

RESTORATION WORK AT BLENHEIM PALACE

By Thomas Rayson

THE restoration of Blenheim is mostly concerned with its stone walls. The stone was quarried in the neighbourhood as was the custom where it was available all over the country for many centuries. The building therefore is one of the largest and most typical of the local character which was so unlike other local characters dictated by the local materials and methods obtaining in those neighbourhoods.

It was fortunate that like medieval work in this area, Blenheim's stone came from Taynton near Burford. This stone is an oolite; it is laminated although it is sometimes difficult to see the bed. Occasionally a stone is found face bedded, but there are only a few of them and they have succumbed to the scaling which is almost inevitable.

The colour of the stone as quarried is a warm tone of milk; in a short time it develops a yellow tint by reason of a fine fungus. This is most prevalent in protected places. The yellowest stones are under the large cornices or on a face well protected from prevailing winds. The film producing the colour can be removed by scraping the surface as it is not only very thin but has become attached to the original face.

The dimensions of the blocks used for the ashlar are large—much larger than those of stone blocks from most other quarries except Portland. The blocks built in vulnerable positions where strength is required are selected for their size and consistency. Such a position is that of the top corner-stones of the main cornice of the four main towers. There is a bed joint between the corona and the cyma. The cyma stone ties back the whole cornice by its bonding into the main mass of masonry. The stone forming the corona is not so large and relies on the large brackets of the frieze for support.

So far as the science of masonry is concerned, Blenheim exhibits a high standard of skill. Quite often it is clear an error of dimension has occurred and there has been an insertion of a "mason" or small piece of stone with fine rubbed joints which for a couple of centuries has camouflaged the error. In restoration now they are discovered.

It is difficult to understand the excessive use of iron in the masonry throughout. To the technical mind of today, there was no need

for it with a few exceptions. And it is the iron cramps and ties that are responsible for nearly the whole of the masonry deterioration which is causing the present anxiety.

There are three types of these iron features: the simple cramp, the flat tie of stone to stone and the linked chain which is built in to counteract thrust to the exterior. The metal is wrought iron. Despite its impurities, the continual presence of damp causes oxidisation which increases a half-inch bar to three times its original thickness.

The force of this rusting is enormous. It will lift almost any weight above it if the stone on which it bears will stand it. If not the stone itself will fracture. This is seen all over the building where a cramp of 8 or 9 inches by 2 inches by half an inch bent down at the ends and placed across the vertical joint between two stones and set in from the face of the stone 5 to 7 inches, has burst off a triangular piece of stone. When the fractured piece is removed the offending cramp is seen solidly embedded in the joint. (Fig. 1)

The method of dealing with such a matter is to remove the stone, cut out the iron and make good the masonry. Sometimes it is possible to insert a small stone while at other times a large stone has to be used.

Restoration has been carried out to the East Tower, which has the Clock; the roof of the eastern entrance Tower; the roofs of the Orangery and the roof which connects it with this Tower; the roofs of the two colonnades of the north front, also the two sculptured groups one of which is completely new; the north façade including the sculpture of the pediment, etc; the east wall and parapet of the Hall, the west front excluding the corner Towers; and the west tower of the Stable Yard which is now in hand.

The iron ties inserted in the top surfaces of the stones are found mainly in the cornices. The West Tower has provided many examples of these ties all of which have been taken out. This tower is composed of piers attached to the walls and free standing piers. These were all bound together on the top surface by iron ties, and iron dowels had been inserted between the stones of the free standing piers. All these irons were removed. In building the piers we have used delta metal dowels and in the top surface tie bands of the same material.

The west front has a semicircular projection on the centre line of the façade. This has an entablature constructed in front of the main wall face and carried on huge, splendidly sculptured caryatid figures. In one instance an iron cramp lifted one stone a half-inch above that adjoining. This cramp was extracted and on investigation a heavy iron chain was discovered formed with one long bar to each

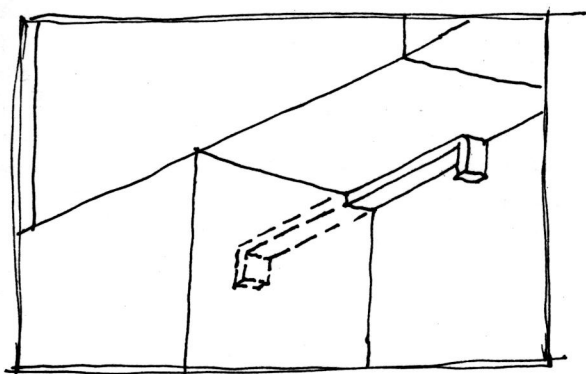


FIG. 1.

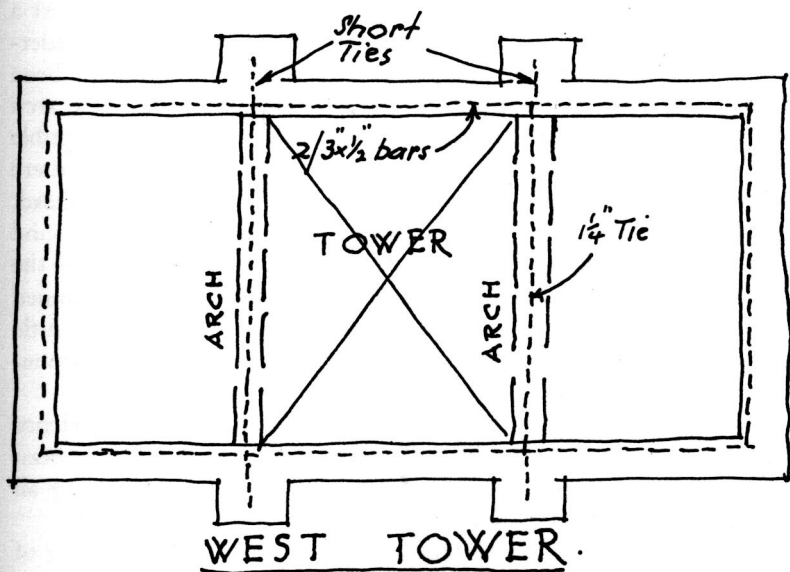


FIG. 2.

bay of the semicircle, with a square shaped link over each support. Oddly there was no tie to the walls and it was difficult to justify the use of such a feature. The superimposed weight was considerable and as it was taken by the carved figures standing in front of the main plane of the wall, it was considered to be prudent to retain this iron "chain". However, in replacing it, the channel containing it was enlarged and the two ends extended and each fixed to the main horizontal beam of a truss of the Library roof. Also the iron was embedded in a thick asphaltic material before the covering stones were relaid.

The latest matter that has caused some anxiety is the condition of the West Tower. There are two pointed stone arches springing north and south and well above the roof level. These arches have an iron rod passing through a voussoir about one half of the height of the arch above the springing. This rod is about $1\frac{1}{4}$ inches square. It has fractured the stone of one arch. On investigation we find that there is a double bar—one on the other—in the north and south walls and these are connected by the arch ties forming a tying-in feature. The wall irons are only about five inches from the *inner face* of the north and south walls so they certainly could not exert a maximum stress. After very careful examination and much consideration, it was decided to cut and extract these irons. It had been thought advisable to adopt a temporary central tie while these arch ties were cut but the strain in them was so small as to be imperceptible and the risk was taken. We are now perfectly convinced that there is no need for this iron tie and the stone restoration is going ahead. (Fig. 2) While we were making these enquiries we found that this rectangular iron tie did not finish here. The plan of the Tower shows an extension east and west. The tie was continued round the three sides of these two extensions and as there is little possibility of lateral thrust, the irons have been taken out and the stone-work made good.

Besides this important feature of the construction there is evidence throughout of the presence of wall cramps. Many have already been removed and the work is proceeding with the object of leaving all the exposed masonry without the devastating effect of iron ties.

Some work of replacing stone has been caused by the inserting of heating boilers and the effect of smoke fumes. The chimney stack at the south east corner of the Hall has been raised above the level of the parapet in the hope that fumes will be able to blow away clear of the masonry.

Two of the small towers, some of which are frittered with flues, have become so decayed as to be almost hazardous. In one case there is not a single stone that can be retained.

Work is proceeding in repairing the slate roofs and lead gutters, but this involves merely technical questions of construction.

There is a great deal to be done to accomplish the complete restoration of this wonderful building. In some ways it is magnificent and is conspicuous amongst the greatest of the same date. It is hoped that grants will become available for the work to proceed after the present grant is exhausted. These great buildings tell the story of the British people as do paintings. When one thinks of the vast sums expended on these, I think we might be excused for feeling envious of such circumstances. May we do everything possible to preserve this lovely heritage of our old buildings for the pleasure and delight of our successors and of the American and European visitors who flock to this country to see their beauty and charm.