

## THE IMPORTANCE OF PHOTOGRAMMETRIC ARCHIVES

The attitude of builders called on to carry out reconstruction after disasters has varied very much through the course of history. The cathedrals of England suffered many disasters during the Middle Ages but while Gothic architecture was a living, growing style rebuilding was usually carried out in the style of the moment regardless of what was to be replaced. The fact that the design of the new work did not follow that of the old was not necessarily a loss. The great octagon over the crossing of Ely Cathedral has suffered some modification at the hands of restorers but it remains among the great triumphs of medieval design and it was occasioned by the collapse of the earlier tower over the crossing. No one now regrets that the original tower was not rebuilt, although scholars would like to know what the original tower was like. Repairs and reconstructions of later, post-medieval periods have varied both in quality and in intention : sometimes (the object has been to improve on the existing design, sometimes to reinstate the design of an) earlier period, sometimes to effect repairs in the plainest possible manner that made no pretence at reproducing the original work, and sometimes to restore or consolidate the structure without alteration. After the fall of the west tower of the cathedral at Hereford in 1786 the whole of the upper part of the nave was rebuilt to a new design, replacing Romanesque work by an imitation of the Gothic style. The central tower of Peterborough was carefully taken down and rebuilt to the old pattern. At Chichester the central tower of the cathedral fell and was rebuilt in 1861-1866 by Sir G. G. Scott but Scott had no photogrammetric survey on which to base his reconstruction. At Westminster Abbey refacing of the stonework has proceeded piecemeal so that there is now only one small section of the original external facing and one original doorway left. Except in Henry VII's chapel the refacing is generally plain or, where the reproduction of Gothic detail has been attempted, the design is one of intelligent guesswork. In such cases, had photogrammetry existed and had the necessary surveys been made, exact reconstruction of the original structures would have been possible. Not that rebuilding or restoration has always been considered desirable. After the great fire of London in 1666 there was little question as to what had to be done. A new city had to be built and a new cathedral

had to be designed; and Sir Christopher Wren's masterpiece was built as a result. A most important piece of evidence for the history of architectural development has been lost to us but we should be the poorer without Wren's new cathedral. The fact remains however that a full and accurate survey of the old cathedral would now be a priceless possession. Similarly we lack any detailed record of the original design of Edward III's Chapel of St. Stephen in the Palace of Westminster, which was mutilated, altered, and finally burnt, so that only the merest fragment now remains. This was another building of the first importance which has been lost.

In peacetime at any rate we are more careful of our old buildings than some earlier generations have been. York Minster suffered two major fires in the first half of the 19th century but modern precautions make the repetition of such disasters unlikely, and modern watchfulness on settlement and decay make a repetition of the Chichester collapse improbable, but such disasters cannot be ruled out as impossible, quite apart from the dangers that may arise in the event of war.

Some movement in a Gothic structure is to be expected, and as Dr. Jaques Heyman of the University of Cambridge has pointed out, small movements can be tolerated and do not indeed do anything to impair stability. But in recent years movement in some of our great cathedrals has passed the limits of what can be regarded with equanimity and urgent work of repair has to be carried out to maintain stability. Especially at York we have had to embark on large scale operations to strengthen the foundations of the central tower and to correct other weaknesses in the upper parts of the structure that have resulted from uneven settlement, including the very dramatic bulge outwards of the enormous east window. The spire of Norwich cathedral has only just been saved; that at Salisbury is under repair; the piers of the nave at Winchester are showing signs of weakness.

With these and other examples of danger surrounding us we cannot afford to be complacent. Foundations will continue to settle, stonework will continue to decay and only constant vigilance will preserve the heritage of fine buildings which has been passed down to us. We are today no longer prepared to believe that we can improve on history or that we should inject into old buildings our own ideas for improving their design. We see it as our duty to hand on to posterity what we have received from the past, unaltered as far as possible, faithfully restored or consolidated where necessary. But we can only restore when we have a clear record of what it is that we are trying to recreate. When stone has decayed and mouldings and carvings have degenerated to shapeless lumps,

it is too late to start asking what the original was like. The records need to be made as soon as possible, before decay has advanced any further, to capture a clear record of all we can while we still have it. In many cases we are already too late; that must not deter us but rather increase our efforts to record what we still have. Photographs can be taken now but the surveys need not be drawn out until they are required. Taking the necessary stereoscopic photographs is the quickest and most economical way of compiling detailed records that can be stored for future use.

The need for a photogrammetric archive was expounded by Dr. Belfiore in 1954 and was the subject of a Memoir presented to the eighth International Congress at Stockholm in 1956 by the Belgian Ministry of Public Works. The authors of this memoir gave figures to show that it is not reasonable to expect to build up in a few years an archive covering every classified monument or even covering every part of those that may be selected as of exceptional interest or open to exceptional risk. Not only is it necessary to make a careful selection of the buildings to be recorded but it is also necessary to consider for each building what are the features of especial beauty or interest for which a restorer would need the most accurate details. Here there is room for the expression of a wide variety of opinion and only by a careful analysis of each problem can a reasonable solution, economical of time and effort, be reached.

But important as it is to build up an archive of photogrammetric records that can be drawn upon as and when emergencies may arise, this must nevertheless take second place to the more pressing needs of the immediate present. So far little use of photogrammetry has been made in the architectural field in England. The dome over the middle of Castle Howard was rebuilt with the aid of photogrammetry, and photogrammetry was used for the rebuilding at Fulton in America of the Church of St. Mary the Virgin, Aldermanbury, London. Other architectural work has been entirely of an experimental nature as for instance studies of Gothic vaulting and tracery by the University of London, and in the archaeological field the photogrammetric recording of carvings at Stonehenge described by K. B. Atkinson in the Photogrammetric Record for April 1968. Now a photogrammetric survey of York Minster is urgently required for the present programme of restoration, and the Ministry of Public Building and Works needs detailed surveys of the Tower of London, Dover Castle, Scarborough Castle, Prudhoe Castle, the Temple Church at Bristol, Hardwick Old Hall and many other monuments for which sufficient staff and adequate time and money for survey by traditional methods are not available. Historians of art and of building construction are asking questions which demand the sort of

accurate survey that only photogrammetry can provide quickly and economically. New schemes of development and of redevelopment are continually threatening the surroundings and the settings of historic buildings and satisfactory judgments can only be made if adequate surveys can be prepared. This too may call for photogrammetry. So in emphasizing the need for building up an archive of photogrammetric records for future use in such emergencies as the future may hold in store for us, I have to admit that it is an objective which for some of us must take second place to the more immediate problems which are calling for action now. But the plotting of surveys takes much more time than the photography. Our policy should be not to let the cameras remain idle while the plotting machines are at work, but to keep the cameras at work taking more photographs than can be plotted immediately, to build up the necessary photographic archive now, which can be drawn on for plotting in the future.

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