F.W.B. CHARLES:

Bredon Tithe Barn

Bredon is one of the three great tithe barns in Worcestershire, built by Bishop of Worchester about 1350. Middle Littleton and Leigh Court are the other two, the former one of the very major examples of base-cruck construction; the latter, the greatest cruck building in existence. All are scheduled as Ancient Monuments and of more than national importance. Middle Littleton, having almost reached the point of no return, with leaking roof and collapsing timbers, was restored by the National Trust in 1977. Leigh Court, ten years ago needing only minor repairs, has now become almost as derelict as Middle Littleton was before its reconstruction. Bredon was in all respects the most secure and structurally sound. Of aisled construction, it completed the trio of contrasting medieval structural forms, and its loss would have been the more serious, rather than less, for the existence of the other two. Needless to say, it would have been serious enough on its own account, having certain unique features as well as qualities in its architecture and construction that are unmatched in any comparable building, excluding not even the barns of Great Coxwell and Bradford-on-Avon.

At 4.30 pm on Friday 18th April 1980, one of 3 school boys set fire to Bredon, playing amongst the hay bales with a cigarette lighter. A visitor in search of the farmer heard cries and said afterwards that if only he could have found a bucket, let alone a fire-extinguisher, he could have put the fire out. As it was, he had to spend time searching the village for a phone and by the time the fire brigade arrived the barn was set fair to burn itself out – as it did for a whole week.

Everything was against it and its owners, again the National Trust. A thirty year lease from 1951 had given the farmer the right to use the barn as he wished. The lease had one more year to run, and then the Trust intended to change it. Villagers and others had complained about the dangerous state it was constantly in, with hay and straw stacked to the roof and lack of supervision. The farmer lives ten miles away, and the manor house (the two buildings until recently were within the same curtilage without the present garden wall that now separates them) is generally unoccupied, its owner living overseas for most of the year. The parish council had twice asked for reports of the Evesham Fire Officer. In desperation to get something done, visitors had even phoned me! But that was not all. The Trust had restored the barn in 1955 and re-slated the roof. The slates were bedded in mortar – an easier way to lay Cotswold stone roofs than having to select each slate so that it lies firm withour the aid of cement. The fire officer pointed out to me

1. View from south-east a week after the fire
Vue du sud-est une semaine après l'incendie

how the heat had built up at the north end, where the fire started and, owing to the absence of ventilation until whole chunks of the roof had collapsed, swept through the length of the barn to the south end where the damage to the stone was the greater.

The only part of the barn in which it was safe (relatively) for the firemen to play their hoses was from the south-east porch. Even this was against orders, for under the new Health and Safety Regulations it is policy to let barns burn out – and of course no distinction is made between a pre-cast Marley barn and an ancient monument. Nevertheless, the firemen saved the porch and the best part of the three adjacent bays, though the upper part of their roof was destroyed, as throughout the barn.

Clearing the debris after the fire, or while the hay was still smouldering, was also hazardous. One of the main posts, burnt away at the bottom, was literally hanging on a few pegs at the top. One of the massive strainer beams, hung like a giant railway signal, still held by pegs to one post but cantilevered over the cross-brace for three-quarters of its length, the opposite post having been burnt away completely. More that half the wooden lintols had also been wholly destroyed, as a result of hay being stacked in the window openings. The gable walls stood solitarily gaunt, with crumbling stone above the openings making the south gable especially unsafe.

What remained at the end ot the day was a hulk of reddened stone; blackened timbers with charring up to half-and-inch thick, either fallen or still standing in a series of nightmarish abstract sculptures, taking on more structural forms as one looked from either end to the trusses near the south-east porch; a few thousand slates, out of a total of

about a hundred thousand, salvaged at some risk, and made more difficult by their mortar bedding; and the south-east porch. Without the survival of the last, reconstruction would have been out of the question.

Of the six months' long debate behind the doors of the National Trust, nothing has yet been divulged, but that the centre philosophical question of whether a building, damaged as badly as this, could be restored and still retain its architectural and historic value was resolved in favour of restoration is surely remarkable. Stemming from no less than William Morris there were powerful voices against it, as no doubt there still are. But there was a strong membership demand for reconstruction, and there were features and details in the design and construction of the barn whose loss, if they *could* be restored or preserved in the context of the whole building, would have been hardly short of irresponsible.

The porch, already noted, has a so-called tallot loft, conventionally for counting the tithes, but no doubt permanently inhabited by the guard or bailiff and his family. It has a fireplace , one of the few medieval chimneys to have survived anywhere, and an earth closet consisting of a shaft about four feet wide by three feet back to front, from the upper floor to gound level, but without any outlet – a unique if not especially aesthetic feature!

The entire timbering of the barn is also exceptional. Each pair of braces – the hughe elbowed timbers of the cross-frames, the lengthwise curved ones of the arcading and the slender wind-braces of the high roof – was obtained from a single log, so that each brace is a mirror image of its opposite number in each frame and bay. The effect of this, looking down the barn along its central axis, is that every frame is perfectly symmetrical, yet none is exactly like any of the others. Jointing is also on an exceptionally high standard, while the numbering of components is of copybook order. The sequence is from truss I at the south end to X at the north, the arcade numbering doubling up in each bay. The porch gallery overlooking bay 3 is the best vantage point to see the latter.

The original erection followed the numbering. Truss I was assembled, the main posts standing on enormous corbel stones at wall-head level. Truss II was framed on the floor and reared. The significance of the straining beam – half-lapped across the back of the cross-braces- is that it joined the opposite posts, making a closed frame and so capable of being reared. Each bay of the nave was completed before the next, the arcade-plate joints being tapered bridles about fifteen inches long, formed just beyond each point. So trusses II to IX were reared. The las truss X was again assembled. Like truss I, it has no strainer beam and is different only in that its posts stand on plinths at floor level insted of corbels halfway up the wall. This suggests that the end gable wall (north) was not yet built, or not completed, when the truss was erected. Indeed there would not have been room for rearing the precious truss, IX, had there been a gable wall. Thus the wall came last and so could be built to accord with the frames istead of the frame having to conform with it – an advantage not shared in the reconstruction. But that was still a long way off.

Also not known at this stage was the barn's date. Core-borings had been taken by a combined American and German group of researchers in 1969[1] . But this was early days for dendrochronology, at least in this country, and the timbers were pronounced «com-

2. Interior looking south, after the fire
Interieur vers le sud, après l'incendie

placent». The rings were too wide and uniform to fit the few recognisable years or «signatures» that could be anchored to particular years. In its architectural and technical design, there were both late and early features, even though the construction was perfectly uniform and it was clear that the entire barn was of one build. Alterations had amounted to no more than making the two doorways in the west wall and a few repairs. c. 1300 seemed the most likely date.

Dr. J. Fletcher took further samples from the larger members, the posts and arcade plates, after the fire, the largest section being one of the wooden pads used for final levelling of the post feet, the full results of this analysis are still awaited, but by re-processing the earlier samples, sent from Germany he has obtained the pretty sure date of 1326 for the latest of the rings. Allowing twenty years for the missing sapwood, it seems the date of the building must have been between 1340 and 1350.

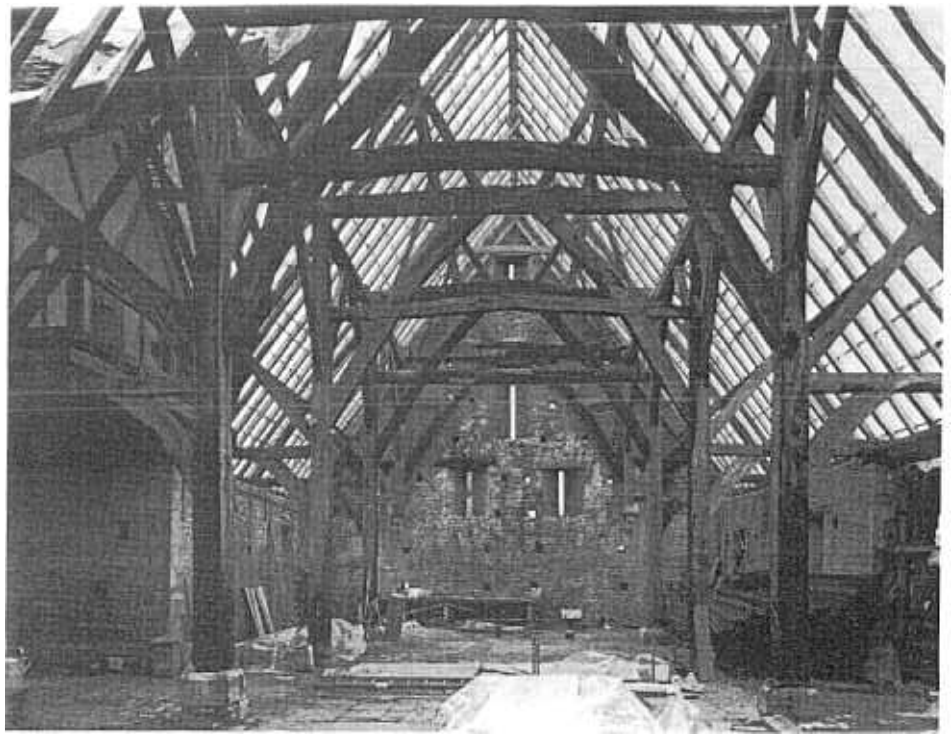
So much for its description. It need only be added that the barn was thoroughly known, not only by the 1969 group, who had also measured, photographed and drawn the building, but by Patricia Borne, whose research as archaeologist in the region in the last few years had inevitably focused on Bredon. Her accurate survey and immaculate details, which she gave to me immediately after the fire, more that complemented the data required for the barn's reconstruction without once having to resort to conjecture.

And so Bredon *could* be rebuilt without twentieth-century invention, and that too was probably unique. The Trust, as if anticipating reconstruction, permitted considerable expenditure of £40.000 on «emergency» repairs, which beginning with replacement of the burnt lintols and buildings back the fallen and dangerous masonry, even included the repair and re-framing of truss V, the first that would be erected if reconstruction went ahead. Finally, as always, the question devolved onto funds. The regional director of the Trust, as both of us were watching the fire on that black Friday, asked me how much it would cost! The only guess of which I have been guilty was my immediate reply – a quarter-of-a-million. And so, as always when an architect is so foolish as to state a figure, it stuck. Every means had to be exploted to reduce it even though, or perhaps because, the Trust was fairly well covered. Insurance provided £150.000 with an amount for inflation in addition. The Ancient Monuments Section of the Department of Environment while not empowered to make grants for restoration, can do so for preservation. Stuart Rigold[2], the then top historian of the Department, recommended the maximum grant – fifty per cent of the cost of preserving the ruin, estimated at £60.000. The initial estimate for the roof of £80.000 was also reduced when tenders were invited, and this reduced the quarter million by £30.000. Thus it looked as if the Trust would be in need of not more that £10.000 plus professional expenses. (The Department of Environment finaly came up with only £10.000 instead of the recommended £30.000).

Nevertheless all means of cutting costs had to be explored. These were to use artifical slates, even corrugated sheeting; to have steel or concrete instead of oak for the main frames, preserving only those which still stood – an engineer was brought in to advise on that, and advised against it; to curtail the barn by the length of the four totally destroyed bays at the north end. For this, the new gable wall, and preservation of the old, standing forever unsupported and unprotected, was likely to cost considerably more that the barn's complete reconstruction.

So on 20th October the Trust decided. On the job, the change from repairs to restoration was imperceptible. The same men, employed by Spicers, the contractors brought in at the beginning, simply went on with the work. But it was now under a negotiated fixed contract sum of £251.254, a figure, already reduced by the actual as opposed to estimated cost of the roof covering, that will probably be further reduced at the end of the day, as other preliminary estimates were also over-safe. Included are new doors throughout and repairs to the southeast porch necessitated by time rather than the fire. The new roof is of secondhand Cotswold slates, plus the few rescued after the fire. It had been hoped that a new quarry would be opened near Burford, it was also possible that the still-working Guiting quarry, producing building stone, would also re-start marketing slates instead of grinding them to dust for sale to the Bradstone artifical slate company! But none of this has yet happened.

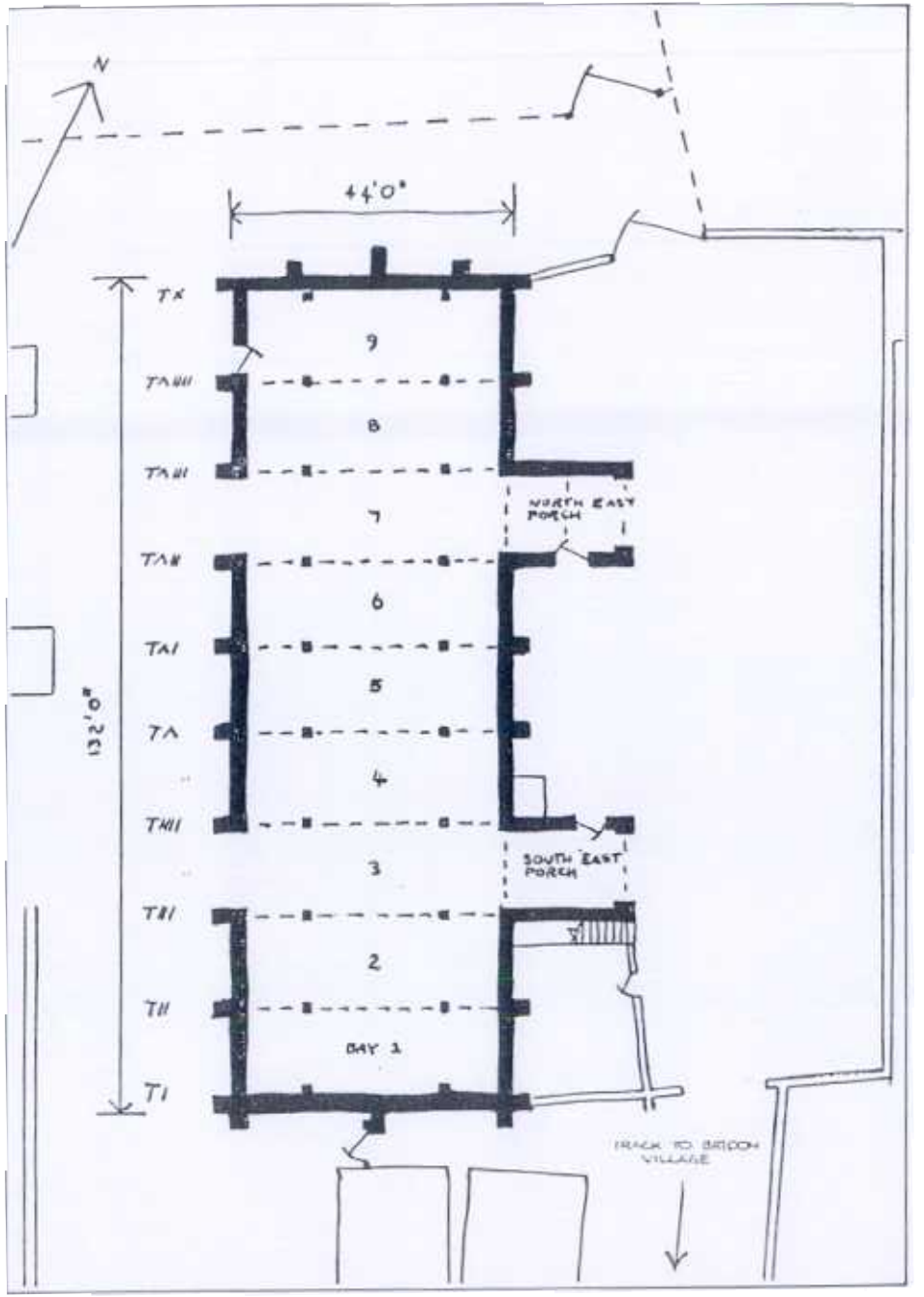
By the spring of 1981 the amount of work on the timbers was over fifty per cent of the total, yet there was nothing to show. Not a single frame had been raised. Three months later the barn was transformed. The sheeted scaffold, erected during the emergency period to protect bays 2 and 3 and provide covered working space, was down and all the cross-frames were up. They were not reared this time. A «Giraffe»[3] owned by Spicers



3. Interior looking south: reconstruction 2 years later
All picture by the courtesy of Mr. Martin Charles.
Interieur vers le sud, reconstruction 2 ans plus tard
Photos. Mr. Martin Charles

could do the raising, post by post, brace by brace, and beam by beam, more economically. But the sequence from upper to lower and had to be the same, and trusses I and II, because truss III was still standing presented problems not encountered from truss IV onwards. The only problem there was of frames already erected, did not conform with the north gable wall, but was nine inches too high! In six hundred years, the gable wall, on the edge of the slope down to the River Avon, had subsided taking the framework with it. To correct this we had to subject the frames to the same settlement in a matter of days. Fortunately, oak while still green is such that it responds to what in any other material would be completely destructive. It bends and gives, so that by cutting off the bottom of the posts nine inches at truss X, and by diminishing amounts down to truss VII, the total frame settled without disturbance of any joint or visible distortion of any member.

Having completed the main cross-frames, the superstructure followed, truss by truss again from south to north, and the rafters followed the superstructure. In almost exactly two years from the date of the fire the framework was completed.



All of it is oak, obtained from Venables of Stafford; all was selected, converted and framed exactly as for the original barn, but of course with modern tools. Everything of the old that could be re-used was preserved in the new structure. No attempt has been made to disguise the new, but instead the new corbel stones in the south wall are dated, and the new timbers can of course be distinguished through they do not stand out from the charred members, cleaned by distinguished though they do not stand out from the charred members, cleaned by brushing but still black. And lastly the date of the fire and the names of the workers who rebuilt the barn will be carved on the tie-beam of truss VI, the first on entering the barn by the south-east proch to be seen of the re-framed trusses.

Today the roof is being laid again and the carpenters are doing such incidentals as doors, and sorting out the unusable timbers to be made into a permanent exhibit within the barn, helping to show how it was built and rebuilt. It will be completed by next spring and will not again be used agriculturally.

Dimensions and essential information about the barn are given on fig. 1., including truss numbers.

[1] This group consisted of Professor Walter Horn and Ernest Born, both architectural historians of Berkeley, California, Rainer Berger, physicist at UCLA and responsible for the first carbon – 14 dating of Englich barns. Veronika Siebenlis of the Muncih dendrochronological laboratory, and her husband. They were engaged, through a series of seasons, in research into both English and continental barns and market halls, and I was fortunate in being allowed to tag along as local guide.

[2] Rigold died a fortnight after his visit to the barn on 30th May another tragedy piled upon Bredon.

[3] More technically, «Site Placing Vehicle» made by the Liner Concrete Machinery Company, and consisting of a mobile hydraulic retractable crane with an effective vertical reach of about thirty feet.

Résumé: La grange de Bredon

La grange de Bredon, réservée à la dîme, est une des plus vastes d'Angleterre. Elle a été construite par l'évêque de Worcester aux environs de 1350 et a été détruite par un incendie le 18 avril 1980. Le National Trust qui en est propriétaire avait alors le choix entre conserver les ruines, ou bien la reconstruire entiérement telle qu'elle avait été pendant 600 ans.

J'avais fait les relevés du bâtiment et j' étais en possession de dessins et de photos qui permettaient une reconstruction sans équivoque. Cet incendie avait soulevé un tollé général, le public accusant le National Trust d'avoir manqué à ses devoirs et exigeant une reconstruction totale.

Nous avons été autorisés à faire les réparations les plus urgentes avec l'entrepreneur engagé pour les travaux futurs. Cela a duré 6 mois, après lesquels le Trust a décidé de reconstruire.

On a étudié les effets du feu sur la charpente et sur la pierre.

On a soigneusement fait des relevés des assemblages et des poutres

a) avant l'incendie
b) aprés l'incendie, montrant les réparations et les compléments nécessaires.
c) aprés les réparations, montrant le travail terminé différant de quelque peu des plans originaux.

Une documentation photographique complète et un journal de bord illustrent les travaux accomplis. Une sélection de diapos montre le processus. Les dernières montrent la grange dans son état actuel: elles peuvent être difficilement distinguées des diapos prises avant l'incendie.