BEYOND *REED*?
The York *Doomsday* Project

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The York *Doomsday* Project was set up to bring the resources of recent advances in multimedia computer technology to the development of new directions in interdisciplinary research and teaching on the English mystery plays. The Project is a co-operative venture directed by Meg Twycross at Lancaster University and Pamela King at the University College of St Martin, also in Lancaster, with the collaboration of the British Library under its 'Initiatives for Access' scheme. The British Academy has provided major research funding for the Project's first year of operation, which has enabled the directors to visit their chief sources of materials and to employ Paul Williams as Project Officer to design and set up storage and transcription facilities for the Project's archive. Olga Horner has since joined the team as Project Associate, assisting in the search for and description of sources.

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This is the opening paragraph of our official statement, as issued to research committees and funding bodies. However, what follows here is a much expanded version, aimed at *METh* readers, whom we assume will be interested in the content and approach of the Project, as well as the technicalities of the computing involved. This also gives us a chance to contribute, if somewhat after the event, to the debate of the Southampton meeting of 1995, where we only hinted at what we were planning to do.

Multimedia, Hypertext, and Teaching Medieval Theatre.

Rather to the surprise — one might almost suspect, alarm — of fellow academics in English departments, medievalists have colonised the new computer technology. In the earlier years of the application of computing to the Humanities, its number-crunching capacities made it ideal for the creation of concordances and indices and the analysis of various problems in language which previously would have taken thousands of man-hours and the expenditure of several forests of trees-worth of filing cards. In this decade (and the time-scale is as small as that) it has leaped forward to the capture, manipulation, and display of very high resolution colour images,

and to the creation of new ways of linking information which go under the names of multimedia and hypertext.

Multimedia allows for text, image, sound, and moving image to be integrated electronically. This in itself is a gift to medievalists, whose culture depends so much on visual evidence: but it is a liberation to specialists in medieval theatre. Our teaching has always been essentially multimedia, drawing heavily on all the resources of audio-visual support units — and often weighing the teacher down physically with heavy equipment. Now at least we have the prospect of involvement with only one large and temperamental piece of equipment. But the real potential of multimedia is the creative one: it allows us to present our material in hitherto unimagined ways, and from that, is beginning to suggest new ways of researching our subject. This is achieved through hypertext.

Hypertext is a way of linking items (which can be text in the conventional sense, but can also be image, sound, or moving image) by multiple paths. Each link can be activated by the click of a mouse — or it can be ignored. This has two effects. The writer of a hypertext book no longer has to choose to privilege one connection between items of data over another connection: s/he can create multiple structures of meaning. And the reader can choose to follow one path and leave another alone, thus to a certain extent constructing his/her own narrative: 'to a certain extent', because the writer of the book has written the links in the first place. However, in a truly interactive book the reader can be given access to the mechanics of programming and write in his/her own links, and even add material of his/her own. Thus we can create the situation in which no book is a finite work: not only does the experience of reading it emphasise, in a limited way, the reader-book interplay of dialogics, the reader can actually write a personal version of the book — a situation more familiar to medievalists who have had to struggle with the textual histories of Chaucer and *Piers Plowman* than to our more modern colleagues who are only just breaking loose from a much more rigid view of the fixity of the text created by the printing technology and the consequent standardisation of editions.[1]

The practical desirability of the potential freedom of the hypertext edition came over very strongly at the 1992 *METh* meeting at Sheffield on 'Teaching Medieval Theatre', when Meg Twycross proposed the creation of an electronic teaching package on the York play of *Doomsday*. This was, one supposes, the formal genesis of the York *Doomsday* Project, though its real genesis must lie much further in the past — with the appearance of the

1979 *REED: York*? or further back yet, with the publication in 1971 of the transcription by Alexandra Johnston and Margaret Rogerson of the 1433 Mercers' Indenture, and their reconstruction of what the pageant waggon might have looked like? or with David Parry's attempt to reconstruct the waggon in the Toronto production in 1977, and Peter Meredith's subsequent reconstruction in *METh* for 1979? or with Meg Twycross's variant reconstruction for the waggon plays at the 1988 York Festival? The emphasis on the practicalities of reconstruction and the materiality of records is essential to the Project as it now stands. But to revert to 1992, it became clear from discussion that teachers did not want a fixed teaching book, however multimedia: they wanted to be able to assemble and reassemble its materials to reflect their own teaching approaches.

This was reinforced from another angle by the pilot schemes run at Lancaster University in 1992–3 and 1993–4. The first (1992–3) involved undergraduates creating their own 'multimedia' packages (aimed at school children studying the Norman Conquest): in effect, this was broken down into individual media, of which video was the most popular, since the best multimedia authoring package then available, Guide, proved not very user-friendly. But it emphasised the same thing from the point of view of the learners: that they got most out of constructing their own products, with guidance, out of materials chosen and arranged by themselves. The students made the material their own, besides learning some very useful transferable skills. This kind of teaching is becoming more and more widespread, as students arrive in higher education with technological user-skills as second nature, in some cases leaving their teachers struggling to catch up. The second (1993–4) involved an M.A. dissertation by Joanne Lomax which centred on the creation of a multimedia package about the York *Doomsday*, written in Asymetrix Toolbook. This led directly to the British Library's interest and involvement in the Project under its 'Initiatives for Access' scheme. This scheme, under the direction of Andrew Prescott, Curator in the Department of Manuscripts, was (and still is) currently engaged in bringing the Electronic *Beowulf* to the computer screen, a high-profile initiative that created a great deal of public interest in the British Library, in the academic possibilities of electronic media, and in *Beowulf* itself.

Initially the intention was, taking all this input into account, to produce a multimedia teaching package centred on the York play of *Doomsday*, on CD-ROM. This teaching package would both provide materials for teachers and sufficient guidance to students for it to be able to be used as a

free-standing facility for distance learning, or for seminar preparation in a more conventional teaching situation. The Lancaster University Department of Computer Science have been very supportive in providing their expertise on, for example, networking and 3-D image manipulation. However, a mixture of pragmatism (funding is not at the moment being handed out to subject-specific packages) and a wider understanding of the nature and potential of the field into which we had stepped has led us to modify and enlarge our aims.

The York Doomsday Archive

We still intend to produce customised electronic teaching packages as one of the spin-offs of the project. We are also under way with the first electronic facsimile of a medieval theatre script, the surviving Coventry pageants edited by Pamela King. However, the Project's major effort is directed to the formation of a machine-readable archive of evidence to the material and intellectual culture relating to the York Mercers' play of *Doomsday*. In order to create this, we are learning how to use information technology as a powerful research tool, for data assembly, ordering, and interrogation.

Currently we are engaged in researching and collecting a body of high-resolution scans of manuscript material and printed books. The archive will eventually contain sound, video, and 3-D reconstructions as well as images of other evidence (painting, stained glass, sculpture, buildings), with cataloguing data and transcriptions of texts.

We have met with some confusion about the status and nature of this archive. Like any conventional physical assemblage of materials around a particular theme of topic, it is not designed for publication in its entirety. Quite apart from the problems posed by copyright and control that publication or any form of open access would create — these have been perhaps the most unexpectedly difficult to resolve of all our problems this year, since the concept is so new that institutions have not yet formulated their official legal attitude to it — the archive will be so huge that it is unlikely that many individuals or institutions will have either the technical means or the necessary space to store it. It will also need a very powerful search engine to manipulate it. A national electronic archive such as the British Library is creating is really the only place for it at present. Material collected so far is stored on the British Library's sector of the University of London Computer Service server, protected by passwords provided only to

the Project Directors and the Project Officer. There are also back-up copies stored independently on CD-ROM at Lancaster.

With the material assembled so far from the British Library alone (see later) — around 20GB or the equivalent of 40 CDs — it is already one of the largest electronic archives in the Humanities in Britain, and this is only the beginning. Its size arises not simply from the ambitious scope of the materials being included, but chiefly because of the technical specifications of the individual files within it: each single image of a manuscript page at the level of resolution that is being achieved occupies on average 21 megabytes of memory. The pages are scanned by the British Library's Kontron ProgRes camera, which was originally developed for medical imaging, at between 300 and 400 dpi (dots per inch). Cameras have already been developed which will scan at far higher resolutions, and in time monitors and videocards (which regulate the quality of definition and accuracy of colour visible on your screen) will catch up with this. We cannot see the size of the original files getting any smaller, and it is likely that they will in fact become larger: at Oxford this year we saw David Cooper, the Project Officer for the Oxford-based Celtic MSS Project, pull up an image file showing one manuscript page which measured over 100MB. Obviously not many standard computers at the moment can handle and manipulate picture files this large, and for general consumption they will have to be reduced, either in 'physical' size or in resolution.[2]

Access, Maintenance, and Conservation.

Access to the Archive will therefore be restricted to the members of the Project team, although the owners of the originals of its parts will be given machine-readable full-size file copies of the relevant parts on CD-ROM. The whole archive will be held, maintained, and refreshed, using the expert resources of the British Library in the conservation of electronic data. The purpose of the archive in this phase is therefore not general access, but the creation of a databank of conservation facsimiles of the highest quality currently attainable. The manuscripts are scanned by one of the Library's photographic officers who is also a member of the conservation staff. This ensures that the manuscripts themselves are treated properly during the photographic process. The electronic medium in which the facsimiles are stored renders them less vulnerable to natural disaster than their physical originals. Most libraries and archives keep some form of photographic record of their most important documents; in non-national archives this may well be black and white microfilm, often provided by the Church of the Latter Day

Saints. These scans have the advantage over microfilm of being both extremely detailed, due to the high resolution of the process (one can even tell which side of the parchment is flesh and which is hair), and in colour. The difference in legibility between black-and-white images and colour images must literally be seen to be believed, especially where ink has faded and/or parchment has yellowed. This was the reason why we embarked, with the British Library's team, on the Coventry facsimile: the projected Leeds Texts and Monographs edition had been delayed for over twelve years because it was just not possible to produce sufficiently legible grayscale photographs.

A further advantage intrinsic to this medium is that an electronic archive has the capacity to be 'intelligent', that is, able to be searched and interrogated in new ways. For example, it opens up new possibilities in palaeography and the identification of specific hands, since shapes, sometimes from manuscripts which are physically in two different archives, can be matched on screen. This can of course be done at present by laying photographs side by side, but what one lacks there is both the very high quality of magnification, and the ability to overlay shapes. (In another branch of the same study, Marie Axton is doing this very promisingly with watermarks in paper.) Peter Meredith has put names to two of the hands in the York Register (John Clerke for text and annotation, Miles Newton for annotation):[3] it *may* be possible in time to suggest an identity for some of the others. The same sort of shape matching may in time enable us to recognise iconographical details electronically, though this is still in the future.

Transcriptions and Encoding Standards

More conventionally, all text sources will be stored with transcriptions which will be machine-encoded using SGML (Standard Generalised Mark-Up Language) to produce a complementary bank of electronic diplomatic editions. These can then be interrogated in the ways which have already become familiar to us, and doubtless in ones which have not yet been developed. The archive is, then, the ultimate in resources, facilitating a variety of research outputs in later phases of the project.

It is important that such transcriptions should be made to an internationally accepted standard. In the early days of electronic editions, when everyone used the standard which was most familiar to him- or herself, and which was in many cases home-made, a happy anarchy reigned, the results of which can be seen in the diversity of materials stored

in the Oxford Text Archive. This was fine when every edition was a self-supporting unit based on a version of one of the current recognised computer languages. It started to fall apart when these languages became obsolete, or the firm supporting them went out of business, and the editions had to be upgraded to be readable by new programmes. Nowadays it is desirable, if the material is to survive and all this work is not to be wasted, that it should be written in a recognised standard format: then future generations of programmers and their employers will have a professional commitment to writing conversion programmes when this format needs to be upgraded. SGML also has the advantage not only of being very flexible, but also of being the big brother of HTML (Hypertext Mark-Up Language), the language used for writing Web pages.

On-Line Access: Advantages and Problems

We have not so far mentioned the advantages and complications of going on-line. The advantages to the scholarly community are obvious, and they lie behind the ethos of the British Library's 'Initiatives for Access' programme. Major research funding for electronic projects has so far been given on the understanding or even against the commitment that the material produced shall be made freely available on-line. This is acceptable when the work concerned is the sole copyright of the researcher, who repays the grant by effectively relinquishing his/her intellectual property in it, whatever the technical legal position may be; or where, as (presumably) with the *Aberdeen Bestiary* Project, the university library concerned feels that the broadcasting of their material is worth it in terms of good publicity for the institution. In a case like ours, however, it does not take into account the understandable worries of the libraries and archives which own the materials, and who see their control over access to images and copyright (often their major or only source of independent revenue in an underfunded world) disappearing into a vortex of illicit international copying and commercial exploitation. Brutally, it is quite simple to steal images from the Web. The various devices that can be adopted to make sure that the material is not worth stealing — planting very conspicuous 'rubber stamps' in the middle of an image, reproducing it at a resolution which makes it commercially unusable — are unfortunately precisely those which negate the whole point of the exercise, which is to provide best-quality, very high-resolution images of the object in question. We suggest a solution at the end of this paper, but the fact remains that as more and more institutions wake up to what might happen, copyright is likely to be

the greatest stumbling-block for this and future projects, especially those which need to acquire material from a range of different institutions. The dream of an international electronic community of scholars rejoicing in an inexhaustible stock of material free on demand is unlikely to come true this century, or for the foreseeable future.

Content

The rationale behind the selection of materials that form the archive is primarily to assemble a complete spectrum of evidence to the material culture of the York play of *Doomsday*. Much of this, especially the materials relating to the overall organisation of the Corpus Christi Play, will also form a framing shell for subsequent collections on other plays, or for an introduction to the York Cycle as a whole. The selection, therefore, falls somewhere between capturing all surviving evidence of life in fifteenth-century York and the kind of drama-and-minstrelsy-specific records assembled by the *REED* project in the 1970s. Hence the Project is assembling a variety of witnesses to the social and economic milieux in which the plays throve, a variety of texts and images which illustrate the devotional context in the North of England in the same period, as well as pan-European intellectual, iconographic, literary, and theatrical materials which supply a wider aesthetic context. These are focused on the play of *Doomsday* and the guild who produced it, but inevitably with such a subject and this particular group of people they illuminate a large slice of late medieval thought and life.

For example, from the resources of the British Library alone, we have been able to commission scans of the entire York Register (the script of the York Corpus Christi Play), of the records of the Corpus Christi Guild, of the Bakers' Guild, and selections from the book of the Barber Surgeons. We have also earmarked samples of service books of late medieval York Use, some with identifiable owners, which kept the concept of the Day of Judgement before the mind's eye of the worshipper, and of the multitude of works of popular devotion, lay or professional, which were designed to remind mankind of this climactic day, and of what they should do in this life to have a chance of survival on it, especially of the schematisation of charity under the Seven Corporal Works of Mercy. Some of these texts actually served as verbal sources for the play itself. So we have selected Yorkshire manuscripts of *The Prick of Conscience*, *The Lay Folks' Catechism*, *Cursor Mundi*, and of devotional miscellanies such as the celebrated Additional MS 37049. This has involved research into the personal

libraries of the clergy and lay folk of fourteenth- and fifteenth-century York as evidenced in their wills and inventories. Our intention is where possible to show the kind of books that a York citizen of the time of the plays might have read, or, if we are very lucky, actually owned, and to give some idea of their physical makeup and status, sometimes quite humble and workaday. To these have been added selected examples of Northern European manuscripts illustrating the evolution of the iconography of *Doomsday*, and of texts (if these do not survive from the Yorkshire area) which formed popular and scholarly thinking about what was likely to happen during the 'great assize' and what it signified.

Plans are far advanced to add to this collection from sources available in York itself, with supplementary material from Oxford, Cambridge, Glasgow, and York's trading partners in the Low Countries. (Some of these latter may, because of copyright problems, not be included in the Archive proper, at least for the present, but will be kept by the Directors for their own research purposes, with notices of their content inserted in the Archive. They may then, after the proper copyright negotiations, be included in publications by the Project.) To the literary, devotional, and iconographic materials assembled so far will thus be added the wider documentation of life in late medieval York, both as it relates to the civic organisation of the Corpus Christi Play, and to individuals associated with the Mercers and their play. This is to be found in documents ranging from Council memoranda and guild accounts and indentures, to wills and inventories, and the trading documents of members of the Guild, itemising the goods which they imported and exported, owned and handled as part of everyday life.

Research Opportunities

The Project has already given rise to a number of research spin-offs, to be published in the short and long term. For example, exploring the Freemen's Register and the shipping accounts of York Mercers through Hull has led us to adjust our view of the number of alien merchants who were integrated into York society, and the numbers of York merchants who spent much of their careers working abroad.[4] This has obvious implications for possible European, especially Dutch and Flemish/Brabant, influences on the plays and pageantry of what we have tended to think of as a land-locked city. The Project is actively seeking funding to research this relationship. Then the exploration of mercantile devotional tastes has led to a review of the date, ownership, and provenance of York's most

famous lay Book of Hours, York Minster Library Additional MS 2, the so-called Bolton Hours. Items in the 1433 Indenture have taken on new significance in the light of the Hull Customs Accounts. Comparison of hands across a number of York-produced mid-fifteenth-century manuscripts has brought us closer to knowing who wrote down what in the city, and given us a sense of how the process of recording city business was managed, who was content to muddle along, and who was a new broom — and incidentally told us which of the late fifteenth-century civic officials could write their own names.

It should be emphasised that research findings are not incidental to the Project: the processes by which materials are selected, included, and catalogued are a research project in their own right, and recognised as such by the British Academy for this year's initial funding. We did of course have a firm idea when we embarked on the project of what we considered to be the primary categories of material to be included, but to have circumscribed the archive at that stage would have been bad historical practice. We had set three general neutral parameters: geography — material should be if possible connected with York; failing that, Yorkshire; failing that, the North East of England; chronology — c.1370 to c.1600; and content — connected with the play and its subject matter, or with the people associated with the play. (Obviously in some cases we have to go outside these boundaries, for example in the 'wider context' area: even there, the hierarchy is first England; then the Low Countries, then northern Europe.) However, the process of drawing boundaries has proved endlessly recursive, as we visit and revisit materials in a continuously evolving context. What may not have seemed relevant three months ago may in the light of further information become a key piece of evidence. As we research, therefore, we constantly re-negotiate the criteria for inclusion. The material itself has its own impetus: as the archive expands, large but imperfect amounts of raw data configure themselves to form new arguments for the relevance and significance of individual items.

Project Organisation

It is for these reasons that we feel that a research enterprise such as the York *Doomsday* Project works best with a small executive team with a comprehensive panel of expert consultants, as the development of the archive is a rolling process which evolves as data is examined, discussed, selected, and stored. Consulting with the experts, most of them outside the field of medieval theatre, brings a new perspective on the material: we

then discuss how new insights and information fit into the project as a whole. We have an official advisory board of consultants, but we are free to add others as the opportunity arises. This year we have had particularly useful input from Jim Bolton of QMW, Ann Rycraft and the York Craftsmen's Wills Group, Louise Wheatley of the York Merchant Adventurers, Kathleen Scott, Ian Pattison of the Royal Commission on Historical Monuments, Maureen Pemberton of the Bodleian Library, Anne Sutton of the Mercers' Company of London, and on the computing side, Chris Daniell and Geoff Maytom of Past Forward, formerly the computer branch of the York Archaeological Trust, and Richard Masters of the British Library (Lending Division) at Boston Spa. In a class of their own are the archivists and librarians: Rita Freedman of the York City Archives, Bernard Barr and Louise Hampson of the York Minster Library, and Professor David Smith of the Borthwick Institute of Historical Research, York.

In this way the Project differs significantly from previous projects in humanities computing such as the Sheffield-based *Canterbury Tales* Project, where the raw material is self-defining, so that the various processing activities may be safely and efficiently farmed out to a number of individual scholars working in a large team, or as in the products of the giant Teaching and Learning Technology Programme.

Conceptual Framework

So, although the Directors of the Project began with a shopping list of items for probable inclusion, this was essentially provisional. What underpins the Project more securely is a theoretical concept of the shape of the archive which has been in place from the beginning. Initially this was conceived as a simple ring-doughnut, where the hole in the middle was the original sequence of irrecoverable performances in the streets of York, and the ring was made up of various different types of indirect witness exemplified above, including the script, which is however not privileged over any other primary record. As the archive has progressed, the principle of the ring has survived, but in the more geometrically sophisticated form of the torus, a three-dimensional object amorphous in all respects except that somewhere there is a hole through it. Thus, as all tori share certain topological properties, so too, although the selection of materials for inclusion in the archive is constantly being modified, conceptually it remains fixed.

Nor does each item in the body of our conceptual torus justify its inclusion because of a simple relationship to the hole in the middle, the play itself. Each small piece of information in the archive is potentially linked to a number of other pieces of information. Thus the body of the torus is made up of items that can be interlinked using hypermedia with one another to explicate both one another and the play. It is not so much a hierarchy or tree-diagram (the way many computer books are organised) as a three-dimensional network (or at least one that can best be perceived in three dimensions). The possible links are always multiple and which we choose depends upon the point of view from which they are encountered. In practical terms this means that no single homogenous reading of the play is imposed on the material. Moreover, as managers of the archive or producers of spin-off packages we may make all the links that occur to us: but later users with different skills and backgrounds should be able to create other links which we have not thought of, both by seeing connections and adding material.

Nor is there a single fixed evolutionary narrative, as the archive can be sliced synchronically or diachronically. We do not have to make the decision over which the *REED* editors must have agonised in the beginning: whether to keep material from the same source together, thus losing a sense of contemporaneity, or to go, as they did, for a synchronic presentation year by year, thus losing the sense of the nature of the document from which the evidence has come.

The Foregrounding of Artefacts

This last is a very important feature of the archive, one that we see as central to its ethos. The distinction between text and image, and between play-script and records, which conventional print collections impose, is broken down by the electronic medium in which the archive is being assembled, as every item is preserved as a facsimile artefact. The physical appearance of each item in the archive is part of the evidence it offers. Hence the Mercers' Indenture, for instance, becomes less a transparent list of now missing objects relating to the performance of *Doomsday*, but is itself an object that conforms to a particular shape, has a particular status, and has its own physical history, having passed through a number of identifiable and not yet identifiable hands. The archive throws us into the world of manuscript studies, and wider areas of conservation archaeology, as the technology which is being used to capture the images foregrounds old texts and images as artefacts in a way which is only surpassed by

handling the originals. The unadulterated images of real objects can be reproduced in such high resolution that it becomes possible, as we have said, to distinguish the flesh from the hair side of the parchment. Then the pages of that manuscript can be viewed in close-up, or can be turned into a simulation of their three-dimensional reality. (Work is currently going on at the British Library on a high-definition, three-dimensional electronic facsimile of the Lindisfarne Gospels, in which the 'reader' will be able to turn the pages by a touch on the screen: not just move from one page to another, but actually see the page turning.) Moreover, the circumstances in which the scans are made allow for the use of sophisticated lighting techniques that have already recuperated lost letters from the margins of the *Beowulf* manuscript. This is particularly useful for materials which have suffered wear and tear, for example the 1415 *Ordo Paginarum* in the A/Y Memorandum Book, some parts of which are now virtually illegible with the naked eye.

Productions and Reconstructions

The picture will also be supplemented by records of the York Play's later production history. These are of interest both in their own right, as evidence of the continued interest in a medieval theatrical form, and historically as appropriations and interpretations of the evidence which was then obtainable. Here pride of place must go to the 1951 Festival of Britain revival by E. Martin Browne of the York Cycle at St Mary's Abbey: a production which has left its mark on the popular perception of the mystery plays in York itself. Martin Browne gave his note- and scrapbooks of the 1950s and 1960s productions, together with photographs and unique sound recordings, to *Medieval English Theatre*, and they are currently stored in Lancaster University as the E. Martin Browne Archive. These can now be digitised, after careful conservation. Video footage and colour photographs of the 1988 York Festival pageant waggon production of *Doomsday* by the Joculatores Lancastrienses will also be incorporated into the archive.

Beyond that still, the electronic medium offers exciting possibilities for the use of visual material in the archive. The pageant route through the streets of fifteenth-century York can be reconstructed in three dimensions using the techniques of virtual reality so that the geographical and topographical locations of the original performance become a readable text, extending the experience of 1988 and 1992 productions, when our idea of how the play might have exploited its setting were revolutionised. In this

way, using photographs of surviving buildings interspersed with grid outlines of now missing ones, the viewer will be able to move with a waggon along the known pageant route. And objects known to have been involved in performance, from a pageant waggon to a stage property, can be speculatively reconstructed and stored as a different type of readable text. We have however postponed starting working on this until an international standard for VRML (Virtual Reality Mark-Up Language) has settled down: we understand that this is expected in the very near future.

Fakes and their Dangers

As we move from the actual to the reconstruction, both of which can be included in a collection that is not subject to the usual hierarchies of information, we move into what are probably the most controversial if the most technologically exciting aspects of the project. Everything in the archive is really a string of binary codes that can realise a temporary two- (or even multi-) dimensional image on screen. In such an environment, where damaged texts can be invisibly mended, and the circumstances of actual performance replicated, a decorum for signalling fakes has to be very carefully observed.

There is a line that can be crossed in manipulating images in this way, whereby it is possible to 'improve' on the original by increasing the contrast between darkened vellum and faded ink, by restoring old pastedowns to their original position, or by 'tidying up' a particularly crabbed hand. Exactly where this line falls is initially difficult to determine: after all, the scans are photographs, and as such merely representations of the original object. We have to depend on the mediating eye of the photographer to make sure that the scan is as 'correct' a version of the original as it is possible to get with the current equipment. If the original photograph is unsatisfactory, it may seem to call for a certain amount of post-operative tinkering. But for an archive like this to maintain a proper scholarly standard, all unsatisfactory scans have to be rejected. Further 'improvements' are a different matter. Some of these techniques have no place in an archive such as this; other aspects of image manipulation, which involve speculative reconstructions, however well-founded, must always be scrupulously and prominently recorded. Where image manipulation improves the legibility of a manuscript by 'repairing' the ravages of time and mistreatment, the tidied-up version can be offered, but only for comparison with the unmediated version. Equally the status of any

reconstruction can have the status of an interpretation only, and must always be presented as such.

Access and Future Scholarship

However, although interpretation will, in the form of reconstruction, inevitably creep into the archive, if only to make it a complete record of the after-life of the plays, it will only play a minor part: the overriding status of the whole is to be as neutral as possible a resource. Its real potential for generations of new readings of the York plays will be realised fully in independent later phases when it begins to be exploited in secondary scholarship. Currently we envisage three broad dimensions of output. Firstly, conservation facsimiles will be copied to the owners of the collections to which the originals belong. As well as being an economical and highly secure means of storing facsimiles of vulnerable and unique objects, their superb photographic quality will allow for them to be exploited by the owners in ways far more flexible than conventional photographs or microfilms. The control of access to the individual items will then become a matter of co-operation between the owners and the Project, including the British Library interest in the actual photographs (under British law, copyright in venerable objects like medieval manuscripts or other artefacts currently subsists in the image, not in the original — a fact that is not always appreciated by would-be users), in which customary legal rights will necessarily be respected on both sides. As we said earlier, owners of records who depend for revenue on giving access to unique materials and to consequent spin-offs may understandably be nervous about the loss of control that high-quality electronic copying such as the Project proposes might appear to bring them. We have already explained why it is impolitic to mount such images on the Web. The public perception of this kind of international piracy tends to rub off on electronic publication of any kind. Though it should be no more dangerous — or anonymous — than publication in a paper facsimile, the degree of resolution in these scans seems to make them particularly vulnerable to commercial theft. In practice, this is likely only to apply to the more attractive manuscript illuminations: it is difficult to imagine an international pirate wanting to steal pages of the manuscript of *The Lay Folks' Catechism*, or even the 1433 Mercers' Indenture, the market for which is likely to be restricted to the readers of this journal.

We believe, however, that in the scholarly community the Project will if anything increase interest in the originals and their repositories. While the

preliminary work and casual curiosity that leads to wear and tear (and which has caused some libraries such as the Bodleian to refuse access to some of their more fragile and precious manuscripts) can be minimised as scholars and students are able to check the precise nature of the original without physically calling it up, greater general intimacy with the nature of the originals should increase informed interest.

Secondly, there is a clearly defined demand for a call-order system whereby scholars would be able to procure from the Project, with the permission of copyright owners, elements of the archive in a machine-readable form for their research. A catalogue of the contents of the archive will be published to this end, in both electronic and conventional print-media forms, as a priority. This is being produced in two stages. First, there is a neutral listing of scans by file names, with cross-identification to the manuscript shelfmark and folio number. Next there will be a much fuller descriptive database of each image. At the moment, we are basing this on the British Library's experimental DTD (Document Type Definition, a method of electronic tagging for the description of the structure of documents). This is being evolved by Richard Masters for the description of the Library's illuminated manuscripts.

Again, release of materials to users would be strictly regulated, and further reproduction controlled, with signed undertakings, much as it is in print media. Materials released in this way would generally be in compressed form, for ease of manipulation on the currently standard specification personal computer, so would not be at the level of resolution of the originals. This in turn would create the usual generational problems for anyone tempted to generate illegal further reproductions.

Finally, the Directors of the Project themselves, as well as publishing fresh research findings that arise from the process of forming the archive, aim to draw on its raw material to write hypertext books for target markets within education.

Ultimately the strength of an archive such as this lies both in its level of security — it captures unique artefacts for posterity as data that can be perpetually refreshed and is not tied to a single location — and in its future utility for research and other purposes in ways as yet unenvisaged.

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NOTES

1. For a discussion of hypertext and its relation to contemporary literary theory see George P. Landow *Hypertext: The Convergence of Contemporary Critical Theory and Technology* (Johns Hopkins UP, Baltimore and London, 1992), though he overemphasises the reader's choice, the potential decentralisation of the units of text, and the nonlinearity of the overall package. Overall he appears to be arguing from experience of a text-based package such as HyperCard, rather than a more graphic programme such as Toolbook.

2. For the technicalities of scanning and digital photography see Peter Robinson *The Digitization of Primary Textual Sources* (Office for Humanities Communication Publications 4: Oxford, 1993).

   There are three main ways in practice of reducing the size of electronic image files using a programme such as Adobe Photoshop: (1) by reducing the resolution (number of pixels per inch/cm) of the image, which loses definition, or, looking at it as a naive viewer, reducing the degree to which it can be enlarged on screen without pixellating (breaking up into pixels); (2) by reducing the size of the image measured in inches/cm, which has the same effect; (3) by removing some of the colour information, which makes it less satisfactory as a facsimile: though technicians correctly maintain that the human eye cannot distinguish all the shades of colour that can be recorded, and this is perfectly satisfactory for more colourful images, reducing colour information on a facsimile of parchment gives it a curious waxy look.

3. Peter Meredith 'John Clerke's Hand in the York Register' *Leeds Studies in English NS 12* (1981) 245—71, and the Introduction to *The York Play: A facsimile of British Library MS Additional 35290* edited Richard Beadle and Peter Meredith (Leeds Texts and Monographs Medieval Drama Facsimiles 7: University of Leeds School of English, 1983) xix—xiii.

4. Meg Twycross gave a preliminary paper on this at the Leeds Medieval Congress in July 1996.

5. A paper on this was delivered at Kalamazoo 1996 by Pamela King, and will be offered, with adjustments and additions, to the next volume of *METh*.

BOOKS RECEIVED

English Parish Drama edited Alexandra F. Johnston and Wim Hüsken (Editions Rodopi, Amsterdam/Atlanta, 1996), 157 pages, ISBN 90-420-0060-0, NFL 50/US$31. The first of the new Ludus series. Essays by REED stalwarts Elizabeth Baldwin, Audrey Douglas, David George, James Gibson, Peter Greenfield, Alexandra Johnston, David Klausner, Barbara Palmer, James Stokes, John Wasson.

'Divers Toyes Mengled': Essays on Medieval and Renaissance Culture in Honour of André Lascombes edited Michel Bitot with Roberta Mullini and Peter Happé (Université François Rabelais, Tours, 1996), 425 pages, ISBN 2-86-906095-5, FFr 200. 28 essays.

Richard Rastall The Heaven Singing: Music in Early Religious Drama (Boydell and Brewer, Woodbridge, 1996), 457 pages, ISBN 0-85991-428-3, £49.50/US$89. See enclosed leaflet for special offer to *METh* readers.

Tudor Theatre: Narrative and Drama edited André Lascombes (Peter Lang, Bern, 1995), 157 pages, ISBN 3-906754-30-8, ISSN 0946-2457: price not given. Volume 2 of Collection Theta, designed to present studies in the drama of the English and European Renaissance. This volume contains papers from the 4th Table Ronde du Theatre Tudor (1989)organised by the Centre d'études supérieures de la Renaissance, Université François Rabelais, Tours.

Tudor Theatre: Emotion in the Theatre edited André Lascombes (Peter Lang, Bern, 1996), 200 pages, ISBN 3-906754-49-9, ISSN 0946-2457: price not given. Volume 3 of Collection Theta; contains papers from the 5th Table Ronde du Theatre Tudor (1993) organised by the Centre d'études supérieures de la Renaissance, Université François Rabelais, Tours.

Festive Drama edited Meg Twycross (D.S. Brewer, Cambridge, 1996), 286 pages, ISBN 0-85991-496-8. Papers from the Sixth Triennial Colloquium of the International Society for the Study of Medieval Theatre, Lancaster, 13-19 June, 1989.

Formes Teatrals de la Tradició Medieval: Actes del VII Col.loqui de la Société Internationale pour l'Etude du Théâtre Médiéval, Girona, Juliol de 1992 edited Francesc Massip (Institut del Teatre, Barcelona, 1996), 524 pages, ISBN 84-7794-413-X.

European Theatre 1470-1600: Traditions and Transformations edited Martin Gosman and Rina Walthaus (Egbert Forsten, Groningen, 1996), 173 pages, ISBN 906980-093-4. 14 papers from the colloquium and theatre festival mounted by the Faculty of Arts, Rijksuniversiteit Groningen, in June 1991.