red Lion Hotel was soon found at the crossing of the four main streets of the town which lead to the four points of the compass, and after partaking of luncheon the Members proceeded Southwards to the five-arched Bridge which crosses the Frome and so joins the so-called Isle of Purbeck to the mainland. To the right of this stood the Castle whereof nothing now remains ; to the left stands the Parish Church of S. Mary, and the remnants of the Benedictine Priory, formerly subject to the Abbey of Lira, in Normandy, and now encased in a modern residence.

The Church of S. Mary has been restored to great usefulness, but to hideous ugliness. Several antiquities have, however, been luckily saved, such as a curious hexagonal font of the 12th Century, made of lead and adorned externally with figures of the 12 Apostles. In the walls of the Nave have also been inlaid inscribed stones in peculiar characters, one of which has been deciphered, "Catug Consecravit Deo." A Bishop of that name is said to have been sent A.D. 430 to England to extirpate the Pelagian Heresy.

The Vestry of the Church is the groined Chapel of King Edward the Martyr, which was built in the Reign of Henry III. to take the place of the old wattle Chapel in which the remains of that King were deposited for three years before their translation to Shaftesbury. Two cross-legged effigies of Knights have been dispossessed of their canopied niches and removed to the Chancel. The Monument of the Rev. John Hutchins, author of the "History and Antiquities of Dorset," and Rector here and at Swyre, still remains.

A quaint little groined Chapel is built over this Vestry, and this requires a ladder to reach the entrance in the S. wall of the Chancel, which has a prettily decorated Early English Arch.

Another little Chapel with piscina and sedilia is in the S.-E. buttress. The E. window of the Church, which is of many lights has been filled with coloured glass by many donors.

Not far from the N.-W. of this Church, is another, Holy Trinity, now a Sunday School, which at the outbreak of the Civil Wars had a Rector, Rev. W. Wake, a great sufferer for his loyalty. He was imprisoned 19 times, and at the Restoration of Charles II. only lived one year to enjoy the restoration of his livings of Trinity and S. Michael. He died in 1661, and was buried in the former Church without monument. His son William bought the Manor of Shapwick Champayne, in Dorset, and was also prisoner for his loyalty 18 times and twice condemned to be hanged. He was the father of W. Wake, Archbishop of Canterbury, 1716-37. It is said there were originally 17 Churches in Wareham, Murray with more probability says eight. The Townhall and Gaol was S. Peter's, but the great fire of July 25th, 1762, nearly consumed the whole town, so that only three now remain, and one only is used for Divine Service.

The Town of Wareham is an ancient Borough by prescription, and returned two Members of Parliament from 13th Edward I. to the Reform Bill of 1832. The Mayor is ex-officio Coroner of the Town and the Isles of Purbeck and Brownsea. The peculiar custom of the Manor was that both males and females had a right to partition of lands. All the old Charters are lost, but the last Charter of Queen Anne, 1703, is still extant, by which the town is incorporated by the style of the Mayor, the Capital, and assistant Burgesses, and among other privileges, is empowered to have a Gaol and two fairs and a "Court of Pie-powder." A curious old house stands in the Market Place, so says Britton in "The Beauties of England and Wales," 1803, called "*Homo cum cane*, the owner of which is always tything-man and obliged to attend at the Wool-Court twice a year with a one-eyed bitch." The Members of the Field Club forgot during

their visit to inquire whether the strange house remains and its owner fulfils still his duties, but after an agreeable visit of 5½ hours the train was again sought, and a return made to Bath shortly after nine o'clock, a slow journey of 74 miles in 3½ hours!

Llanthony Abbey and Abergavenny, June 16th.—A large party of Members of the Field Club numbering 22, started by the 8.30 a.m. Great Western train, via. the Severn Tunnel, on June 16th, for Abergavenny. Two brakes met their arrival there at 11.8 a.m., and after a beautiful drive of 11 miles up the valley of Ewyas the ancient Priory of Llan-Dewi-nant-Honddu, now contracted into the name Llanthony, was reached at 1 p.m. A part of the old Monastic buildings has been converted into a picturesque hostelry, and very soon the resources of the hostess as to supplying liquid refreshments were put into requisition, the temperature of the day being something near 80° fahr. in the shade.

The remains of the Priory Church are considerable, and many parts are in excellent preservation owing to the fine sandstone of the Old Red series of which it was built.

This Monastery of Augustinian Monks had but a short existence, and before the close of the reign of King John, 1216, had definitely yielded up its precedence to its daughter Priory of New Llanthony at Gloucester.

The charm of its remote situation on the banks of the Honddu and foot of the Black Mountains did not spare the Monks from continual raids of the Welsh, but the marvel remains, how in so short a tenure, such magnificent buildings could have been erected, and how the immense cost of them could have been defrayed.

Early in the 6th century David, Archbishop of Caerleon, founded a small cell on this secluded spot in order that he might occasionally retire for religious meditation. On the transference of the Welsh primatial see to Menevia this cell saw no more of

the Saint, but on the conquest of this part of the Welsh marches by Sir Hugo de Laci, who came in the suite of William the Conqueror, William, one of his followers, and Ernicius, confessor to Queen Maud, settled here as Monks in 1103. A new church was erected by these Monks on the site of S. David's ruined cell, and it was consecrated to S. John the Baptist in 1108 by Urban Bishop of Landaff and Reynelm Bishop of Hereford. Nothing of this church however remains; the present ruins are of transition architecture Norman and Early English, and are thought to be of the time of King Henry I. who sent Roger Bishop of Sarum with large sums of money to the Monks of Ewyas to enable them to erect Monastic buildings. The Austin Friars of Holy Trinity London, Merton and Colchester despatched 40 of their members to commence the establishment, Ernicius being first Prior. Both Ernicius and William the Hermit were buried beneath the high altar. Robert de Bethune was second Prior, and was greatly aided by Anselm, Archbishop of Canterbury, and the pious gifts of Queen Maud, wife of Henry I. He was elected Bishop of Hereford in 1131, and was succeeded by Robert de Bracy, who fled with his monks to Hereford to claim his predecessor's aid against the Welsh on the death of King Henry 1135, and the place never recovered its position but became for a few years a mere cell to its more prosperous daughter at Gloucester, which King John greatly enriched. At the dissolution under Henry VIII. the revenues were £748 per annum. The records of the Priories came into the possession of the Duke of Norfolk on his marriage to the heiress of the Scudamores, who became possessed of the remains of the Gloucester Priory by marriage, and are said to be the most perfect of all the Monastic records in the Kingdom. The ruins of the Llanthony Priory were purchased by the late W. Savage Landor, in 1809, who spent large sums of money on them, and they are still the property of the family.

Remounting the brakes at 3 p.m. the return journey to Abergavenny was quickly completed and a visit paid to the

restored Church of S. Mary, which consists of a huge Nave and equally lofty N. Aisle, with a Central Tower, under which are the Choir Stalls, with an Altar in the first bay of the Chancel, considerably raised on a wooden flooring. Behind this are the Monks' Stalls of ancient black oak and canopied Stalls for the Prior and Sub-Prior, with large chambers to the N. and S. in which are a series of elaborate tombs, worthy of much careful examination, as being of great historical interest.

Among these tombs, which have mostly recumbent effigies of great artistic merit, but wholly covered with engraved initials of generations of idiotic idlers, are those of Eva de Braose, daughter of William, Earl of Pembroke, and wife of William de Braose, Lord of Abergavenny, deceased 1246; of Eva de Cantelupe, Baroness Bergavenny, 1257; Sir William de Hastings, who died 1349; and Lawrence Hastings, Earl of Pembroke, 1348; a gorgeous tomb with two figures recumbent with canopies over their heads with the base surrounded by small statues is in the centre of the S. Aisle. The male figure, whose head is lying on an infant, and his feet resting on a lion with a trilobed tail, is that of Sir William Ap Thomas, progenitor of all the Herberts, Earls of Pembroke, who died in 1445; his wife, whose head has but an ordinary pillow for her headrest, and no footstool, is Gwladys, daughter of Sir David Gam, dying in 1454. May be the lady was an heiress, or it was a case of the grey mare being the better horse, for this doughty knight lies on the left of his wife.

In the S. wall opposite to this monument is that of a prolific father, Sir Richard Herbert, of Ewyas, who died in 1510. At the rear of the figure there seem to be six sons bearing swords and two daughters at the extremes of the line.

In the N. Aisle is a grand tomb of a gentleman and lady side by side. It is said to be the monument of Sir David Lewis, Judge of Admiralty in the reign of Queen Elizabeth, 1584, and founder of Jesus College, Oxford, and in the wall to the N. of

the Eastern Altar of the Church is the monument of another Judge, Andrew Powell, who died in 1635.

There is also preserved here a stone figure of Jesse, the father of David, large as life, with the boughs radiating from his body, which formerly must have borne the effigies of King David's descendants in the direct line up to the birth of our Blessed Lord. A Jesse tree in coloured glass is not uncommon. Indeed, we have in Bath Abbey a window in the S. transept with such a pedigree, but if this tree in stone with all the figures in life-size were erected in this Church, it must have been an unique object.

A dinner awaited the party at the Angel Hotel at five p.m., so that the visit to the Church had to be cut short. After the viands of Mr. John Pritchard, the well-known host of this house, had been well discussed, a train at 6.30 received again the whole party, who duly arrived in Bath by 9 p.m. with most pleasant reminiscences of this charming part of Monmouthshire, the Sugarloaf and Skirrid, Rivers Usk, Monnow and Honddu, and the well-wooded vale of Ewyas.

Frome, Nunney Castle and Vallis, July 14th.—Eighteen Members attended this Excursion, and left the Great Western Station by the 10.18 a.m. train for Frome, which was reached shortly after half-past 11. The finely restored Church of S. John, with its Calvary, Chapels and tomb in the Churchyard of the saintly Bishop Ken, as well as the quaint monument of a former Vicar named Methuen in the Vestry, were again thoroughly examined, but nothing novel in the way of restoration or decoration seems to have been added to this Church since the last visit of the Field Club on October 7th, 1892. The statues in the Calvary on the left of the Northern ascent to the Church show sad signs of decay from the weather and winter frosts. Had they been constructed of marble or harder material they might have withstood better the vicissitudes of our climate. The Verger exhibited the treasures of the Church to the Club, and first the

silvergilt Chalice and case of the nonjuring Bishop Ken, which he used after being deprived of his Bishopric of Bath and Wells, and at his death bequeathed to S. John's Church, at Frome. This is considered the most valuable possession of the Church. Three Processional Crosses were next shown, one being of handsomely worked silver, with figure of Christ, and studded on the reverse side with Topazes and Crystals. Seven lights hang before the High Altar in this Church, burning night and day in elegant pendant lamps, representing the Seven Spirits of God's Throne, and each Altar in the Church is provided with a Sanctus bell to be sounded at the Consecration of the Elements.

As the luncheon hour was at hand the Crown Hotel was sought by the Members, and after a very excellent repast, two brakes received them and started for the Holwell Quarries, passing on the way the Park and Mansion of the Earl of Cork and Orrery, at Marston, and a large Sycamore, *Acer pseudoplatanus*, overhanging the Park wall, locally named the "Snuff-box tree," a former Earl of Cork having planted here a seedling maple, which he had brought in his snuff-box. On arriving at the Hollwell Quarries, the Rev. H. H. Winwood, F.G.S., vice-president of the Field Club, drew the attention of the members to the peculiar dikes in the Carboniferous limestone strata, which were filled with a liassic limestone, containing the characteristic shells of that geological age. Other fissures contained infillings of Rhætic age, and it was from three tons of reddish marl of this age found here by the late Mr. Charles Moore, and carried off to Bath, that he picked out some 70,000 teeth of fish, now in Bath Museum, and 27 teeth of the oldest mammal that ever walked on this earth, *Microlestes Moorei*, a small Kangaroo rat. The infillings of these veins in the Carboniferous limestone were of incalculably younger age geologically, and must have been sub-aqueously deposited in them when a sea covered the limestone. The peculiarity of these veins is that they expand as they descend,

and from this it is inferred that the Mendip range, of which these quarries form the easternmost end cannot have been elevated by a volcanic upheaval, in which case the fissures, being caused by internal explosion, would have been wider at the top than the bottom, but have rather their origin in the internal contraction of the earth's crust.

The Members of the Field Club when appealed to by their Vice-President to state their views on this difficult controversy, prudently left the matter to be settled by the further expansion of geological knowledge, and re-mounted the brakes for Nunney Castle, which was reached in a brief half hour.

Crossing the Nunney brook and the moat by foot bridges and passing round the Castle the entrance is reached on the centre of the Western side. What remains of the Castle is a parallelogram 61 feet in length by 26 in width, the four corners having round towers. The interior is gutted but formerly had four floors. This Castle is said to have been built by Sir John De-la-Mare in 1373 by spoils he had taken in France when fighting under the Black Prince. King Edward III. granted him a license to "kernellate" the manse in 1374.

In the Somerset Archæological Society's Proceedings vol. xxii, 1876, a very full account of the history of this Castle appears, written by a Member of the Field Club, Mr. Emanuel Green, who gives all the information obtainable from ancient records, wills and deeds of the De-la-Mare family, the owners of this Castle from the reign of Henry III., 1262, to the death of the last male of the race in 1396. This John De-la-Mare's sister and heiress, Constantia, carried the property into the family of Poulet by wedding John Poulet, Kt., and for four generations this family held the Castle, the last being created Lord St. John, 1539, and dying Marquis of Winchester in 1572, and Treasurer of England under Queen Elizabeth. The property was sold by this latter to Richard Prater, of Water Eaton, co. Berks, and on his death in 1578 his son, George Prater, succeeded, and dying in 1622 Col.

Richard Prater became owner. Under this Prater the Civil War broke out between Charles I. and Parliament, and the Castle was held for the King, but on General Sir Thomas Fairfax sending two regiments with three cannon, from Castle Cary, to besiege the place, surrendered on Sept. 20th, 1645, on bare quarter. There were taken in the Castle Capt. Turberville and 80 Irishmen, guns for 200, and two barrels of powder. With these were some refugees and "a good store of Papists, who were not poor until the soldiers left them."

The Standard taken on the Castle was "red, and in the midst thereof a fair crucifix cross," which was sent to be exhibited to Parliament, and which was the principal cause of the place being ordered to be slighted, and Col. Prater's whole property being sequestered for treason, notwithstanding that his son and heir, George Prater, professed that neither his father, who died in 1651, nor he were "papists in arms." The building remains to this day in the ruinous state to which it was reduced by order of Parliament, and after passing through several owners was purchased as late as July 10th, 1896, by Mr Harold Griffin, of Battersea, for £565, for what purpose remains to be seen hereafter.

The Church of Nunney contains monuments to Sir Nicholas De-la-Mare, 1297, who built the Church; to Sir Philip De-la-Mare and his wife, who endowed a chantry in the same; and to Richard Prater and wife, who succeeded the Poulets in the property.

Not being able to obtain access to the Church, the brakes were again mounted, and after a pleasant drive partly through the grounds of Mr. J. H. Shore, who on July 10th, at the sale of the Castle and other property of the Theobald family, purchased the Manor Farm of 264 acres, at Nunney, and 44 acres of arable land, the party were deposited at Egford bridges, at the entrance of the Vallis, through which it was proposed to walk to the Hapsford Mills. The beauty of this Vallis has been much damaged by the immense quantity of Carboniferous Limestone that has been

quarried for lime and road metal, but the Vice-President of the Club fully explained the most interesting sections exhibited in the various quarries. Representatives of three or four distinct geological formations are to be seen here. Highly inclined strata of Carboniferous Limestone form the base, planed off as smooth as a table either by ice or water; here and there on this horizontal surface have been deposited strata of Rhætic age, full of fish bones and scales, and among them the teeth of a Kangaroo rat, *Microlestes*. There is also a thin band full of plants and insects and various shells, one peculiar to this Rhætic age being *avicula contorta*.

Above these strata in some quarries appeared the White Lias, and above again horizontal strata of Oolite, the fissures in which were filled with deposits of quite later ages. All the coal strata above the Mountain Limestone, with the Pennant Sandstone and all the Triassic series, have been denuded and swept away. The Hapsford Mills were reached after a walk by these interesting geological sections of about a mile and a half, and the brakes were found awaiting the party at the summit of the hill. These speedily covered the distance to the Railway Station, and the train deposited all at Bath after a rapid run of an hour.

Siston Court and Church, October 6th.—At the close of the Quarterly Meeting this day a small party of Members of the Bath Field Club proceeded by the 12.10 p.m. Midland train to Warmley station for the purpose of viewing Siston Court, by the sanction of the Hon. Mrs. Alfred Thesiger, who at present resides there, and the objects of interest in the village and Church.

The weather was everything that was bad, an incessant downpour of rain and a South-West gale, so that only nine Members started out of 23, who had signified to the Secretary their intention of joining the excursion. Those who braved the elements found, however, an excellent luncheon prepared for a much larger party at the Griffin Inn at Bridge Yate. The Vicar of Warmley was a guest at luncheon, and gave the Members many

interesting notes on the neighbourhood. Among others was the information that the derivation of the name of this hamlet was from a former Church dedicated to S. Bridget in the place. There is not the slightest trace of such a Church having existed either in ruins or documents, but a farm is styled Church farm and a lane bears the same name. After doing full justice to this repast a mile walk followed in wind and rain to the village of Siston, passing halfway on the left in a farm-house the porch and window of an ancient building where Queen Catherine Parr is said to have resided for some months and held her Court after visiting Bath.

The Church of Siston is dedicated to S. Anne, mother of the B.V.M., and possesses a Norman door in the S. Porch, and a most interesting leaden font of the same age. It seems to have been cast, and the exterior is ornamented with six figures of vested Bishops in the act of blessing, and six panels of scroll work in the intervals. The Rector of Siston exhibited to the Members an ancient Inventory of Church property on paper, signed by the Churchwardens of the Reformation period, stating that there belonged to the parish a Priest's Vestments, some parcel-gilt Altar-plate and two Altar cloths with other articles, but that the "Church had been broken" and the plate had disappeared. The thieving Wardens of that period generally ascribed to burglars the loss of Church valuables. In the Church, which is of Early English architecture, are several mural tablets of the Trotman family, who held the Court from the commencement of the 18th Century to 1843, when their coheiress brought the mansion into the family of Dickenson, who now hold it. In the S. of the Nave there is a modern recess fitted up as a pew, and containing on the E. side a monument erected by a disconsolate widow, named Ivyleafe, to her husband. The widow is represented in marble with emaciated figure weeping over an urn. There are three chained books on the sill of the North window, rebound in 1889, but with several pages missing. There are also several coloured windows in the Church, which has an elegant

Western tower, and stands in the midst of a Churchyard, filled with tombstones, hardly one of which retains its perpendicularity.

Thanking the Rector for his kindness in conducting the Members over his Church, and valuable information, a start was made for the Court which stands on a hill, not far from the Church. The weather was still execrable and the condition of the pedestrians from the wet and dirt was not such as to justify the invasion of the interior of the mansion, although the lady who resides therein at present had offered the party all facilities for viewing it. It is said to contain several interesting pictures of the Stuart Kings and Cromwell, besides a pair of jack-boots left by the latter on his departure from the place after a visit. There has been a house here held by the Dennys family from early in the 15th century, and Sir Henry Billingsley, who wed the heiress and succeeded to the property, entertained therein, in 1613, Anne of Denmark, Queen of James I., on her route to Bath for the waters. The present house is of the time of Charles I., and is a fine mansion built mostly of Lias with a façade flanked by two round picturesque towers and two wings extending to the front. On the outer façades of the wings are the Arms of the Dennys family, with the Coats of the families into which they formed alliances by marriage. The Arms of the Dennys family were in heraldic diction, Gules, a bend engrailed azure between three leopards' heads, Or, jessant fleurs-de-lis of the second. There are several members of this family buried in the neighbouring Church of Pucklechurch with monuments and brasses, and an emblazonment of Arms with eight quarterings is over the porch of a house in that village. The façade of Siston Court with its wings forms three sides of a quadrangle looking East, and from the drive is of considerable grandeur. Several later additions seem to have been made to the structure. The park surrounding the place is extensive and well timbered. After taking a walk round the Court and a cursory glance at the park the wretched weather

made it advisable to make a hurried retreat to Warmley Station, whence a train speedily restored the Members to Bath and their domestic comforts.

The distant Excursions were thus successfully accomplished, but the weekly Walks in the immediate neighbourhood seem to have entirely ceased. In the earlier years of the Field Club's existence scarcely a Tuesday passed without a goodly number of Members putting in an appearance at 10.30 a.m. at the Royal Institution, and a walk followed, longer or shorter, as the several Members felt capable of it, or were desirous to return home for a mid-day meal. In fact, by the Rules of the Club, this was the primary object of its formation, viz., "To make Excursions around Bath with a view of investigating the Natural History, Geology and Antiquities of the Neighbourhood." *Tempora mutantur, nos et mutamur in illis* and in these days of later rising and disinclination to pedestrian exercise, the healthful "constitutional" has yielded its life to the sedentary boredom of listening to read papers on others' observations, or scanning them in the published Proceedings or Newspaper Report. The Secretary is quite prepared to meet Members at the Royal Institution, say at 11 a.m. on every Tuesday after the 1st of May, and recommence this excellent custom and motive of the Club.

The Afternoon Meetings for receiving papers on local and other topics recommenced in the fall of the year, and at the first, on December 9th, 1896, the President, the Rev. Canon Ellacombe, for the fourth year in succession, read an interesting paper on the effects of the weather of the past year on his garden. This paper, under the title of "The Great Drought of 1896," is published at page 293 of these Proceedings, so that no abstract is required here. The reading, however, gave rise to very considerable discussion, many Members stating their personal observations of trees, shrubs, flowers and fruit. Amongst others, Surgeon-Major Mantell, Col. H. C. B. Tanner, Mr. Story-Maskelyne, Rev. T. D. Whale, and Mr. Leveson Scarth, expressed

their views on the past season, and its diminutive fall of rain of 3½ inches between April 1st and July 31st. The Rev. H. H. Winwood, in proposing a vote of thanks to the reader, which was seconded by Mr. H. D. Skrine, reminded the Members that a most instructive paper read on December 7th, 1870, by the late President, the Rev. Leonard Blomefield, on "S. Swithin and other weather Saints," was very well worth their perusal, if interested in ancient weather proverbs. One however quoted by the President in his paper

> "If there is ice in November that will bear a duck,
> There will be nothing after but sludge and muck."

has been singularly falsified by the weather of November, 1896, and January, 1897.

The paper of the President was followed immediately by a paper on "the Bezoar Stone," by Mr. R. J. H. Scott. Although not of strictly local interest, this quaint stomachic concretion found in several ruminant animals, and even in human beings, has from early ages been highly prized as an amulet or remedy against poisons and illfortune by the ignorant and superstitious, especially in Oriental countries. The paper is published as Appendix No. I to this summary. Several Members present with Indian experience considered the stones used by the natives in India as an antidote to snake bites may be of the same origin as Bezoar Stones, and Col. Bingham Wright stated that a thorough belief in the good luck and prosperity of a family through its long possession of such a talisman came to his knowledge in Greece where a family named Vetura prized such a stone as their most valuable possession. Hearty thanks were returned to Mr. Scott for his interesting communication.

At a second Afternoon Meeting held on January 13th, 1897, under the presidency of Canon Ellacombe, the Rev. H. H. Winwood, F.G.S., Vice-President of the Club, gave an extremely interesting account in respect to a Rhætic exposure at Boyce Hill,

Lower Weston, on the site of a new brewery which is being erected for the Bath Brewery Company. The paper is published in these Proceedings at page 306.

The Chairman, at the conclusion of the Rev. H. H. Winwood's remarks, spoke of the value of the paper and the valuable addition which it would make to the Field Club Proceedings. He also alluded to the value of the discoveries, and went on to point out how in some respects the results resembled those of the Bitton boring. He could say, on behalf of Mr. Winwood, that he would be only too happy to answer any questions which Members might wish to put. He was sure that the more they cross-examined him the more he would be pleased. Replying to a question by Mr. Daubeny as to the depth of the Rhætic bed, Mr. Winwood replied that roughly speaking it was from 10 to 15 feet. Mr. Winwood having answered a number of other questions of detail put by Canon Ellacombe, Dr. Mantell, and others, Mr. McMurtrie made some interesting observations. He remarked that in connection with investigations, the results of which had been so lucidly described by Mr. Winwood, one could not fail to remember what a name Mr. Moore made for himself in the earlier geological days in this part of the country by discoveries of that formation, adding enormously to the geological interest in this part of England. With regard to the first boring which Mr. Winwood described, he thought it was a very fair example of the Strata which they met with in various parts of this district. He heartily joined with the Chairman in thanking Mr. Winwood for his extremely interesting paper, and he only wished a greater interest was manifested in the subject among the younger section of the community, who would be ready to come on and take up the work of the older Members of the Society. They would all agree with him that there was plenty of scope for investigations, for there never was a finer district in which to study geology.

At the close of Mr. Winwood's paper, a paper was read by Captain A. C. Burmester on "The Hill and Ruins of Sigari in

Ceylon." Not being strictly of local interest, an abstract of the paper is given as Appendix No. II to this Summary. Capt. Burmester held an appointment in the Royal Artillery for some years in Ceylon, and paid two visits to this remote hill fort. Mr. H. D. Skrine, who had succeeded Canon Ellacombe in the chair, when the latter had to depart in order to catch his train, read a letter which he had just received from a son containing strangely coincident with Capt. Burmester's paper a pen and ink sketch of the hill of Sigari, but without an account of the ruins on the summit as the writer had passed the spot in ignorance that explorations were being carried out on the summit. In conclusion, he proposed a vote of thanks to Capt. Burmester for his paper which the Rev. H. H. Winwood seconded in a brief speech.

On February 10th, 1897, the last Afternoon Meeting on the printed rota was held, and a very considerable number of Members assembled to hear a paper from Major J. Llewellyn Evans, on "The Stones of Carnac" in the arrondissement of Morbihan Brittany. Major Evans during a visit to Auray visited these alignments, Menhirs cromlechs and dolmens, and made very considerable and interesting notes of his observations. An abstract of these is added to this Summary in Appendix No. III., the situation in a foreign country and distance from the Bath centre not allowing the subject to be considered as strictly within the cable-tow of the Field Club, but nevertheless very instructive to its Members, for comparison with our own Megalithic monuments at Stanton Drew, Wellow, Avebury and Stonehenge. The subsequent discussion on the paper was interesting, having more reference to the Stone circles and avenues of our own neighbourhood. Rev. C. W. Shickle drew the attention of those present to the talented and exhaustive article on the Stone Alignments of Carnac by the Rev. W. C. Lukis, M.A., F.S.A., in Vol. XIII. of the "Wiltshire Archæological and Natural History Journal," which is in the Field Club's library, which article gives every opinion of weight or authority for the meaning and origin of these stone avenues and circles.

The Rev. H. H. Winwood, Vice-President, thanked the reader for his excellent paper on behalf of those present, and stated that these Carnac Alignments were indubitably of the polished stone age, although it was not yet possible to assign to their origin an exact meaning, whether they were places of sepulture, public meeting or worship. The sculptures and ornamentation in lines and circles on the Carnac Stones were of a very rude type, but one was an axe of more advanced form at Gavr Inis.

At a meeting of the Bath Antiquarian Field Club, held at the Institution on February 17th, the President, Canon Ellacombe presiding, a paper was read by Mr. Norton Tompkins on "Bath Thermal Springs and their Mineral Properties." It will be remembered that Mr. Tompkins read a paper before the Field Club in May, 1894, on "Bath Thermal Springs, their Source and Origin." He then endeavoured to show that the water originates near the village of Downhead, Mendip, where it is seen pouring in large quantities into a series of eight swallet holes. These holes mark the line of the southern extremity of the great Clandown fault which intersects the Mendip anticlinal, passing close to the Igneous dyke discovered by a celebrated Bath geologist, the late Mr. C. Moore, in 1867. That the fault strikes into the centre of the Radstock Coal Basin, as far as Timsbury, where it intersects other arterial faults which come in the direction of Bath. He also contended that these faults being of considerable magnitude, having in the first instance from six to 700ft. downthrow west, and the second a downthrow south 600ft. That these faults must of necessity descend to the source of the disturbance passing through the Carboniferous Limestone a stratum of solid rock 2,000ft thick at the base of the Radstock Coal Basin, and as the limestone rises to within 200ft. of the surface underneath Bath, the water following the disturbance in the limestone rises through the 200ft. of newer deposit to the Springs at the Baths.

After a resumé of the above facts Mr. Tompkins proceeded with the subject of his second paper, "The Thermal and Mineral

Properties of the Springs," commencing with a few additional remarks on the origin of the heat of the water, quoting a celebrated French Geologist, M. Elie de Beaumont, who has enumerated "five distinct periods of volcanic convulsions which have affected this world in Geological times," the third of such periods occurring at the close of the ancient Palæozoic systems and commencement of the secondary periods, or in other words in the Middle Ages of Geological time. This convulsion being so great and general that wherever the Carboniferous system can be seen in Europe or America it is found to be thrown up into mountain ridges or sunk into basin-like depressions. That the molten eruptive material of the earths interior was the cause of the disturbance, and that the pressure of the sinking basin forced the molten lava through the surface at the dyke. The water sinking deep into the disturbed ground around the dyke comes into contact with a remnant of the volcanic heat.

The mineral ingredients of our springs was next dealt with. Our springs contain no more Calcium Carbonate than ordinary spring water. Magnesium, Carbonate and Chloride is undoubtedly derived from the limestone formation through which the water passes from Mendip to Bath. Bath water contains a large proportion of Calcium Sulphate, the Sulphuric in this and in compound with Sodium and Potassium amounts to 67 grains of a total of 168. L. D. Dana, one of the greatest mineralogists of the day was quoted to prove "The great repositories of Sulphur are active and extinct volcanos." Calcium Sulphate as a geological formation is peculiar to the age succeeding the great volcanic eruption above referred to, and contemporary with the Sodium Chloride or common salt deposits of Cheshire and Worcestershire. Coupling with this the Potassium of our springs make up the bulk of the mineral properties. These are all essentially the production of eruptive and volcanic rocks. The volcanic rock on Mendip which lies in the course of our water is described by H. B. Woodward, F.G.S., as a Felstone.

This mineral consists of Orthoclase and Quartz. Orthoclase contains from seven to 15 per cent. of Potash and two to three per cent. of Soda, and as these Alkaline minerals do not exist in any of the aqueous rocks through which the water flows, accessible, and in such abundance as we find them in our springs, it is therefore clear that the mineral properties of the water declare their source.

The paper was accompanied by a number of plans and sections, illustrative of the local geological evidence of the truth of the theory.

The President, in thanking Mr. Norton Tompkins for his communication, which he regretted could not be read in its entirety owing to its considerably exceeding the usual time allotted to papers read before the Field Club, called on any Members present who studied geology and analytical chemistry more than he did, to offer any remarks they thought fit on the subject of the Bath waters. Mr. Story-Maskelyne rose to remind the Members of an excellent paper on the "Thermal Springs of Bath and elsewhere," read by the late Mr. R. E. Crickitt in 1867, and published in the first number of the Club's Proceedings, and stated that Mr Tompkins gave quite a different theory for the heat of the water than that of Mr. Crickitt. He had a theory of his own as regarded the five great outbursts of volcanic energy, which had mainly brought the globe into its present conformation, and considered they were synchronous with the alterations of the poles of the earth, and a study of the Pyramids, and their present divergence from the true points of the compass explains considerably the way the axis of the earth's rotation has changed from the early date they were erected.

The Rev. H. H. Winwood in thanking Mr. Tompkins for the indefatigable industry and investigation he had expended on the subject of the Bath waters, could not deny his theory was excellent, but regretted that the facts on which it was founded were quite the contrary. The complicated system of faults and

fissures propounded by Mr. Tompkins in his first paper read to the Club, were repeated at the commencement of the present, although they had been long ago exploded by every geologist of repute. As to the chemical composition of the water it might be rightly stated, but the Members of the Field Club were not able to decide, not being chemists.

Other Members briefly spoke on the subject of the paper, and a vote of thanks was returned to Mr. Tompkins for his communication.

The Field Club has lost but one of its Members by death during the year, and that on the very last day. The Rev. Elias Thackeray Stubbs, M.A., of Trinity College, Dublin, and Rector of Charlecombe passed away to his rest at Hyeres, France, on February 18th, 1897. A Member of our Club since 1886 he ever took great interest in its affairs and while his health lasted took part in most of the excursions, and meetings. Three Members have been lost to the Club by resignation, Mr. Spencer Wilson, who joined the Club in 1875, Gen. J. Bayly, R.E., C.B., F.S.A., and Col. H. S. E. Reeves, C.B., while our ranks have received but one recruit in the year. The number of active Members on our lists for this year, therefore, stands at 95, leaving, therefore, five vacancies for gentlemen with an appetite for scientific research, or anxious to become better acquainted with the Natural History, Geology, Botany or Archæology of the neighbourhood.

The Field Club's library has received considerable additions during the year. One of our Members, Mr. J. S. Bartrum, presented a copy of "Hydriotaphia and the garden of Cyrus" by Sir Thomas Browne, "Myths, Scenes and Worthies of Somerset" by Mrs. E. Boger, and the quarterly issues of the "Reliquary and Illustrated Archæologist." Another of our Members, Mr. W. Daubeny, added to our shelves "The Memoir of the Megatherium" by Sir R. Owen, F.R.S. R. S. Fowler Esq., F.R.C.S., presented the Club with "The Proceedings of the International Congress of Prehistoric Archæology, held at Norwich, 1868," and the late Sir

Isaac Pitman two of his works in Phonetic Spelling. The Smithsonian Institute of the U.S.A. have forwarded some 20 valuable volumes on various North American topics, and all the Societies with whom the Field Club exchange proceedings have added their own to our stock. Many photographs have been added to the Club's album, and the Field Club can look back on the past year as a very successful and prosperous period of its existence, and proceed onward with bright prospects of even better fortune.

WALTER W. MARTIN,
Hon. Sec.

APPENDIX I.

The Bezoar Stone. By R. J. H. Scott, Esq., F.R.C.S.

(Read December 9th, 1896.)

This stone takes its name from its supposed antidotal properties, the word "Bezoar" being an Arabian name for a "Counter-poison or Antidote."

There are several kinds of Bezoar stones, viz., "Bezoar Orientale" found in the 4th stomach of the Capra Agagrus of Persia (said to be) oblong, size of a kidney bean, shining olive or dark green in colour. "Bezoar Occidentale" found in the 4th stomach of the Chamois of Piedmont,—sometimes as large as a hen's egg : surface rough, colour green, greyish or brown. The "Porcupine Bezoar," called by the Portugese "The Stone of the Pig," is of the size of a filbert ; in form, irregular, and mammilated on the surface. In China Bezoars are found in the maw of the cow, and are then called "Nyen-Whang," that is "the yellow of cows" from the colour of the stone ; which is about the size of a goose's egg of a soft chalky substance ; it is esteemed a sovereign remedy in fainting fits. Bezoars are also procured from the alligator of America, from the wild boar, from monkeys, and from the ox.

The Bezoars of the East and West must be distinguished. The former praised by the Arabians as marvellous medicament, have been formerly of very great price, whereas, the Western Bezoars have been discredited.

The Oriental Bezoar stone is said to consist (chemically) of Resinous matters, and a crystalline matter, called "Bezoardique Acid." It is greenish in the interior, formed of very thin concentric layers, more or less green. It is bitter, and possesses a characteristic aromatic odour, its density is 1132, it burns with brilliancy like resin, and is soluble in concentrated alcohol especially with heat.

"The Porcupine Bezoar" appears to be soapy and greasy to the touch, its colour is of a blackish green or olive green yellow ; it is thought to be formed in the gall bladder of the porcupine, as it bears all the characteristics of a bilious and soapy concretion.

Another kind of Bezoar is brown or violet in colour, insoluble in alcohol, but it dissolves in the Alkalies, and gives when exposed to the air a blood red purple liquid, this by distillation produces a yellow sublimate of empyreumatic odour. M. Berthollet has found also a ligneous matter in some Bezoars. When heated, when pulverized, or when rubbed, the Bezoars emit a fragrant odour. In sawing through the middle a vegetable matter is sometimes found in their centre, which does for a nucleus or basis, and which is successfully hidden by Ammonio-Magnesian Phosphates mixed with a colouring vegetable extractive matter, and animal secretion; of the nature of the Bile; this gives to the Bezoars that olive or green colour and that odour of musk which is characteristic of them. There is on the Molar teeth of some of these ruminants a coat of dark gilt colour, which is also noticed on the Bezoars of these animals.

The wild "she goat" (Capra Agagrus), and the hollow horned ruminants, in which these stones are found, live on leaves and buds of shrubs, they sport themselves on the mountains, and frequent the solitary rocks. Their flesh has often a musked odour which imparts itself to these stony concretions of the stomach, and which depends probably on their bile. This becomes musked in passing to a certain state of decomposition.

Fictitious Bezoars have been made of various materials. Some are made from Gypsum stained by some vegetable juice.

Tobacco pipe clay tinged with ox-gall is commonly employed since it answers to two of the genuine tests, viz.: 1st a yellow tint to paper rubbed with chalk, 2nd green colour to paper rubbed over with quick lime. The vegetable stained do not answer to these tests.

False Bezoars are also prepared with oyster shells, or eyes of the Crayfish, pulverized and mixed into a paste with gum water, and a little musk or ambergris, then they are formed into a ball, and dried, but they are distinguished from the true Bezoars in that they have not concentric and foliated layers, nor crystalline striæ in their section, and they do not give an olive colour when they are rubbed on paper coated with lime or chalk.

The Orientals attribute to these stones of animal origin some therapeutic properties which makes them objects of great price, it is scarcely necessary to say that these marvellous properties are only founded on superstition.

In the time of the Middle ages the medical faculty of Arabia imported into Europe these medicaments, with the superstitions and exaggerated ideas of the Orient. It attributed some marvellous properties to Bezoars; as that of expelling venoms; contending with poisons, reviving life, etc.

In 1808 the Shah of Persia sent three of the Porcupine Bezoar stones as a present to Napoleon which proves the importance attributed to them at the beginning of the century.

The Porcupine Bezoar is carried, says "Virey," in his "Dictionary of Natural History," in the amulet to keep off infection when credit is given to the virtue of this remedy. In Portugal they are hired out at 10 or 12 francs per day. In Holland they are also held in great esteem, and are carried on the person in a box of gold or silver or are inclosed in filigree spheres of silver.

The specimen I am showing you to-day is 8 inches by $7\frac{1}{2}$ in circumference, of a dark green olive colour, and weighs $8\frac{1}{4}$ oz. with the true Bezoar odour.

La Grande Encyclopédié—EDWIN BOURGOIN.
Dictionnaire d' Histoire Naturelle—VIREY.
English Dictionary.—J. MURRAY.

APPENDIX II.

Abstract of paper on "The Hill and Ruins of Sigari, Ceylon."

By CAPTAIN A. C. BURMESTER.

(Read January 13th, 1897.)

The Northern and Eastern parts of Ceylon are at present in great part covered with jungle and inhabited by a small and scattered population, a great contrast to the condition of the same 1,000 years ago when the greater portion of it was intersected by a complicated system of tanks and irrigation works and dotted with large wealthy cities. The change since then has been generally ascribed to con-

tinual waves of Tamil invasion from Southern India, which destroyed security of life and property so that the waterworks which were necessary to the existence and health of a teaming population fell into ruin.

Many remains of the lost civilization exist in gigantic "bunds" stone pillars, dagobas and other buildings now imbedded in jungle, among which is Sigari, in some respects different from any other of these relics of antiquity. From Kandy the latest Singhalese capital, the great North road runs to Jaffna passing through Matali 16 miles where the railway ends, and Dambool, 45 miles North of Kandy where there is a celebrated Buddhist Temple. Sigari lies about 10 miles East of Dambool in a undulating country covered with thick jungle, and with small population. It is a granite rock with perpendicular or even overhanging sides some 500 feet in elevation, less than a mile in circumference, round two sides of which an incomplete spiral groove gradually mounting to the summit is formed by a peculiar gallery.

To the South and South-East of the rock is a tank much reduced from its original dimensions and a poor insignificant village on its edge. Singhalese records assert that in A.D. 459, King Dhatu Sena, whose capital was Amuradhapura was assassinated by his son Kasyapa, being built alive into a bund of a water reservoir. Kasyapa seized the throne, and for his personal security changed his capital to Sigari, whereon he built a fortress, and there reigned 18 years. A brother of Kasyapa had escaped into Southern India and in A.D. 477 returned with a strong army and defeated his brother who committed suicide to avoid falling into his brother's power. Amuradhapura again became the capital, and Sigari came into possession of Buddhist priests, but gradually fell into decay and until the last ten years was considered inaccessible.

In March, 1896, Captain A. C. Burmester was travelling by road from Trincomali to Matali and found Mr. H. Bell, B.C.S., and the Archæological Survey of Ceylon at work on the Hill. The track from the road to Sigari was through thick jungle, and the ascent of the hill commenced at 8 a.m. was not effected before noon. The fortress originally was surrounded by at least six lines of enormous walls built of large blocks of granite roughly squared laid without mortar, and generally with a considerable batter. Two converging staircases led

up to the entrance of the great gallery, composed of many hundred steps of white quartz, which is not found locally. Access to the gallery is now obtained by ladders easily, and its construction is remarkable, its support being of brick without mortar, laid in steps or groves cut in the hard granite of the hill. The bricks are of excellent quality, superior to any modern ones manufactured in Ceylon. The whole surface of the inner wall of rock, and the outer walls is covered with white plaster of smooth texture, and the latter are from 8 to 9 feet in height, while the pathway is from 6 to 10 feet in width. This gallery is still intact on the West face of the hill always ascending, until it comes to an abrupt end by a fall of the face of the cliff, which overhangs a great part of the gallery and has so preserved it and its frescoes, which are boldly delineated in half length female figures, presumably representing Queens and their attendants, the former with rich yellow complexions, the latter with green. In 1889 Mr. A. Murray, of the Ceylon P.W.D., one of the earliest explorers of the site copied the chief portraits in crayons, and since that time Mr. Pereira, a Singhalese and expert draughtsman, has painted them in oils for the Archæological Survey, but their execution when viewed close at hand is rough and disappointing.

A view from the base of the North-West angle of the hill, now with a large talus of débris, proves from the grooves remaining on the face of the rock that the gallery passed originally completely round the North side, and eventually reached the summit at the North-East angle.

The ascent to the summit is now made from this side by ladders erected on the mass of débris which abuts on this cliff, now about 50 or 60 feet in height, which land the climber on the upper grooves of the former gallery now defended by a handrail on the outer side. All traces of the brickwork on the face and summit have long disappeared on this side. Certain caves are on the precipitous Eastern side of the Hill, but are only approachable by being lowered from the summit, and contain no objects of interest.

The summit plateau has now been cleared over half its extent of the dense jungle, and about 100 coolies are employed by the Ceylon Archæological Survey. Owing to the extreme heat during the day and the comparatively cold nights the only season in which work can be carried on is from December to April, after which violent gales d

rains cause a supension of all progress. The whole surface was originally covered with buildings, a large "pokuna" or water tank being in the centre and a rock cut cistern near the South end of the plateau. Massive parallel walls, white quartz platforms and stairways are the chief features of the remains. The brick walls are covered with plaster and are ornamented with horizontal courses. The superficial rubbish to be removed is composed of vegetable mould and brick débris of some 20 feet in depth. Very little wear from the passage of feet appears on the steps and platforms, which latter are such a feature throughout the ruins. There is a monolith throne discovered in 1895 cut from the granite of the rock "in situ" the edges as sharp as the day they were originally chiselled. The absence of stone pillars, although sockets for their reception exist everywhere, prove that wood was extensively used for columns and also for structural work. The fine plaster may have been made of burnt shells and coral brought from the nearest sea shore, the bricks from the clay removed in digging the great tank below the fortress. No valuables have been found in the ruins, but iron work for gates, iron nails and scissors, a bronze guard for the foot, a Roman coin of the 4th Century, and copper nails have been discovered. Visitors to the fortress have inscribed their names in thousands on the plaster of the gallery, some of them are apparently more than 1,000 years old. In the immediate vicinity of the fortress below the stairways of the gallery are two remarkable rocks, evidently united at a remote period. They are called the "Cistern" and the "Audience Hall" rocks. On the summit of the former there is a tank holding now from four to five feet of water of considerable size, with a flight of steps leading into it. The Audience Rock formerly had a platform of stone supported on joists around it. The sockets are still clearly visible. The throne was split by tree roots when first discovered. There are caves beneath both rocks, containing shrines and stonework belonging to the original erections above. Further to the North of the hill there is a remarkable boulder called the "Prison Rock," partially supported on short stone pillars, with a line of square holes running horizontally across its face, evidently intended to support the roof beams of a building erected against it. Four rocks stand some distance to the West of Sigari, now cleared of the jungle which covered them in 1895. One is styled the "Preaching Rock," covered with grooving and stepping

holes, and originally with platforms, tier above tier supported on pillars bedded in the rock.

The site of the ancient city is so covered with jungle that it is difficult to discover its plan, but there seem to have been three water-tanks, the sustaining "bund" being now breached in several places so that the present tank is but a fragment of the ancient one, but sufficient for the present population of the village.

APPENDIX III.

Abstract of paper on "The Stones of Carnac, Morbihan Brittany." By MAJOR J. LL. EVANS.

(Read February 10th, 1897.)

The department of Morbihan in the ancient Duchy of Brittany, a bleak granite country, contains an extraordinary number of the megalithic alignments dolmens, menhirs, cromlechs and tumuli called "Buttes" locally. A "Dolmen" is a sepulchral chamber with or without a corridor leading to it. Wellow is an instance of such in the neighbourhood of Bath. A "Menhir" is a high standing stone like those at Stanton Drew, and when many of these are placed in a circle, the Bretons call it a "Cromlech." Auray, a small town picturesquely situated high above the river Loc is a suitable centre for visiting several of the finest of these megalithic remains of antiquity, and is the site of an immensely popular pilgrimage in July to the Church of S. Anne two miles distant, and also the scene of the massacre of the Royalist prisoners who surrendered to General Hoche after the battle of Quiberon in 1795, on the promise that there lives should be spared. A "Chapelle Expiatoire" is erected over the sepulture spot of the 950 victims.

Driving from Auray over an open heather and gorse clad country, at a point eight kilometres from the town the Dolmen of Manè Keriaval is reached at the point where the Carnac road branches off from the main road to Quiberon, viâ Plouharnel. This Dolmen contains five sepulchral chambers with a corridor, three remaining still perfect. It stands in a cup-shaped hollow two feet deep, on a long low tumulus.

The upper soil has been removed, so that the whole is exposed to the view. The entrance consists of four upright slabs with a covering stone seven feet long, out of which extends a corridor with two chambers on the right and one on the left, with a terminal chamber of six upright wall slabs and a cover ten feet long ; the height is six feet internally. Continuing along the road the Dolmen of Manè Kerioned is reached standing on a mound, which is mounted by eight steps. There are three Dolmens in this group with different orientation. Into one it is necessary to descend nine steps. In the second were found some curious beads of amber, rock crystal, jade, lapis lazuli, agate, and glass black and white which are now deposited in the Miln Museum at Carnac. The third stands in a more elevated part of the Tumulus and is very massive.

From this point the main road is left and a cart track followed in a S.S.E. direction, and the alignments of Ménec are soon reached with eleven rows of stones, only seven of which are now perfect but 1,204 stones are still left in this series. The direction is East and West, the stones at the latter being far higher than at the opposite end. There is a large prostrate slab at the Western end, wedge shaped twelve feet long, nine wide and five thick at the base. There is one tall stone said to mark the solstitial point. All the stones are of the granite of the country.

At the head of these alignments, a Cromlech or circle of stones originally existed, only half remaining, now the fence of a kitchen garden of the farmer of Ménec.

There are three other sets or rows of stones in the the Carnac systems, called Kerlescan (the place of burning) Kermario (the palace of the dead) and Manio. In the first the Eastern end changes its direction to the North Eastward and there are traceable fourteen rows and a cromlech of thirty-nine Menhirs at the West end. The stones of Kermario are more gigantic than in the other alignments, but all the systems have a dominant solstitial Menhir, that of Ménec measuring ten feet eight inches, that of Manio twenty one feet. It is said that Ménec is aligned on the summer solstice, Kerlescan on the winter and Kermario on both solstices.

Near the village of Carnac there is a large tumulus, called Mont St. Michel, with a chapel on its summit which is some fifty feet above the plain. At its South side are the Gallo-Roman remains called " Les

Bossenos." An Englishman named Miln lived seven years at Carnac investigating the antiquities and left a Museum of his discoveries, stone implements, kelts, rough and polished, urns containing burnt bones, and an entire skeleton found in a Kistvaen on the island of Thinic near Quiberon. There are here also many remains of the Roman occupation, one peculiarly interesting being the collection of a Roman Archæologist consisting of curios, beads, stone implements, &c.

Inscriptions have been found in six out of the fifty-six Dolmens of his neighbourhood, but there is no clue to their interpretation. Locmariaquer is about 8½ miles from Auray, and is a small port on the sea of Morbihan which is a deep bay of the Atlantic, and is said to contain as many islands as there are days in the year. Dolmens and tumuli are numerous around this place. Half-a-mile distant there is a Dolmen called "Manè Lud" with a corridor five feet high and eight paces long with a terminal chamber covered by a single slab twenty feet long. This Dolmen has a figure of a long straight sword with a cross hilt carved on the floor slab, and several other ornamentations supposed to be writing. It is in the flank of a very large barrow, which has been removed, so as to expose the stones.

About 100 yards from the last is "Dol yr Groh," which consists of one enormous slab partly resting on the ground and partly supported by one thin perpendicular stone, but it has no corridor.

The gigantic Menhir called "Men er H'roeck" or the Fairy Stone lies prostrate eighty yards to the South, seventy-seven feet long, sixteen and a half feet in diameter at the thickest part and ten to thirteen feet in thickness. It is perfectly smooth in surface and oval in section, and broken in four pieces, it is supposed by lightning. The weight is estimated at two hundred tons, and the fractures are as clean as if cut by a saw. The nearest Dolmen to this stone is "The Table of the Merchants" which is an enormous slab of granite eighteen feet long by twelve broad, supported at the end by an elegantly cut slab shaped like an inverted heraldic shield, and covered with strange ornamentation.

Within the village is the gigantic Dolmen called "Man yr Rutual," the covering slab of which is nearly twenty-eight feet long. It contains two chambers, circular in shape. Gavr-Inis one of the 365 islands of the sea of Morbihan is easily reached from Locmariaquer by sailing boat in twenty-five minutes when wind and tide are

favourable. Here is the remarkable tumulus and Dolmen four hundred feet in circuit and thirty feet high. The key to the entrance, which is slightly up the slope, and candles are obtainable at the farmhouse. You enter down some rough steps into a long low passage, fourteen paces long and less than five feet high, which terminates in a square chamber, nine feet square and six high. The chiselling and jointing of the slabs in this Dolmen are perfect and highly finished, fitted without cement, resembling ancient work in India, particularly that of Asseerghur. The slabs are nearly all of granite, but one seems to be of white quartz, all are covered with carved ornamentation, grooved lines, circles, axes and fern leaves. Two small serpents are on one slab, and several diamond shaped ornaments.

It is said that a gold ornament, a ring and some beads and calcined bones were found in this Dolmen, which are now in the Museum of Vannes, the capital of the Department. The Knights Templar occupied Gavr-Inis, and doubtless ransacked the place of all its valuables.

There are very few points of resemblance between these megalithic remains of Brittany and our own. There is nothing like Stonehenge abroad, and we have no alignments of stones arranged like Ménec. Silbury Hill may be compared to Mont S. Michel, but the former is far nearer to the Avebury avenues than the latter to Ménec.

The barrow at Wellow resembles somewhat a smaller Manè Keriaval, and Kits' Coity house in Kent Dol yr Groh, but the latter had side casing to the chamber, of which the former is destitute. The Cromlechs in Brittany are always at the head of avenues, whereas the circle of Menhirs, at Stanton Drew, and elsewhere in England have no alignments attached.

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Dr.	£	s.	d.
Balance from last Year's Account	44	4	9
93 Subscriptions at 10s. each	46	10	0
3 Entrance Fees at 5s. each	0	15	0
Sale of Proceedings	3	10	0
The Deposit at National Provincial Bank, £40, with Interest from Feb. 26th, 1896			
	£94	19	9

Cr.	£	s.	d.
Rent to Royal Literary and Scientific Institution	5	0	0
Messrs. Lewis & Son's account for printing	25	9	3
Gratuities to Librarian, Porter, and Lewis's Clerk	1	0	0
Expenses of Hon. Secretary	0	19	4
„ of Hon. Librarian	2	12	9
Donation to Somerset Record Society ...	1	1	0
Dr. Hill's Lecture on Egypt	4	11	5
In Deposit	40	0	0
Current balance in Bank	14	6	0
	£94	19	9

Examined and found correct,
R. L. TAYLOR, Auditor.
February 15th, 1897.

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1897.

Alnwick Geology of. See Pamphlets. Vol. I.

Alert Cruise of, Coppinger. 1 Vol.

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Anales dei Museo National Republico de Costa Rica. See South American Pamphlets.

Anstie J. Coal Fields of Gloucester and Somerset.

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Vols. X, XI, XII, XIII, Part 1.

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Drybrook Section Forest of Dean. See Pamphlets. Vol. I.
J. Jones & W. C. Lucy
Dulwich College Science Society. See various societies. Vol. I.
Dumfriesshire and Galloway Natural History Society.
1863-4. See Scotch societies.
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Roman Antiquities of North Wiltshire Downs. Rev. A. C. Smith

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Rome, British Archæological Society of. See Pamphlets. Vol. I.

Royal Geographical Society. 1861, 1844. See various societies. Vol. II.

Scarth Rev. H. M. Roman Villa at Chedworth. 1869.
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} See Pamphlets. Vol. I.

1. On the Roman Miliaries found in Britain.

Scarth Rev. H. M.

2. Roman Maratime Towns in Kent.
3. On an Inscribed Votive Tablet found at Binchester (the Ancient Vivonium) Co., Durham, in 1879.
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Wesley and Swedenborg. Sir Eizak Pitman

What I Believe. Leon Tolstoi

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APPENDIX.

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J.W. Powell

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,, ,, 13. The San Jose Scale (Aspidiosus perniciosus) and other destructive Insects of New York.
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FIELD CLUB PROCEEDINGS, 1896-97.

INDEX TO CONTENTS VOL. VIII., No. 4.