

ART. XXI.—*Reports on Excavations at Springs Bloomery, near Coniston Hall, Lancashire, with Notes on the probable age of the Furness Bloomeries.* No. I, by H. S. COWPER,* F.S.A. No. II, by W. G. COLLINGWOOD, M.A.

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No. I.—BY H. S. COWPER, F.S.A.

HEAPS of slag, the *debris* of old iron smelting operations, are very numerous in High Furness, and have for many years attracted some attention from the curious, including this Society, who have on more than one occasion visited the sites of bloomeries. Nevertheless no attempt has hitherto been made to ascertain by the use of the pick and the shovel, any information as to date or methods in use: both of which have consequently remained wrapped in obscurity. With this object in view the large bloomery at the Springs near Coniston Hall was trenched and examined in May and June this year; and although the excavations lacked any sensational discoveries, it is thought that the results should be put on record. In the report also certain analogies are noted, and a list of bloomeries known to the excavators is added. The list can no doubt be supplemented.

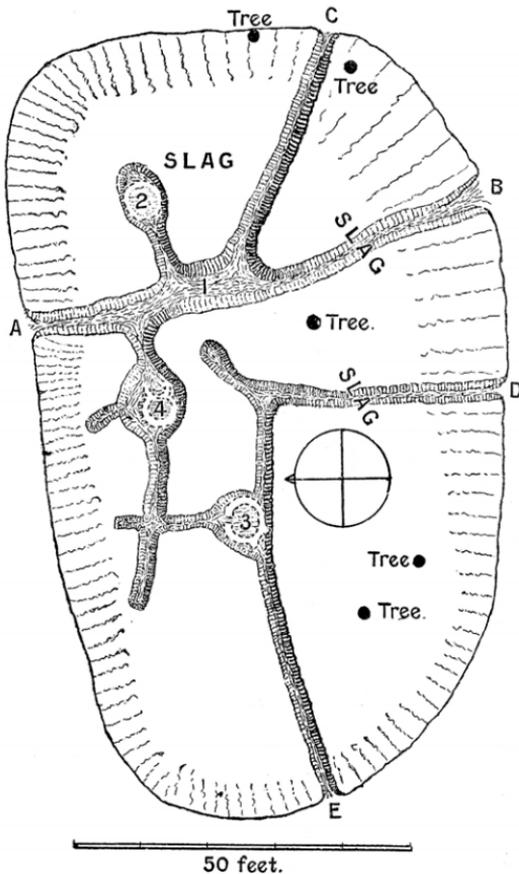
PREVIOUS LITERATURE.

In Volume VIII. of our *Transactions*, page 85, is a paper of our member the Rev. T. Ellwood, rector of Torver, on "The Bloomeries of High Furness." This should be read before perusing the present report.

* The writer of Part I. is alone responsible for the opinions expressed. The use of "we" instead of "I" is due to his having, in Mr. Collingwood's absence, prepared it as a joint report; but as the latter differs somewhat in his conclusions, these will be found in his paper.—H.S.C.

THE EXCAVATIONS.

Work was commenced on May 12th with five men, and carried on on the 13th and 17th with two men. During the week ending May 29th also, several days were occupied by two men on the site, and the trenches thus formed are shewn in the plan here given.



PLAN OF EXCAVATIONS AT SPRINGS BLOOMERY.

It will be seen that the mound is of oval form lying with its narrower end towards the west. There are five trees

trees growing upon it, and the surface is fairly covered with turf. The trenches cut, shew however, that the material of which the mound is composed is not homogeneous over its entire area, and that it varies somewhat in depth.

The exact measurements of such a mound are of but small importance, and it suffices to say that its entire length is 115 feet and its central width 69 feet.

The trench A.B. passes through the deepest part of the mound, being in places about four feet deep. The northern half of it was cut through charcoal with little or no slag, but on the southern side the trenching revealed slag only, loosely packed together, and very little bound with mould.

At 1, was found at the bottom burned clay, but there was no other evidence to show that there had ever been an actual hearth at this spot. The radial trench to C. passed through slag, but nothing was found.

At 2, in a shorter radial trench an undoubted hearth was found, a circular foundation of rough stones, about 7 feet in internal diameter, with a flooring of stones packed with clay. Although poorly preserved, there could be no doubt as to the original purpose of this structure.

The remaining trenches shewed a less depth of material, generally one to three feet. That ending at D. passed through slag but revealed nothing. At 3, in mixed earth and slag, another hearth, the best preserved of all, was laid bare. It was a roughly built circular foundation of stones, the external diameter of which was 6 to 7 feet, and within about 4 feet. On the north side there was an opening in the walling, and on the south-west an arrangement of large stones forming low radiating walls, with apparently a pit between them. This arrangement, which we also found elsewhere (at 4,) was probably to run off the molten metal, and should be compared with a figure of a Mashonaland hearth given in Bent's "Ruined Cities of Mashonaland" (1896, p. 308). The only other discovery

covery was at 4, where a very much destroyed foundation, four to five feet in diameter, was laid bare. The segmental or radiating walls with enclosed pit, was here on the east side. Mr. Collingwood thinks that this was another furnace like that at 3, but that with No. 2 it had been disused, and the refuse over it has come from later used hearths. Throughout the diggings no relics which bore decisively on the question of age were found.*

The site of this bloomery has been described by Mr. Ellwood, and elsewhere, so we need only notice here that Hoathwaite Beck, which runs out to the lake, is about 50 yards from the mound. At the nearest point by the beck side, is a small heap of slag and charcoal which could not be dug into, as a boundary wall crosses it: but between here and the bloomery the space is strewn with slag. We should note also that the beck does not run here in a gully or gorge.

LOCAL HISTORY.

Although of much interest, as illustrating our subject, we have not room here to describe the varied types of rude smelting hearths used in early times, and yet or till recently among many semi-barbarous races.† Let us, therefore, see what local history has to tell us about the Furness bloomeries. On this question we find a certain amount of evidence—not very definite but still valuable—in the Abbey Coucher book. What there is, however, points to the fact that the industry was of a valuable and important character in the Reformation times. It was no doubt one of the Lord Abbot's sources of revenue. The ore was mined in Low Furness and then conveyed to the fells, because the plentiful supply of fuel made it worth

* See Mr. Collingwood's paper following this.

† This report, together with the description of many varieties of rude ancient and modern smelting hearths, was read before the Archæological Institute, December 1st, 1897.—H.S.C.

while

while. Transport would be partly by packhorse, and partly by the waterways of Coniston and Windermere.

On this subject Mr. Atkinson has, in his preface to the Chetham Society edition of the *Coucher* book, some interesting remarks.* He points out, however, that in this book we get no information as to the extent to which the iron was worked by the convent, what the fuel was or where it was obtained: while from the Gisburne (Guisborough) Chartulary we learn that there no limit was placed to the use of timber and wood: and at Rievaulx that the monks might use dead-wood only.

At Gisburne too we learn from him that the furnaces (*astræ, favercæ, fabricæ, forgiæ,*) were built in groups of three, four, or more: and that water was a desideratum if not a necessity: although how it was used is not exactly ascertained. In the Furness charters, however, we hear of water privileges, the water being "ad lavandum," *i.e.*, for washing the ore. The convent also bestowed on their tenants yearly one ton of *livery* iron for repairing their ploughs and farm gear.†

All this, however, does not take us very far, and we have to wait till Reformation days for more definite information. In the certificate of the revenues of the Abbey in 1537, it is stated that the King's Commissioners were able to lease sufficient wood in Furness fells to maintain three bloomsmithies only to William Sandes and John Sawrey for £20, a considerable sum in those days. It appears that the lessees in this case took up the manufacture of iron with the intention of supplying the forged metal to the tenants of the Abbey Manors, their needs in this respect having been satisfied, at anyrate to some extent, direct from the Abbey prior to the dissolution. But this speculation—for a speculation it undoubtedly was—was

* Volume XIV, p. 12, et seq.

† Atkinson's *Furness Coucher Book*, Chetham Society, Vol. XIV, p. xv; also Beck's *Annales Furnesienses*, p. 14.

not destined to be successful, for in the 7 Elizabeth (1564) the smithies were put an end to by a Royal decree in consequence of the destruction to the woods, which were required by the flocks of High Furness. That there was much truth in this we need not doubt, but it is also probable that the tenants were naturally somewhat aggrieved at finding themselves compelled to buy from a private firm what up to that date they had probably received freely from their feudal lords in payment for their services. So long as the destruction of the woods entailed by the manufacture directly benefited the Abbey, and indirectly themselves, they had not grumbled, but they naturally found the case altered when the profits were passing into the pockets of private individuals.

The decree by which these bloomsmithies were abolished is, like the Commissioners' certificate of 1537, useless for identifying the sites of the hearths. It is printed in full, as Appendix No. 9, in the first edition of West's *Furness*, and as it is extremely diffuse and technical, it is unnecessary to give here more than the briefest abstract. We find first that the rent of the smithies to be abolished was to be made good to the Crown by the tenants of Hawkshead and Colton: and at the same time certain regulations concerning musters and fines were enacted. And because after the closing of the bloomsmithies the tenants "shall hardly come by iron, by reason that seldom any is brought from the partes beyond the seas, into any of the coasts near adjoining . . . and when any shall happen to be brought . . . yet the same cannot be carried . . . because that the ways . . . be so straight and dangerous, and do ly over such high mountains and stoney rocks that no carriage of any weight can there pass": it was further enacted that the tenants themselves were to be at liberty to make iron for themselves, using only the "shreadings, tops, lops, crops, underwood," but not the timber. Hence arose the bloomsmithy rent, payable until recently by the
tenants

tenants of High Furness, which in some townships is not yet extinguished. It was payable on the feasts of the Annunciation of the Virgin Mary, and St. Michael, the Archangel, *i.e.*, Lady Day and Michaelmas.

At the end of the 17th century charcoal smelting furnaces were reintroduced into the district as private ventures, and wood for charcoal becoming valuable the tenants enclosed portions of their woods to preserve them for this purpose. Iron works were commenced at Force Forge by Captain William Rawlinson, of Rusland, who died in 1680, and soon after at Cunsey by Myles Sandys, of Grathwaite, the last being we believe on the site of the old ones abolished by the above-mentioned decree. The forge at Backbarrow was founded in 1710, and still works. That at Newlands in Ulverston Parish in 1747, and it was in use as late as 1880. The Lowwood iron-works were, we believe, erected at about the same time as those at Backbarrow: at any rate they were in blast in 1766, at which date also were those at Low Nibthwaite. The Duddon Bridge works, it is supposed, date from about 1745.*

There is very little history to be found about those bloomeries which are outside the Abbey estates: yet probably a complete search would reveal numerous sites. William de Lancaster granted to the Canons of Conishead for their bloomeries, all the dead wood in Blawith, and we know, from the report of the Keswick German miners, that a smelting hearth was in operation close to Coniston about 1650; and in 1674 we have the following entry from Sir Daniel Fleming's account book. "March 24, 1674-5. Given as earnest unto Charles Russell, hammer man now at Conswick† to be hammer man at

* Mr. Roper, formerly manager of some of the Furness charcoal forges, says 1747, but they are shewn in West's map, which is dated 1745. See Mr. Roper's account quoted in Tweddell and Richardson's "Furness: Past and Present," Vol. II, p. 181. See also a paper on "The Old Blast Furnace at Duddon Bridge," by T. Barlow Massicks, these *Transactions*, Vol. XIV, p. 448.

† Probably this is a clerical error for "Cunsey."

Coniston

Coniston Forge, for 35/- per tun, to have grease for the bellows, and leave for some sheep to go on the fell. £00.05s.00d.”

This forge, which still bears the name, was in use in 1750 : but of the numerous sites on the Lake margin we have no sort of record ; and it remains to consider if anything in the excavations justify any inferences as to date and origin.

SUMMARY OF EVIDENCE.

Upon the bloomery excavated, and also upon another within the old park of Coniston Hall, there are a few well grown oak and timber trees : and it has been argued that this is a proof that these bloomeries existed long anterior to the formation of the deer park. But these trees on the excavated bloomery are, in the opinion of competent judges, not over fifty years of age, and it is doubtful if any within the park exceed a hundred years. Therefore they are quite useless for fixing a date to these hearths, for in the absence of all local tradition we may feel quite certain they have not been in work during the past century.

The absolute lack of any certain relics is unfortunate : but we are hardly justified from this in concluding that the bloomeries were worked by poor and savage tribes, who would have few manufactured objects. Iron smelting did not necessitate the use of fictile vessels as some industries did, nor can we expect rubbish heaps such as accumulate near inhabited sites. The furnace master who smelted and the forge master or smith became in England distinct callings.* Furnaces and forges were, however, often together, and there is some reason to believe that these local bloomeries were generally associated with forges for the working up of the smelted iron. To this point we shall return.

* Starkie Gardner. Iron Work (South Kensington Art Handbook), p. 11.

Though

Though the bloomery is turfed over, and soil has penetrated the slag for twelve or eighteen inches, the loose condition of the material generally seems to argue against a high antiquity.† But it is very singular that there is absolutely no known record of the use of these sites. Mr. S. H. le Fleming believes that amongst his numerous documents relating to the manor there is no reference to iron smelting: and it must be allowed that when the Flemings lived at the Hall they would hardly approve of smelting operations of any extent in their park. The size and shape of the hearths seem to shew that they were rude simple erections in no way superior to many which were in use till recently by semi-barbarous races: and as the foundations are only a course or two high, and but few stones of size were found near them, it may be concluded that they were not lofty erections with tall chimneys, such as the *Stückofen* or improved Catalan forge. The fact that several hearths were found in the same bloomery indicates probably that as work went on it was easier to build new hearths, utilising, as far as possible, the material of the old ones, than to clear the *débris* and rubbish from the site. Possibly, it may also mean that to extract the bloom it was necessary to partly destroy the hearth.

The next questions that arise are, how the blast was obtained, and for what reason the smelting was performed in the vicinity of a running stream?

The latter indeed could hardly have been meant only for washing, because the lake is close at hand: but possibly running water was more effective. Yet we can hardly think that, as the ore had to be carried all the way from Low Furness, this would be done without first

† Though such a matter is difficult to judge, the writer, if suddenly confronted with a section of the bloomery, having had no previous knowledge of the subject, would certainly have said that in his opinion it had been made within at least the last 300 years.

cleansing

cleansing it, in order to lighten weight and lessen bulk. It is therefore possible that a small water-wheel was erected near the bloomery to press the bellows, and a little mill-race carried from the adjacent beck for power. No trace of such a race was, however, observed at Coniston, although at Cunsey Forge, which is probably more modern, and was certainly a bigger bloomery, the site of one can be seen. The mill-race might, however, have consisted of wooden troughs, carried a short distance on trestles. But if it had not been for the propinquity of the streams to these bloomeries we should have judged, from the small size of the hearths and their rude construction, that a natural air blast or hand-bellows were in use.

However the position of the slag heap at Farra Grain, suggests that the stream was for some other purpose than for a water wheel. It is of large size and though close to the stream, so high above it, that though it would be possible to bring a mill race from a distance up stream, it is impossible to doubt that had this use of water being thus desired, the iron smelting hearth would have been down below by the beck side. Consequently in this case at any rate we believe that the water was used in the manipulation of the smelted iron, and that probably there was below a forge. The reason for the propinquity of the stream may in every case be the same : but why those on Coniston require to be both near lake and stream, we cannot suggest.

Though there is therefore no evidence to put an actual date to the Coniston Hall bloomery, and still less to the numerous other slag heaps in the district, the result of these excavations tends to place them at a more recent epoch than has sometimes been suggested. We have seen that by the Elizabethan decree the tenants of the Abbey were left at liberty to make iron for their own use : and we incline to think that these rude smelting hearths are in many cases the sites of the operations thus carried

on

on by the inhabitants of the fell districts since that period. Some of course may be earlier, but the Commissioners' certificate of 1537 states that the convent had had a smithy or sometimes two or three, so that probably these pre-Reformation bloomeries were on a considerable scale, as so few were in operation.* It is probable that they were on the Crake and Leven where fuel was plentiful and water power excellent: and possibly at Cunsey, where the Sandys family erected their bloomery in later times. So far we have not one tittle of evidence that any hearths in the fells of Lancashire date from Roman or Pre-Norman times, and we cannot refrain from expressing a doubt if such evidence will ever be forthcoming.

LIST OF CHARCOAL SMELTING HEARTHES IN HIGH
FURNACE AND NEIGHBOURHOOD.

Ancient Chapelry of Hawkshead.

					Ordnance 6-inch Maps.
Backbarrow *	.....	.....	.....	.....	12 N.W.
Beck Leven, W. side of Coniston Lake	.....	.....	.....	.....	4 S.E.
Blelham Tarn	.....	.....	.....	.....	2 S.W.
Colthouse Heights	.....	.....	.....	.....	5 N.W.
Cunsey Forge*	.....	.....	.....	.....	5 S.E.
Cunsey Mill *	.....	.....	.....	.....	5 S.E.
Elinghearth	.....	.....	.....	.....	8 S.W.
Finsthwaite, "Cinder Hill" near Finsthwaite house	.....	.....	.....	.....	8 S.W.
Force Forge *	.....	.....	.....	.....	8 N.W.
Nibthwaite (Low Nibthwaite forge)	.....	.....	.....	.....	7 S.E.
Penny Bridge Furnace ?	.....	.....	.....	.....	11 N.E.
Rusland, near Bethacar moor (? Ashslack)	.....	.....	.....	.....	7 S.E. or 8 N.W.
Rusland and Grathwaite (between) "Cinder Hill"	.....	.....	.....	.....	8 N.W.
Rusland near "Cinder Hill"	.....	.....	.....	.....	8 N.W.
Rusland $\frac{3}{4}$ mile S.E. between Birch Parrock and Walker Parrock	.....	.....	.....	.....	8 S.W.
Satterthwaite (Farra Grain bridge)	.....	.....	.....	.....	5 S.W.

* Mr. Atkinson has computed that the Abbey had 40 furnaces in operation, but if this was so, it is evident from this statement of the Commissioners that these were in other parts of the Abbey estates.

Satterthwaite

Satterthwaite, Low Dale Park	.....	.....	.....	8 N.W.
Stott Park near " Smithy Haw " wood ?	.....	.....	.....	8 S.E.
Tarn gill, Tarn Hows, Monk Coniston	.....	.....	.....	2 S.W.
Yewdale near the limekiln Low Yewdale?	.....	.....	.....	1 S.E.

Lancashire Fells outside the Chapelry of Hawkshead.

Coniston, The Forge*	.....	.....	.....	4 N.E.
Coniston Lake, below Fir Island	.....	.....	.....	4 S.E.
Coniston Lake, The Springs Deer Park, Coniston Hall	.....	.....	.....	4 N.E.
Coniston Lake, Water Park, Coniston Hall	.....	.....	.....	4 N.E.
Coniston Lake, Harrison Coppice	.....	.....	.....	4 S.E.
Coniston Lake, near Stable Harvey.....	.....	.....	.....	7 N.E.
Coniston Lake, Moor Gill	.....	.....	.....	4 S.E.
Dunnerdale, Cinderstone Beck, near Stonestar	6 N.E.
Spark Bridge	11 N.E.

Ancient Parish of Ulverston.

Newland in Egton*	11 S.E.
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Ancient Parish of Cartmel.

Low Wood, river Leven*	12 N.W.
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Westmorland, on confines of Hawkshead Chapelry.

Colwith Forge*	25 S.E.
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Cumberland, on confines of Lancashire.

Duddon Bridge, The Forge*	88 E.
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Of those starred there is historical record of smelting operations. Backbarrow turned out about 260 tons of bar iron in 1750, and 769 of cast iron in 1796 (J. D. Kendall, *Iron Ores of Great Britain*). At Cunsey Forge and Cunsey Mill there are separate heaps of slag. At the former, also, a charcoal store barn, remains of a mill-race, and, it is said, circular hearths. Mr. Collingwood says the landing-place on the Lake (Windermere) for these two was at Hammerhole, close to Holmewell. Elinghearth is doubtful: but West, in his *Antiquities of Furness* (1st edition, Appendix No. 9,) says "Eling" signifies wood ashes

ashes. Spark Bridge Furnace turned out 120 tons in 1750, and Newland in 1796 was making 700 tons of cast iron. Mr. Collingwood says that the ore for Coniston Forge was landed at Robin Wray, near the present Gondola (steamer) station, and for Tarn Gill (or Tom Gill) at the head of the Lake near Mr. Marshall's boat-house: which accounts for occasional pieces of slag and ore at each place. Colwith Forge is mentioned by the Rev. T. Robinson in 1709, in his *Natural History of Cumberland*. Duddon Bridge Furnace was in existence about 1745, and was worked till about 1866 (T. Barlow Massicks in these *Transactions*, Vol. XIV, p. 448).

No. II.—By W. G. COLLINGWOOD, M.A.

Throughout High Furness there are many remains of bloomeries or furnaces where iron ore was smelted with charcoal. Of these sites, some are known to have been occupied in recent times. Coniston Forge, for example, is alluded to in a report of the German miners at Keswick, about 1650 (West's *Antiquities of Furness*, ed. I.), and in a letter of Sir Daniel Fleming's in 1675 (Rydal MSS.); in 1750 it turned out 80 tons of bar iron a year (J. D. Kendall, F.G.S., *Iron Ores of Great Britain, &c.*); and Mr. Henry Atkinson, Coniston, says that in digging on the site he has found not only masses of slag, but also a number of cast-iron 'images.' From this it appears that smelting, casting, and forging were carried on somewhat extensively during the 17th and 18th centuries. Similar recent bloomeries are well-known at Backbarrow, Cunsey, Force Forge, Nibthwaite, Penny Bridge, and Spark Bridge; and on the borders of High Furness at Colwith, at Newlands and Lowwood on the Leven, and at Duddon Bridge (the last described by Mr. T. Barlow Massicks in a paper read to this Society in 1896).*

* Printed in these *Transactions*, vol. xiv, p. 448.

But

But beside these recent and extensive works, there are many sites where small slag-heaps show that iron has been smelted, though no historical record remains, and even tradition is silent. They have been noticed by the Rev. T. Ellwood in a paper read to this Society, and formerly were ascribed to the Romans.† Last year Mr. Ellwood advanced the theory that they might be Norse, as the Norse are known to have been ‘great smiths’ and workers in iron.

There are more than twenty such sites in High Furness, of which seven are on the shore of Coniston Water,—at Beck Leven, and below Fir Island ‡ on the eastern side, and at Waterpark near the Hall, Springs, Harrison Coppice, Knapping tree, and Moor Gill on the western side. Not far from the Lake there are slag-heaps at Tom Gill (Glen Mary) and in Yewdale near the Limekiln ‡; also at Stable Harvey in Torver. In Dunnerdale there is Cinderstone Beck near Stonestar; in Rusland four sites, and in Satterthwaite two; also remains at Blelham Tarn and on Colthouse Heights. Bloomeries are also suggested by the place-names of Smithy Haw-wood, near Stottpark, on Windermere, Cinder Hill, near Finsthwaite, and Elinghearth (*Eling* meaning wood-ashes, according to a note in West’s first edition).

Since in other parts of England the bloomeries have yielded relics fixing their date, it was thought worth while to dig, and the Springs bloomery was chosen as the most convenient. It is a mound of 115 by 69 feet in base, on the shore of Coniston Water, about a mile south of the Old Hall. The spot is overgrown with turf and set with a few oak trees, which prove that the mound is at any-rate older than this century. On cutting trenches it was found that though the soil had penetrated some 18 inches

† *Ibid*, viii, p. 85.

‡ These two sites are named from hearsay only.

beneath

beneath the surface, the slag beneath was loose and un-mixed with soil, unlike the condition of pre-historic or Roman remains.

Heathwaite Beck runs into the Lake about 50 yards to the south ; and at the nearest point on its bank is another small mound of slag and burnt stones. The space between this and the bloomery is strewn with slag. All these sites are near running water,—it has been thought for the purpose of turning a wheel to drive the bellows. If the water was brought in a wooden trough upon trestles no explanation is needed of the total disappearance of such rude machinery as may have been used.

Digging was begun with five men on May 12th, and continued with two men on fair days till May 29th. There were found :—

Hearths, resembling the two still existing in partial preservation at Harrison Coppice and Knapping tree, further down the lake shore ; where are round buildings, 9 feet across, still standing some 3 feet from the base, of small, rough stones, burnt red by the firing, and surrounded by heaps of slag. The hearths at Springs were smaller. One was quite ruined, and showed only a base of cobbles packed in clay. It had been abandoned and covered with four or five feet of slag. The next was less completely ruined, and was heaped with the burnt stones of which it had been built, and about two feet of soil and slag. The third was well defined, about 7 feet across, though only the lower course of the wall remained, covered with a few inches of soil ; evidently the most recent of the three. On the north side of it was a passage about five inches broad through the masonry, as if for a blow-hole. On the south-west, outside the circle, large stones formed two low walls, diverging like the cheeks of an open fire-grate, with a pit between them, lined with clay, and apparently a hole leading from the clay bottom of the furnace down into the pit (as if to let the molten metal

metal run off). The same arrangement was traceable in the second hearth, and is identical with that of the Mashonaland bloomery figured by Mr. Theodore Bent in *Ruined Cities of Mashonaland* (p. 308, pointed out by Mr. H. S. Cowper).

These small, rude hearths cannot have been used when the great historical furnaces were in blast, and sufficing for the needs of the neighbourhood. They must be an earlier type; that is to say, of a period before the age of Elizabeth, when improved and more extensive furnaces came into vogue. In some places, perhaps, hearths of this type were used in the 16th century: but there are reasons now to be given against assigning that date to this particular bloomery.

Clay.—The stones were packed with blue clay, but the inside and bottom of the hearths were lined with a reddish yellow clay, baked hard; of which broken bits, with charcoal and slag adhering, lay among the *débris*, or had been trodden into the floor. The clay must have been dug from the pits in Waterpark field, which was part of the deer park of Coniston Hall. It is impossible that this could have been done during the time when the deer park was stocked with deer and jealously kept. Indeed, it is most unlikely that the Flemings of the Hall would permit rough colliers and furnace-men to haunt the borders of their park at any time. Now the park was in existence during all the 17th century, and probably during the 16th century. It was early in the 16th century that the Abbot formed his deer parks in Low and High Furness, and smaller gentry probably followed his lead. Consequently, this bloomery was not likely to have been worked during the 16th and 17th centuries.

Slag.—The mass of the mound consisted of heavy black iron slag, produced at a low heat by a primitive process of smelting. Exactly identical slag was found this summer in a bloomery of the early 11th century at Ljarskogår
in

in Iceland, where Grettir the Strong worked at smithying with Thorstein Kuggson, his kinsman, 'a great worker of iron,' in A.D. 1018 (Grettla, chap. 53). Similar remains of bloomeries exist in many places in Iceland; so that it is not impossible that the kindred Vikings who settled here originated the industry. A little red slag, as elsewhere on the same shore, and some with a coppery glance, were found.

Dross, ore, charcoal, and nails turned up in small quantities. The dross was very light and porous, like pumice, and bright purple; identical with that found on Peel Island, and considered by Mr. T. Barlow Massicks to be a product of the flux used in smelting. Small bits of red hematite were found, and great quantities of charcoal made from coppice wood, and charcoal dust, screened off from the available coals. Also a nail and two bolt-heads, in shape like those found in such numbers at Peel Island, and in the same state of rust with slender metallic core. These, and the purple dross, seem to connect the Springs bloomery with the dwellers on the Island, where fragments of pottery were also found, and said by Chancellor Ferguson and Mr. W. H. St. John Hope, to be early mediæval.

We have reason, then, for putting back the date beyond the beginning of the 16th century, but not so far back as Roman times: while the indications suggest a similar age to a site we have fixed as early mediæval.

Now the Furness monks began their iron industries after acquiring mines at Elliscales in 1230 and Orgrave in 1235. In 1240 they got leave from the Baron of Kendal to put boats on Coniston Water, for fishing and carrying. By 1292 a great part of their income was derived from iron-works. The Rev. J. C. Atkinson, in his introduction to the *Coucher Book*, seems to calculate that they must have had some 40 hearths going in the whole of Furness to produce the iron they made.

This

This industry went on for nearly three centuries. Before 1250 the descendants of Norse settlers may have smelted iron by Coniston Water-side ; but we cannot look earlier than the 10th century, or later than the 15th century, for the date of these older Coniston bloomeries.
