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### **Reconstruction of the Globe: A Retrospective**

"I ought not to have suggested in The Stage of the Globe, 356, that the first Globe might have been rectangular." (Chambers 1923a, 434n2)

The Globe playhouse occupies special places in the collective conscious and unconscious of Shakespeare studies and--where id was, there shall ego be--the Wanamaker reconstruction has brought important theoretical and practical conflicts into the open. The validity of historical methods and pursuit of authenticity have always been contentious issues, but the act of making a physical reconstruction focuses the minds of supporters and objectors in a way that no hypothetical model can. The Wanamaker project can be credited with the achievement of accelerating research into the design and operation of the Globe so that in the last thirty years the body of published work on the subject has more than doubled. Whether or not the reconstructed building itself aids scholarship, the research underlying its claim to authenticity represents a considerable return on the capital outlay.

The first landmark in the scholarly reconstruction of the Globe is E. K. Chambers's The Elizabethan Stage which contained his hypothesized plans for the building (Chambers 1923b, 85). All earlier attempts at reconstruction lacked Chambers's compendious knowledge of early modern drama and cultural history. Chambers argued that the movement of playing companies between different playhouses, especially in the period prior to the construction of the Globe, suggests standardization of design (Chambers 1923b, 50) and he found few differences between late sixteenth-century plays and early seventeenth-century plays that might be taken to indicate that the Globe or Fortune differed substantially from their predecessors (Chambers 1923b, 103-04).

Chambers offered no precise defence of his drawing because it was intended to be schematic rather than architectural, and showed neither the dimensions nor the arrangement of structural members. General features, not unrecoverable particularities, were his concern. It is worth noting that Chambers's octagonal playhouse which was supposed to be Globe-like and

typical seems dependent upon J. C. Visscher's engraving of 1616 called Londinum Florentiss[is]ma Britanniae Urbs (Foakes 1985, 18-19). When Chambers's book was published in 1923 the Visscher engraving was still considered authoritative and of the several pictures which suggest that the Globe had as few as six or eight sides, it enjoyed the highest status. That the Globe was six sided was supported by Hester Thrale who, in 1819, recorded having seen its uncovered foundations some fifty years before (Chambers 1923a, 428). Interest in finding corroboration for Thrale's claim has persisted although most scholars disregard her evidence entirely (Clout 1993-4).

In 1942 John Cranford Adams published his The Globe Playhouse: Its Design and Equipment and in 1950 Adams and Irwin Smith completed a beautiful scale model of the First Globe which was immediately incorporated into a public display at the Folger Library in Washington. Following the Visscher engraving, Adams made his Globe octagonal and from the Fortune and Hope construction contracts Adams deduced that the Globe was "84 feet across between outside walls, 34 feet high to the eaves, and 58 feet across the interior yard" (Adams 1942, 3). The Fortune contract specified galleries 12 feet 6 inches deep (Adams 1942, 20-21) and Adams assumed that this included 6 inches for the outer wall, so the real centre-to-centre spacing of the posts was 12 feet. The Fortune would have been constructed from regularly shaped units, Adams reasoned, and the simplest arrangement would have been to repeat the 12 foot square bays that formed the corners of the auditorium. Six and a half such bays form a structure 78 feet between centres or 80 feet once the thickness of posts and exterior covering is added (Adams 1942, 21). The width of the enclosed yard would be that of four and a half bays, 54 feet between centres, or 55 feet to the furthest edges of the posts. Finding that his arrangements led so easily to the 55 feet and 80 feet specifications of the Fortune contract convinced Adams that he had hit upon the groundplan.

What if the Globe also used 12 foot square bay units? Two such bays could form each of the eight sides of the playhouse. Adams calculated--wrongly, as it happened--that this would give the Globe an external diameter of 84 feet including the six inches of outer covering at either end (Adams 1942, 21); the true figure was 83 feet. Adams constructed his Globe's stage from a line connecting "the middle post of one sector across to the middle post of the next sector but one" (Adams 1942, 22, 90) which gave a width of 43 feet. The Fortune's stage was 43 feet wide and Adams thought this correspondence could not be coincidence-- he must have hit upon the groundplan of the Globe (Adams 1942, 22).

Unfortunately, Adams's calculation of the width of his stage was also wrong. The correct figure is the width of one side of the playhouse yard, 24 feet, plus the width of the bases of two right-angled isosceles triangles whose hypotenuses are half the width of one side of the playhouse yard, which comes to very nearly 41 feet. A discrepancy of almost 2 feet, over 4½%, is gross enough to invalidate his postulated correspondence with the Fortune contract and, since this correspondence validated all the assumptions which led to it, the entire reconstruction must be discounted as pure speculation.

Adams spotted the fatal error in his calculations and in 1943 he published a revised text of the book with the offending calculations emended. Although a note was added acknowledging the error (Adams 1943, 90), libraries frequently catalogue the 1942 and 1943 printings as a single first edition. Adams excised his insistence that the correspondence between the Fortune stage and his Globe's stage validated the method, but put nothing in its place to substantiate his claim to have discovered the precise dimensions of the Globe. However, it was not the mathematics in Adams's book that drew fire from scholars of original staging, but rather the interior features and facilities of his Globe.

Adams's Globe had a total of six main stage traps and a large recessed alcove discovery space. Suspended above this playing space was a second stage which was fronted with a balustraded balcony ('tarras') and which had another, smaller, recessed alcove discovery space at its rear. At either side of this balcony, and at 45 degrees to it, was a glazed bay window which overhung a correspondingly angled stage door on the platform stage. Extending from the top of the tiring house, and connected to it at the eaves, was a 'heavens' covering the entire stage. At the height of the third auditorium gallery the tiring house had a music room. The upper stage (at the same height as the second auditorium gallery) had a trap door set in its floor which provided communication with the main stage.

Adams's Globe was rich in features to assist theatrical spectacle and to provide a physical referent for almost every scenic structure mentioned in Renaissance drama. If a scene required a 'corner' to hide around, or a 'balcony' from which to be wooed or to be thrown, Adams's Globe could offer a realistic analogue. Supporting his design with dramatic quotations, Adams cared not which playhouse a particular play was written for: the Globe was the finest playhouse and so it must have incorporated at least the major features of all the others.

The history of the scholarship of Globe reconstruction in the fifty years since its publication can broadly be characterized as one of reaction to, and refutation of, Adams's book. Adams shared Chambers's conviction that the playhouses were largely alike and he used a wide range of play texts as evidence for the staging needs which any playhouse might have to satisfy. But as a necessary consequence of this method one is able to reconstruct only an idealized 'typical' playhouse, not any particular playhouse. Chambers implicitly accepted this principle. Adams implicitly rejected it and produced highly detailed plans of the Globe which he misrepresented as reliable scholarly deduction.

Adams's aesthetic judgements were challenged by those who felt that he showed little appreciation of theatrical convention which, contrary to his assumption, would allow a scene set indoors to be played on the front of a thrust stage. But with the mathematical error glossed over, the first part of Adams's Globe to collapse was the octagonal outer wall. In the first volume of Shakespeare Survey, I. A. Shapiro proved that Visscher's engraving was derived from the panorama in John Norden's Civitas Londini and was

therefore entirely without authority (Shapiro 1948). After considering several other pictures and rejecting their authority, Shapiro concluded that the Hollar engraving of 1647 (Foakes 1985, 29-31, 36-38) was the most reliable view of the Bankside playhouses. A different approach was needed to demolish Adams's interior arrangements.

Before publishing his major work on Elizabethan playhouse design, The Globe Restored, C. Walter Hodges published two articles concerning the De Witt drawing of the Swan. In the first Hodges insisted that De Witt showed that the Swan was a polygon with sufficient number of sides that it was virtually round ("This to my mind rules out the notion of an octagonal building in favour of, say, a sixteen-sided polygon") and that the 'inner stage' "was neither a permanent nor an indispensable part of Elizabethan public stage practice" (Hodges 1951, 34). The following year Hodges published an article with Richard Southern which argued that De Witt's Swan was essentially a Renaissance rather than a Tudor design. In particular the stage posts being, as De Witt stated, painted to resemble marble, their ornate bases and capitals, and their entasis, all point to classical and continental influence upon the indigenous building tradition (Southern & Hodges 1952). Students of Elizabethan playhouse design can be assigned places along a spectrum of 'faith in De Witt' and the reaction to Adams's Globe was a collective move towards the 'greater faith' end of this spectrum. The work of Hodges and Southern helped by showing that the sketch does not necessarily contradict anti-theatrical declamations of playhouse opulence.

Despite its title, Hodges's The Globe Restored contained no representation of the first Globe. Instead Hodges offered a typical playhouse of 1595 and the second Globe of 1614 (Hodges 1953, 174, 177) for which Hodges had the authority of the Hollar engraving, validated by Shapiro. Hodges's decision not to reconstruct the first Globe appears to have been a reaction to Adams's over-confidence which went "far beyond the warrant of evidence" (Hodges 1953, 53). Hodges attempted to reconcile the De Witt drawing with the needs of the plays and with George Kernodle's work on baroque decoration (Kernodle 1944, 130-53). Hodges's 'typical playhouse' of 1595 added no major features not present in De Witt. To provide a larger upper stage as well as a discovery space Hodges conjectured the use of a stage booth (Hodges 1953, 56-60). Hodges rejected the staging principles of Adams's book and with them the need for a large upper stage.

In the same vein as Hodges, A. M. Nagler offered a thorough critique of Adams's Globe as an inappropriate venue for the drama. Nagler considered the only reliable evidence to be "the stage directions in the quartos and the First Folio of Shakespeare's plays" and the documents of Platter and Henslowe (Nagler 1958, 19) and he poured scorn on Adams's theory that many scenes were played on an inner stage and on a large upper stage. Nagler argued for acceptance of the evidence of the De Witt drawing, which shows a flat wall, and for discoveries and concealments achieved using a portable booth (1958, 26-32). Instead of Adams's large upper stage Nagler, like Hodges, offered the stage balcony shown by De Witt, augmented at need

by the solid upper surface of a stage booth placed against the back wall (Nagler 1958, 47-51).

Adams's large upper stage had practical drawbacks too. Warren D. Smith noted that it caused a problem in Adams's reconstruction of the original staging of Shakespeare's King Lear (Smith 1951, 24). The Folio text has a stage direction for Edgar to come out from his hiding place immediately before Edmund's call "Brother, a word, discend" (Shakespeare 1968, TLN 948-9), which Adams was forced to move down three lines to give Edgar time to descend from the upper stage (Adams 1948, 319). Smith argued instead for a booth-like scaffolding serving for 'aloft' scenes. George F. Reynolds concurred and blamed Adams's errors on his misguided convictions about naturalistic staging (Reynolds 1951).

The attack on Adams was sustained in three articles by Richard Hosley (1957; 1959; 1960). One demolished Adams's upper stage by showing that Shakespeare's use of a raised playing space was less frequent than Adams claimed and that it usually involved engagement with the main stage (for example a conversation or an observation) which kept the players near to the balustraded front of the 'aloft' space. The De Witt drawing of the Swan shows an upper playing space sufficient, Hosley argued, for the staging needs of all of Shakespeare's plays (Hosley 1957). In "The Discovery Space in Shakespeare's Globe" Hosley argued against the inner stage by showing that there is no positive evidence to suggest such a space. The term 'study' appears in the stage directions of a few relevant plays, but Hosley argued that these were 'fictional' stage directions referring to the imagined location and not the playhouse fabric (1959, 35). To establish the body of relevant evidence, Hosley produced a list of thirty plays performed by Shakespeare's company between 1599 and 1608 when their only permanent London venue was the Globe. As George F. Reynolds argued in his work on plays at the Red Bull (Reynolds 1940, 1-29), if the company had only one playhouse for a certain period of time then any play written for the company during that time ought to assume, and to reflect, the features and practices of that venue. Not least of the problems with this method is its potential for logical circularity: the staging of plays is generally inferred from performance conditions, and here the performance conditions are being inferred from the staging. Nonetheless, most people prefer a method that at least aims to be economical with evidence over one that, Adams-like, makes no distinction between public theatre plays of the 1580s and private theatre plays of the 1610s.

Of the 30 'Globe plays' claimed by Hosley, 21 have no scenes using the discovery space and in the remaining ones the uses are "few and infrequent", are "essentially 'shows', or disclosures of a player or object invested with some special interest or significance", and "do not involve any appreciable movement within the discovery-space" (Hosley 1959, 44-45). Still, some kind of discovery space is needed and Hosley argued that a discovery "can be effected without curtains in a tiring-house whose doors open out upon the stage" (Hosley 1959, 41), with perhaps the assistance of a booth-like arrangement of curtains (Hosley 1959, 42-43).

In "Was There a Music-Room in Shakespeare's Globe?" Hosley used his list of Globe plays to show that Adams's third-level music room is contradicted by the evidence of the drama. Most of the Globe plays have stage directions for music, but in only nine of the plays is the location specified. In these nine plays there are a total of seventeen such stage directions and in every case but one the music is described as coming from `within'. The exception is the direction for "Musicke of the Hoboyes is vnder the Stage" in Antony and Cleopatra (Shakespeare 1968, TLN 2482; Hosley 1960, 118). This suggests that there was no elevated music room at the Globe before 1609.

In these three articles Hosley demonstrated by a strict economy of evidence that the De Witt drawing of the Swan shows everything needed to stage all the plays written for the Globe. This was a significant achievement because it placed the subject on what some consider to be the firmest evidential basis available: a contemporary drawing. Later, John B. Gleason provided impressively detailed evidence that we ought to trust the representational skills of De Witt and his copyist Van Buchell and should ignore John Dover Wilson's obscurely racist dismissal of "one Dutchman's copy of another Dutchman's sketch" (Gleason 1981, 329).

If the De Witt Swan is capable of staging all the plays written for the Globe then it, together with the Fortune contract, could form the basis of a Globe reconstruction so long as we assume that the outdoor playhouses of London were essentially alike. Two articles published in Shakespeare Survey 12 (1959) indicated the range of opinion about the homogeneity of the playhouses. W. F. Rothwell argued that playing conditions were far from standardized and that, at least until 1598, players were required to adapt to the exigencies of a variety of venues (Rothwell 1959). Conditions at court were unlike the conditions on tour--it was "an era of change and experimentations in matters dramatic and theatrical"--and hence standardization of playhouse design is unlikely (Rothwell 1959, 20). By Rothwell's reasoning the De Witt drawing of the Swan and the Fortune contract are good evidence for the Swan and the Fortune, but not for any other playhouses.

Taking the opposite view about typicality, Richard Southern attempted to adjust the dimensions given in the Fortune contract to make them practicable for a `round' playhouse with reasonable sight-lines (Southern 1959). Because Hollar shows what appears to be a smoothly rounded exterior to the Globe, Southern's model had a sixteen-sided polygonal frame which, from a distance, would look almost circular. Southern's stage cover, stage posts, and frons scenae were derived from the De Witt drawing of the Swan with the exception of a small discovery space between the stage doors. This was justified, quite ingeniously, by supposing that on the day De Witt happened to attend the theatre the back-wall curtain was never parted and so the visitor "supposed it a mere decorative hanging against a solid wall" (Southern 1959, 32). Southern's reconstruction used the 80 feet width and the gallery heights of the Fortune contract, displaying precisely the confidence about transference of dimensions from one playhouse to another that Rothwell sought to discredit.

In 1975 Hosley published an extended essay which represented his work on the Globe in the form of a single hypothetical model, and it was the first full reconstruction to be published since Adams's assistant, Irwin Smith, had pointlessly re-iterated their discredited arguments (Smith 1956). Having shown that the De Witt Swan has everything necessary to stage the Globe plays, Hosley based his model upon this sketch plus two additions: a trap and a flight machine (Hosley 1975, 165, 172). From a revised list of 29 Globe plays--one less than before because A Warning for Fair Women was inexplicably dropped--Hosley inferred the Globe's fixtures and fittings (Hosley 1975, 182-95). Although three stage doors would be convenient for some scenes, Hosley concluded that two would suffice for all the plays. The need for a discovery space of at least 14 square feet could be supplied by one of the stage doors and an arrangement of curtains. The need for an `aloft' playing space of at least 14 square feet could be satisfied by one or more of the `boxes' in the gallery over the stage shown by De Witt. There was no need for the music room to be visible or elevated, and hence none is shown by De Witt.

Hosley defended his addition of a trap--De Witt shows none--by reference to four `Globe plays'. In A Larum for London there is a "vault" into which a character is pushed and then is stoned (Anon. 1602, E4v-F1r), and in the graveyard scene in Shakespeare's Hamlet a trap seems the logical way to provide a grave into which may descend Ophelia, followed shortly by Laertes and possibly Hamlet (Zitner 1985). In Shakespeare's Macbeth apparitions must rise and fall and likewise in Barnes's The Devil's Charter devils "ascend" and "discend" (Barnes 1607, A2v). Hosley's trap was a simple horizontally mounted door, but one of Barnes's devils appears to need assistance in rising: "Fiery exhalations lightning thunder ascend a King, with a red face crowned imperiall riding upon a Lyon, or dragon" (Barnes 1607, G1v). The player's legs must be visible upon the lion/dragon for him to be riding it, so walking up steps would be difficult. Perhaps the lion property was fitted with false human legs so that the player's legs could manage the ascent, although the effect might be considerably more comic than seems appropriate. This evidence seems to imply an elevator mechanism underneath the Globe's stage-floor trap, although Hosley made no mention of it. Nicola Sabbattini claimed to have managed ascents using four strong-armed men lifting a platform by brute force, and, on another occasion, by arranging a see-saw under the stage with one end supporting the platform which rose into the trap (Hewitt 1958, 123-4, 177). John Astington considered these methods impractical and concluded that the existing technology of elevator machines would have an obvious application in the understage area of a playhouse (Astington 1987).

In support of the existence of a flight machine at the Globe, Hosley cited the torturing of the English Factor by strappado and hanging in A Larum for London (Anon. 1602, D4r-D4v, E4r-E4v). Since the torture takes place in a street scene it is difficult to understand Hosley's insistence that a rope descended from the stage superstructure. When flight machinery is used for the descent of supernatural characters the rope is the means to a theatrical end and can be ignored by the spectators. In a scene of public torture,

however, the rope exists in the world of the play and may be carried on stage by the torturers. Throwing the rope around the balustrades of the stage balcony seems more natural than Hosley's method which brings an undesirable suggestion of supernatural assistance. The only other use of 'suspension gear' in the Globe plays offered by Hosley was the raising of Antony to the top of Cleopatra's monument in Shakespeare's Antony and Cleopatra for which Hosley summarized an argument made at length elsewhere (Hosley 1975, 192-93; Hosley 1964). As with the 'suspension' of the English Factor in A Larum for London, the raising of Antony is a feat achieved within the world of the play, so the assistance of a flight machine seems unnecessary.

The evidence does not support Hosley's flight machine, so its inclusion makes him as guilty as Adams of scholarly wish-fulfilment. Indeed, we might wonder if Hosley's odd terminology ('suspension equipment') betrays his realization that no Globe plays uses flying. Rigorous application of Hosley's minimalist method which takes the De Witt drawing as the highest authority on the design of Elizabethan playhouses has the inevitable consequence of producing a Globe which is functionally identical to the Swan.

Glynne Wickham posited a radical disjunction between the Swan depicted by De Witt and all later playhouses. Wickham argued that the origins of the playhouses lay in multi-purpose arenas in which 'play' meant a range of entertainments including animal torture and formalized combat (Wickham 1963, 153-72). Drama moved out of doors and into these arenas in the second half of the sixteenth century, but the structures retained their multi-use capabilities (Wickham 1963, 299-323). The privy council order of 1597 was intended to put the theatrical companies on a new footing: to serve the monarch (Wickham 1972, 9-29). We cannot rely on the De Witt drawing of the Swan for information about the Globe because, Wickham reasoned, the "new deal" made court performance the aim of public playing and so court conditions became the new template for the public theatres (Wickham 1972, 29-30).

The foregoing is, very roughly, where scholarship of Globe reconstruction stood at the commencement of the Wanamaker project. Nothing was achieved by the Wanamaker project during the 1970s, but in 1982 the International Shakespeare Globe Centre (ISGC) Trust was formed and Andrew Gurr and John Orrell became formally responsible for the practical scholarship upon which the reconstruction would be based (Day 1996, 82-85).

Orrell's first published article on the Globe was concerned with the construction practices of its builder, Peter Street (Orrell 1980). Orrell argued that since Street was illiterate (he signed the Fortune contract with just his mark) his work should be considered within the tradition of medieval and Tudor practice rather than continental innovation. Street was a surveyor, not an architect, and the primary tool of his trade was the 16½ feet 'rod' and the 'three-rod line' marked off in rod lengths (Orrell 1980, 140-41). Orrell noted that the 43 feet width of the Fortune stage is approximately the altitude of an equilateral triangle whose sides are each 3 rods in length. Equilateral triangles



are the basic unit of division used by surveyors because their area is conveniently half the base multiplied by the height. Using just the three-rod line and the well-known technique of ad quadratum geometry, Street could have constructed a groundplan for the foundations of the Fortune which would provide the external and internal dimensions of 80 feet and 55 feet as specified in the contract (Orrell 1980, 143-44). Ad quadratum geometric progression works by inscribing a circle around a given square and then producing a further square from four tangents of this circle. The ratio of the widths of the two squares is 1:root2. The ratio of the areas of the two squares is 1:2, and this is the ratio of the two squares (one 56 feet 1 inch square, the other 79 feet 2 inches square) which formed the yard and outer wall of the Fortune, once the thicknesses of the wall posts had been allowed for (Orrell 1980, 146). Like Adams before him, Orrell thought he had found a numerical correspondence which was unlikely to be coincidental, and hence ad quadratum was Street's working method.

Because the second Globe was built on the same foundation as the first it must have shared the same groundplan. This allowed Orrell to deduce the size of the first Globe from the preliminary sketch made by Hollar for his 'Long View' of London which shows the second Globe and which is apparently free of the artistic distortions fashionable in the period. The sketch shows a Globe whose overall diameter is 1.397 times that of its yard, if we assume that the upper galleries did not project over the lower ones and hence that the inner circuit of the roof is directly above the yard wall. Orrell thought 1:1.397 close enough to 1:root2 to prove his point about ad quadratum construction. Orrell noted that the Hope contract specifies its first gallery as 12 feet high, and that since this is the same as the first gallery at the Fortune, it is reasonable to suppose that the other galleries at the Hope followed those of the Fortune, making the Hope 34 feet high to the plates. In Hollar's sketch the Globe is drawn exactly the same height as the Hope despite being nearer to the vantage point, and hence it must have been a little shorter. From this approximation of the height of the Globe Orrell got the approximate scale of the drawing, and calculated the width to be 100 feet. This yields a centre-to-centre diameter between opposite main posts of 99 feet. The ad quadratum principle would give a yard of 70 feet between centres and a stage 49 feet 6 inches wide, which is exactly the length of Street's three-rod line (Orrell 1980, 150). Again, coincidence seemed an unlikely source of this correspondence.

At a symposium held at Wayne State University in Detroit to discuss physical reconstruction of the second Globe, Orrell revealed an entirely new way to read the Hollar sketch based upon the hunch that Hollar used a drawing frame which yielded almost photographic accuracy (Orrell 1981). The proper test of this hypothesis required that Orrell locate at least four landmarks whose real-world intervals at the vantage point, St Saviour's church, were in the same ratio as their intervals in the sketch. In the event Orrell was able to line up five landmarks in this way and he emphasized that this indicated an accuracy far beyond the reach of artistic judgment: Hollar must have been using an instrument (Orrell 1981, 110-11). Moreover, only at a certain angle relative to north--the angle towards which Hollar's instrument pointed--would these particular intervals occur, and so Orrell's method

revealed the exact orientation of the instrument. The distance from each landmark to St Saviour's church is known, so the rule of 'similar triangles' told Orrell just how large a given object in the scene would have been to produce the image of itself in the sketch. After an allowance for anamorphosis--a distortion unique to circular objects--Hollar's sketch tells us that the Hope was 99.29 feet wide and the Globe was 103.35 feet wide (Orrell 1981, 116). This figure was a little too high to reconcile with his theory about ad quadratum layout and the three-rod line, but when the work appeared in book form, Orrell had revised the figure down to 102.35 feet,  $\pm 2\%$ , helped by the realization that the sketch is a little wider than he had thought (Orrell 1981, 116n9; Orrell 1983b, 89, 102). Now Orrell could say that the Globe and the Hope were probably the same diameter of "a few inches over a round 100 ft" (Orrell 1983b, 104) and that the "inveterate sightseer" Hollar drew them the same size, despite the Hope being further away, because he wanted to show that they were the alike in size (Orrell 1983b, 106).

Knowing the exact angle of Hollar's drawing frame, Orrell was able to deduce that the clearly visible stage-cover fascia board, and hence the Globe stage, faced 48.25 degrees east of north, which is very nearly the bearing on which the sun would have risen at midsummer in Southwark (Orrell 1983b, 154-57). Whether by design or chance, in the middle of the afternoon the stage would be entirely shaded. With the size, shape, and orientation of the second Globe firmly established, the data were available to design a reconstruction of the first Globe.

Throughout the detailed planning and construction of the Wanamaker Globe, Orrell's arguments held sway despite objections to the size of the building and to the design of the stage cover. Orrell argued that the short cover extending from a chordally-ridged stage 'house' shown by De Witt was not copied at the 1599 Globe, which instead had a radially-ridged cover projecting from the auditorium roof to the middle of the yard (Orrell 1983a, 10). The first storey of the reconstructed auditorium had to be made at least twice the height of a person to make room for an entrance tunnel to the yard and a walkway around the back of the lowest gallery, so the Fortune's 13 feet allowance for the lower storey would not do for modern-sized people (Orrell 1983a, 5). Allowing for the fact that we are 10% bigger than the Elizabethans pushed the height of the Globe reconstruction to 36½ feet to the plates, which is 2 feet 9 inches taller than the Fortune and considerably taller than Orrell's approximated measurement from the Hollar sketch (Gurr 1983, 14). This was the first numerical choice which deviated from the known facts of playhouse design in order to meet modern needs and it marks the moment when mere recovery of historical fact became inadequate to the task in hand.

Two stage posts were to support the stage cover and to be placed far enough forward and far enough apart "to afford clear views of the tiring house doors". A useful rejoinder to this comment would have been 'from where?', since the positioning of the posts caused controversy later. Specifying its differences from the Globe, the Fortune contract called for pilastered columns, so the stage posts at the Globe would instead be turned and, to keep them slender, proportioned in the Corinthian order (Gurr 1983, 16). At this first

seminar John Ronayne argued that the interior decoration of the Globe must have been something between "the English tradition of the ornamented facade, low relief decorating flat surfaces, and the innovation of classical sculptural principles" (Ronayne 1983, 22). Ronayne pointed out that in exterior views the Globe appears white with stone walls, although it must have been timber-framed. The Fortune contract specifies that "all the saide fframe and the Stairecases thereof to be sufficiencytly enclosed w<sup>th</sup>oute w<sup>th</sup> lathe lyme & haire" (Foakes & Rickert 1961, 308), and Ronayne remarked that for the Globe "a magpie black and white half-timbering is not acceptable" (Ronayne 1983, 23). Because De Witt praised the sumptuousness of playhouses his apparently stark sketch cannot alone determine the interior of the Globe, and Ronayne offered contemporary examples of lavish decoration which might be copied. As well as marbelization effects on the columns and false painted balustrading on the gallery fronts, the frons ought not to be considered a visually neutral surface serving only an acoustic function, but should be "the centrepiece appropriate to a house of fantasy, imagination and illusion" (Ronayne 1983, 24). The project had moved a long way from Hosley's minimalistic approach to reconstruction as articulated in his 1975 paper.

The Wanamaker project was set to proceed with a design based on Orrell's findings when two archaeological discoveries provided a wealth of new evidence to be absorbed. In early February 1989 the foundations of the Rose were unearthed and non-destructively excavated (Day 1996, 192-201). These foundations showed both the original configuration of the building and the result of the extensive alterations made in 1592, known from the expenses recorded by Henslowe (Foakes & Rickert 1961, 9-13). Upon first glance the remains of the Rose controverted the most basic assumption about playhouse design: the groundplans of both phases were irregular polygons, and so chaos prevailed where order was expected. The original design appeared to be a 14-sided polygon of about 74 feet across (Orrell & Gurr 1989, 636). In both phases the stage was tapered and, unless the stage was remarkably small, the frons scenae must have followed the angled wall formed by the fronts of the bays against which the stage stood. Even with this allowance, the original stage was a mere 475 square feet in area (Orrell & Gurr 1989, 649). In a study encompassing all the theatres of early modern London Orrell had offered evidence that "the two Globes, the Rose, the Hope and the Boar's Head all faced northeast, away from the afternoon sun" (Orrell 1988, 92) but the stages of the Rose remains were both "on the northern side of the polygon" (Orrell & Gurr 1989, 636) and hence the Rose faced south and its stage received illumination from the afternoon sun. Neither stage reached as far as the middle of the yard, and the earlier stage certainly (and the later possibly) met the yard wall not at a corner but rather in the middle of a bay. The theoretical reconstruction to which the uncovered Rose bore closest resemblance was, to everyone's surprise, the discredited Globe of John Cranford Adams.

Franklin J. Hildy called an academic conference at the University of Georgia in February 1990 to assess the discoveries. While this was being planned a second team from the Museum of London began working on the site of the first Globe and on 12 October 1989 they announced discovery of

part of the Globe foundations. At the conference Orrell presented his considered response to the evidence from the Rose and his preliminary examination of the evidence from the Globe (Orrell 1990). The Globe remains appeared to be part of the foundations of the outer wall and one stair turret. The location of this turret, on a radial about 60 degrees east of north, matched neither of the turrets shown by Hollar, and it was 50% wider than it should have been (Orrell 1990, 97). Orrell admitted that these anomalies threw doubt on Hollar's representation of the orientation of the Globe, but drew comfort from the fact that the turret was centred on an angle of the main frame wall, as he expected, and not centred mid-wall as Hosley thought (Hosley 1981, 88-91).

Orrell attempted to measure the angles and dimensions suggested by the scant remains, and from them determine the size and shape of the Globe. Assuming that the Globe was a regular polygon--an assumption made less safe by the Rose remains--the few measurable angles and dimensions in the Globe remains suggested a 20-sided polygon with a diameter of very nearly 100 feet (Orrell 1990, 99-100). The ground floor galleries were 12½ feet, or 12 feet 8 inches deep if measured radially, which is some 3 feet less than we would expect from the ad quadratum method, but nonetheless they could have been constructed using a three-rod line if geometric pre-calculation were used to derive the correct length for each bay's outer wall.

The ISGC decided to build two experimental bays based on Orrell's tentative response to the evidence of the Globe remains, assuming that the original had 20 gallery bays each 12½ feet deep, the overall diameter being 100 feet across points (McCurdy 1993). Orrell had concluded that this was not an ad quadratum design since the diameters of the circles within which are inscribed the inner and outer polygons of the groundplan are not in a 1:root2 relation. But the workshop experience of the project's timber-framing expert, Peter McCurdy, suggested that the wall plate frame would be fabricated at the same time as the ground sill frame, and that Peter Street would have considered the proportions of the former, which defined the dimensions of the uppermost gallery bay, to be just as important as those of the ground sill frame. If there was a jetty (the "Jutty-forwards" of the Fortune contract) of 12 inches in each of the two elevated bays, the uppermost gallery bay would be in an ad quadratum relationship with the overall diameter. McCurdy noted that the possibility of converting the Theatre into tenements, discussed by Allen and Burbage (Wallace 1913, 216), indicates that the rakers which supported the seating were not structurally integrated into the frame since such conversion would require their removal. Only a playhouse constructed floor-on-floor, and hence with an overhanging jetty and without integrated rakers for bracing, could be converted to tenements (McCurdy 1993, 11-12).

When more of the Globe's foundations were unearthed, Orrell measured the most intact angle in what appeared to be part of the inner gallery wall as 162 degrees, which indicated a 20-sided playhouse (Blatherwick & Gurr 1992, 331). If the playhouse was about 100 feet across, as Orrell had long believed, a 20-sided configuration could be made to fit extremely well with the uncovered remains (Blatherwick & Gurr 1992, 332-33). In an article describing

the construction of the experimental bays, Hildy argued that Orrell had not used the most accurate drawings of the uncovered Globe remains--the ones made on the site-- and that these showed the one measurable angle to be 160 degrees rather than 162. This small difference would reduce the extrapolated playhouse to 90 feet diameter and 18 sides (Hildy 1992b, 7).

The discovery of the Globe remains gave the best indication yet of the precise geographical site of the playhouse and Orrell fed into his formulae derived from Hollar's sketch to produce a revised diameter of 97.6 feet  $\pm 2\%$  (Gurr 1993, 5). Orrell accepted that the published plans of the remains were inaccurate, but showed that Hildy's 'originals' too were distorted. At a meeting to determine how the project should proceed, plans of competing configurations were laid over a diagram of the Globe remains to see which would best fit. Apart from Orrell's proposed configuration, the closest fit was an 18-sided 90 feet diameter configuration offered by Hildy. All sides accepted that they were working with inaccurate drawings, and Hildy argued that the only proper method was to count the grid squares on the original drawings and to derive the angles by trigonometry, as he had done (Gurr 1993, 10). Gurr, as chair of the meeting, called for delegates to vote on whether the project should adopt Orrell's or Hildy's plan. Orrell's design won by 14 votes to 6 (Gurr 1993, 11-14).

The Wanamaker Globe is 100 feet across because of this vote, apparently taken in a hurry and with ambiguous and distorted evidence placed before the voters. With two Globe bays completed, perhaps the pressing need to get started on the remaining bays rather than dismantle what had already been accomplished--as Hildy's plans would have required--was uppermost in committee members' minds. Objections to the vastness of the Globe reconstruction--the entire Rose playhouse could be placed within its yard--were received from all quarters and the disagreement continues.<sup>1</sup>

Of course, a 100 foot diameter is about 11% greater than a 90 foot diameter, and modern humans are about 10% larger than Elizabethans, so it could be argued that our Globe feels about as large to us as their Globe felt to them. However, it is not clear that our voices are commensurately louder and actors know that adding a little to the diameter of a circular auditorium adds a lot to the volume of air to be moved. The significance of the decision to make the Globe reconstruction taller than the original to allow for a two-person clearance in the lowest gallery has been overlooked in arguments about the size of the building. If the original was about 100 feet across then the extra height of the reconstruction throws the building out of proportion, a fact not publicly acknowledged by the project. If the proportions are right, then the building's overall size may be defended as an attempt to recreate the 'feel'--in relation to human body-size--of the original.

The three-quarters-complete Wanamaker Globe opened for a workshop season in the autumn of 1995 and has been extensively reported, the proposed location of the stage posts was rejected by a number of theatre practitioners (Nelsen 1997). Moving the posts necessitated redesigning the stage cover, but the chosen solution involving a pentice apron 'skirt' to the

cover was defended as the kind of thing Street could have made if his clients had objected to the posts being near the corners of the stage.

As the Wanamaker Globe reached completion a book was published which provided justification for its least well documented feature: the decoration. Ronayne's position on the external rendering of the building had altered since his comment that "a magpie black and white half-timbering is not acceptable" (Ronayne 1983, 23). Now he argued the opposite:

As our reconstruction is the first major timber-framed building in the capital since the Fire, our decision, on balance, was to expose the structure of what is a rare sight in London, rather than cover it up as the Elizabethans may have done, taking for granted the frameworked appearance. For them, outer rendering was grander. For us, half timbering is more generally evocative. (Ronayne 1997, 122)

This is a surprising shift in the theoretical underpinning of the project, since the stated aim was always recovery of 'what had been' in the Elizabethan period and not 'what is evocative' of the period.

Ronayne cited contemporary accounts of the sumptuousness of playhouses to defend the brightly painted interior of the Wanamaker Globe, and the "carved proportions Called Satiers" (Foakes & Rickert 1961, 308) from the Fortune contract to defend the statues in the frons scenae (Ronayne 1997, 124). Triumphant arches made of wood but painted to look like stone were another source of information, made relevant by De Witt's statement that the Swan stage posts were cunningly painted like marble. The interior decoration of the Globe was based upon analogues from the late 1590s and early 1600s rather than the 1570s when the Theatre was built because in the hurried dismantling and move to Southwark only the main timbers would have been preserved; the decoration would have been remade in 1599 at the new site (Keenan & Davidson 1997, 155n2). The iconographical scheme at the Wanamaker Globe, which relates the name of the playhouse to its function, was chosen because early modern English design combined "Northern continental 'classicism' with the grotesques, strapwork, cartouches and feigned architectural patterns of Flemish Mannerism" and "...it was conventional for Early Modern decorative schemes to make some statement about their use, purpose or patrons" (Keenan & Davidson 1997, 148).

## Conclusion

There is no possibility of recreating Elizabethan London, its politics, its relations with a rapidly expanding world of commerce, and its inhabitants who visited its theatres. New Historicist and Cultural Materialist scholars have pointed out that detached from its cultural milieu a reconstructed playhouse is vulnerable to anachronistic ideas about the drama. This theoretical objection has practical correlates. From the mid 1590s spectators sat on the stage at outdoor theatres (Orrell 1988, 90; Egan 1997), and this provided opportunities for characters to 'hide' from others on stage by sitting amongst the onstage audience. If a character were dressed in everyday clothes similar to those worn by members of the audience this trick might be reasonably realistic, but

in a modern performance this would require the character to wear modern dress. Authentic original dress would be a barrier to the recreation of the authentic original trick.

A similar dilemma relates to the playhouse fabric: as Ronayne noted, a building with an exposed timber frame is as unusual in late twentieth-century London as one with exterior rendering would have been in early modern London. But to use this as a justification for not covering the timber frame of the Wanamaker Globe is to privilege historical effect over historical cause and amounts to a prejudgement of a result of the experiment. The true historicist value of an authentic reconstruction can be measured by the number and detail of apparently insignificant features which are recreated.

New Historicist and Cultural Materialist attacks upon the Wanamaker Globe have concentrated upon the struggle between Southwark Council and ISGC and on the support the project has received from right-wing elements of the academic, theatrical, and political establishment. Two typical studies are John Drakakis's "Theatre, Ideology, and Institution: Shakespeare and the Roadsweepers", (Drakakis 1988) and Terence Hawkes's chapter "Bardbiz" in his Meaning By Shakespeare (Hawkes 1992, 141-53). Drakakis and Hawkes rightly claim that many supporters of the project are motivated by an urge not to historicize Shakespeare but to glorify him. But this objection is poor historicism if it glosses over the remarkable tensions between and contradictions within the various groups and forces which aligned to make Wanamaker's intentions viable. Hawkes raised a theoretical objection to the project, but it was not serious:

If the first Globe is the 'original one', then a central problem must be that the timbers from which it was built were themselves 'originally' used to construct Burbage's first playhouse, called The Theatre, situated on the north bank of the Thames and dismantled in December 1598. . . . The dizzying prospect of a third remove enters with the fact that the best physical picture of the Globe is the one afforded by Wenceslas Hollar's 'Long View' of London. But this gives a view of the second Globe, which is of course a reconstruction on the same site of the first Globe. Finally, as if in mockery of all such reaching after authenticity, it happens that Hollar's engraving reverses the captions on the two buildings, with the result that the one it clearly nominates as 'The Globe' is no such thing. (Hawkes 1992, 142)

Leaving aside the error concerning Hollar's work (it is the preliminary sketch, not the labelled engraving, that constitutes "the best physical picture of the Globe"), this apparent objection is in fact a good example of the relative freedom from theoretical difficulty which certain aspects of the project enjoy as a consequence of evidential plenitude. We possess an exterior view of the Theatre (Abram Booth's 'Utrecht' engraving), plus details of court cases arising from the transformation of the Theatre into the Globe and from the re-negotiation of the lease for the Bankside land on which the second Globe was built, and also a deposition swearing that the second Globe re-used the foundations of the first Globe. There are grave problems concerning the notion of authenticity but the "third remove" identified by Hawkes is not among them and the fact that he can so easily trace the history of the Burbages'

outdoor playhouses is testament to early twentieth-century scholarship of historical recovery within relatively unproblematic conceptual parameters.

Hawkes quoted from Joseph Quincy Adam's speech upon the opening of the Washington Folger Library which described "the forces of immigration" as "a menace to the preservation of our long-established English civilization" (Hawkes 1992, 152). Such bigotries are worth recording, but it must be remembered that the resources of the Folger Library are as available to New Historicist and Cultural Materialist scholars as they are to their opponents. It is a delicious irony that Karl Marx minutely dissected the economic instability of capitalism from within one of its greatest expressions of confidence, the British Library, and likewise an edifice built to the glorification of a transcendent bard must, if it is meticulous, undermine that very transcendence by rendering Shakespeare's world strange to us.

Historical materialism aims to create intellectual models of the cultural and political milieu of early modern London which necessarily presuppose that worthwhile knowledge about the past is recoverable. No further theoretical justification for the Wanamaker project is needed if it is accepted that the experiment may as likely fail as succeed. That is to say, it may be discovered that playhouse design has no significant bearing on the meaning of, and methods of signification used within, early modern drama. If it is found that playhouse design is an important determinant of the drama then the reconstructed Globe may be defended as a historicist tool which undermines the claim that Shakespeare's work transcends historical and cultural difference. The constituency of, and the class antagonisms within, the original audience cannot be recovered, but this is equally true of intellectual and physical models of the past: our partial, anachronistic, twentieth-century minds are all we have to start with. As Leah Marcus pointed out, E. K. Chambers's motivation for his monumental studies was essentially anti-historicist: he "advocated the study of history in order to discount it" (Marcus 1996, 21). That is to say, Chambers attended to the minute details of material influence in order to subtract this from the drama of the period in the hope of revealing the transcendent 'art'. Even if, as Hawkes claimed, the Wanamaker project 'packages' historical difference and smooths over historical tensions and contradictions, the scholarship of the project is equally available to materialists and idealists and, as with Chambers's work, the former are likely to make full use of it.

## Notes

<sup>1</sup>The progression of the arguments can be traced through Orrell 1987b; Hosley 1987; Gurr 1987; Orrell 1987a; Orrell 1990; Blatherwick & Gurr 1992; Hildy 1992b; Gurr 1993; Nelsen 1992; Hildy 1992a; Orrell 1993; Fitzpatrick 1996; and Orrell 1998.

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