At 2 p.m. the Society visited the

## Church of St. John the Baptist.

The Vicar was unfortunately prevented by ill health from acting as guide to the building. In his absence the Senior Curate, the Rev. A. G. MORTIMER, gave the following account of the history of the church—

"This church was founded by S. Aldhelm, towards the end of the 7th century, about A.D. 680. There is a passage in Faricius, who wrote the life of S. Aldhelm, to this effect. Faricius' words are these :—'Aldhelm therefore applied for an edict ratified by the authority of the Supreme Pontiff to the effect that the monasteries which by God's grace he was with great care governing namely—Malmesbury where he had been installed, built by Maidulph of holy memory, from whose race that saint was descended, and another built in honour of S. John, on the river which is called Froome might be rendered free from all secular service.'

"In Ingram's Saxon Chronicle we are told that King Edred died at Frome, and possibly his body may be lying within the church's walls.

"In Domesday Book we have a full description of the

church property belonging to Frome, and it must by then have been of some importance as Reinbald was then Priest who was Chancellor both to Edward the Confessor and William the Conqueror.

"Probably the old Saxon church remained till about Stephen's reign, indeed it is mentioned in William of Malmesbury. The church was then entirely rebuilt in the reign of Stephen. The foundations of the north and south doorways of the porches, a doorway in the west wall of the Lady Chapel, and the foundations of the arcades west of the porches still remain as works of this century. In the thirteenth century the chancel arch seems to have been built, the tower also as high as the sills of the belfry window, and the arcade of the nave as far west as the porches. In the 14th century the western portion of the arcade was built on the foundation of the Norman arches, the west front, the windows in the aisles, and the present Lady Chapel. In the 15th century the roof of the nave was raised and the clerestory added, the tower raised with its battlements, and the spire first erected and a rood-loft; a broken piscina still remains where the altar of the rood-loft would have been, also the S. Andrew's Chapel was added, and in the early part of the next century the S. Nicholas' Chapel. I would also observe here that in the tower may be seen some old stones carved with the figures of animals, which were discovered in the restoration. The church has around it four chantry chapels, the earliest the Lady Chapel, first built of much smaller size in Stephen's reign—a doorway, the piscina, and the base moulding on the outside still remain of this. In 1337 it was rebuilt and enlarged as it is at present. In the 'Inquisitiones ad quod damnum' it is found that in the 10th year of Edward III, A.D. 1337, 'Feodith Russell and others gave certain messuages and lands to a chaplain for performing Divine service in the chapel of the Blessed Virgin in the church of St. John of Frome.' Again in the 23rd year of Edward III 'it was granted to Christiana, who was wife of Roger Eliot; Thomas, son of Luce le Webbe;

William, son of Roger Caynez; John Honycod; John, son of John Cable, and John, son of William de Hatcombe, that they may give and assign certain tenements with their appurtenances in Frome to a certain chaplain, to be held in Mortmain.' One Stephen Winslade granted the manor of 'Froome Valleyse' to John Payne of London, and died A.D. 1405, seized of the manor and hundred of Frome, leaving Elizabeth, the wife of Edmund Leversege, his daughter and heiress. This accounts for the armorial bearings of the Leverseges in this chapel. In their family it remained till 1706, when it passed into the hands of Lionel Leaman, and from that family in 1751 it was sold to the family of the Earl of Cork, with whom it remained until the last restoration.

"The next chantry was that of S. John the Baptist on the north side of the choir. It was founded 1377, and Laurence Walshe was the first chaplain. John Lyepole was the last priest who held the chantry, and he was dismissed at the dissolution with a pension of £5. S. Andrew's Chapel on the south side of the choir is the next. Founded in 1412. It has been so altered that there is little of the original chapel left. The endowment of this chapel is given in Collinson. In 1517 license was given to John Cable of Froome Braunch to build and endow a chantry with one chaplain to celebrate the Divine office every day for ever at the altar of S. Nicholas. This chapel is now used as the baptistery, but in the window are four squares of old glass containing the arms of the Cables, and a rebus on their name, a *K* and a bell, the whole enclosed by a rope or cable. These are the only pieces of old glass left in the church, and in the churchwardens' books, which have been preserved from the time of Elizabeth, we find an entry to this effect: 'Paid Mr. Avery one shilling for certificate to ye Parliament that we took down all the painted glass in the church.'

"Under the east window is the grave of Bishop Ken, one of the non jurors, and in the vestry is the chalice and case he used whilst in exile, and which he left to the parish of Frome.

"At the last restoration, which was finished in 1865 under the present Vicar, everything almost had to be renewed, but it was done exactly as it was found—restored stone by stone, so that in form and shape the church is the same old church of S. John of Frome."

Mr. Mortimer illustrated his remarks by references to a good plan of the building.

Mr. PARKER, C.B., said he had been requested to say a few words respecting that very fine church. Their parish churches were not merely historical monuments, but were built for Christian worship. When a church was in a bad state, as that church was at one time, it was necessary to pull it down; and when a grand work of restoration was accomplished they had no reason to find fault. In the case before them nothing of the original church remained but the plan and the foundations. The church was originally Norman, and several of the piers at the west end were still Norman in their character. To that had been added the chancel. Taken as a whole the church was like a piece of patch-work. There were many things which the clergyman had explained better than he could, as he was not sufficiently acquainted with its local history. For practical purposes the restoration had been well, honestly, and judiciously done. Some additions had been made for ornament, and some changes made, which, as an archæologist, he would rather had been left undone; but everything had been carried out to make a handsome place for public worship, with a great spirit of liberality; and all that was worth preserving had been preserved. The present arches were faithful representations of the originals, except in one or two particulars. It was not an archæological question, for there was very little that was archæological left, except the plan and the foundations. It was easy to see that the first five arches were Norman, and that there were three different periods represented. The church was now a comparatively modern one, with everything very handsome, and in imitation of the old style.

Mr. FREEMAN said he had read the church in an opposite way to Mr. Parker and Mr. Mortimer. The original church consisted of chancel, tower, and nave, and the 14th century additions were at the west end.

Mr. PARKER: I do not think you will find it so.

Mr. FREEMAN: Is it likely that the church was commenced at the west end, and the additions made at the east end?

Mr. PARKER agreed that it was not likely.

Mr. FREEMAN said he considered the original church was at the chancel end, where there were little bits of Norman work scattered about here and there.

Mr. DAVIS said that at Ledbury there was a very similar arrangement, but in better style. He did not think there was the slightest ground for saying that the west end was Norman. The doorways were Norman, but they were evidently not in their right places.

Mr. FREEMAN remarked that the removal of doorways was a very common occurrence.

Mr. PARKER said he had taken for granted what had been told him as well as the accuracy of the plan.

Mr. DAVIS said he had no doubt in his mind that the west end was the latest part of the church.

The Rev. A. G. MORTIMER said that Mr. Giles was the architect in the restoration, and that he argued from the north and south porches.

Mr. DAVIS: It is clear that the doors are not in their right places.

Mr. FREEMAN said he saw no signs of Norman work in the pillars referred to. They had before them an example of a church with a single tower on one side, forming a transept; but the transept on the other side did not take the form of a tower. Similar examples might be seen at Exeter and Ottery St. Mary. Originally there was a nave of three bays, besides the bay formed by the tower. It was in the late 14th or early 15th century style. Somebody had added the four bays of a new

type at the west end—a type which Mr. Davis informed him was local; but which he had seen scattered about the country: at St. Asaph's Cathedral and Northampton for instance. They would see that the mouldings ran uninterruptedly round the so-called Norman pillars. He hardly knew what to believe. He would like to have seen the church before it was pulled about, so as to have known what it was like. When they had in this county the best type of wooden roof, why should they run away to other counties for inferior specimens? Why should they go to the east of England for big angels, trefoils, and hammer beams? When he saw them here in Somersetshire he could not help saying—"Friends, you have no business here; go back to Norfolk." If he went on he was afraid he should not agree with Mr. Parker. Surely a church might be made as good for the purposes of worship by preserving its ancient features as by doing away with them. The two were not inconsistent. Was Divine worship promoted by taking away a Somersetshire roof and putting a Norfolk one instead? Could they not pray in an English church as well as in an Italian one? Why could they not have good honest plaster, with paint on it, instead of long lines of bare masonry? Why should the statues at the west end be so large, as though they were on a tower 100 feet high? It was altogether a very remarkable church, and one that had been altered in a very remarkable way, so as to lose many of its original features and interesting peculiarities, and he did not see that the religious purposes of the church had been forwarded thereby. He had no doubt that what he had said would be unpalatable, but he was bound to bear testimony against what seemed to him to be a mere itch for change.

Mr. Parker pointed out what he considered to be distinct remains of Norman work at the west end of the church.

Mr. King said that on the whole the glass in the church, though by many different hands, was fairly good. The glass of the Lady Chapel, however, was simply execrable.

Mr. DAVIS denied that the west end of the church was Norman; the arches and the foundations were a later addition. The doorways could only be accounted for by removal.

Mr. PARKER suggested that the heavy capitals of the Early English period had been blended with the Norman, but that did not disprove that the west end was Norman.

## Vallis.

At four o'clock the Society visited Vallis. Entering the vale from the Hapsford road a halt was made at the first quarry, where Mr. C. MOORE, F.G.S., became the guide to the party. He said they had standing before them the representatives of three or four distinct geological formations. At the bottom there was the Carboniferous Limestone, planed down almost as smooth and horizontal as a table. Then there came in on the top of the limestone a little band of blue clay; but between these two there was a gap where thousands of feet of stratified beds should be found; for while the limestone was the bottom of the coal measures, the blue clay belonged to the Rhætic series. Rocks were known by their organic remains, and they would find no trace of the Carboniferous Limestone passing above the blue clay. There was next a fauna coming in, special to that horizon. Above the blue clay were the pebbly beds, which represented the coast line of the Rhætic sea. Mixed up with those pebbles were various interesting organic remains—all dismembered, nothing perfect, as was the case with the lias; but they had as interesting a fauna as there was in the world. It consisted of bones, broken and scattered, teeth, scales of fishes, in some instanes very numerous. There were also certain forms representing some fourteen or fifteen genera of fishes. Associated with those fish remains were found traces of a little creature, which possessed a great amount of interest. A little kangaroo once walked about that neighbourhood, and they knew very well that the kangaroo was now almost confined to Australia. The kangaroo of that district was almost identical with the little kangaroo rat of Australia.

If they compared the teeth of the one with the teeth of the other they would find scarcely any difference. It was called Microlestes. They might depend, therefore, that a little kangaroo once ran about the Mendip hills. He had twenty-nine of the teeth of the animal found in the quarry before them, the teeth having been preserved because the enamel resisted the action of the ocean, and the tossing which they must have had in those pebbly beds. Then there were found various shells, one of which was called the Avicula Contorta, which was confined to that horizon; so that it had been suggested that those beds should be called the Avicula Contorta beds. There were other things in those beds, such as plants and insects, but it required a practical eye to detect them. If he had preceded them a few minutes he might have found a few samples. One of the most wonderful features of geology was the preservation of insects. There was a little band before them full of plants and insects. Then again there was a little crustation—pockets in the ocean of the period, which were occupied by a series of Contorta. When they were opened up in the direction of their laminæ they were very fine. His friend, Mr. Winwood, had brought him a sample which contained a tiny little tooth, and another on which there was a detached fish-scale. In the next quarry they would find above the white lias, beds of oolite. There was another very interesting feature connected with these quarries. They would see a vein running across the section, which had been filled in with a later material, ages younger than the rocks on each side. Every section had its own special features, and he knew of no neighbourhood that possessed the same amount of interest.

In reply to Sir William V. Guise and Mr. Flatman, Mr. Moore said that the Rhætic beds were in all the quarries, and that they belonged to the same series as the rocks at Holwell.

On the way to the next quarry specimens of Avicula Contorta were found by several of the party on a heap of stones ready to be carted away for road mending.

At the next halt Mr. MOORE shortly recapitulated what he had previously stated. Immediately succeeding the Carboniferous Limestone they had a formation which ought to have been thousands of feet higher up. There ought to have been between the limestone and the rubbly or coal measures several thousand feet of Triassic beds; but here resting on the limestone were beds of Rhætic age. All the rubbly beds represented the oolite period. They were very much fissured, but some of the fissures were not very large. Those fissures were filled up with material millions of years younger, and they might tell the age of the fissures by their organic contents.

Mr. SANFORD pointed out that the blue bands were liassic, not rhætic.

Mr. MOORE said they had displaced the oolite on either side.

At the junction of the Egford and Bedlam portions of the vale with the Hapsford valley, Mr. MOORE stopped the party in order that they might obtain a view of the "de la Beche" section of rocks, remarkable for the planing down previously referred to.

At the Egford end of the vale, in reply to Sir W. Guise, Mr. MOORE said that the last bed of the Mendips faced the quarry. The quarry had always greatly interested him—not because he obtained many organic remains there, but because of its grandeur, and the manner in which all the features were placed before them. They had a higher section of the Carboniferous beds than they had seen before, with the same features repeated in various phases, going down into the beds of conglomerate. The explanation of this was that the limestone had been fissured and broken up, and there was an infilling of a much later age. There was also a vein in the rocks composed to a large extent of Sulphate of Barytes, showing that lead was not far distant, though they need not think of sinking for it there. If they were going to sink for iron or lead ore, they would go down to a certain point where the edge of the vein sticks out, when they would suddenly lose the vein in which

they were sinking; for curiously enough there had been a shifting of the beds, and they would have to search ten or twelve feet further on before finding the vein. If they simply followed the vein they would come to the Carboniferous Limestone, and they would think that the vein ended, whereas it had only been pushed forward. In another corner of the quarry there was another vein with an ochrous deposit, and still another vein with Inferior Oolite at the top. At the top of the quarry they lost altogether the Rhætic beds of which he had spoken, and they had nothing but Inferior Oolite.

In reply to the Earl of Cork, Mr. MOORE explained the direction in which the coal measures would probably be found.

His LORDSHIP then said they had heard with great interest Mr. Moore's explanations of those very curious quarries. He knew that he had been a frequent visitor to them, and had acted as a friend to him, for though he had shown him little pieces of lead found there, he had recommended him never to sink for it. They would all be pleased to hear a few words from Sir Wm. Guise, who was the President of a similar society in the county of Gloucester.

Sir WILLIAM V. GUISE said he was present as a learner. He had been to those quarries before them in company with several other gentlemen last year, and they went into the whole story of them. They were very remarkable and interesting. Yet if they came into the Cotswold country he should be able to tell them more about it than he could tell about these quarries. He might perhaps throw out a few suggestions. There had been a great motive power at work in that district, displacing the limestone, which he attributed to the disturbances consequent upon the elevation of the Mendips by a process of infinitessimal slowness, by which no less than 4000 feet of coal measures had been swept away, causing a vast denudation. Those who had been to the Vobster coal field, as he had been with Mr. Mc Murtrie, would see that immense beds of mountain limestone had been turned up on their

edges, or turned completely over, by that denudation. It would be quite worth their while to go to Vobster. The disturbance they saw before them was due to the upthrust of the Mendips. He had never met with any one who could say why those vast regions of mountain limestone had been levelled off almost as smooth as a table. Some persons had attributed it to the action of sea water; but he had never seen such effects produced by the sea.

Mr. MOORE suggested that pebbles, in addition to the sea, would have caused it.

Mr. SANFORD asked whether ice would not have caused the smoothness referred to.

Sir WILLIAM GUISE said that that had been before suggested, and it was not impossible.

Mr. MOORE said they were in possession of facts which proved that that district was at one time entirely covered with ice.

## The Old Manor House,

or Dining Hall of the ancient Leversedge family, was next visited. It adjoins the old Vallis Farm. It is now used as a carpenter's shop.

Mr. J. H. PARKER, C.B., said that the hall evidently belonged to the time of Henry VII. The roof was still almost perfect. He pointed out where the dais, kitchen, pantry, buttery, etc., must have been.

A large number of Members of the Society, and others, met at dinner at 6.30 p.m., at the George Hotel. At the end of dinner the noble President proposed "The Queen," and "Success to the Society," specially naming Mr. E. A. Freeman, D.C.L., Mr. J. H. Parker, C.B., and Mr. Chas. Moore, who returned thanks. Mr. H. Danby Seymour proposed "The health of the noble President," and the Earl of Cork, in reply, spoke of the well known literary tastes which had made Mr. Seymour so good a President during the past year.

# The Evening Meeting

was well attended. At the opening of the meeting Mr. J. H. PARKER called attention to the work of restoration which had just been begun in Witham Friary Church. The present church is part of the first Carthusian Monastery ever founded in England. It has been much marred by modern additions and changes. It is now intended to bring it back as far as possible to the simple dignity of its original form. The ugly Georgian tower at the west is to be pulled down, and a bell-cote put in its place. The church has a stone-vaulted roof throughout, and a simple Norman apse.

Mr. E. A. FREEMAN begged those present to mark the importance of Witham Friary Church as a rare instance of an English parish church with a stone-vaulted roof. Such roofs were common enough across the channel. The real founder of the monastery and the builder of the church was S. Hugh of Grenoble. He brought the idea of the stone roof from his Burgundian home across to England, and so it came about that this Somersetshire church was marked by this grand foreign characteristic. S. Hugh was sent for by King Henry to rule over his new foundation at Witham; it was while he was Prior there, in 1186, that he was chosen Bishop of Lincoln, and as Bishop he still went on with his architectural work, of which the result is now to be seen in his cathedral church.

Rev. A. BURNEY, the rector of Witham, said that the greatest care would be taken to preserve the old features of the church. Several interesting things had been discovered, among them a rood staircase, with the moulding of the doorway corresponding with the moulding of the inner arch of the east window, of about the middle of the 15th century. The font, the licence of which was granted by Bishop Beckington, has also been found in the north wall. It seems that the outer walls were once cased. Every care should be taken of the vaulting, and the restoration

should be thoroughly conservative in character. Funds were urgently needed for the work.

The President then called on the Hon. and Right Rev. Bishop Clifford, who read a paper on the "Site of the Battle of Æthandune, and the Campaign of 878,"[1] which he illustrated by a large map.

Mr. FREEMAN said that he could not agree with some of the statements which had been made by the Bishop, and especially differed from him in the estimate which he seemed to have formed of the value of some of his authorities. At the same time the paper was most ingenious, and he cordially welcomed every such attempt to solve some of the difficult questions about the identity of places which often puzzled the student of history.

Mr. H. D. SEYMOUR then read a paper by Mr. C. H. Samson, of Dunster, on "Some discoveries which had been recently made at S. Mary's Abbey, Old Cleeve."[2]

Mr. CHAS. MOORE, F.G.S., then gave a description of the geological characteristics of Vallis. He said that having spoken already to them on the subject it became a question to him whether he could make the physical character of the district further interesting to them. But it was probably not quite exhausted. He had before mentioned that the county of Somerset had as large a share of interest geologically as any county in England, and it was so for this reason, that there were represented in it nearly all the geological formations which occur on the face of the earth. That was saying much, but there were very few formations which were not represented within the boundary of the county. And, interesting as the county of Somerset was, the greatest amount of interest was centred in the neighbourhood of Frome. He knew no locality in England,

(1). Printed in Part II.

(2). When Mr. Samson wrote this paper for the Society the excavations at Cleeve Abbey were still in progress. The work has now been finished, and Mr. Samson has most kindly made such additions to, and changes in his paper, as bring in the whole of what has yet been discovered. The paper, which has thus been in a great part rewritten, is printed in Part II.

or even in the world, which was more interesting than the district a few miles round that town. That circumstance arose from the disturbance which had been effected by the elevation of the Mendip range, which they knew formed the backbone of the county. The most easterly portion of that range was seen in the valley which they had visited that day, or rather the most easterly extension of the carboniferous limestone would be seen at Howell, on the Nunney road, and in a valley at Spring Gardens, near Mr. Shepherd's mill. The carboniferous limestone then passed under the secondary formations, and was never seen in England again to the east of these two places. The Mendip hills passed through the whole of our county to Weston-super-Mare; their equivalents were seen in the islands of the Steep and Flat Holms in the Channel, and then surrounded the South Wales coal basin. The uplift of the Mendip range had not been a slow one, as suggested by Sir William Guise, but very much more sudden than he supposed. That uplift had affected the old red sandstone, the carboniferous limestone, and the whole of the coal measures. Probably Mr. McMurtrie would tell them on the following evening that the coal measures alone of this county were some 12,000 feet in thickness, and when they considered that fact, and that the carboniferous limestone had had not only 25,000 feet of stratified beds brought out of their horizontal position into one nearly vertical, but also a very considerable area turned over upon themselves, they would think that the force which caused it must have been a very powerful one; and they must remember, at the same time, that that force had not only been exerted over the district where they were assembled, but all the way to the west, fringing the whole of the South Wales coal basin. Whether that had been done at one time, or during a considerable period, it was difficult to say. The supposition was that the range of the Mendips, at least the geological formations of which the Mendips were composed, passed under the south-eastern counties, and under the channel, to the south of France,

where the carboniferous limestone was repeated and where coal was worked. And it was in consequence of this that the boring operations in Sussex had been carried on to test the presence of coal in the palæozoic rocks below. The borings had gone down some 1670 feet, and though the palæozoic beds had not been reached, something would result from the operations. It was a very peculiar feature, whether the Mendip range passed in that direction or not, that there was a great covering of secondary beds, and to the surprise of everybody connected with that boring, the Kimmeridge clay, which occurred in our neighbourhood, was found to be upwards of a thousand feet in thickness; this had teased the committee very much, having unexpectedly to deal with such an enormous amount of secondary beds as he had mentioned. One reason why he thought the elevation of the Mendip Hills was sudden was the force with which the outlying beds were displaced. Not only were the beds brought up vertically and left standing on their edges, but they had been turned over and inverted. They had an outlying patch of limestone in the neighbourhood of Vobster, three-quarters of a mile in length, carried away from its parent rock and the overlying coal measures, to a mile or a mile and half from its original position. The force that could have elevated and crumpled up so great a thickness of stratified deposits and carried the whole country bodily with it to the north, must have been very great indeed. Although it was clear that volcanic action alone could account for the physical conditions above mentioned, until lately no visible trace of volcanic rocks had been discovered. It was then his good fortune to discover immediately under the turf at East Lane, a black rock different to anything that had been observed in the neighbourhood, and which turned out to be trap rock. An examination of the Mendips had led to this discovery, that in the immediate neighbourhood of Downend, close by Tadhill, occupying to a considerable extent the northern side of the Mendips, there was a great basaltic dyke, extending three miles in length. It was seen again on the road leading from

Stoke Lane, and on the map before them he had laid down its position coming up through the old red sandstone and the carboniferous limestone north and south. They had seen that day in the sections visited, some of very great interest. He was led to the examination of that district by a very curious accident. He was going along the road to Wanstrow, and on one of the heaps of blue carboniferous limestone by the side of the road he saw a piece of yellow rock which looked altogether different from the other portion of the heaps. He drew up, and on looking at it, and cracking it with his hammer—which was his constant companion,—he found to his surprise fish teeth and bones. He at once saw that those remains belonged to a bed which came in at the bottom of the lias, termed the Rhætic beds, in consequence of having large developements in the Rhenish Alps. It was a surprise to him to find that stone in this neighbourhood, because he was not conscious of the beds being within twenty miles of the spot where he found it, and he rather suspected that at some point or other, in one of the quarries, that this bed came in on the edges of the upturned limestone. As soon as he could he examined the whole of the district, without success; but not very long afterwards he happened to be in the neighbourhood of Holwell, when he saw a vein of yellow limestone going down one of the quarries. On examining it he found that it was from that spot had been dug the stone of which he was in search, and to his surprise he found Rhætic organic remains caught up in the carboniferous limestone. He should mention to them, as he did at Vallis in the afternoon, that those teeth and bones were millions of years younger than the stone in which they were caught up on each side. The representatives of those special remains, and the beds in which they were found, were met with only in a thin band of stone at the bottom of the lias. Where the Rhætic beds were opened there were frequently found beds two or three inches in thickness made up of the teeth of fish and fragmentary bones. If they went to Watchet they would find it there; if

they went through Somersetshire they would find it; and if they went into the Midland counties, where the lias was seen, they would also find it. In the north of England it occupied the same position; likewise in France and Germany, this thin band of stone, made up of fragments and teeth of fish, would be found in the same position, and he had lately been informed that it was present under similar conditions in New Zealand. It was this that the stone at Wanstrow represented. When examining that district it was a long time before he could read it, for it was a great puzzle. In looking over Holwell quarry he found, instead of it being all carboniferous limestone, a vein of the liassic age; then a little patch of limestone, containing remains of the Rhætic age and also liassic; then a little limestone, and another infilling; and so it went on, the infillings usually thickening as they went down. Low down in the bottom of the quarry he found a nest of shells, and he was enabled to cut out of a block of carboniferous limestone as big as his hand five or six different genera of liassic shells. It was not very long before he had exhausted the stone of its fish remains, but soon after he found another place in which there was a reddish or yellowish deposit of marl which had gone down one of those cracks. He found that it contained some remains, and that he could get them out in immense numbers. He thought that if he could get the material home he should be able to do so more carefully, so he went to a farmer and asked for what sum he would remove it to his house. He replied that he (Mr. Moore) could get better gravel nearer home, and he said he could, but that he wanted that. A bargain was struck, and for 55s. he had removed to his house, and placed in the cellar, three tons of the infilling. On that he worked for nearly three years, and obtained from it more than a million fossils, every one of which he had picked out separately. He had with him at that moment 70,000 teeth of one kind of fish alone, found in three square yards of earth. So they might fancy the great amount of interest which was attached to those

peculiar infillings. In the same drift from which these specimens came he found the teeth of the oldest quadruped and the oldest mammal that, as far as they knew, ever walked on this earth—the little kangaroo, the Microlestes, to which reference was made in the afternoon. Only one specimen was known before, and he was lucky enough to find 27 of those in the three yards of stuff at Holwell. The little kangaroo must have been very abundant in order to enable him to find so many in so small a space. He had prepared figures of the different forms of remains he had found with them. They included scutes of a reptile new to this country, with a covering like a crocodile, and teeth, jaws, and vertebræ of various fishes—fourteen or fifteen genera of fish and eight or nine of reptiles. The question came to his mind, how did they get such a peculiar mixture of organisms in those fissures. They had that afternoon a discussion about the planing down of the carboniferous limestone. His belief was—and they must give great latitude to geological time—that the carboniferous limestone formed the bottom of the sea during a very long period, indeed, certainly during the time when those Rhætic remains were being deposited. At that time the limestone became disturbed and fissured, and the remains of a Rhætic sea were carried down and helped to fill up the fissures which were then made. Again, there was a later movement of the limestone, and liassic organic remains were then carried down. It was a fact that the Mendips were so cut up with fissures, east and west, and cross courses passing through them, that, in order to represent the character of the beds in the Mendips, instead of putting them as plain carboniferous limestone, they ought to show long lines of Rhætic beds, and lias intersecting them in every direction. The veins, such as they were, were true mineral veins, and the filling up of some of them had occupied a very considerable time. When a vein was opened it was not filled all at once. If they had a vein two feet wide, carbonate of lime would be formed on each side, then a band of some other material came in—if a lead vein, a thin

deposit of lead, or if an iron vein, a deposit of hematite iron ore. These separate vertical bands filling and occupying these fissures, represented a special and long period of time, during which those thin layers were deposited. They would get that kind of thing in the veins of this neighbourhood, and in the centre of them all find beds as young as the middle lias going down and filling up the whole of the veins themselves. Another very curious feature of this neighbourhood was this. He believed that the whole of the minerals, whether lead or iron, were as young as the above periods, and did not belong to the carboniferous limestone itself. A fissure which had been caused in an old rock must be filled up by some younger material, and it was so in every instance in this neighbourhood, whether lead, sulphate of barytes, or iron, or with material of the secondary age, millions of years younger than the rock on either side. One curious thing he met with on the Mendips at Charterhouse. At a spot where an old mine had been abandoned he found blue clay, identical with the lias and belonging the the liassic age. He was told that it came from the bottom of the mine, but he could not believe it, as it was so much younger than the surrounding strata. The captain of the mine told him that they left off working in the blue clay, and he (Mr. Moore) had the mine uncovered to prove it. He found it difficult to descend the mine by means of ladders, but he safely reached the bottom, where he found that the vein had been filled up in the way he had stated, and discovered 150 species of liassic shells, found on the top of the Mendips carried down nearly three hundred feet in a carboniferous limestone fissure. Mr. Moore concluded by stating that in this district, and the neighbourhood of Frome especially, as much interest can be found geologically as in any other part of the world.

Mr. TAIT handed in a note on the subject of Mr. Moore's paper, but unfortunately the hour was so late that the President was not able to arrange that it should be read. The substance of it was that according to Mr. Moore's theory concerning the

age of the stratum under consideration, it was necessary to suppose an unconformability between the middle and upper lias to explain the phenomenon required by his supposition. Mr. Tait considers that the stratum of clay which intervenes between the so-called marlstone and the inferior oolite of the Radstock district, which is estimated by Mr. Moore at 50 feet in the Tunley bank, and which is said by him to belong to the upper lias, really forms part of the middle lias. Only a day or so before Mr. Tait had gathered near Wellow, on the line of railway towards Radstock, most decided fossil evidence as to the age of the stratum. The section displayed inferior oolite resting on about 20 feet of a bluish sandy clay, with small clay stones and a few fossils for the most part fragmentary but determinable. The fossils put in evidence were Belemnites, s. p., Monotis inequivalvis, Pecten priscus, Plicatula spinosa, Pentacrinus scalaris, and some others, the midliassic age of which cannot be doubted. In the north of this district it was true that the upper lias existed below the inferior oolite, but there the succession of the middle and upper liassic strata was complete, for there the marlstone was the highest stratum of the middle lias, and was not coterminous with that of Radstock. He stated that in passing south from Bath the upper lias was truncated; then the higher marlstone disappeared, and thus the inferior oolite finally rested on the subjacent clay bed, which overlies the marlstone of Radstock. So then there was no necessity for calling in the aid of an unconformability between the middle and upper lias.

Mr. Sanford said that, though no one could possibly dispute the value of Mr. Moore's palæontological researches, he dissented from his views of the physical phenomena, which caused the denudation of the older rocks. The upheaval and denudation of the Mendips must be taken in connexion with a similar upheaval and crumpling, and with a similar planing down of rocks of a like age which had taken place throughout the south-west of England, and particularly in the country between

Dartmoor and Exmoor, where the rocks were crumpled like sheets of paper squeezed together in the hand, and were planed off again by some agent similar to that which had planed the Mendips. He stated that the hollows of these rocks were filled with aqueous deposits of similar age ; that the earliest of these secondary deposits were of Triassic age, that there were no rocks of Permian age west of the Mendips, and that there was consequently the enormous Permian age to be accounted for. He stated that subaqueal deposits, except coal, were rare, and that submarine denudation was altogether unknown and inconceivable. Hence he argued that the great upheaval and denudation of the whole district took place during the Permian period : that the upheaval would have probably produced mountains of enormous height, which would have furnished an agent quite powerful enough to have effected the denudation, viz., glaciers of immense length and thickness. He suggested that search should be made beneath the Triassic and Rhætic beds for ice scratches, which might in some cases be still preserved. If any such were found it would go far to settle the question.