

RECONSTRUCTING HISTORICAL COMMUNITIES WITH A COMPUTER

Final Report to the Social Science Research Council 1983

APPROACHES

Preface: archival revolution.

Before about 1960 it would have been impossible to have attempted the project described in this report. The records for particular parishes, for example Earls Colne and Kirkby Lonsdale, were scattered, unindexed, their whereabouts unknown. Even when located, the documents were often found to be in private hands or in large repositories where they could not be located amidst documents for other places. During the last twenty years there has been an archival revolution. The two main features of this have been the widespread establishment of local Record Offices and a vastly improved system of listing and indexing the records. There have also been changes at the Public Record Office which have, perhaps for only a short time, made whole classes of documents, such as the Chancery records, easily available for the first time since they were created. Thus documents which were previously in private hands or with solicitors have become accessible and others which could not be found have been listed. For example, in Earls Colne, the valuable archdeaconry materials have only become available since the last war, having been found in a solicitor's attic; the survey of Earls Colne taken in about 1598 was only found in a safe during the course of the project; the invaluable listings and manorial records for Kirkby Lonsdale only came to light during the deposit of the Fleming and Lowther manuscripts in the Cumberland and Westmorland record offices. It is very difficult in the 1980s to envisage the difficulties facing the historian of local communities before about 1960. For the first time since the records were written in the fifteenth to eighteenth centuries they have become visible and guides and indexes to them have begun to appear.

Yet even with these improvements, locating the material for a specific place is a lengthy and expensive business since records tend to be very widely scattered in England. Many of the documents are stored in the local Record Office and our first step was to enquire there. But a large quantity are still in private hands. We were very fortunate to establish good relations with the family of the previous lords of the manors in Earls Colne, the Proberts, and thereby have access not only to Josselin's Diary, but also to manorial records which were not deposited. Many records are also in ecclesiastical repositories or in the Public Record Office in London. For example, the ecclesiastical court records relating to Kirkby Lonsdale are distributed between Carlisle, Chester, Leeds, London, Preston and York. Even when the place of deposit is discovered, it may take a considerable time to find the records relating to a particular parish, especially if one is searching through the records of a court that covers the whole of England. It is for this reason, among others, that the records of such courts as Chancery, King's Bench and Star Chamber have remained practically unused by historians, with a very few exceptions. The growing number of good guides to

the nature and location of records helps us considerably, though they cannot possibly go into the necessary detail to describe the nature and contents of each source. Perhaps as much as a quarter of all our time in processing the historical records used in this study has been spent in finding them, looking through lists and indexes, or hunting through boxes for the odd stray reference or will. This can be extremely tedious work and it is much better done for short periods, by members of a team, than for days on end by an individual.

Anthropology and history.

During the same twenty years there has been a theoretical revolution within history. Part of this can be seen in the relationship between anthropology and history. During this period there has been a growing interest in the methods and models to be derived from the social sciences and their application to historical sources, particularly in relation to the approaches of social and cultural anthropology. This project grew out of this interdisciplinary interest. The aim was to attempt to do what an anthropologist does, but instead of undertaking this in a contemporary society, to do so on the basis of the surviving records of a past civilization. 'Anthropology' literally means the study of man. It is not surprising that with such a wide object of study and with an intellectual history stretching over several hundred years, there should be many variants and schools of anthropology. Here we will concentrate on only a part of the anthropological tradition and its influence on this project.

Anthropology is above all a comparative discipline. It considers each particular case, whether a village, society, nation or civilization, in a comparative framework, trying to see what is universal and what particular. For the anthropologist, or for the historian interested in anthropology, this has several advantages. It helps to set what he discovers alongside similar cases. This makes it easier to consider many unfamiliar matters in the past, for example witchcraft and magic, alongside currently existing systems. Thus, as we will show, many topics which we might fail to understand or even consider if we merely concentrated on the more obvious aspects of our documentation and our own present experience are brought out of the background. The cultural and mental gaps between past and present are partially closed. In other cases, and equally valuably, the comparative approach has the opposite effect, distancing us from our own past and hence making it possible to question and analyse topics which we tend to take for granted because they still exist. This is a particularly insidious and invisible pressure in those societies which have changed little in certain basic respects. Usually working in another culture, the anthropologist all the time compares his findings explicitly or implicitly with the institutions of his own and of other cultures. This heightens his sense of the peculiarities of the peoples he is studying and forces him to ask questions about their most obvious and accepted institutions and assumptions. This pressure lies behind much of our project as it continues to develop.

A second feature of the anthropological approach is that it is, in so far as this is possible, 'total'. Anthropologists are interested in the 'whole man'. Though he or she may write up the results in separate monographs on religion, economics, politics and so on, the fieldwork itself is designed to capture that 'histoire sociale totale' which was also the avowed aim of the **Annales** school. In the

handbook devised by a committee of anthropologists to guide their colleagues (Notes and Queries in Anthropology), the topics listed for investigation cover every aspect of life: physical, material, economic, social, religious, political, linguistic. There is nothing that an anthropologist is not interested in and, above all, he or she is interested in the connectedness, the web, of life. This partly reflects the nature of the societies anthropologists have studied. In many, the modern western divisions between the fields listed above are not accepted or meaningful and reality bridges them. Therefore, information is collected on every matter, though it is later disciplined within a general theme or thesis in the analysis.

The attempt to gather everything that can be learnt, is both a reflection and a cause of a particular methodology, the study of a demarcated area or peoples. Many of the classic studies in anthropology concern a small unit, a tribe, a peasant village, ideally bounded by the sea, by mountains or by forests. The characteristic methodology of anthropologists, known as 'participant-observation', that is living and working in the community of study, learning the language, entering into social relations with the people to be observed, can only succeed in a small group. It is possible to be observed, can only succeed in a small group. It is possible to sample, to use questionnaire and survey techniques. But ultimately the best information comes from talking to and watching a few dozen people. The anthropologist almost becomes an instrument upon which the culture plays, the tune being reflected in his diaries and notebooks.

In the end, the aim of many of the great anthropologists was to grasp the 'spirit', the 'logic', the 'pattern' or the 'ethos' of a culture. Thus, in the end the aim was similar to that of the great philosophers, historians and travelers, Montesquieu in his **Spirit of the Laws**, Tacitus in his **Germania**, Doughty in his **Arabia Deserta**.

When we turn to the practice of anthropology using documentary sources from the past, it is obvious that there are technical and methodological differences. Yet it is essential to realize that this project was conceived as an attempt to see how far it would be possible to reconstruct the lives of past individuals. Using the local records produced in a literate culture, processed by hand and computer, we would investigate the questions asked by anthropologists. Such an attempt was part of a growing interest in bringing anthropology and history together during this period and we may mention some of the other studies which have influenced our work and been produced alongside it.

Some attempts to combine anthropology and local history have been made on the Continent by historians and anthropologists and there have been studies in North America, in Japan and China and elsewhere. Here we will concentrate briefly on the work of a similar kind undertaken for England. England has always been noted for its active tradition of local history writing and there are innumerable histories of particular parishes, manors and localities (cf. Macfarlane 1983; ch.1.) Since the last war, this tradition of antiquarianism has been strengthened by the involvement of professional historians. The first major interest was in the landscape, economic change and the more external features of the past over a number of centuries (Hoskins, Chibnall, Spufford, Ravensdale), with much interest shown by historical geographers (Baker and Butlin, Darby). As the interest in historical demography grew, so studies of fertility, nuptiality and mortality in particular

parishes, as well as of household structure, became common (Laslett, Wrigley). A significant widening of interests was achieved when the potential of wills and other documents for the study of literacy and religious allegiance was realized (Spufford, Cressy). More recently, an interest in conflict and crime has led to the growing utilization of quarter sessions and other legal records for the study of social control (Thompson, Wrightson and Levine, Macfarlane 1980). In the preliminary attempts to penetrate the feelings and thoughts of ordinary people, these sources have been given depth by special records such as the contemporary **History of Myddle** by Richard Gough (Hey). This growing tide of localized studies has been supplemented by intensive work on specific manors (Razi, Raftis) and on larger units such as market towns which have particularly good sources (Phythian-Adams).

These are valuable studies and much can be learnt from them. In many instances they give answers to general questions from a detailed study, much as do specialized ethnographies in anthropology. This project has attempted to build on these approaches and to add to them. The questions we shall be addressing are overlapping and yet slightly different from those that have been asked so far. The sources we shall be using are more extensive and wider than any that have so far been used, for example the more or less complete manor court rolls over a very long period and the central equity records. Yet we have followed the trend of these workers in concentrating on a specific geographical area. In order to attempt an anthropological study of the past it has been necessary to reconstruct as much as possible of the past of specific communities. In doing this we have provided data both for us and also a data-base and model for other social scientists.

THE THREE SAMPLE COMMUNITIES

Reasons for the choice of Earls Colne, Essex.

Earls Colne was chosen partly because it was located in the county of Essex which was particularly suitable for several reasons. A survey of all the legal records for England undertaken some years ago showed that this county has probably the best surviving collection of early common law records for any county in England: there is no other county where the Quarter Sessions and Assize indictments are continuous from 1560. It also has unusually fine surviving archdeaconry records. The main defect is that almost all the probate inventories have been lost: this is a serious disadvantage for certain types of work on material culture. The second consideration was the organization and indexing of records. The Essex Record Office was early renowned as the most efficient and best organized in the county and this is an enormous advantage when trying to locate all the records relating to a particular place.

Having chosen the county of Essex, it was necessary to choose a particular parish. In order to undertake the demographic work proposed by the SSRC Cambridge Group it is advisable to select a parish with a mean average population of at least 800 persons. (ed. Wrigley). This is quite a large parish by Essex standards. We had previously worked on a group of parishes, Hatfield, Boreham and Little Baddow, with a population of over one thousand in all, but it soon became clear that the

manorial records for these three were defective. A survey of all the parishes in Essex suggested that there were perhaps half a dozen with really fine runs of manorial records combined with a sufficiently early and complete parish register. Several of these had already been partially studied: Thaxted by Dr. K.C. Newton and Ingatestone by F.G. Emmison, for example. Only one of those remaining had a Elizabethan map, which would prove very important for any study of land-ownership. This was Earls Colne near Colchester. As well as the map and a survey to go with it, excellent manorial records had been preserved by the local landowners. There was also one other unique source: the best surviving village diary for England before the nineteenth century, with the possible exception of that of Oliver Heywood, was kept by the vicar of Earls Colne, Ralph Josselin, between 1641 and 1683. We had edited and published the full diary (Macfarlane 1976). It was obvious that its survival would add great depth to an intensive study of this parish.

A brief description of Earls Colne.

Later in this report we shall give a more detailed analysis of certain aspects of life in Earls Colne, so here we will provide a brief description of the parish. Earls Colne is named after the river Colne upon which it lies, and the Earls of Oxford, who owned the manor from before the start of our documents and who were often buried there. It is five miles from the market town of Coggeshall, ten miles from Colchester and about forty miles north east of the city of London. With a total circumference of approximately ten miles and an area of just under three thousand acres, it constituted a tiny part of the land area of England. Likewise, its total population, which fluctuated between 500 and 1000 persons during this period, only constituted roughly one hundredth of the total population of England and Wales. Later we shall discuss how far Earls Colne was exceptional within Essex and within England. We may now turn to a few of the outstanding and fairly constant features of the parish over the whole three hundred and fifty years during which we shall be studying it, namely between 1400 and 1750.

Earls Colne lies in the boulder clay plateau of northern central Essex at a height of between one and four hundred feet above sea level, in an area of small hills and valleys. Although there were traces of open field cultivation in the fifteenth century, most of the parish, like much of central Essex, had been early enclosed into small fields with hedges. Most of the old forest had receded, except for one large medieval woodland called Chalkney Wood, comprising about a fifteenth of the parish. There were also a few alder groves and marshes, but most of the rest of the land was used for mixed farming. The use of the land changed during the period 1400-1750. In the seventeenth century, for example, the crops included grain, hops, fruit, and vegetables and there were various kinds of animal husbandry.

Although the river Colne which formed the northern border of the parish was not navigable at this point, its waters drove two important mills. The main communications were along roads to Coggeshall, Colchester and Halstead, including the main Cambridge to Colchester road which ran through the village. Much of the produce from the village was taken in this way down to Colchester where it was carried by water to other ports, including London. There was an annual fair and there were numerous shops and inns. There was a market place with open stalls in the middle of the

village. The market itself ended by the early fifteenth century, when Halstead took over as the market centre. Occupations altered over the centuries: apart from agriculture, the most important were shop-keeping and petty manufactures. As well as smiths, tanners, millers and other occupations there were, particularly from the later sixteenth century with the influx of Dutch immigrants into north eastern Essex, considerable numbers employed in spinning and weaving cloth for export all over Europe. In all these respects, Earls Colne was similar to other villages in northern and central Essex.

The size of the village fluctuated very considerably over these three hundred and fifty years, from a lower limit of a little over a hundred dwellings to an upper limit of twice that number. In 1598, for which there is a surviving map, there were 139 houses and the Priory. Some of these houses were subdivided into tenements, so that there were, in fact, 171 dwellings. Two thirds of the houses lay in the main village along the street, the other third was scattered as farms and cottages through the rest of the parish: a nucleated settlement pattern characteristic of this part of Essex. There were also several larger buildings: the parish church of St. Andrew; the buildings of the small Benedictine Priory of Colne which flourished until 1534; and the central residence of the lords of the manor which was several times rebuilt, being moved from near to the church to the site of the dissolved Priory.

When we turn to the landholding pattern, we find that less than two hundred acres of Earls Colne was held by free deed or freehold directly of the King. The rest was held in two lordships: the manor of Earls Colne and Colne Priory. During the period from 1137 up to 1583 the former was held by the Earls of Oxford as part of the Earldom. The seventeenth Earl sold it in that year to Roger Harlakenden whose descendants have held it ever since. The other, the manor of Colne Priory, was held by the Priory until 1534 and then granted a few years later to the Earls of Oxford until they sold it to the same Harlakenden family in 1592. Approximately two fifths of each of the two manors were let out to tenants by copyhold tenure, the other three fifths were held directly by the lords as demesne. During the course of time, some of this land was formed into largish farms, usually of between fifty and one hundred acres, such as Hay House and Curds.

It is clear from the many surviving records that there was very considerable social mobility in the parish, both vertical and geographical. Many people spent only a few weeks or years there and the boundaries of the parish were not strong barriers to movement. Many owned property both within and outside the parish. Kinship, commercial and other ties cut across the parish boundary. We have thus chosen a somewhat artificial entity, recognized as the basic unit of ecclesiastical and civil jurisdiction and, by change, coinciding more or less with manorial boundaries, yet not constituting a closed and discrete 'community'. It is a geographical and administrative space through which we can watch a tiny part of the population of England move over the centuries.

The typicality and representativeness of Earls Colne.

When drawing conclusions from an intensive parish study it is clearly necessary to have some broad assessment of the typicality and representativeness of the sample. Within the county of Essex,

there were clearly variations from parish to parish depending on a multitude of factors: from the nature of the soil and the system of agricultural production, to the particular manorial history of each parish and the personality of the vicars, landowners and other powerful individuals. The fact that until 1534 there was a Priory in Earls Colne, that the manors were for long owned by the powerful Earls of Oxford, that the town was on a main road, that it had a river running through it, that the Halakenden family who bought the manors favoured the Puritans, each of these made it a unique place with a unique history. It was different from the next parish and very different from marshland villages on the coast or parishes in the open-field areas of north-east Essex.

Yet, combined with this uniqueness, is the equally obvious fact that there were many similarities between Earls Colne and neighbouring parishes. In the course of making a study of one parish, one necessarily works through very large quantities of records for other parishes in the same administrative area. We have searched many neighbouring parish registers for Earls Colne names, scanned through the court records of hundreds of cases in the archdeaconry, quarter sessions and other jurisdictions, transcribed many wills from nearby villages. We have also undertaken small studies of the records of other central Essex villages, specifically Great Tey, Hatfield Peverel, Boreham and Little Baddow. We have worked through the hearth taxes from a number of Essex parishes and we have made studies of particular aspects of Essex life on a county rather than a parish basis, particularly witchcraft, sex and marriage, diaries.

The conclusion that emerges from this work, a mixture of systematic analysis and more impressionistic soaking in the records of a county, is that the uniqueness of each parish in the county was set within a deeper similarity between parishes. There were variations within a pattern; while the details varied very considerably, one can say a good deal in a general way about most Essex villages on the basis of a study of one of them. Thus when we read accounts of other Essex manors or villages (Wrightson and Levine, Newton), or look at the manorial, quarter sessions and other records published for the county as a whole, there is a great sense of familiarity. That this should be so is part of the peculiar features of this society at that time. It marks it off from most Continental countries until very recently and also from most of the societies studied by anthropologists. Whether in Spain or New Guinea, there are often huge linguistic, cultural and social differences between each 'community', so that it would be very difficult to generalize outwards in many civilizations to generalize beyond the regional level. It seems that the uniformity of law, custom and language throughout England from the fourteenth century onwards, combined with very high geographical mobility rates, was such that each Essex parish was in many ways similar to others. This contention cannot be proven here; it is merely a suggestion to which we shall return during the course of the report.

While it may be conceded that there were certain deep similarities within Essex, or even within East Anglia, it is likely to be felt that the variations between different regions was so great in the past, that nothing can be said about 'England' from one microscopic study. Those who concentrate on the physical geography and farming systems of the past, rightly point to the differences between regions and it would seem that nothing could be said, for example, about the inhabitants of Derbyshire, Cornwall, or Durham from the study of an Essex parish. Again, at one level, this is

obviously true. Essex is near London and this influenced everyone who lived there; the county was in the 'lowland' region, early enclosed for the most part, practising mixed arable and pasture cultivation. We may wonder how it could be similar in any respects to an upland, pastoral area a long way from London. It was with a view to seeing how far the Essex patterns could be seen as special, and how far as general and 'English' rather than specifically East Anglian, that we have studied, as a control parish, an area in every respect at the opposite extreme to Earls Colne Lonsdale, namely Kirkby Lonsdale, in Westmorland (now termed Cumbria). Westmorland is ecologically, socially and in every way as far removed from Essex as one can find in England. Furthermore, it is at the furthest remove from London. The reasons for the choice of Kirkby Lonsdale itself and the character of the parish need to be explained. Although we have not worked as extensively on this parish as on Earls Colne, not having computerized the records or published them, we have spent a number of years collecting, indexing and analysing the Kirkby Lonsdale material during this project and explicit comparisons between the two regions have played an important part in our work.

Reasons for the choice of Kirkby Lonsdale.

We have explained that we wished to find as a control a county which was in every respect as contrasted to Essex as possible. Several northern and western counties might have been chosen: Westmorland was chosen partly because of the special records for Kirkby Lonsdale which we shall now describe. When the private and official papers of the learned antiquary and Justice of the Peace Sir Daniel Fleming were deposited at the Westmorland Record Office in the mid 1960s there emerged one of the most complete listings of inhabitants for any region in England. A number of parishes were covered, but the largest of these was the parish of Kirkby Lonsdale, comprising a market town and eight other townships. Thus for the year 1695 we have a practically complete list of inhabitants for the whole wide parish. There was also a very fine parish register, commencing at the start of parish registration and practically continuous from 1540. A very full survival of the very numerous wills and inventories for this area in the archdeaconry of Richmond, added to the wealth of records. The manorial system was fully operative for longer in Westmorland than in Essex and thus, although the court rolls only survive from the early seventeenth century for Kirkby Lonsdale, it is possible to gain a very good idea of how the system worked. There are also good churchwardens' accounts and poor law documents, along with the probate inventories. Finally, in the papers of the local Justice of the Peace, Fleming, and in the Assize depositions, unique for the northern circuit, there is the material for a detailed study of crime and law in the parish (Macfarlane 1981). Finally, there has been a particularly fine antiquarian and local historical tradition in the north-west of England and there are consequently an unusually large number of studies of particular manors, parishes and towns, which all provide a comparative background for the Kirkby Lonsdale study, and give further comparisons with the Essex findings. The strong impression from this comparative study of the two parishes, is that just as Earls Colne was both unique within Essex, and yet shared many basic features with other Essex parishes, so Essex or Westmorland were each unique within England, and yet there are very many deep and striking similarities. The law, language, procedures, customs, material culture, markets, measures, attitudes, religious sentiments and many other features are part of a general, English, pattern. This is a striking contrast with all

other contemporary Continental countries, with the possible exception of Holland and Scandinavia. In France, for example, one knows that each region and even sub-region had its own language and culture. In England the contrasts were not nearly so marked.

A brief description of Kirkby Lonsdale

Kirkby Lonsdale, the kirk or church by the River Lune's dale, is a large upland parish, about twelve miles long and at its widest, about five miles broad. It lies on the upper stretches of the large river Lune, along the Westmorland/Yorkshire border. It straddles the four main physical zones in this area, the rounded Pennines of the east, the craggy moorlands typical of the Lake District to the west, the empty heaths to the north and the flat lush lands of north Lancashire to the south. The parish included the eight chapelries or townships of Hutton Roof, Lupton, Killington, Mansergh, Firbank, Middleton, Barbon and Casterton, and numbered about 2,400 persons in all. There was at the southern point the town of Kirkby Lonsdale itself, the second largest market town in Westmorland in the seventeenth century, with a population of about 600 persons. Kirkby was much larger and more straggling than Earls Colne, but each lay on an important highway - in the case of Kirkby Lonsdale the famous 'Devil's Bridge' afforded a crossing for the Settle to Kendal road over the river lune.

The settlement pattern in Kirkby was totally contrasted to that of the southern parish for instead of a nucleated village and a few farmhouses and cottages in the fields, we here have a dispersed settlement pattern, with hamlets and groups of houses in the outlying parts of the parish. The houses were built of stone and slate. On the rapidly rising terrain, from the water-meadows by the river to high grazing on the bracken-covered fells at a little over two thousand feet, the agricultural practised was very different from that of the relatively flat Essex countryside. The inhabitants grew oats and barley near their houses and fattened cattle and raised sheep on the out-fields. This was basically a pastoral region, producing milk, meat, wool and leather. Many combined these agricultural activities with small trading and artisan activities. There was a particularly vigorous knitting and cloth-making rural industry here. From the earliest sources there were very many occupations and bi-occupations and the area was well-known for exporting servants to the south. Some ten miles to the west was the market town and administrative centre of Lonsdale whither the cloth and other products of Kirkby Lonsdale were sold. To the east were large Pennine parishes.

Hearth tax returns for the parish suggest that the distribution of wealth was more even than in Earls Colne. There were few resident gentry and the majority of the population were the middling farmers and artisans, who would later be termed by Wordsworth and others 'statesmen'; that is independent people with their own farms, and this partly reflected the manorial history of the area. Each chapelry had originally been a manor, but nearly all of them were sold off to the tenants during the sixteenth century, so that they were now freeholders. It was chiefly in the three southern chapelries of Lupton, Hutton Roof and Kirkby Lonsdale itself that this had not happened. Even where the manors survived, the tenants, holding by a form of tenure known as border service, were particularly favoured. Another distinctive feature of the area was the high emphasis on education and literacy, for there were a number of fine grammar schools in the area, and the emphasis on

religion. This was the area known as the 'Gallilea of Quakerism', where George Fox made some of his earliest converts. Finally, the influence of London was at its least marked, for the capital was over two hundred and fifty miles away; much closer were York and the Scottish border. In every respect, geographical, ecological, agricultural, social and religious, this area was contrasted to Essex, which makes the deeper similarities all the more striking. If we can find things in common between Kirkby and Earls Colne, there are preliminary grounds for believing that we are talking about English, rather than specific features. Of course we also have to face the question of how far Kirkby itself was exceptional in the region. Again, all that can be said, at present, is that we have compared it to published accounts for other local areas, and in searching through the records have always had an eye out for contrasts. While it is clear that the parish had its own history, our peculiarities and that Warton (Lucas), Hawkshead (Cowper) or Troutbeck (Scott) were different, yet they also overlapped in many features.

A third sample; another culture

The report below will concentrate exclusively on the English parishes described above, although the project was originally devised and always featured a three-way comparison. Just as it is necessary to move out of Earls Colne to find out what is 'English' about the patterns, so it is necessary to move out of Europe to see what is European about the patterns, i.e. what is human nature and what is culture. Complementary to the historical study, therefore, was an anthropological investigation of another 'parish', or 'panchayat' as it was called in that culture, namely the village of Thak in central Nepal.

Thak is a panchayat high up on the foothills of the Annapurna range of mountains in Nepal, its lands varying from two to six thousand feet on a mountain side. Its approximate area is ten square miles and it was inhabited by about 1810 persons when fieldwork was undertaken for fifteen months there by Alan Macfarlane in 1969.

The panchayat is mostly inhabited by a people called Gurungs, best known to the British as recruits into the Gurkha regiments of the British Army. They are a small, muscular people, speaking a Tibeto-Burman language. Their economy rests on a mixture of grain production for domestic consumption and long-distance migratory work, chiefly in the Indian and British armies. Their social structure is divided into two major segments, the upper and lower jats, and they have among them a number of non-Gurung caste groups. They were probably originally nomadic pastoralists who for centuries have circled round the high pastures and only recently settled down to arable cultivation under the pressure of growing population. Their religion is a mixture of Tibetan bon, Buddhism and Hinduism. In every respect they provide a perfect contrast to the two English parishes. The climate, a monsoon one with heavy rains in June to August, is totally different from the English one. The terrain is much higher and steeper even than Kirkby Lonsdale. The language is entirely different, as is the social structure. For example, the society is divided into exogamous lineages, with preferential cousin marriage and a complex kinship terminology entirely different from the English Eskimo terminology. Norms of behaviour, concepts of the after-life and social relations are very widely different. In every respect the contrast is instructive.

The data which was collected for this Gurung community consisted of surveys and censuses, genealogies, questionnaires and direct observations of behaviour. As much historical material as possible was assembled, particularly land-tax records, which enabled some historical account of land use and ownership and population over the last hundred years to be made. An analysis of Thak has been published, using some of this material (Macfarlane 1976), and this complements a number of other studies of this well documented people. In the ensuing report, contrasts with societies elsewhere in the world will frequently be made to bring home the characteristic features of the English villagers. Although few of these will explicitly be with Thak, it is essential to remember that our most detailed contrast is with this Himalayan village.

METHODS USED IN MANUAL ANALYSIS

Transferring the documents from the repository

Even after the archival revolution described above, which has made the documents available again, there are still very large problems in their use, one of these is the very quantity of what has survived. Many local historians during the last two hundred years have spent months and often years, supported on private or clerical incomes, transcribing small portions of the records of a particular parish into their notebooks, which then linger unused in libraries or attics. The modern student, particularly someone working for a postgraduate degree, has not the time or the money to spend years at the Public or local record office, transcribing in full the often lengthy documents. Even if he were able to do so, he would be aware that even his most careful efforts to accurately transcribe would contain errors and there would have to be much extra travel and checking. As one processes material, words that were hitherto obscure take on a possible meaning and it is necessary to check this with the original. Fortunately, during the same period that the material became available for the first time, there was also a photographic revolution. The development of various techniques of photocopying documents, including xeroxing, microfilming and microfiche, has enormously helped the study of local history. Until one has faced two thousand probate inventories for one parish, or hundreds of feet of minute written court roll, it is difficult to see how the development of photography can alter the very nature of the questions that we can ask. Yet, this technological change has made a vast difference. It has freed the historian so that he can undertake a depth of analysis hitherto barred by the sheer practical impossibility of bringing together all the original material to one spot where it could be analysed. Naturally, this requires money, and we are extremely fortunate to have had the support of King's College, Cambridge and the S.S.R.C. in this work. But even for the amateur, the costs of filming a court roll and then working on it at home is not prohibitive, whereas the travel to the depository and subsistence would be.

The final aim is to transfer all the original material, in copy form, from its scattered resting places to one's study so that it can be carefully analysed. The method of doing this will vary with each document and each worker, but it is important to record our own experiences in facing this problem since it may help others. One possibility is merely to take an 'abstract' from a document. For

example, when faced with a large number of cases in a particular court or a manor court roll, all having a common form, it may be thought sensible to copy out the cases in a standard and re-ordered format, perhaps merely summarizing the process. This is what we did ourselves, at first, with the manorial transfers and other court records. Unfortunately, however, we had to re-do much of this earlier material as it became clear that we had left out much that is of interest and had pre-judged various questions by the very way in which we had abstracted and re-ordered the material on the basis of imperfect knowledge. We later opted for complete transcripts, though we did translate all documents into one standard language, English.

Connected with the arguments concerning whether to make an abstract or a full transcript is one concerning the way in which the material is transferred from the original repository. If one has decided to obtain an unchanged transcript it will save enormous periods of time and labour if a photocopy can be made. Also, all manual transcripts need to be double-checked since errors in transcription are bound to occur and will require another time-consuming visit to the Record Office and the re-ordering and finding of the transcribed passages. Furthermore, the exact location of words on the page, the style of the handwriting, and the pieces which are crossed out, all these can turn out to be important at a later date and can only be inadequately captured in a handwritten or typed transcript. We therefore decided to photograph as much of the local materials as possible. What has been photographed is indicated at the end of this report, whether by xerox or microfilm. Microfilms are far cheaper than xerox copies and easier to store and certain documents, such as court rolls, are often too bulky to be photographed in any other way. We devised a method of using an ordinary 35mm slide projector, cutting up the microfilm and mounting it as slides, and hence enlarging the original documents several times by projecting it on a wall. It is often much easier to read in this form, especially valuable when the document is written in a tiny hand (as Josselin's diary) or badly damaged. But for certain purposes, it is more convenient to be able to use a xerox, and particularly for page-sized documents to which one will frequently be referring in the original, such as wills and inventories. Obviously, these documents which are totally concerned with the place of interest, for example a parish register or court rolls, can be microfilmed, whereas it would be wasteful and pointless to microfilm general records where there are only occasional references to the relevant parish.

A particular problem we faced was posed by the enormous sheets of parchment and paper produced by the central legal courts, particularly the immense Chancery proceedings. These were very expensive indeed to photograph, since they could not be xeroxed or microfilmed, yet it was essential to obtain a full transcript. It would have taken many months to transcribe them by hand in the Public Record Office and this is one of the reasons such records have scarcely ever been used. We devised a compromise, which was to make a full verbal transcript onto a small portable tape-recorder and then to type off a dictation machine in Cambridge. Of course, it is necessary to spell out all names and unusual words and, even when this is done, errors creep in. Yet this appears to be the most efficient, accurate and economical method and has enabled us to collect material which would otherwise have absorbed the whole of the project time.

Another advantage of making a full transcript is that it makes it possible gradually to learn the

meaning of the documents. There are a number of technical problems concerning the transcribing of a wide range of English documents from the fourteenth to the eighteenth centuries and these had to be resolved as we worked. It was necessary for members of the team to master certain fairly esoteric skills, such as palaeography so that one could actually read documents varying from an account roll for the early fifteenth century, through the abbreviated latin scribblings of clerks in the courts, to the almost unreadable jottings of the lord of the manor in his private account books. Much of the material had to be translated from latin and this was not standard latin, but a special variant used when the clerks tried to put English grammar alongside a latin vocabulary. Some of the most difficult of these documents were only translated by combining the skills of several persons. One would dictate into a tape-recorder from a slide, concentrating entirely on the miniscule handwriting on the wall. A second would type all the text ready for computing processing and check all the names, places and the process with the use of various hand-indexes. A third would do through double-checking and helping to resolve ambiguities. It would have been a lifetime's work for one person to transcribe the rolls themselves.

The difficulties were not merely produced by the language, the hand-writing and the often faded and torn state of the documents. Almost all the surviving documents were produced by complex legal and administrative processes, hence before one could even begin to understand or translate them, it was necessary to have some understanding of how an ecclesiastical or manorial court worked. Such a working knowledge was partly present at the start of the project, but an enormous amount had to be learnt on the job. In this report we shall produce some of the fruits of that knowledge.

Hand-indexing the material

Elsewhere we have described in print and in some detail the method of hand-indexing the material which we devised (Macfarlane et al, 1977 ch.3). Here we will briefly summarize the procedures and the nature of the indexes which we have created. The final produce of the work of transcribing of sources is an exact, typewritten or handwritten version of the original record, in English. A copy of this transcript is filed by the source, using coloured files to denote major categories of record. There are for Earls Colne many spring-backed files of material organized by source and for Kirkby Lonsdale approximately a hundred files. There are four other major ways of classifying the material, by name, subject, date and place. It is necessary to be able to move both within an index and between indexes, for example from name to name, date to date, name to date etc. Thus a certain number of other indexes have also been created. Some of these have been created for Kirkby Lonsdale. but the Earls Colne material has been fully indexed and we will therefore indicate what has been constructed for a parish containing about 700 persons on average.

A personal name index to all the sources, including cross-reference to every personal name, on small coloured cards organized under surname and then forename within surname, has been made. This has created an index containing approximately 36 drawers of some 60,000 name cards. Sorting and checking these has been a very time-consuming business since one is in effect performing 'family reconstitution' on all the sources and attempting to create separate individuals. Each

individual is finally distinguished. This has been complemented by a digest of the information on each person onto paper sheets, each individual being allocated one line on which all the main facts of his other life is recorded.

Indexes to other specific sources have been created, for example to the Hearth Tax, to will-makers, to the parish registers of neighbouring parishes, and these make certain types of search more efficient. There is also a general land and house index containing all references to particular houses or parcels of land at the time of sale. Usually this contains the whole of a description in a court roll or rental. It is organized by the name of the place, in alphabetical order. Like the name index, the specific references to houses have been consolidated onto sheets as well so that the history of dwelling, sometimes from the end of the fourteenth century through to the mid-nineteenth century, is recorded. With one line to each transfer and cross-referred to a numbered map for the location, this constitutes a large file.

The manorial transfers require two special indexes of their own. One is the 'to' index, which contains all transfers of property in the court rolls, organized alphabetically under the names of the persons who received the property. The 'from' index is similar but organized by the names of the people from whom the property was transferred. This makes it possible to trace a piece of property through time by working backwards and forwards between the two.

All rentals and surveys are indexed separately, the organized alphabetically by the names of the holders of the land. There is also a separate map index, which links fields and houses in the documents to the map; it includes the 1598 rental, 1838 tithe award and 1854 rental, and it gives a key name to property which can then be looked at more fully in the house and land index noted above.

Another index is the 'general subject index', which contains full transcripts of cases from various courts, including the court leet, Quarter Sessions, ecclesiastical courts, and also from other sources such as wills, diaries etc. It is organized under major topics such as 'godchildren', 'murder', 'weather', etc. and makes it possible to find out whether there is material on a subject. This is supplemented by a court index, which is similar except that the material is organized alphabetically by person, rather than by subject. It also includes the ownership of free-hold land, common recoveries etc. which are not covered by the ordinary manorial index.

The indexes described above consist of two major categories: those produced by abstracting from a record and those where the whole of a record is included. Its nature and purposes, and the way in which we created it from various categories off record has been described in detail in Macfarlane et al. 1977 (pp. 93-111) and it is therefore unnecessary to repeat that description. There is in the same book a lengthy discussion of the advantages and disadvantages of re-ordering material when creating indexes. Here, therefore, we will merely summarize our conclusions from our experience. We finally came to the conclusion that the saving in time in searching which is achieved if material is re-ordered to produce an index does not outweigh the disadvantages. In other words it is best not to re-order the material. Firstly, it takes much longer to produce the indexes if one re-orders, and

secondly it leads to various kinds of inaccuracy. It has thus become clear that while it may help to guide the eye in various ways if one re-orders, this can be done by the use of capital letters or underlining and the text itself should be transcribed onto the indexes in full and in the original order.

Another point which we have learnt from bitter experience is that transcribing, indexing and linking together records which refer to the same person are separate stages and must not be conflated. Although to do so may appear to save time and paper, it is a false economy, for often the people turn out to be different people. Thus our method of indexing the ecclesiastical court records which originally involved placing several appearances of apparently the same person at the same court onto one card turned out to be unsatisfactory and lead to errors. The general rule of only one 'event' on one card still obtained. As to the specific methods of creating indexes to selected records, these are described and illustrated with diagrams on pp. 98-111 of the work referred to above (which has been deposited with the SSRC in connection with an earlier report).

There are two major problems in hand-indexing, one of time, the other of linkage. In an earlier estimate (Macfarlane 1977: 208) we suggested that it would take a single researcher working for 30 hours a week, 50 weeks a year, some 20 years to carry out the preparation of the data in the form of indexes described above. However, this is probably a pessimistic estimate, for now that a method has been worked out and many of the sources described and transcribed in this publication, it would be likely that between a half and three-quarters of that time would be needed. Even so, it is clearly not a task that will be done often, if ever again. If the manor court rolls, which constitute over half the material we have, were omitted or merely sampled, then the task would take perhaps five years of full-time work. In our own project, however, developing the methods, and hence having to repeat many of the stages, it has indeed probably taken the twenty man-years we prophesied.

Information about the past comes to the historian as a set of discrete records, each one separate. Before the material can be used for many purposes, these separate documents need to be linked or matched. An investigator studying a contemporary community will probably have little difficulty in deciding whether two pieces of information relate to the same or different individuals, but it is often much more difficult to do so when there are thousands of short references to named individuals in the past. Names of one individual are often spelt in different ways; there are frequently two or more people with the same name living in a community; the information is sometimes vague; the description of lands and houses of ten omits names altogether. 'Record linkage' is therefore a central and difficult problem (cf Wrigley 1973). Even with much care it is not possible to identify unambiguously all the individuals or other items mentioned in the records and hence it is not possible to link them all together. Consequently, there is always likely to be ambiguity in the final indexes.

Nevertheless, we do believe that record linkage by hand is possible. Indeed, contrary to what one might expect, the more types of record there are to be linked, the easier the task becomes. As information increases, ambiguities decrease, thus while it is very difficult indeed to link just baptisms, marriages and burials, when these are supplemented by other records, the confidence we

can place in the linkage rises. Since many of our results will be affected by the way in which we have linked pieces of land and people, it is necessary to provide a brief summary of our assumptions and procedures in hand record linkage.

We abstracted each and every reference to a person onto a slip of paper, with a cross reference to the source. These slips were then rearranged by surname, then forename. The difficult part was distinguishing between persons with the same name. Indications that we had a problem were: two or more baptisms or burials of persons of the same name, different parents for what seemed to be the same individual, birth to death spans of over 100 years, burials before baptisms, burials before a wedding or before a will was made. In order to bring out these problems, we put the slips in chronological order and tried to connect the most likely patterns into people. In the majority of cases this was easy on the basis of logical deduction, yet some ambiguities remain. In some cases there is just too little information to make any definite identification possible.

The nature and quality of the historical records

One problem that faces all historians is the archival and technical one of record loss. Even the best documented parish will have large gaps in most sets of records. Although one of the advantages of the multi-source work described in this report is that it makes it possible to gain some idea of the dimensions of the loss and particularly when we have two parishes to compare, the holes remain. For Earls Colne, for example, the losses of the burial register entries for the years 1590-1610, and of the original court rolls for Colne Priory manor for much of the fifteenth and sixteenth centuries, are cruel blows. Like many other Essex parishes, the probate inventories have also disappeared. The fragility of the past is constantly made obvious by the disappearance of documents we know once existed.

Another problem lies in the ambiguity of the records themselves, and often this arises from our own ignorance. Only as we continue to work on the material do we gradually come to know what many of the documents really mean. Often it is possible to resolve the ambiguities, for example we may perform various cross-checking tests to find out whether Hearth Taxes list those who own property or those who are resident. Much more difficult is the problem of the extent to which documents mean what they say. A notorious example of this is the whole area of 'legal fictions', whereby a completely fictitious account of an event that did not occur is devised in order to get round legal difficulties, as in the case of common recoveries (described below). In fact, all legal records pose problems. Since so much is at stake and so much is fiction, it is often almost impossible to be sure to what extent what is describing as happening really reflects any events in the 'real' world in the past.

A separate problem is that some of the more complex documents, for example wills or manorial transfers, are themselves ambiguous. The English language has a considerable capacity for ambiguity and it is often quite impossible to decide what a sentence means. For instance, if punctuation is not used properly, it may be impossible to decide whether in the statement 'John son of John the blacksmith', the occupation refers to the father or the son. The problem of ambiguity

and meaning becomes especially critical when producing indexes.

A further limitation of the historical records is that they are mostly concerned with behaviour and events, rather than with the normative or cognitive level. We have a very large amount of information about how people behaved and interacted, but know far too little about what they thought or said they were doing. This means that we can generate very large quantities of statistical information, but the reasons why people behaved in certain patterned ways can only be inferred. This is a reversal of the situation of the contemporary investigator. The anthropologist has a great deal of material at the normative level, that is people's comments on how one ought to behave, how people are thought to behave, and the reasons why people are supposed to behave in certain ways. But often such an observer has little information about the way people actually do behave outside his own observations of a very limited set of actions. Thus present-day investigators are often forced to infer the statistical level from the normative data. The position of the historian using past material may be likened to the famous metaphor of Plato's cave: we see the shadows on the wall, namely the surviving fragments of described events and partial comments on them; we then have to deduce what threw the shadows, the morality and mentality of the actors has to be inferred, projecting backwards from the shadows. We never observe people directly, but only through the creation of ever-subtler mirrors.

It will be obvious that the material that survives for a particular parish represents only a very small fraction of what happened in it. There are very large areas which are of interest to us and were of importance to those who lived in previous centuries that are completely omitted in the records. Unless we step back from a parish study for a moment, we may forget that in England there were civil wars, scientific advances, the collapse of an established religion, the start of colonial conquest. Even such locally important phenomena as the weather or plague may leave no obvious and direct trace in the records. The topics which never occur directly in such parish records are far more numerous than those which do and such omissions encompass most of what is really important. For Earls Colne this is vividly illustrated if we compare the account of village life we would obtain from village records with the account which, by chance, has survived in the diary kept by the resident vicar, Ralph Josselin. This diary provides a picture of a world of religious turmoil, political involvement, daily disease and illness which is almost totally missing in the normal parish records (see Macfarlane 1970, 1976). It is for this reason essential to understand very clearly what the records were created for and what, therefore, we can expect them to contain and what omit. It is extremely dangerous to assume that because something is not mentioned in the records, or not mentioned until late in our period, that it was not common widespread. Thus we cannot assume, for instance, that no-one believed in the Devil or witchcraft before the later sixteenth century just because there is no reference in the records to such matters until that time. It is thus important to set parish records alongside other records of all kinds.

Another weakness of the material arises from the fact that it has been necessary to concentrate on small, delimited, geographical areas. Although we have taken two contrasted areas, and though, as argued above, there are grounds for thinking that each parish was in some ways 'representative', there are further problems. By taking a small space, we tend to get fragments of peoples' lives. The

well-known high degree of geographical mobility in England as far back as the records stretch means that economically, socially, intellectually and in every other way the parishes of Earls Colne and Kirkby Lonsdale, were not isolated. Ideas, food, markets, government, kinship, all overflowed the parish boundaries. Although we may make some efforts to follow some of these chains outside the delimited area, we are bound to oversimplify and impoverish the past by adopting a parish as the unit of study. This will be seen dramatically later when we consider the way in which legally, politically and socially events and people in Earls Colne were drawn into the central courts of law.

A further bias which needs to be made explicitly concerns the under-recording of certain groups in the population of the past. Women, servants and children, as well as the poor and the old, are less well recorded than others. Although most individuals appear to have been visible in the records at one point or another, it is the wealthy and males who crowd onto the stage.

A final difficulty emerging from the nature of our records may be mentioned. Despite excellent computing facilities and an enormous amount of effort and thought, we were finally unable to achieve automatic record linkage. This is undoubtedly connected to the particular nature of the English records. As described in more detail in our **Introduction to English Historical Records**, the records for England as a whole are continuous and rich. Yet they also have a curious feature when compared to the records produced by Roman Law and inquisitorial processes on the Continent. The problems we have encountered in linking bits of information about people in the past would not be nearly as serious in Portugal, France, Switzerland, Germany and elsewhere. Surveys of records for these countries and discussions with those working on them for the same period suggest a basic difference: put simply, in the English case there is no overall strategy on the part of the authorities. People are not identified clearly. There appears to have been little communication between the three major record collecting bodies, the State, the Church and the Estates, even within each of these there was little cross-checking or identification. Each record keeper started from scratch and worked for himself. There is nothing, for example, to match the massive system of identification and cross-referencing produced by the Holy Office of the Inquisition for most European countries. The records in England were often produced by part-time or unofficial record-keepers, often members of the local or at least the regional community, they were not full-time bureaucrats with systematized, standardized methods of their European counterparts. Much of the documentation was thus collected for particular needs or arose out of ad hoc decisions. Combined with the highly mobile nature of the population this makes it very much harder in the English context to identify people. The difference was long ago noticed when comparing the fullness of French parish registers, which made the linking necessary for family reconstitution so easy, with the much sparser English parochial registers. The phenomenon is a much larger one, however, and the difference which can be found there is inflated many times over when we consider the records as a whole. Thus the job of community reconstruction in England is much more difficult than it would be in many other historical societies.

METHODS OF COMPUTER ANALYSIS

Preface and overview

This section of the report attempts to describe in general terms the computing methods developed in the project. It will also provide a critical overview of the work done in terms of the computer software produced. It will attempt to indicate which parts of the job caused the most difficulty and where anyone else attempting a similar task might experience problems.

One of the most elementary points is to discover what computers are good at doing and what they find difficult. Computers are good at storing information and at moving that information from one place to another. They can be used to search for data records once they have been stored, but require complicated software to make this happen efficiently. They can also be used to modify information stored and to sort data into a specific order. Computers do not, on the whole, make it particularly easy for data to be entered into them. Much commercial work goes into making the data entry task as simple as possible, using such things as bar codes on supermarket checkouts. The data entry task was by far the largest and most difficult job which was undertaken by the project.

Computers need explicit instructions in order to make them do anything. Another large part of the project was concerned with manipulating the data so that questions could be asked: this involved converting the data into a form which is easy for computers to maintain and search; creating a query language which mapped questions about the data as entered into questions about the data as stored; and finally producing an output from the machine which resembled fairly closely the original data entered.

Computers are normally regarded as being good at repetitive tasks: one such tedious job previously done by hand is that of nominal record linkage, therefore a major aim of the project was to attempt record linkage by computer. Our eventual conclusion is that a computer can help a great deal as a tool for performing record linkage, but it cannot be programmed to make the complex decisions required to distinguish different people. It can do the simple cases, but a human mind is required for the difficult ones. Unfortunately, it is difficult for the computer to identify the complex cases where it ought to give up.

Finally, much of the software would be designed in a different way if the project was starting again tomorrow. In particular, the advances in hardware over the last seven years have been tremendous and manipulate the information on a minicomputer costing around ten thousand pounds. The software would then be interactive as opposed to the batch system developed within the constraints of a particular university computing environment.

Data entry

There were a number of major decisions concerning data entry which had to be made before the data was entered into the machine; these concerned the structure and mechanisms to be used. We used a small sample as a testbed for various ideas and entered this sample in a number of different formats before making the final decision. This use of test data is very important, for whilst it may be discouraging to type in the same sample in three or four formats, it is better than discovering a

logical error in the data entry process after two years work.

We may briefly describe the data entry system which we devised as follows. A full description of the input conventions and methods is contained in appendices C, D. The overall aim was to devise a system whereby a full transcript of the original historical records could be entered into the machine without coding or abstraction. This would make it possible to return to the original text if necessary and would preclude the necessity of taking decisions about the meaning at too early a stage.

There are a great number of different types of record available to us from the past, but from the point of view of the computer user, they fall into two major categories. The first are those records which have some immediately apparent logical structure; censuses are an obvious example, in that items of information are already neatly collected under suitable headings; most parish registers could also be classified as suitable for this approach. Using a DBMS (Data Base Management System) to store this type of information is remarkably easy. A census, regarded as a large table, could have columns labelled as Name, Age, Occupation, and so forth. Unfortunately, the large bulk of the records available to us is not in a form so obviously amenable to computer analysis. Techniques such as those used by GENDATA (developed by the SSRC Cambridge Group) may be used in order to abstract those sections of information deemed to have interest before the data is entered into the DBMS. This data extraction is matched to a specific structure, specified by a template: the template is then used as the basis for later searches.

This approach works well if the documents are reasonably well structured, as in a highly standardised inventory. But it proves inadequate when a complex document such as a will is encountered. This approach also suffers from the disadvantage that the potential enquirer must have a very clear idea of the types of question he wishes to ask in order to perform the abstraction. If the answers to his queries lead him off in a different direction, the material required may not be available in the abstractions.

The Earls Colne project used a technique devised by Charles Jardine which allows for the whole of a document to be stored by a DBMS, while ensuring that the meaning of the text is also transmitted to the machine. This latter point is extremely important, as it is at present impossible for a computer actually to understand the meaning of natural language and so some way has to be devised for the semantic structure of language to be indicated by a human being. Very briefly, text is entered into the machine verbatim, except that spelling is modernised, purely in order to aid the later searching of the text; the method would work just as well on documents where the original spelling was maintained. As the text is entered, or at a later date, a number of syntactic markers are added to the text. These markers are tagged bracket pairs, which enclose and thus identify a section of text. the tag belongs to a set which may be provided at the historian's discretion - we use a total of 14. The information contained within the bracket pair (and not contained within any further nested pairs) is deemed to belong to the type indicated by the tag. These types can represent anything, but we use them to indicate that a section of text refers to someone's name, some personal information, a kin relationship, a piece of land, and so on. This set of types was chosen simply because it reflects our own interest. The great advantage of the system is that because the syntactic

markers used are not contained within the original text, it is an extremely simple matter to remove some, or all, or the marks and to try again. There is no need to go back and type in all the information once more, only this time adjusting it to fit a slightly different template.

There are a number of finer details of the system which include the way in which enclosing tagged brackets are constrained to follow certain rules, so that, for instance, a kin relationship must connect two sections of text which refer to people. There are also methods for coping with pronoun resolution and the English passive. One other facet of the system should be stressed here: in some documents the structure of the text makes it almost impossible to insert brackets correctly. This occurs in a remarkably small number of cases and is normally the result of extremely bad grammar or misplaced words. In this case another pair of syntactic markers may be used to indicate that the text is to be regarded as moved out of that particular bracket pair and into another. It should be noted that no text is actually moved; once the markers are removed the text is still as it was originally transcribed.

An example may serve to clarify this technique. In the following section of text, taken from a burial register, the tags used represent people (P), their names (N) and kin relationships (K); dates are identified by D tags. Thus we might have the following: (P (N Robt-Cobb) (K son of (P (N Jn-Cob))) buried) (D 10/9/1609). This text is then fed into a parsing program

The data entry conventions and methods we developed were devised over the last ten years during a period of tremendous changes in computing software and hardware. Although very satisfactory at the time, we would be tempted to make a number of changes if we were starting again now. One of our major advantages is that we have all the data that survives for the parish. This is also our major problem. In many cases there is just too much to absorb. Although sometimes one needs to read through an entire court case, for example, in many other places a simple abstract would be perfectly acceptable. Thus we would probably add a further level (called by us dollar nodes) above the actual text structure. Currently we hold here information concerning the folio or page number, the date, the original reference number and the file name. We think that it would be worth while to hold a brief abstract of the original document here. Thus would not be used instead of the original text, but in addition.

One feature of the input system was particularly valuable and this was the back reference mechanism. A node, often representing a person, would be tagged with a number and then this number could be used later to refer back to the original node. This was used to correlate such things as 'the sister of my aforesaid wife's brother' in wills. The original program design allowed for ten back references to be active at a time, although this was quickly raised to twenty, thirty and eventually forty as we realised how complex some of the documents such as wills were. This led to a common error which was difficult to check, namely accidentally linking someone to the wrong node by using a back reference number incorrectly. This could be avoided in future by using names instead of numbers to identify the references. The names would probably be the names of the people involved and would make this type of error less likely.

We used a range of different types of hardware during the life of the project, starting with crude paper tape punches and ending with highly sophisticated interactive graphics screens with light pens. In the light of today's developments in microcomputers, the data entry would all be done using a suitable micro running a commercial word processing system. We had to write our own screen editors and data entry programs because suitable machines with appropriate software were both rare and expensive. If time permitted, new data entry programs could be written now which gave interactive error indications while the data was entered, thus avoiding the multiple passes through the data in order to get it correct.

Perhaps one of the most vital things about the project is that we had extremely good relationships with the Computing Service, which provided us with every facility we asked for. They also provided a number of tools which are available on a mainframe computer but not quite of the same standard. For example, most mainframe computers provide an editor of some sort. The standard of this varies immensely from a crude program which will only edit small files to something really much more powerful. We were lucky at Cambridge as a new text editor was developed during the life of the project and we could actually provide some input as to how this design might proceed. The result was a text editor called ZED which proved invaluable to us as a simple yet reliable way of making changes and manipulating our data. The editor is programmable in such a way that data could be converted automatically from one form to another as required by a simple string of ZED commands. The alternative would have been to write a special purpose program every time.

There were cases where special purpose programs had to be written; these ad hoc programs were perhaps the most beneficial for the project. Even if the major software had been commercially available, which it was not at the time, the fact that the project staff always included someone who could write these little programs as required was vital. As an example, we discovered quite late on in the data entry task that we needed to distinguish first and last names. A program was written which automatically added a distinguishing mark to known unambiguous first names and prompted the user for a decision on ambiguous ones. This program was not very large but saved immense amounts of time.

The final point of difficulty encountered during the data entry was the cataloguing of the data. Each file had to have a unique name and was also given a name which indicated the state of editing which it was at. This proved very useful, given that we had a large number of tapes with different data at different stages of modification.

Data interpretation

The task of manipulating the data was done using a number of software tools. A detailed description and specification of these is contained in the appendices to this report. All of them, with the exception of a standard sort package, were written especially for the project.

The first program was the parser, which took the data as entered and converted it into a form which could be stored within the database. This program was initially conceived as simply

performing the conversion, but later grew rather complicated in order to produce error messages and diagnostic output. The parser understands the brackets and produces several outputs. The first output is a list of error messages. These include mismatched brackets, invalid links between bracket types, and unknown bracket types. The parser also translates certain quantities such as money, areas of land, and dates, into a normalised form. In particular, dates may be expressed in the original documents in many ways. A regnal date, expressed as 12/4/1 Eliz 1 (meaning the twelfth day of April in the first year of the reign of Elizabeth the first) is converted automatically into a suitable standard representation of the civil year. Similarly, date ranges are allowed; /5/1644 is translated into a date range running from the first day to the last day in the month. These translations are reflected on a diagnostic output produced by the parser, where they can be checked. This output also provides a formatted version of the text, where the formatting corresponds to the structure of the brackets used. This provides a valuable aid to checking whether the text has been correctly bracketed. We kept a copy of the entire diagnostic output of the parser on microfiche which has become a useful guide when hunting inconsistencies in the data at a later point.

The parser was also modified to provide a printed listing of the data in a justified and paginated version of the text. We also produced a computer output microfiche copy which has been published by Chadwyck-Healey as a microfiche set, so that others can have access to the data, even when they do not have a computer.

The range of input data accepted by the parser was also extended so that by the end of the project information such as dates could be entered in a number of highly flexible formats, ranging from the standard 2/1/1683 to something as odd as mich/last, meaning the michaelmas of the preceding year.

The final outputs from the parser represent the documents in structured form, where the structure is derived from the combination of the original text and the syntactic marks. The entire document collection may be regarded as a large network, where small sections of text, tagged with the appropriate type code, are pointed to by other sections of text. The DBMS is used to store and manipulate this structure.

Storing and manipulating the data

The main data manipulation tool was the data base management system CODD (COroutine Driven Database), described more fully in the paper appended to this report. This was specially written for the project and has been used with much success to store and extract data. The data is stored in an internal representation which is produced by the parser, and must be converted on output to a form which resembles the original. The database supports the relational model of data. In essence, all the data are viewed as a number of tables. Rows of the table may be extracted according to selection criteria, or certain columns from the table may be removed. This action will be familiar to users of SPSS as SELECT IF and LIST CASES. The Tables may also be regarded as sets, and the set theoretic operations of union, intersection, and difference performed. Finally, two tables may be joined together; this entails producing a new table where each row is obtained by finding rows in the two input tables which have a matching key value. The new row contains the

key value plus any further information from both tables.

It should be stated here that relational DBMS are still very much at a research stage and that this data could probably be stored within a more traditional DBMS, such as is normally found on many computer systems. However, the relational approach is fundamentally extremely flexible, and it was this aspect which made us choose it. There is the normal cost associated with flexibility, which is higher execution times. The CODD system attempts to minimise the overhead involved by disregarding other aspects of data storage normally considered vital in a standard DBMS. In particular, there is no way in which a single incorrect value may be changed within the CODD system without a great deal of expense. One would hope that historical documents do not require constant updating.

The query language

The relational DBMS allows the user to manipulate data in any way required. This is done via a query language, which enables simple commands to be given in order to perform specific data transformations. At the most basic level, these commands correspond to the relational operations described above. The CODD DBMS is used through the accompanying query language, which is called CHIPS (Cambridge Historical Information Programming System). This enables special purpose printing routines to be written fairly quickly and easily so that a number of special purpose outputs are available. CHIPS also allows libraries of procedures to be set up which can be written originally by an 'expert' but which can be used by someone less expert. Thus it is possible, for example, to follow a link to another text item in the data structure. A full specification and description of the enquiry language is provided in an appendix to this report. However, one example may be given to give a flavour of the system.

The following query is part of an attempt to produce information concerning the way in which people are interrelated. It produces a list of the names of those people who are specified in the data as being the son of someone. Both the parent and the son are given, together with the corresponding reference number; this number is unique to that paragraph of text and corresponds to the reference number on the microfiche output and the diagnostic information produced from the parsing program.

```
begin
people = nodesoftype [son-ref] p
kinlink = people -> [son]
sons = nodeswithword "son"
sonkin = kinlink * sons
person2 = sonkin ->[par-ref] -> [parent] n
othername = person2 backto [son-ref,son,par-ref,parent]
answer=othername![s(son, 'I'),s(parent, 'I'),w(son,20),w(parent,20)]

print (answer)
```


end

The output produced from the database is not, of course, limited to this precise format. In general, it is useful to obtain lists like this, although we have used the system to produce index cards which filled gaps in a manual system produced previously. The columns in the output may contain any section of the data required, and this may range from the text contained within the contents of a single bracket pair to the whole text of a document. Normally the paragraph is a useful size, although in other cases it may simply be required to obtain the name of those people who performed some action, as in this example.

It should be obvious from this that the person asking the question must have a very good knowledge of the contents of the database in order to formulate a meaningful query. This is unfortunate as it means that complete strangers cannot really use the data without help from someone who knows the data and how it has been bracketed. There is no obvious solution to this problem. We have all the data, which is complicated, in its original form; if we had made it easier to ask questions we would have had to make decisions about the meaning of the data which we were reluctant to do. Perhaps the data abstract described earlier in this report might be useful in this context.

Much of the work performed within the database has been in order to extract information from the underlying data to produce a more formal, standardised structure. Our main interest has been the people involved, so a large amount of work went into the production of a person record for each person in the data. In fact we have only looked at people with two names, although we have done much work to try and find another name for someone who has only one explicitly mentioned in the text. For example, "John Smith and his wife Mary" will lead to two people references for John Smith and Mary Smith. This is a good example of the complexity of the task when attempting analysis with a computer. It is a trivial matter for a human to work out that the wife's name would be Smith, but it requires a very large and complex computer program to work out the same thing.

One of the most useful results from this part of the project was the entire set of indexes to the data produced from the database. The nature of these indexes is described in more detail in the next part of the report. They have been published on microfiche and, when used in conjunction with the microfiche containing the data, represent an extremely valuable mechanism for people without access to the Cambridge computer and the actual data.

A number of abstractions have been produced, described in the Data Retrieval Language Guide. These include kin references which have been abstracted from the data and then further derived by following links so that if A is son of B and B is married to C then A is also son of C. There are also relations which describe person nodes concerning dead people, people specified as senior or junior, and references to baptisms, marriages and burials. There are useful aids when searching the database and are also the basis for record linkage.

It is worth emphasizing the complexity of the queries involved in creating these abstracted

relations. The CHIPS query language is a very concise high level relational algebra; two or three lines is normally sufficient to ask a question. In order to produce these abstracts, queries of up to one hundred lines were required. Such queries are immensely complex and well beyond the capability of any commercial database management system. Thus we can justify our need to write our own software since, even now, many years after the project started, there is still no suitable software available in the marketplace.

Record linkage

One of the original aims of the project was to investigate automatic record linkage. Very briefly, we experimented along the following lines. Initially all the references to a sample set of people with the same name were entered into the system from the hand index. A number of programs were written which examined various algorithms for disambiguation. This work showed two things. Firstly there were a number of attributes of people which were vital in separating them; these included obvious things such as their parents and spouses, but also information such as whether they were noted as being widowed or single, or whether the reference was to them after their death. It also showed that a great deal of information could be assumed from the type of document involved. For example, in a christening register the person being christened could be assumed to be under 5 years old unless the age was explicitly given. The people mentioned as parents could be assumed to be married; any married people could be assumed to be over 16, and anyone under 16 could be assumed to be unmarried.

Secondly, the work showed which algorithms worked best. It soon transpired that any approach must first attempt to match those people who were more likely to be the same. Once there were a number of references to a person grouped together then estimates of that person's birth, marriage and death dates were more accurate, even in the case when none of these dates were given explicitly.

The second stage of the record linkage work has been to extract the information which the first stage showed was required. This has been particularly time consuming. It is a complicated task simply to find a forname and surname for people, as there are large numbers of occurrences of John, son of Richard Smith where the surname Smith must be assumed from the kinship link between John and Richard.

Among the algorithms which we tried was one which required the following information (if it is available) for each name occurrence: the date of the reference, the age of the person, the father, mother and spouse. In addition, information concerning whether this is an event which can only happen once (such as a birth or death) can be provided. It is also useful to determine if the reference is posthumous, or whether the reference is to a widow or to someone mentioned as senior or junior. All of this information is obtained from complex searches and combinations within the database.

The program then constructed a similarity matrix, where a value is held which represents the likelihood of two references being the same. This value is obtained by first examining

contradictions and removing those as a possibility. Then a value is computed from such things as the overlap of date ranges and whether people are more likely to be married when they are 50 years old rather than when they are 25. The type of document from which the reference came is also considered here, as some documents are more accurate than others.

Once this matrix has been constructed, the two references which are the most similar were combined. This normally reduces the possible range of dates for the composite person and may also bring a mention of a father and a mention of a mother together. The similarity matrix is now constructed again, as the change to the information about the composite person will affect the interaction of that person with others. The two most similar references are now united again and the process repeats until the maximum similarity value falls below a specified threshold.

At one time this method appeared promising, yet there were a number of problems. One was that the approach was extremely expensive in terms of computer time; a second was that the computation of similarity values was clearly crucial. This could only be done on a rather ad hoc and impressionistic basis. After considerable trials and modifications, we came to the final conclusion that the method does not work: it is too complex and expensive to be achieved and it is not certain that it leads to a correct result. Indeed, we can now say with some certainty that the computer cannot be used to perform the linking on anything but the most trivial cases. If documents were more standardised and each person had much more extra identification information associated with him or her, then linkage could be done totally automatically. This may well be possible with many sets of records for other parts of the world in the past where the authorities provided much fuller and less ambiguous information about named individuals. The range and ambiguity of the English records, however, is such that the linkage job is difficult for humans and impossible for computers. Some linkage can be done with the computer, but whether the answer is correct is difficult to determine. The computer can be usefully used to aid the human in performing the linkage process and can retrieve, manipulate and display the information as required. This is a help, yet it is essential to stress that the whole task of community reconstruction is in essence extremely time consuming. Computers can only act on data which has been entered by hand, checked by hand and, to a large extent, linked by hand.

Thus after a large number of different attempts at automatic record linkage, we decided to use the computer merely as a tool to help humans make the final decision. A large amount of work had gone into producing abstracts from the data which described the kin relationships and a number of other facts. These were used to help the manual analysis. A simple interface for the user meant that the machine requested a particular standard spelling of a name, and then retrieved all the references to that name along with any additional information on kin etc. This information was stored in a special compact file on disc. A printout was produced which showed all the information extracted for each name.

A further interactive program was then used which printed the person node identifier, the date of the entry and any of the special information. The human operator then made a decision about who was who and entered a code for each person, where the code was the same for the same individual.

Provision was made for possibly ambiguous resolutions. We also allowed the entry to be specified as 'not of Earls Colne', and for people who held property in the parish but did not live there.

The entire set of names were linked in this manner during the project and we now have a relation within the database which ties up every person identifier with an individual identifier. This will enable any queries asked in the future to be made with reference to the linked individuals. However, this final linked population in the database was made possible through a great deal of human intervention, with the computer retrieving, manipulating and displaying the data. The computer did not, and in our view, could not, make any sensible decisions about the record linkage process itself. Even with co-operation between humans and computer, there are still a few people whom it has been impossible to link, due to the fact that the computer cannot at the moment find sufficient information about them.

Future maintenance and support

As we repeatedly warned our steering committee and stressed in our reports and applications for further support, there is no way in which we can continue to maintain this sophisticated and pioneering package. We shall deposit a copy of the data and programs with the SSRC Data Archive, but the software will not be maintained as from the termination of the present project. The team involved has split up and the Cambridge computer is changing over to a new operating system within the next year. When that happens the database management system CODD will not be moved over to the new system. Furthermore, the computing service will not continue to provide a disc pack so there would be nowhere to store the data. Thus it is doubly important that we have published all the data and indexes to the data on microfiche so that others can have access to some of the results of the project. One day, perhaps, it will be possible for the whole of the data and programs to fit into a much smaller computer and someone may resurrect it. We intend to continue to work on the material using whatever resources are available. As far as CODD and CHIPS are concerned, however, they will no longer be support.

THE COMPUTERIZED INDEXES

Using the Earls Colne data in the data base system, we have produced with the aid of the computer a number of indexes to the data. These are available on microfiche and we have copies on paper. Some of the indexes parallel those produced by hand: others are of a kind which it would have been practically impossible to produce by hand, or at least would have taken many months to do so. We shall briefly describe each of these indexes.

The Name Index

This is an index showing every occurrence in the records of each personal name. There is no attempt to separate or link particular historical individuals within each name. Thus the seven historical persons called Henry Abbot will appear under the one entry, Abbott, Henry-. No attempt to pre-judge connections between records had been made and it is up to the searcher to decide

whether the documents are referring to one person or different individuals with the same name.

The entries appear in alphabetical order of surname and within the surname, of forename, Both surnames and forenames have been standardized, thus the many different spellings of a name such as Leffingwell have all been put under one variant. Forenames that are used interchangeably, such as Robert and Roger, have also been standardized. In order to make it possible for a searcher to find the standard name, two preliminary lists have been provided. Firstly, there is a list of all the variant spellings of surnames and forenames and against each of these is given the standard name that has been adopted. Often there is a very great difference, for example all the following have been put under Greenwood: Grymarde, Goymer, Gournour, Grimward, Gernons, Gimerd, Gonner and others. Thus if one looks up Gernons, one will find that it has been standardized as Greenwood. A reversed list is also provided to make it possible to look up Greenwood in order to see all the ways in which it was variously spelt at the time. These lists were produced in the following way. The computer was used to group together similar sounding words (using SOUNDEX). This list had to be substantially modified and refined by hand on the basis of partial linking of records through the use of a hand card index. Some of the names were so dissimilar that there is no way that a computer could have seen them as identical.

The name index gives for each forename/surname the numbered references within the microfiche of at least one occurrence of that name, Each reference to an occurrence of that name is specified by the paragraph number where it occurs in the data base. Sometimes the same name occurs twice or more within an entry and it is also possible that two or more people with the same name will occur within one entry. All these will only lead to one reference being given. It is thus not possible merely to count the number of references and then to assume that a name is only mentioned that number of times. Nor is it safe to assume that if there is only one reference given to a name, there is only one person of that name mentioned in the documents.

If two surnames are given in the documents, in other words, if there is an alias, then references are provided under each of the surnames. Likewise, in the very occasional instances where a person had more than one forename, references are given under both the combination of names, Some indication of the size of this index can be obtained from the fact that when printed out in double columns, it takes some 31,266 lines of computer print. Many of the entries are, of course, small, with only one or two references to an infant who died young, or an outsider. Many others are very lengthy indeed, for example the 542 to 'Henry Abbott'.

The land index

This is an index showing every occurrence in the records of each names piece of real estate, that is land and houses, lying within the manors of Earls Colne and Colne Priory. This is no attempt to link together or separate specific plots and houses. Thus under one general name there may be references to several separate properties of that name. No attempt to pre-judge connections between records has been made and it is up to the searcher to decide whether the documents refer to one property or different properties with the same name.

The entries appear in alphabetical order of name. One name has been chosen as the standard name and under it are printed all the variants: for example, the different names which particular plots were called over the three hundred and fifty years of the documents. A separate list has been produced which shows for each variant the standard name adopted in the main index. Thus, for example, to find land called Ansaxhegge one would look in the preliminary list to find that the standard name is Hancers Hedge. The lists of variants and the index were produced in the following way: the computer was used to group together similar names of property, which were then substantially modified and refined by hand. This was done on the basis of partial linking of property records through a hand index so that it is possible to put together or separate properties which we know to be the same or different. Such an index is more than a simple index by name; it is the result of the partial linking of records.

The land index gives for each standard name the numbered reference within the data of at least one occurrence of that name. Each reference to an occurrence of that name is specified by the paragraph number where it occurs. As with the name index, a specific record may contain more than one reference to a piece of land. The index cross refers to a map of the parish which has been reproduced on the microfiche collection. Although not as lengthy as the name index, this land still occupies some 21,482 lines of computer print-out.

The Place index

This is one of the indexes which would have taken a considerable amount of time to create by hand and is thus only available in computerized form. The index shows every occurrence in the records of each named place. It includes the names of countries, counties, cities, towns and villages. It also includes the names of manors, but it does not include the names of houses and parcels of land, which are in the land index. It does include the names of streets in Earls Colne.

The entries appear in alphabetical order. One name has been chosen as the standard name and under it are printed all the variants. The lists of variants and the index were produced in the following way. The computer was used to group together similar names of places. This was then substantially modified and refined by hand. As the computer can only group names consisting of one word, indexing those places whose names consist of two or more words is difficult. For instance, Castle Hedingham and Sible Hedingham are problems: all the Hedinghams may be found under the standard name of Hedingham, but only Sible Hedingham will be found under the standard name Sible. It becomes more complicated if the component names are extremely common. As a result the qualifiers Great and Little have been excluded. Where certain spellings have only been used in one context, they have been utilized to differentiate otherwise ambiguous compound names.

The place index gives for each standard name the numbered reference to the data. As with the other indexes, the same name may occur more than once in a record, and this will only lead to one reference. When printed out, the place index generated some 11,823 lines of text.

The date index

This is an index which it would take many years to create by hand, and indeed it is doubtful whether it could be done even then. Essentially, every piece of information in the database has been assigned a date and the computer has then inverted the file and has provided a reference to every date mentioned in the documents. Each reference to an occurrence of that date is specified by the paragraph number where it occurs. When the date is exact, specifying day, month and year, then the references to that date are listed in the index. Imprecise dates, for example those which merely give a year, or even a range of years, are handled as follows. If a date is accurate to within a month, then the records which contain that month are listed in the index entry, labelled with just the name of the month. If a date is less accurate than a month, records which contain that date are listed in index entries labelled with just the year. If the span reference will appear in each index entry for the years involved. For example, the date range 1610-1612 will appear in index entries marked 1610, 1611 and 1612. The date Jun/1610-Dec/1610 will appear in the index for 1610. The date Jun/1610 or 1/Jan/1610-5/Jan/1610 will appear in the index for Jan 1610. The date 1/Jan/1610 will appear in the index for 1st Jan 1610.

Essentially, therefore, we have an index which forms a sort of diary to events in the village. Events recorded as occurring on each day of each week between 1400 and 1750 are recorded. Since the computer has a program which automatically converts dates into days of the week, it is thus possible to look at what happened on Fridays, or a specific Friday in a specific month in a specific year.

The subject index

For the historian this is the most interesting of the indexes and it is one which it would have been impossible to make without a computer. Basically, it is an index showing the use of every word (with exceptions noted below) in the many thousands of pages of documents. We will give a fairly full description of its nature and creation since it is so important and unusual.

The computer was used to make the preliminary extraction of words, to make subsequent context checks, and to give the final reference of the use of each word. Firstly, a list of all the words present in the documents with their frequency was made by the computer. It was from this 'population' of words that the individual words (including all the typing and spelling errors) were then extracted manually and arranged under the keywords (described below) to form a thesaurus. For each word under these keywords the computer was used finally to find and list their 'paragraph' reference numbers.

Initially the task appeared fairly straight forward, simply arranging 'sheep' and 'pigs' under Animal, and 'apples' and 'pears' under Food. As English words rarely have only one meaning or use, 'applies' could just as easily be placed under Crops - in fact they are listed under both keywords. However, apples are always apples, and will always be at the same time both a food and a crop. The problems come when a word may sometimes be used as one thing and sometimes as another. Take the word

'bill'; this may be used as a tool, as in a hedging bill; in the sense of bills and bonds; or in the case of a verdict, as in 'true bill'. It is found frequently in all these senses and must therefore be listed under several headings. But whereas each reference listed under 'apples' will find a fruit that is at the same time both food and crop, each reference to 'bill' will not necessarily refer to the particular keyword under which it is found. It is because of this problem that certain decisions had to be taken with words which appear frequently in one guise which may have little information content, and rarely occur in a form which may be interesting. If they are placed under the keyword relevant to the rarer form, the searcher would have the frustrating task of sifting fruitlessly through many references to the more frequent usage. Of course it would be possible to edit by hand each reference after exhaustive context checks, but this would be almost as time consuming as composing a standard subject index. It was not always possible to find these ambiguous words, although all possible care has been taken to check all suspect words of medium or low frequency. Great care therefore has to be taken before using the frequency or absence of certain words in the index to support the argument.

Another difficulty is that over long periods of time the meaning of some words changes. For example, the word 'spinster' at the beginning of these documents most frequently refers to one who spins, whereas by the end it refers almost exclusively to an unmarried female. As with the example 'bill' above, this word is listed under several headings, and may be found equally under 'Clothing Industry' words as well as under 'Status'.

Where a word is modified by the addition of another, particularly where each word on its own has little intrinsic value, this index, unlike a true subject index, cannot hope to satisfy. It is realized that many important areas of study will as a result be poorly covered. However, where a word is most frequently used in one of these multiple situations, and has a minimum use elsewhere, it has sometimes been included. This accounts for some of the more apparently unreasonable inclusions.

In order to make it easier to search through the words, it was decided that they should be grouped, as in a thesaurus, under major headings. Whereas some of the keywords or categories chosen are self evident, there are others where inclusion must be explained. As a large proportion of the documents come from courts of law, so a disproportionate number of the keywords refer to crimes and criminals. As actions and people are separated in listing Industry and Occupation, so are the Crimes from the Criminals. Unfortunately, the crimes committed are not usually specified: larceny, the action of unlawfully carrying away of personal property, is most often described by words such as 'he did unlawfully enter, take and carry away...' Although the words 'take' and 'carry' are in themselves quite innocent words, and are used in the documents in many different senses, they mean in this phrasing that a crime is alleged. Hence we have decided that all the words that may imply a crime, but are not themselves crimes, are included in a large and varied collection of words under the keyword Crime.

Ultimately, most researchers wish to reach into the society, to the people and their hopes, fears, morals and aspirations. It was with this in mind that the index was extended beyond the simpler nouns (like animals and crops), to include keywords such as Personal, Social and Moral. The choice

of keywords and their construction is loosely based on Roget's Thesaurus. Whilst Roget has many subdivisions within each of these categories, they have been amalgamated here in the interests of simplicity. As a result of this some of the words included under these keywords may appear rather bizarre.

The form of an index is as follows: keyword, word, reference number. The keywords are chosen to reflect the contents of the documents and our current interests. They are arranged alphabetically, and not in any logical or hierarchical system as in a true thesaurus; in this respect, the index more truly corresponds to a thesaurus. Under each of these keyword headings are listed alphabetically words lifted from the documents. Their inclusion and exclusion are entirely subjective. Below each word there is listed a reference number for every occurrence of that word in whatever sense in a record. As this is generated within the computer, it will accurately reflect the exact number of occasions upon which each word was used, it will not, however, give more than one number if the word is used more than once within once record.

Included with the major index is a cross reference index. The form of this is: word, keyword. Here, rather than the keywords being alphabetically arranged, all the words used in the major index are listed alphabetically, and against each are all the keywords under which they can be found. If, for example, one wished to study surgical practices, one would look under the cross reference index for the words 'surgeon', 'surgeons' and 'surgery'. Against the first two would be the keywords Medical and Occupation, and against the last Medical and Industry (being loosely the carrying out of an occupation). Having found the keywords covering the topic of interest it would be necessary to look through the list to find the references relevant to each word.

The indexes provide a reference to occurrences in numbered records. Certain words, although of interest, appeared so often that to print all references to them would be wasteful and unhelpful. An interested searcher would thus have to use the word searching program directly on the data to find all references to these words. It was therefore decided to omit words which produced more than five hundred references. A list of those words which have had to be omitted is given in the index.

A listing of the keywords (with expanded meaning in brackets where required), will give an indication of the major areas where the documents are particularly full. They are as follows: agriculture, animal, apparel, bed (beds and bedding), bible (bibles and books), body, bounds (hedges, walls, fences etc.), church (church buildings), church goods (furniture, vestments etc.), churchmen, cloth, clothing-industry, communications, construction (building materials and methods), crime, crimes, criminals, crops, death, drainage, drink, edifice (buildings), education, finance, fire (fires and fuels), food, goods (non-household movables), householdstuff, house, industry (carrying out of an occupation), jewel, jurisdictions, kin (kinship), land (not including buildings or tenure), legal (legal terms), medical, money, moral (words implying moral judgments and standards), occupations, office, personal (personal attributes and emotions), play, pollution (dirt and decay), poor, relation (relations other than kinship), religion, rights, rites (religious rites), service, sex, size (measurements), social (words implying social relationships and attitudes), sport (blood sports), status (position in society), tenure (holding), time (saints days, days of the week etc),

transport, verdict (outcome of case), warlike(weapons and violence), weather, wood, youth

Just to give an idea of what sort of words will come under such a keyword, we may take one of them, body. The following parts of the body were referred to in historical documents for an English village between 1400 and 1750: backbone, belly, blood, bosoms, bowels, breast, brow, cheek, chest, elbow, eye, face, feet, finger, fist, foot, forefinger, forehead, head, heart, heels, intestines, joint, knees, leg, lungs, mouth, neck, nose, nostrils, prick, privities, shoulder, skin, stomach, thigh, throat, tongue, tooth, waist, womb. Using the wordsearch program of the computer it is possible to find the contexts of the use of each of these words. By hand, with the index, one can search through the microfiche of paper copy to find how the words were used and how the words' meaning changed over time. The total length of the index, when printed out, is some 4,810 lines.
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PRELIMINARY IMPRESSIONS FROM THE RECORDS

Preface

The gathering together and indexing of the records using both hand and computerized methods has been a much larger task than we originally anticipated. We are now, however, at last in a position to begin serious analysis of the linked records and to set them within the context of the wider English society. Over the next few years we will draw on these records in pursuing general themes. Currently, we have commenced analysis of a number of topics. At this stage it is only possible to indicate some of the areas which we will analyse. Some preliminary impressions of what we are likely to find will be outlined, though these are at present only working hypotheses. Publications which have already appeared will be referred to. Thus this a broad survey of the possible value of local records and of the impressions which we obtain from those of Kirkby Lonsdale and Earls Colne.

Natural world and material culture

The records of local communities throw little light on the natural world within which human beings have lived out their lives in the past. We sometimes obtain glimpses of the climate and of the seasons, of the weather and of the soil, the vegetation and the animal species which must have played an enormous part in shaping the quality of people's lives in the past. Yet we have to make an effort to remember this for such matters only appear very occasionally and in the background, indirectly echoed by the documents. This is a major contrast with anthropological experience, for example in the study of the Nepalese community (Macfarlane 1976), where one was constantly aware of natural forces, of the forest and mountains, of the struggle to obtain enough water or wood, of the overlap between the human world and the world of animals and birds. Indeed, if the historian is going to attempt to grasp some idea of this natural world, he needs to put his documents on one side, take the advice of the historian R.H. Tawney, and walk around the area he is studying. Only then will he obtain some idea of the contours and the soils, of the climate and vegetation, even

if these have changed very considerably since the period under study. We undertook a good deal of this practical fieldwork, particularly in Kirkby Lonsdale which has suffered less change than Earls Colne.

Anthropologists have always been particularly interested in material culture. They see field shapes, house styles, clothing fashions, tools and measures as expressions of culture, as communication systems as well as material phenomena. Here again, though there is slightly more information in local records, it is still largely a matter of small, discrete, pieces of information. The situation is much better in Kirkby Lonsdale than in Earls Colne, for in the former there are many hundreds of surviving and detailed inventories of possessions. From these and other documents we can learn a certain amount about food and food preparation, about cloth and cloth production, about furniture and housing changes. We can also learn a certain amount about those matters which were regulated by the manor, for example, fencing, ditching and the use of proper weights and measures. Putting all the sources for the two parishes together, including diaries and other accounts, what are the first, over-riding, comparative impressions?

When we compare the period 1400 to 1750 in English parishes either to contemporary continental parishes, or to the Third World today (for example the Nepalese study), certain features seem to stand out. Comparatively speaking, we are examining a very tamed and affluent world. It was a very orderly and controlled material world, with the physical dimensions, the tracks, woods, field shapes, waterways and building patterns, already well established by the start of our period in 1400 in Earls Colne. This was a long-inhabited landscape, almost entirely shaped by man. Within this landscape there lived a basically very well fed, well clothed and well housed population whose 'standard of living', when compared on the whole to other contemporary peasantries, was very high. Over the period as a whole there were some substantial changes; a few in the basic natural world, and more in the world of diet, clothing and housing. It would seem that for some there was rising affluence, though for many by the eighteenth century the position was worse than it had been in 1400. What is surprising, perhaps, is that given the length of the period, some 350 years, it is difficult to see any major 'revolution' in the material world. Improvements, modifications, and alterations there were, but these were spread out and did not alter the basic material features of the society. The central characteristic of the society, namely that it appears already to have reached a peculiar situation which fits neither into the normal 'subsistence and totally dependent on the material world' type of pattern we find in much of the Third World today, nor into the post-industrial pattern (of more or less total divorce from the natural world), always seems to have been present. We are dealing with a pre-machine society, dependent, as all such societies are, on wind, water and animal (including human) power. Yet unlike many such societies, it seems to have escaped from that extreme vulnerability - to the weather, to the seasons, to animal and crop diseases - which continued to afflict much of Europe until the later nineteenth century. In terms of agricultural and other productive technology, it is difficult to find any hint of a major shift. The techniques and material culture of the start and end of our period was still largely within the same framework.

The one great vulnerability lay not in relation to food, but in relation to disease. Although famine

and even dearth appear to be largely conquered, this is not the case with disease and epidemics. Here are clearly dealing with villagers who live in a society which in its incidence of endemic and epidemic diseases had patterns which are in marked contrast with the present and fall in the broad range of 'pre-modern' structures. High infant mortality rates, bubonic and pneumonic plague and smallpox, were very marked features of the society and helped to give it its peculiar flavour. The obsessions with sickness and possible death is very forcefully shown, for instance, in the diary of Ralph Josselin, the vicar of Earls Colne.

The demographic world

We shall be exploring at some length the changing population of Earls Colne and the accuracy of various sources for estimating population. The combination of parish registers with all other surviving records makes it possible to undertake very intensive analysis of fertility, nuptiality and mortality at the parish level and we will be pursuing this. The most general findings confirm the work of the S.S.R.C. Cambridge Group, namely that there are a number of peculiar features in the English situation. In contrast to much of the continent and many developing societies, population growth during this period was slow, marriages were at a very late age and mortality and fertility were well below the high levels found elsewhere. There was an absence of a relation between high fertility and high mortality in 'crisis' years. There were large numbers of never-married persons. Many of these features are thought of as 'post demographic transition' phenomena and it is curious to find them in English parishes in the period before the eighteenth century. At present our central thesis is that the peculiar demographic features were linked to peculiarities in the social and economic system. The stress on private property and an individualistic ethic had broken the link between economic, social and biological reproduction. There was thus a contrast to 'peasant' or 'tribal' systems where the stress on communal ownership and the family often leads to a great pressure to have children. In the latter situation population characteristically builds up until a crisis (war, famine, disease) decimates it; it then starts to build up again. The disincentive to have children, the delaying in marriage until a person was mature and independent, these are features which we can explore in relation to other parts of the society.

The operation of formal institutions at the local level

Anthropologists have always been interested in the formal institutions which appear to control society. Yet because they have usually worked in tribal or peasant societies where State and Church, the 'Great Tradition', is absent or distant, they often say little about them. The absence is compounded by the difficulty of simultaneously studying a particular community in depth and also being able to investigate the major centres of power. The material from Kirkby Lonsdale and Earls Colne is particularly helpful in correcting this bias. This is firstly because, for reasons alluded to throughout this report, the gap between the 'little tradition' of the community and the 'great tradition' of the State and Church does not seem to have developed in England. We are dealing with historical material created by a centralized Church and a centralized State. The very records themselves give evidence of the activity and the local penetration of these institutions. Indeed, most of the records we have were made by formal institutions, the State, the Church and Estates. Consequently much of

the material throws light precisely on that link between the centre and the periphery which it is so hard to examine through conventional anthropological fieldwork. Let us now examine each of the formal institutions which impinged on the life of inhabitants of Earls Colne and Kirkby Lonsdale in a little more detail.

State Institutions

About the operation of the State we can learn a very great deal. About the various courts of common law and equity and their processes and the cases that came before them; of the operation of general laws at the local level; of the power and jurisdiction, the interplay between national law and local custom, there is much information. We can watch the officers of the State at the local level, the Justices of the Peace and the constables, operating over the centuries and see the way in which social control was maintained. We can investigate the financing of the State, how the taxes were allocated, collected and avoided. We can watch how the State raised soldiers, controlled the market, attempted to direct migration, tried to deal with problems of poverty. Changes in these areas over the centuries can be observed. Brief examples of the kinds of analysis we are undertaking may be described.

We have begun to analyse the effectiveness and workings of the criminal courts, from the Quarter Sessions, through Assizes, to King's Bench. A great deal of work has now been undertaken on criminal patterns in the past using the records created by such institutions, but serious doubt was cast on the value of such work by Dr. James Cockburn, who suggested that many of the details in the records such as the name of the accused, the domicile, the date of the offence and the seriousness of the offence are inaccurate if we compare recognizances and indictments. By setting the indictments within the context of a total reconstruction of the records of two parishes it is possible to test just how accurate or misleading criminal records are. We have published a monograph examining these problems (Macfarlane 1981) and we have carried out other exercises to examine the problem (Macfarlane 1980). It would appear that indictments in Earls Colne clearly distinguished between the accused, his accessories and receivers, and that the value of the goods stolen was indeed sometimes lessened to avoid a capital offence. By comparing the occupation/status given in the indictment with that in the local records, it becomes clear that there is not such a large discrepancy as Cockburn feared. For instance, in 9 out of 17 indictments so far checked for Earls Colne there is an exact match and in all but one of the other cases the difference arises because one document is speaking of status, the other of occupation. Thus a person was both a labourer and a bricklayer. As far as residence is concerned, of fifty accused persons said to be of Earls Colne, it would seem that about one quarter were only so described because the crime was said to have been committed there.

Concerning the actual operation of the criminal law, we have published a study which combines the use of local records, the manuscript records of a local justice, and central Assize records, concerning the parish of Kirkby Lonsdale (Macfarlane 1980). By setting these findings in a comparative framework, we were able to argue that many of the recent stereotypes concerning the lawlessness of the past were incorrect. Again, we draw attention to many of the peculiar features of

the English population - the absence of bandits, of physical violence, of mafia, of opposition between young and old, town and country, peasants and landlords. In that study we concentrated on the criminal courts, but we are now working in parallel on the civil courts which were, in many respects, more important.

We have been examining the process and contents of the records of the central prerogative and equity courts which flourished in the later sixteenth and seventeenth centuries and which provide lengthy bills, answers and examinations. Chancery, Requests, Star Chamber, Wards and Liveries are the main courts and because of satisfactory catalogues and indexes and other factors, these records have largely been neglected as a source for local analysis.

For Earls Colne there were a clump of cases, extending to over a hundred thousand words of text, between 1580 and 1625. They concerned a dispute between the Earls of Oxford and the former steward whom they considered had cheated them and fraudulently obtained the manors of Earls Colne and Colne Priory. The bundle of rights in dispute covered many facets of life in Earls Colne. There were disputes over the tithes, over the appointment of the vicar, over the running of the school and appointment of the schoolmaster, over the responsibility of repairing the Great Bridge in Colne, over the standing timber in Colne Park, over the ownership of hop grounds, over the ownership of the mills, as well as over the very ownerships of the manors. These led to several alleged riots, smashed glass in the church, accusations of gross fraud and corruption. Nor were the cases confined to disputes between the gentry. Others were drawn in, the copyholders against their lord over the rights to chop wood on their copyholds, an aged woman over her rights to her husband's land and the right to disinherit her children. The cases were heard before many of the most distinguished judges of the land, Lord Ellesmere (Lord Chancellor), Sir Henry Hobart (Chief Justice of the Common Pleas), Sir Edward Coke (Chief Justice of the King's Bench), John Williams (Bishop of Lincoln, Lord Chancellor), and Viscount Mandeville (Chief Justice of the King's Bench). A great deal of verbatim comment is included.

In order to understand many topics, extending from the nature of the manor, of the judicial institutions, through to the attitudes of individuals to their superiors, towards children, towards law and order, it is essential to unravel this mass of litigation and to tie it in with the private account books, land transfers, wills and other documents which explain who the actors are and some of their motives. We have therefore spent some time drafting a preliminary analysis of this set of cases, so valuable in that they allow us to reach down into the ordinary lives of the villages. A preliminary draft of about 100,000 words of analysis has been written. This will need to be set within the demographic and economic analysis described elsewhere in this report.

Although these are bound to be very preliminary and tentative impressions from our work, it is worth recording our first conclusions from this analysis. In relation to the courts and law in general, the impression we have from studying two parishes in opposite parts of England over long periods of time include the following. When we look at the interlocking jurisdictions and courts, at the systems of common law, equity, conciliar, manorial and ecclesiastical courts, at who came to courts, the fees, the judgments, and the nature of the process, a number of peculiarities strike us in

comparison to the situation reported for continental Europe or the Third World. There is an impressive uniformity of law throughout England, with only minor differences between regions; an impressive universality of the law, with few distinctions because of wealth, status, age, sex etc; a marked durability of the law, with strong continuities in the main structure of the institutions throughout our period; and a massive involvement in law of ordinary people. The courts were used to persuade people to allegiance and orderliness through oaths and through judicial ceremonial. It is difficult to think of a more court-soaked society than England throughout this period and it is difficult to over-emphasize the strong interconnections between different jurisdictions and between the locality and the centre. If ever there was a society which lived under law and in a constant state of litigation, this was it.

In relation to the preservation of public order, we have begun to examine the control of violence, of what were termed at the time 'crime and misdemeanour', that is interpersonal acts which were held to be acts against the commonwealth and not just against individuals. The very classification of such acts as involving acts against a 'state' is, of course, interesting in itself and unusual. The detailed intervention of State appointed persons, from cases of the most trivial kind, offences on the public highway in the court leet, up to treason and riot and murder is very well documented in the materials and susceptible to analysis. Our initial hypotheses stem from Macfarlane (1981, ch.11), namely that we have in both our parishes departed a long way from the violent, brutal, feuding, bandit-ridden type of society which many anthropologists have found in traditional peasantries. The crimes we witness in both parishes are capitalistic crimes; theft, coining, extortion etc., and the level of inter-personal violence of a physical and verbal kind is fairly low. Furthermore, the treatment of offenders, while savage in theory, is not so savage in practice. Another interesting feature is the quality of the local policing. Although done by amateurs, the constables, justices etc. on the whole it seems to have worked well. Nor is there any evidence of a notable conflict between the local community and its norms of justice and those of the national law; the divergence between local custom and national law seems to have been slight.

The most striking fact about the system of government revealed by the documents is a curious ambiguity. Just as F.W. Maitland described England as the most feudal and the least feudal of countries, so England could also be described as the most governed and the least governed of countries, the most centralized and the least centralized. On the one hand an examination of the courts, of the collection of taxes, of the activities of the Justices, of the regulation of things like prices and wages, shows the everything ultimately flowed from the centre, from Westminster and London, downwards. The decisions made at the centre were as effective in Essex as they were in Westmorland; decisions and information travelled very fast. Every villager in both parishes through the rates, through taxes, through oaths, through poor law obligations, was tied into the central structure and there was a massive vertical integration of a kind totally unknown in the sprawling peasantries of India, China or France. It is no coincidence that the welfare state was invented in England, for the tradition of public responsibility, of the right and duty of the State and the Church to redistribute wealth, was already strongly present in both our parishes from very early on.

On the other hand there was an equally surprising and untypical devolution of power and responsibility. The local gentry, the local 'middling sort' felt that they had power to take decisions and were expected to take responsibilities. The taxes could be relatively light because there was only a very slender, almost non-existent central bureaucracy. The country was largely run by people who did so alongside their normal jobs, justices constables, jurors. The overblown bureaucracies which have been held to be responsible for the ills of many societies, the large standing army, the army of tax collectors and armed police and other paid officials, was somehow avoided. This again seems to be explained by some kind of vertically integrated bureaucratic system of an unusual kind. If we use Weber's three ideal types of authority- charismatic, traditional, bureaucratic - England does not really fit conveniently into any of them, but it is definitely furthest away from the first two of the types than the last.

It might be expected from this that such a situation, with an absence of officials, and a great deal of personal responsibility, would be an ideal situation for the development of those 'patron-client' structures which have been found classically in Mediterranean societies, India and China. Where the centre is weak, dyadic ties of a personal kind provide the effective, though informal, integrating mechanism. Curiously enough, this does not appear to have been the case. Of course, if one defines patron-client links very widely, as some have done, and include for example every tie between a lord and his man, then a copyholder who regularly takes an oath of fealty, is a client, and our sample parishes were thick with clientage. Furthermore, the deferential language of letters and requests to powerful people, and the use of money in return for 'favours' might lead an unwary analyst to jump to the conclusion that this is indeed a society in which government was based on just those personalized, unequal, quasi-moral, relationships which anthropologists have documented elsewhere. Yet the closer examination which has for the first time become possible by setting the complex legal cases in their social setting reveals a strikingly different situation. For example, except possibly at the level of the very highest of the aristocracy, the idea of a very powerful man who keeps an army of retainers in his control with political gifts, who forms a kind of channel to power and influence does not fit the situation. It appears from our studies that people bought advice and power on the open market through hiring lawyers, doctors, teachers, just as people hired helpers in the economic domain through employing servants, bailiffs and labourers. The essence of the situation is that instead of a quasi-moral relationship based on favours of a vague kind by the patron, including generalized 'protection', in return for which the client gives generalized support, there appears to have been a more equal relationship. This was a relationship of contract, in which a person does specific tasks - mowing a field, fighting a law case - in return for a specific fee. The cash nexus enters in and deadens the moral, long-term, aspect, making for that balanced reciprocity which anthropologists have analysed.

A related aspect concerns the morality of power, It is difficult to detect in the detailed documents that large gap between the 'official' morality of government - the supposed impartiality and rule-guided behaviour of the formal institutions - and the presence of an alternative, informal, morality, based on personal ties which is such a striking feature of most political systems, and which is often termed 'corruption'. Such a gap, the 'black economy' of the political economy, is very

widespread in much of the world. Thus it would be naive to assume that there was nothing of this. But the amazing fact about the system revealed by our probings into the documents is that, unless all traces are lost because everything was done by word of mouth or have been destroyed, the 'corruption', the gap between ideals and practice, is minimal. There is very little evidence in either of our parishes that officials were corrupt in the sense of confusing their private and their public lives. There is little evidence of that cynicism which leads people to defend their admittedly corrupt behaviour by claiming that 'everyone does it'. Just as in economic dealings, an honourable reputation was absolutely essential, since so much of the transacting was done on a basis of trust, so in government, all officials had to be assumed to be governed by public sentiment and to be above personal influence, otherwise the wheels of a complicated, largely unwritten and voluntary, system would not have worked. Justice and government not only had to be done, but had to be seen to be done. The anger and bitterness of the judges when they suspected that the court rolls of Earls Colne had been tampered with, their reprimand to the lord of the manor Harlakenden when they learned that he kept the rolls himself rather than leaving them with his steward, and the anger of the steward that he might become involved in something which might damage his reputation, are all parts of this system. Built into the structure was a complicated set of balances and checks; for example, the way in which higher courts could issue writs to bring up suspect actions and decisions from flower courts, or the way in which high constables were to check ordinary constables. The case described in Macfarlane (1981), concerning a deviant high constable, shows how delicate was the balance and the fierce reactions when something did go wrong.

The other formal institutions: Church and Estates

In the description of the nature of the record-making machinery we have provided an overview of how these institutions worked. There is certainly as much material on the operation of these institutions at the local level as there is concerning the influence of the State. In relation to the Church, we can learn about its officers, the clergy, churchwardens and sidesmen, its services and rituals, its financing, its courts and procedures. In Earls Colne the presence of a Priory up to 1534 enables us, through the use of account rolls and other documents, to add the further dimension of the study of a medieval religious house. The laws, customs and discipline of the church as observed at the local level, the seating pattern, the prayers, perambulations and ritual calendar, all find some reflection in the local documents. In Kirkby Lonsdale there is an especially interesting set of materials concerning the Quakers, for this was the centre of northern Quakerism. The church was also one of the main bodies which provided for the poor, so we learn a good deal about charity and the re-allocation of money to the poor. As with a study of the State, almost every question we ask takes us outside the parish, to higher levels of the organization, and to other kinds of evidence. The ethical and religious system which the Church as an organization tried to uphold will be examined later in this survey.

Perhaps the best recorded of all the formal institutions in the parishes was that of the landed estates, the manors. For Earls Colne, more than half of all the surviving records for the parish concern the operations of the manor court which deal with copyhold and other tenancies. The rolls also record minor offences concerning the land and breaking of the peace, quarrels, minor assaults

and thefts and other matters described above. Combined with the other archives produced by the Estates, the surveys and rentals, maps, accounts of income and expenditure, the transfers of land, as well as the indirect information from cases in the King's courts, we are able to learn an enormous amount about both the operation of manorial estates, and also about landholding and the distribution of property.

In conclusion, if we consider the three formal institutions together, what impresses us is the way in which they fitted together, and the enormous part they played in holding the society together. Their strength, uniformity and continuity, as we shall argue below, helps to explain many other features which are striking about the English system.

The economic world

We have undertaken a number of preliminary analyses of various aspects of the economy of the two parishes. This has been partly to discover substantive results, partly to estimate the utility and distortions in the records. For example, the manorial rental of 1678 for Earls Colne has been carefully compared to nearby documents, in order to see what is missing and the value of rentals in general. What emerges most clearly from this and other very extensive workings on the land transfers in the manor court roll of Earls Colne, is the care which must be taken in using manorial records. When they are almost all that one has, in the period before 1560 in Earls Colne, it is easy to believe that they reflect the real resident, landholding, population. They have thus been used by some historians to estimate many figures and facts about the society - residence patterns, geographical and social mobility, inheritance practices and even demographic rates. But when the records can be checked against other sources, as we are now doing, it becomes apparent that when dealing with the copyholders we are concerned with people who are often at several removes from the real village population. Many are outsiders, there are many subtenants, many people in the village never owned copyhold property. The manor must again be looked at as a legal entity, a corporation, and not as a real unit which coincided with a group of people living in a certain place.

We have now pieced together complete histories of the transfer of every piece of land and every house in Earls Colne, in so far as records survive, between 1400 and 1850. This framework of tenure can be combined with other records to provide a picture of the local economy. We have made some analysis of the private account books kept by Richard Harlakenden the elder and younger during the years 1603-1640. These give us invaluable information for Earls Colne on the running of the demesne land, otherwise poorly recorded in estate documents, as well as many details about local inhabitants, prices, law cases and other matters. Combined with Josselin's diary, probate inventories and churchwarden's accounts for Kirkby Lonsdale, as well as detailed litigation about property, we are beginning to be able to form some impressions concerning the nature of the economic system.

We may start with the occupational structure and the nature of occupations in these two areas. It is characteristic of many 'traditional' societies that there is only a very limited division of labour in the countryside; the society consists of artisans and skilled craftsmen and merchants who live in the

towns and are termed the 'bourgeois', and the peasants or agricultural workers who live in the countryside. In the countryside, each household of family is, as far as possible, occupationally self-sufficient. Peasants will try to do most of the carpentry and mending and making of farm machinery. What we find in our parishes is in sharp contrast to this. There are a host of trades and occupations which are often carried on alongside some farming, or, often, are the major activity of individuals. In the villages there are merchants and tradesmen, artisans and service workers of all kinds, from the start of our records. Such persons are often the wealthiest in the village. Almost all services can be bought for cash. There is a vast and intricate division and specialization of labour which, in itself, provides that organic solidarity which Durkheim believed to be the central feature of 'modern' society. This proliferation of occupations helps to give the parishes their special flavour, with the rich butchers, bakers, alehouse-keepers, weavers and others playing a very important part. It is as if, occupationally, the town and the country had become merged. The markets and the fairs which were held in both towns, alongside the many permanent stalls and shops, were features of this situation. In both areas the cloth industry dominated, but there were numerous other important manufactures as well. The number of shops and the amazing variety of things that could early be purchased in them (as shown in sixteenth century shop inventories for Kirkby), shows that this was already a 'nation of shopkeepers'.

By bringing together all the documents we can investigate the web of exchange and payment, examine the nature and extent of rent, the operations of market prices, the workings of shops and fairs. The impression is that from the start of the documents we appear to be in the presence of a fully monetized economy, dealing with villages within a national market and affected by national pressures. As with power, in economics we are immediately led out of the parishes to fairs and markets in other counties and towns and even to trade to the Baltic, the Continent, the Mediterranean and, later, to the New World and the East. The market was clearly, to use Polanyi's term, an 'instituted process': money, property rights, contracts and exchange alongside a centralized nation state and a common law and culture were the bonds which held people together.

This very extensive penetration of both the State and of the market economy into rural villages in Essex and Westmorland from at least the fourteenth century is in market contrast to what has been discovered from much of the rest of Europe. The kind of transformations, for example, which occurred in Scotland from the middle of the eighteenth century, and in much of continental Europe from the middle of the nineteenth, seems to have occurred in England before our records begin. Its importance is enormous. The context of a strong central State and very developed division of labour, free market for labour and commodities, extensive use of cash and credit, are all essential features in understanding the mentality and morality of the inhabitants which we shall examine shortly. The developed form of individualistic behaviour which we have argued elsewhere was characteristic of England could not have existed in a vacuum (Macfarlane 1978). Where the State and Market are weak and provide little integration, personal or 'status' ties are used to hold society together - mainly of the quasi-familistic type. Here the individual could stand alone because he was working in an already created web of authority and contract.

There are related peculiarities. One is the outstanding and early importance of contractually

employed training and labour. The very developed system of apprenticeship and of servanthood, for instance, is in marked contrast to much of Europe where training and labour was provided by non-contractual, family, labour. Throughout our period, in both parishes, servants and apprentices were clearly a very central institution.

One way of looking at the peculiarity is to look at the nature of the relationship between people and land. An analysis of what people in the parishes did, and of their monetary transactions, and hence, ultimately, on the land, a huge super-structure had been erected on it, a vast professional and trading world, so that most individuals spent much of their time in occupations which were not directly connected to land. The land itself had, curiously, become a commodity, an object to be dealt in, alongside other objects such as wool, preferments, membership of a trade guild. Land was a means to an end, like money, and not an end in itself. This is a very different attitude to that in most agricultural societies where land and the family are inter-blended and land consequently has a huge emotional and symbolic value for individuals. There is no hint in any of the many documents we have examined, whether wills, court cases, land transfers, of anything of this attitude towards land. It was mortgaged, bought and sold, rented out, with apparent disregard for its symbolic value. In fact the relationship to the land was but one aspect of a very peculiar attitude towards property as a whole.

Property, as lawyers and anthropologists frequently remind us, is not a thing in itself, but a set of relationships or rights in a thing. There is some peculiarity in the English common law notions of property, seen in the obsession of English law with real estate, which has led to a particular flexibility of the relationship of persons to 'things'. Two points can be singled out here. Firstly, the idea of private, individual, ownership - a concept alien to almost all peasantries - is clearly fully developed in England by 1400. Whether we are talking of copyhold or freehold, the individual and not some wider group 'owns' certain rights in a piece of land or a house. These rights may be conditional and hedged in relation to a lord or the King, but no more than any rights even nowadays are hedged in. We have investigated this topic in some detail, partly drawing on the parish material, in a monograph (Macfarlane 1978).

The second feature is that the flexibility of the concepts of property made it possible to separate a whole bundle of rights in an object and to assign them to different people. In many societies the rights have to be treated as a compact bundle - hence the difficulty or impossibility of leasing, mortgaging etc. In England there were infinite levels and differentiations between ownership, use, etc. This made possible the nested levels of tenancy (subinfeudation) which are such a marked feature of the society. The ownership of a particular house in Earls Colne, for example, might look as follows: King - Lord of Manor - Copyholder - Sub-Tenant - Sub-subtenant. It might well only be the last of these who was resident in the house; most of our documents deal with the top three layers who had financial interest, but regarded the house or field merely as source of rent and perhaps services of a mind kind. The situation is very similar to that today where most of the houses and lands are co-owned by their inhabitants and by banks and building societies which have lent them money. This series of levels of ownership, each one exploiting a resource and in return funnelling rent and services upwards, led to a very instrumental attitude towards land. Rights could be and

were bought and sold in almost anything - a school, the church, a trading company, a wood, a house. People's wealth comes from holding many of these.

This fact, so clear by the later eighteenth century, has been partly discussed by historians in various ways and is supposed to be one of the major products of an economic revolution, the transition to 'capitalism' in the sixteenth and seventeenth centuries. But a closer examination of the whole set of documents for two places over a long period gives no sign of such a revolution having occurred at all. With many topics, we could have explained this by the defects of the records. But in this case the records are very largely concerned with just this topic; three quarters of them are concerned with property and property relations. It is difficult to see how such a revolution could have escaped our attention.

The gap which had emerged between people and things, particularly land, was made possible by various symbolic instruments, the most important was money. Monetized values, whether in the form of actual currency or credit, are something which are held on the fringes of most traditional societies; it is well known that if they enter in too far they destroy a whole cluster of community and family values. Although money is essential in peasantries - principally to pay taxes, rents and for the purchase of a few luxuries and necessities from the outside world, it does not enter into most daily relationships. The situation in both our parishes from the start of the records is completely different. The penetration of cash is complete and spectacular from the very start of the material. The detailed account rolls, manor court rolls, rentals and other documents would not make sense unless we realize the importance of monetary values. Almost everything was given a price and almost everything was bought and sold for cash. Money seems to have penetrated to the lowest levels.

Connected to this penetration of cash we find many unusual features. One of these is the curious pattern of borrowing. In the absence of cash at the village level, a central feature of peasantries through the world is the growth of a class of professional 'money lenders'. In return for cash loans for dowries, taxes, to help before the harvest, such moneylenders appropriate large sums from the peasantry and often take over their land. This kind of money-lender, found well documented in China or India, is totally absent as an institution in our parishes. Of course there was a vast amount of lending and borrowing - but of a different form, which we examine elsewhere.

Another absence is that of 'share-cropping', whereby the owner of the soil takes half the produce and the worker the other half. This is an institution which avoids the necessity for cash as rent and it is very widespread in almost all major agrarian civilizations. It is found in continental Europe in the systems of mezzadria and metayage, but it is curiously absent and, as far as can be seen, has never been heard of in England. The particular concepts of property and widespread cash made it unnecessary. People leased land and paid a money rent instead.

A final feature may be noted, namely the curious system of inheritance of wealth. Two aspects of which may be mentioned in passing. Firstly, there is the stress on passing the property a more or less intact to one person through male primogeniture or entails. In much of the rest of the world,

property is equally divided between all children of all sons. Secondly there is the strong right to alienate the property. The property (except where there is an entail, as in some gentry families) belongs to the individual, and not to the family. Thus he or she may alienate it during life, or leave it by will to non-kin. There is no sign of the 'restraint lignager', which governed property on the continent. In both these respects there is little suggestion in the documents that the fundamental laws of inheritance altered in any important ways during our long period. Of course there were some shifts, as, for example, in the Statute of Uses. But the first impression from a study of numerous transmissions by will and by court transfer, is of the continuity of both rules and practices. A final oddity of the English system was that in cases where property was indeed allowed to go to kin, the rules ensured that it always flowed downwards. The early rule described by Maitland whereby property always descends and never ascends, so that uncles could never inherit from nephews, for example, is an important consideration throughout our period and was in complete contrast to the practices in the Roman Law countries of continental Europe.

There is very considerable material in the local records on these topics. For Kirkby Lonsdale we have a listing of inhabitants which enables us to investigate household size and structure. For that date, 1695, there is no indication of any major variation from the nuclear pattern documented by Laslett and his colleagues for other parts of the country. In so far as one can deduce these things in the absence of listings, it would seem that complex households were also largely absent in Earls Colne. The records also allow us to examine the kinship terminology, both the terms of reference and those of address, and how these change over the centuries. There seems to have been little variation from the 'Eskimo' kinship terminology of present-day England, which terminologically isolates the nuclear family. The other major area for anthropological analysis, concepts of descent, that is how people consider themselves to be related to each other, are readily apparent in the records. The material for both parishes indicates an identical system of an ego-centres and bilateral type, reckoning kinship through both males and females equally, though employing patronymics. This bilateral system fits with the kinship terminology and also with the inheritance practices which are also bilateral. The formal system seems to have changed very little over this period and appears to be structurally similar in the two parishes.

The records allow us not only to study the formal system and the ideal level, but the actual practice, the contents of kinship. In the documents we have many transactions between individuals - borrowing, witnessing, acting as pledges or guarantors, as well as negative acts such as assault and theft. We can watch the family system in relation to religion, economics and politics. Similarly we can devise measures of 'kinship density', that is the degree to which fellow villagers also tended to be kin. The importance or unimportance of quasi-kinship and fictive kinship, of institutions such as godparenthood, fostering, adoption can be analysed. Although many strands again take us outside the parish, it is possible as a result of very considerable effort to reconstruct kinship charts for many village families, a number of those we have created stretching back over several generations.

Likewise we have made some preliminary analyses of marriage patterns. The social and geographical range of marriage partners and the degree to which different occupations inter-marry have for some years now been subjects of historical analysis, as has the question of marriage age.

Less widely analysed as yet has been the question of payments at marriage, dowry and bridewealth, as well as marital property after separation, divorce or death. All these economic aspects of marriage are reasonably well recorded in local documents, particularly for the wealthier groups in the village. What are only mentioned in passing are the topics of courtship and love, of marriage arranging and of the quality of the marital relationship. Likewise the rituals of the wedding itself and the subsequent relations between husband and bride's kin are hardly alluded to. The historian has to turn to records outside his sample to answer the questions concerning ritual, symbol and structure which interest anthropologists. As in so many cases, we can observe something of the statistical patterns, but the assumptions and norms which produced these patterns are rarely even indirectly expressed. What are the kinds of impressions which are beginning to emerge from our work?

Kinship and marriage are without doubt the most important principles of social integration in the majority of human societies. Whether one looks at the economic, social or ritual worlds, the family and wider kin provide the prime unit for support. This has led to the many accounts of an opposition between the world of the family and the rest of society, sometimes termed 'amoral familism'. It has led many anthropologists to devote most of their monographs to the practical consequences of kinship. Because of the high geographical mobility, those who lived near each other were characteristically not kin. The basic unit of production was not the family, but the individual farmer, labourer or artisan and his wife. Those who co-operated in village life were mainly non-kin. In other words, kinship, it appears, did not provide the organizing principle for the economy. Nor did it do so for politics. There is only a very little evidence that feuds and factions were organized on kinship lines. Nor was kinship important from a religious or ritual viewpoint. There is no trace of ancestor beliefs, of family rituals (apart from rites de passages) that stretched outside the nuclear family.

The weakness of kinship outside the group of husband, wife and small children, also appears reflected in marriage institutions. In most tribal and peasant societies, where kin groups are discrete and strong, marriage is, in Radcliffe-Brown's words, a 're-arrangement of social structure'. Hence a marriage deeply concerns the whole community and particularly the two sets of kin. It is thus arranged by the kin, often with the aid of a marriage intermediary, a broker. The individual male and female have little say in the arrangement. Often the bride is very young, for her family must marry her off at puberty. There is no question of romantic love or personal choice and little encouragement for the young couple to get to know each other before the wedding. After marriage, the two often maintain their strongest link with others, particularly their siblings and parents; towards each other there is often reserve, often expressed in separate eating, walking, and peremptory commands by the husband. Marriage in such a situation is ultimately a political alliance, about the re-organization of flows of wealth, and in order to produce children.

The glimpses afforded by the local records for Earls Colne and Kirkby Lonsdale do not confirm to this model. There are no traces of marriage brokers. Clearly the young couple were often first attracted to each other. They appear to have been allowed considerable freedom to get to know each other. After marriage, there are a number of hints in the records that the husband-wife relationship

was more important than any other and that it was far more egalitarian than one might have predicted. Above all, since what seem to have held the society together were not the personal ties of blood, but the impersonal ties of money (the Market) and of office (the State), marriages did not in any sense 're-arrange the social structure'. A marriage affected the participants very deeply, but it was ultimately, as the Church emphasized, an individual contract between two individuals. Even the neighbours' veto could be avoided, as it often was in Earls Colne, by purchasing a marriage licence which avoided the necessity of the saying of the 'banns'. Thus individuals were not deeply embedded in family relationships, they had freedom of movement. From the time they left home, in their teens, they stood alone. This makes England probably the most unfamilistic pre-industrial society known to us.

Class, status and power

There is a great deal in the assembled documents concerning the various kinds of relations of inequality. A detailed analysis is possible of the distribution of ownership and wealth, of consumption patterns, linguistic usages, ways in which prestige and honour were gained and maintained. The historian has to work cautiously and indirectly since the documents do not speak of these matters directly and it is usually what is assumed and not said that is most important. Yet in their terms of address between individuals, in the seating patterns, in the patterns of intermarriage and in many other indices we gain some idea of the nature of inequality and watch how the principles and outcome change over time. We can also investigate the patterns of social mobility as individuals and families rise and decline over the centuries.

A major setting for many of these relationships of equality and inequality, alongside the important sphere of work and law, was in what we may broadly term 'leisure', although what is labour and what leisure is, of course, culturally defined. The English have, it seems, always taken their games, sport and drinking seriously, and consequently there is material for the study of informal relations in hunting and fishing, in the playing of games and gambling, and in the inns and alehouses which were so common in both Earls Colne and Kirkby Lonsdale. There are, for example, instances of games of tennis as early as the fifteenth, and of football as early as the sixteenth century. The enormous importance of public drinking is clear throughout the material and the inn and alehouse were obviously as important to the population as the Church or court room.

If we record our impressions specifically concerning class, we are faced with a strange contradiction in the material. England is often thought of as the most class-conscious of countries, and indeed in some ways it is. Inherited and acquired differences are very important now and they clearly were from the start of our period. The whole educational and social systems emphasize differences and people expend much energy in attempting to move up in the hierarchy. In this sense it was the most hierarchical of societies. Yet, in another sense, it would appear that it was a classless society. This was partly a function of the ease and frequency of social mobility. There was frequent inter-marriage between people at different levels. Though there is evidence of growing separation between a small village elite and the rest in both our parishes during the seventeenth and eighteenth centuries, the hierarchy remained curiously open. There was an absence of the almost

caste-like distinctions between the estates or orders which we find in the adjacent continental countries of the ancien regime. Except at the very top and the very bottom, it is difficult to know to which 'class' people belonged in the past. There was no obvious three or four-fold division; there was no 'middle-class', the best one can talk about is the large group of the 'middling sort', who varied enormously. There is a noticeable absence in our period of any kind of 'class consciousness'. Of course, there were remarks that certain people were too rich, that they were above themselves. But the idea that there was a discrete group of oppressed and downtrodden persons, a 'proletariat' who stood in conscious opposition to another group, the 'capitalists', does not work in either of our parishes.

It appears that there was hierarchy, but an open hierarchy, a meritocratic system of sorts. Wealth not blood was the great criterion of position, a situation where money and contract, not blood and status, ruled. Through luck and hard-work, or through bad fortune and sloth, a person could quickly move from the top to the bottom of the society. There were no discrete, enduring groups or orders. There was endless social movement and within one generation children of the same parents could be near the top and near the bottom of the social pyramid. Life was a never-ending game in which a person could at any moment lose most of what he had won. The insecurities of fortune's wheel fits very well with those religious and social insecurities which Weber and his followers have documented. This provided the social background for that acquisitive and competitive society which is reflected in the local documents.

If we turn from ownership of the means of production, or class, to status and status honour, there is the same contradiction. It is clear that we are dealing with a society where the difference between various estates are in theory very important. Through most of the period there were elaborate attempts to regulate the expressions of status - costumes, diet, deportment, sport. We are dealing with a society built on 'callings' and 'estates', on infinite gradations of that ascription of social honour about which Weber wrote. But unlike almost all other traditional societies, these ascriptions were not fixed and permanent. The gradations were so many and so subtle, and the convertibility of wealth into status so easy, that people appeared to have moved very rapidly up and down the ladder during their lives. The impermanence of particular positions appears to be linked to another curious feature, the absence of a bitterly enforced code of honour.

If we compare the situation in England (excluding for the moment the courtiers of the Crown) with that in the 'honour and shame' cultures documented by anthropologists for the Mediterranean, there is a curious lack of emphasis on 'respect' 'honour' and 'deference'. The constant competition for honour, with its constant ramifications in wounded pride, duelling, taunts, gossip, flaunting of male power, is missing. There are hints of this at the level of the higher gentry, but from the inhabitants of our parishes there is very little sign of it. This is certainly not a society held together by honour and respect. A related feature of this, the system of patrons and clients, of protection provided by the patron, and of respect and honour afforded to him by his client, is also, as we have earlier argued, largely absent. Although the villages we are examining appear to be impressed by wealth and by skill, they seem to be strangely unimpressed by political office.

Other principles of social structure

One of the principles frequently employed in societies to differentiate and to unite the world is the opposition between males and females. A great deal of material is buried in the local records concerning gender relations, but is it extremely difficult to interpret. Where gender is used as a major principle of organization, there is usually a very opposition between the ideals and behaviour of the sexes, as in Hindu, Islamic or Mediterranean cultures. In the extreme cases the worlds of men and women overlap very little indeed and there is a very large emphasis on the threat and hostility between the genders and on the inferiority and subservience of women. This is related again to the 'honour and shame' complex; men have honour, women bring shame. Against such a background, what is striking at first glance from our parish records is the absence of a marked opposition. There is a striking similarity between men and women, a relaxed and friendly attitude, a mutual and affectionate sparring of almost equals, an absence of most of what is now known as male machismo, of female 'shame' of a stress on threats to female virginity. Women are not hidden away by dress or by buildings; they are not the vulnerable possessions of men. Though within the family, in relations of power, the man has the casting vote, it is meant to be a rule at the family level where both are 'under the law'. There are only hints of a gender opposition. As important as gender as a principle of social differentiation and cohesion is age. Some societies, particularly those in East Africa, take this to the level of organizing most of their social life around age grades. In most peasant and tribal societies, age differences are very important indeed. The principle friendships and bonds are within age-grades, the principle oppositions and bonds of authority are between the old and the young. Usually this is marked by ritual; there are elaborate rituals of movement from one age category to another, from one social age to the next. Thus puberty and circumcision rites are central, and later rites mark off the very old. There is a very different role for each age groups. Such age sets were found, for example, to be the principle work groups in our Nepalese study. In general, when we look at the English parishes, what is outstanding is the weak development of age as an important structural feature. There are only passing references to age categories. There is no evidence that people grouped themselves for any important activities on the basis of age. Rituals of aging were very weakly developed. Social adulthood was automatic and was not conferred by the society, as it is by marriage or initiation in many other societies. There was no artificial way of divorcing social from physical age and hence keeping men as 'boys', and women as 'girls' all their lives. At the other extreme, there is little evidence that being one of the 'elders' conferred enormous power and dignity. The 'curse' of the old, for example, which is so often important elsewhere, is nowhere visible here. The natural aging process of the human body, just like its natural gender, was not built up culturally to provide a major way of conceiving of and organizing the society. This explains the almost total absence of those active 'youth groups', bands of young men who plagued many European societies. For example, there is no sign of developed age associations in village ceremonials, though of course it would be carrying the argument too far to dismiss the importance of age totally.

If, as we have argued, the natural features of blood, gender, age were not the basis for the social structure, and if they were not bolstered by constructed kinship and constructed political ties, we may wonder how the society was held together. A great deal of co-operation is required to run any

social system. If kin were dispersed and gender and age-bonds not emphasized, how did the society work? One obvious area is in neighbourly relations, proximity. It is thus strange to find once again a far from clear indication of the importance of mere physical proximity in our evidence. It is clear that people did rely on their neighbours quite considerably and inter-acted with them in a relaxed and non-competitive manner which would cause amazement in many familistic societies. On the other hand, in the end even neighbours could be dispensed with. There is less evidence of the presence of institutionalized work groups based on neighbourhood than one would find in many rural societies, for example in Galicia or Ireland. Apart from the legal entity of the 'tithing', there is little evidence of particular groups of neighbours doing anything together and yet much evidence of friction with neighbours. Neighbours, like kin, were forced on one, but in both cases, we have the impression that they had a large area of choice as to whether they used the relationship or not. It was possible to leave a potential relationship undeveloped and yet not to threaten one's subsistence. One passed the time of day with some of them, and co-operated and drank with them up to a certain point, but the relationship was manipulable and if a person moved on, his neighbours were left behind.

One has neighbours and kin thrust upon one, but can choose one's friends. It is by definition an equal relationship, based on mutual liking. The extreme example is love and marriage, 'married friends'. Thus friendship is different from all the relationships considered before, since it is based on pure selection. In many societies friendship is very weakly developed, or non-existent. The idea of having 'friends', people one likes, trusts etc. outside one's family or village is absurd. The idea of 'friends' of the opposite gender whom one is not courting is an abomination. But in a society where kinship and the other 'natural' principles of association are weak, friendship is given space. The public house is where one meets one's friends, the patterns of games and leisure and the conversations and contacts are with friends. It is possible, through Josselin's diary, and through wills and court records, to show that friendship is one of the pivots of the social structure in this society.

Friendships are usually based on a mutual interest, whether in literature, religion, leisure or business. They are, however filled with sentiment and endure over a long period. It appears that they were complemented in this society by numerous more fragmentary relationships. Indeed they were so fragmentary that it is difficult to perceive them and it is for this reason among others that they tend to escape the notice of the historian. In a society which is dominated by contract, rather than status, many of the relations are single-stranded ones based on exchanges. Such contact, often with strangers, or with people whom one vaguely knows but with whom one only has a single-stranded type of relation, are absent in many societies where people are mostly involved in complex relations at different levels. Thus, anthropologists have introduced discussions of single-stranded, bureaucratic, balanced reciprocal relationships. The presence of such relations depends on a situation where money is widespread, and contracts can be enforced. Our first impression from these parishes is that such shallow relationships were very widespread here from the start of our documents. It is a world which is largely based on single-stranded, equal, exchanges and contracts. It is, to paraphrase Milson's remark about the late thirteenth world revealed by Maitland, a flat world inhabited by equal neighbours. People seem to have treated each other as

potential partners in endless exchanges and contracts. The nearest anthropological analogy is perhaps the endless and individualistic exchanges of New Guinea. We are dealing with a basically transactional society. People are, as we see in the documents, constantly doing deals: buying, selling, hiring, borrowing, promising, agreeing. Such a system has to be protected by an elaborate legal and enforcement code such as that provided by the powerful legal system we have described above, for it is largely based on trust. Life is an endless game or competition, in which people are endlessly striving for minor victories and conquests. People are entrepreneurs and negotiators, constantly concerned not with that improvement in personal honour which is, for example, the obsession of many peasants, nor with splendid consumption, but with wealth and with winning another victory. Thus, when we draw diagrams of the social contacts of individual in our parishes, we find they are the centres of networks of short and longer-term ties, but the alliances are constantly shifting.

Sometimes however, the temporary relationships become more strongly re-enforced into associations of various kinds. It is thus one of the curious features of this system that it encouraged numerous associations based on like-mindedness. Although we only find a few of these in our parishes, it is a world which gave birth to such famous institutions as fellows of colleges, trades associations, the boy scouts and girl guides, the women's institute, in other words numerous societies to study and engage in all kinds of activity. At our period, most of these associations were centred on religious or economic activity, for example the Quakers or guilds.

The mental world

The study of alien modes of thought has long been a central concern of anthropology and it is here that it has made many of its most striking contributions. The historian would also like to enter the thought worlds of the people he studies, but at first sight the formal nature of most of the surviving documents and the fact that they were written by an educated elite would seem to make it impossible to go far in this direction. Yet recent work on wills, diaries, inquisition records and other sources has shown that the position is not an entirely hopeless one.

To start with, we can learn a considerable amount about literacy and education at the local level, the ability to read and write and sometimes facts about the ownership of books from inventories. The degree to which ability to read and write was important, the accounting abilities of village officers, the diffusion of the written word, all can be partly reconstructed from village records. The control of the written word is often a powerful tool in perpetuating the division between a cultured elite and ordinary peasants, between the 'Great' and the 'Little' traditions. The degree to which this was the case over past centuries in our communities can be examined in some detail.

Another area for investigation concerns thoughts about death, disease and causation. The occasional witchcraft or sorcery trial, religious sentiments expressed in wills, verdicts in coroner's inquisitions can be used to begin to build up a picture of the mental reactions to the high levels of mortality and morbidity and to the insecurities of the economy. There are hints of millenarian beliefs about the end of the world, of judgments and providences. The activities of minority

religious groups, particularly the Elizabethan nonconformists and later the Quakers provide information on religious beliefs and sentiments and force people explicitly to define their beliefs.

If, for the present, we include here religion, then the outstanding feature of the religious system that emerges from both our areas is its 'protestantism', that is the emphasis on individualism, asceticism, internalization of revelation. Contrasted to the world of saints, pilgrimages, rituals, masses, local cults etc. of southern Catholicism or other world religions, this is religiously a very domesticated, not to say impoverished world. Many take the Reformation to be the turning point, and it is certainly the case that the tendency in this direction was heightened by the abolition of the magic and ritual of Catholicism, culminating in the ultimate rational, quiet, meditative tendencies of Quakerism. But it seems likely that the political change at the Reformation did not really make a complete break in an older tradition. For the religious system, as can be seen, fits very well with those features of the kinship, political and economic system which seem to be present well before the Reformation. There was and continued to be a world of spirits and of Spirit, which the historian needs to bear constantly in mind. Yet there is a striking absence of that elaborate spiritual and ritual world which Durkheim, for example, saw as a manifestation of the particular mechanical solidarities of an agricultural world. It is already a world of much nonconformity and tolerance, of individual opinion, of inner revelation rather than communal ritual.

In pursuing the difficult topic of mind and thought, we would need to look more carefully at language and speech. This is difficult because we are dealing with written records alone, and hence do not know what everyday speech was like, except occasionally when it is reported. We can indeed make some study of changes in grammar and vocabulary and the meaning of words, and the introduction of new concepts over time. Indeed, since every word used can be intensively analysed with the use of the computer, and we have almost all the material surviving for two parishes over hundreds of years, it will be possible to make a most interesting study of linguistic usage. Through patient analyses we should also be able to piece together small sets of information on the attitudes to many things: towards night, day and the divisions of time, towards natural objects, towards the human body and its parts. There are even occasional glimpses, particularly in court cases or libellous rhymes, of the sense of humour of villagers and the use of language in gossip and ridicule. But all these gleanings need to be set within a range of other records.

Moving towards the more abstract field of symbolism, we can on the basis of the documents make some comments on the symbolism and importance of colours, numbers and gestures. The work of anthropologists on classification of animals, on boundaries, on purity and danger, can be partially replicated. We can study the material for the use of proverbs and sayings, the use of analogies and metaphors, the concepts of luck and chance. In none of these topics will local community studies provide more than a glimpse, to be supplemented by material from other contemporary sources. Often a search for material on a particular topic leads to a complete absence of information which then poses a difficult problem of interpretation.

Although this will overlap with our discussion of the effects of literacy and of the moral universe, it is still perhaps worth recording a few preliminary impressions concerning the mental world of the

inhabitants of these two parishes. The integration, monetarization, mobility which we have stressed throughout seems to have created a mental world very far from that in many ecologically similar societies. For example, the world we witness in the Nepalese society is a long way from that revealed by the Kirkby Lonsdale and Earls Colne material. The rigid polarities of space and time, divided into sacred and profane, safe and dangerous, tame and wild, male and female, which have been documented for many peasant societies are largely absent. As predicted by anthropologists, writing and paper, money and contracts, in other words free communications, have homogenized time and space: they are dead, flat, conquered. The village is not filled with dangerous areas, the years with special times. There is more qualitative evaluation that we might find in a modern industrial society. But when we place the evidence against the reported situation for most human societies, the qualitative differences are relatively slight. Concepts of purity and danger, for example, are very weakly developed; there are few, if any, absolute taboos. Indeed the very concept (and word) taboo, is foreign to the culture. The obsession in the society is not with boundaries and thresholds and rituals to join or divide, it is with money, contracts, custom, fair behaviour.

All these, of course, are tentative and preliminary impressions, for the data has not been properly analysed and is not, in any case, conclusive. Furthermore, first impressions are sometimes wrong. But certainly, at present, it would seem that what we are finding in Earls Colne may contrast very strongly with what is reported for other mainly agricultural societies. If, as we

have argued, the political, legal, economic and social worlds are also unusual, it would not be surprising if the mental world was likewise.

The moral world

Overlapping with the mental world in practice, but for our purpose here distinguishable, is the study of the moral world, within which will be included what is thought to be right and wrong, and the ways in which people act. These again are subjects which are at the centre of anthropological investigation, being at the heart of 'culture'. We will limit our discussion to sexual morality, economic morality and personal morality, each in turn only superficially.

Although sexual morality has been dealt with cursorily in the general description of morality elsewhere, it is a topic which deserves fuller treatment because the documents contain an unusually large amount of information on the topic. Thanks to the workings of the various courts, and particularly the unusually complete ecclesiastical records, the degree to which people in these villages were obsessed with purity, virginity, shame and honour, can be investigated in some detail. In the English material it is possible to make detailed studies of such topics as adultery, bridal pregnancy, bastardy, ordinary sexual relations, incest, sexual defamation and slander and we have commenced investigations of these topics. The formal codes and the degree to which people lived up to them, and their excuses when they failed, provide us with much to be investigated.

Perhaps the most striking first impression when we step back from the multitudinous evidence for our two parishes is the absence of horror, shame and emotion connected with sexuality. Incest and adultery, for example, which elsewhere are usually regarded with disgust and horror and often

physically punished, seem to have been only moderately regarded. Women's virginity was largely a private matter, and did not bring ruin, when lost, to her kin. There is no evidence of the testing of virginity at marriage, no large concern with women's sexual purity, little evidence of emphasis on male virility. Sex, like everything else, seems to be treated as a commodity. There is a curious combination of mild asceticism and a relaxed attitude which makes it impossible to classify the society as either 'puritan' or licentious. Furthermore, sex and fertility seem to have been well differentiated. There is some evidence that sex was for pleasure, rather than solely as a means to reproduce. But while sex was pleasurable, except in the fantasies of a few zealots it was not seen as the overwhelming and consuming passion. It was not assumed that every man or woman was burning with lust, that every widow was burning to enter into sexual relations, that males and females were like animals that had to be forcibly held apart. Indeed the whole sexual morality is puzzling, conforming neither to that in many other traditional societies, yet containing elements, for example of public scrutiny, which we find strange.

The playing down of the importance of sexual morality can be linked in a tentative way to many of the features described above. When the family and marriage are not the institutions which ultimately hold the society together, sex becomes less important. Adultery, incest, the ravishing of unmarried girls, do not threaten the very foundations of society. To threaten the State, or to threaten the economy, or even, to a certain extent, to threaten the Church, is to undermine the society. For these the punishment is death. But to violate and confuse sexual relations - as long as the partner is a consenting member of the opposite sex - is a venial sin. It is only when the sex is 'unnatural' in manner or includes force and hence assault, that it becomes a crime.

Turning now to economic morality, there is a vast amount of material in our sources concerning economic morality. the 'moral economy'. This concerns the ways in which economics were embedded in morality and the nature of their changing relationship. What was fair, just, honest and of good report in dealings over money, land and business is chronicled in great depth in our records. Much of the elaborate machinery of law and the system of equity was concerned with the problems of deceit, fraud, unfair dealings and the honouring of contracts. There is therefore ample material, particularly in the church and equity courts, to investigate the subtle and important interconnections between morality and economics. For example, we can study the degree to which the inhabitants of our two villages were bound by what certain anthropologists have called the 'image of limited good', that is the idea that wealth is limited and the increase of one person's wealth means the decrease of another's. We can see whether there appear to be changes in the economic morality, in the attitudes towards borrowing at interest, towards 'fair' rents, towards the moral obligations of property.

This topic takes on a special importance because this is the classic instance, according to sociological theory, of the transition from a pre-capitalist to a capitalistic economic morality, and hence we would expect attitudes towards usury, labour and its value, saving and spending, to be transformed. Local records provide some information, though again only a part, for the investigation of these problems.

These are large topics and even first impressions could fill many pages. One general impression that comes through strongly is the degree to which from a very early period there is a moral system governing economic behaviour, certain actions and attitudes are just, right, praiseworthy, but this morality changes in only small ways through the centuries. That is to say, it is difficult, certainly at the local level, to find evidence of a revolutionary transformation of economic morality. We might have expected at the start of the period to have witnessed economic behaviour embedded in social and religious constraints. We would have expected many 'capitalistic' practices and attitudes to be forbidden and penalized, for example the central feature of interest and acquisition. Gradually, as in the descriptions of Weber and Tawney, the rules should be changed so that people were now 'free' to pursue their economic objectives. As the rules changed, so we might have expected a shift in the nature of the game. People who had before tried to maximize social and ritual goals, perhaps, would now try to maximize economic profit in a 'rational' way (in Weber's sense). At the same time we would have expected a transformation of a moral economy appropriate to peasantry, with communal and family restraints, to one based on the individual.

Yet, in so far as we can see behind the documents, there is little trace of this revolutionary shift. It is difficult to see any obvious universal movement, with all the rules and ends of behaviour changing. At the start, it would seem, land and labour were treated as commodities on the market. Their use and acquisition were, of course, subject to rules about what was acceptable, and hence economics, as it always is, was embedded in morality. But it was not an embedding of a different kind from that today - in other words there was not a sea of kinship or religion which prevented accumulation. The same rules that governed behaviour in the fifteenth century, as far as we can see, were those that governed it in the eighteenth.

Having said this, it is important to distinguish the continuity of the rules from the varying outcome over time. The game having been played out over a very long period, the outcome was a different society, with a different set of social relations. But what it is difficult to find is a gradual separation out of economics. There were still rules as to what was right, fair and just, as there had been at the start of the period, and people still took account of these rules. Indeed the rules were so basic that they did not usually need to be stated since they were assumed to be universal, obvious and 'natural'. Thus the Lord Chancellor in Chancery interpreted these rules in the eighteenth century largely as he had done in the fifteenth century, though the country was obviously now a large imperial power and much more wealthy. The Church had lost some of its power of course, but it is difficult to find evidence that we have moved from the economic morality of a 'peasant' to that of an industrial/capitalist society. If this impression is confirmed by the nature of village records, it will necessitate considerable rethinking of many stereotypes.

Finally, there is the residual sphere of personal morality. This encompasses topics such as the degree to which moral codes are universal - one code for the rich and poor, men and women, old and young - or differentiated. Anthropologists have often noticed the absence of absolute standards of truth, good and evil in the societies they study. These matters are contingent; it is good to lie to an enemy or even to all those outside the family. Was this the case in our sample villages? How far did the 'moral community' stretch; was it bounded by the village border or did it even encompass

townsmen? Questions concerning truth and falsehood, of fairness and unfairness, of generosity and meanness, of cruelty and kindness are among the most difficult and intriguing for historians. If, as in Earls Colne, we are lucky enough to have people arguing about these matters in the ecclesiastical and equity courts, it is possible to begin to suggest certain features of the moral systems of past villagers.

We may take just one impression from Earls Colne concerning the uniformity of morality. In many peasantries truth and morality are limited, often one is only truthful, honest and fair to a very small set of close kin. 'Amoral familism' sets each family against another and certainly once outside the village all morality is dead and deception reigns. Truth is relative to the social relationships. Also morality is cut across by class or caste: the moral systems and responsibilities end at the bounds of peasantry, nobility etc. What is curious at first sight about the material from our villages is that people appear to have subscribed to an idea of universal morality: people were expected to tell the truth, the whole truth and nothing but the truth, that strangers could be trusted, that morality stretched outside the family and even the village. It is plain that many contemporaries believed that disinterestedness and altruism existed, that the world was not full of ravenous wolves. The ideas of the 'gentleman', of the word being as good as a bond, of fair dealing, are all parts of this complex. It is easy to see how necessary all this was for a commercial economy, yet this does not diminish the fact that it contrasts so strongly to the situation in many societies.

Emotion, feeling, psychology

This is a particularly difficult area to probe through written documents about the past. Yet there is material available, albeit indirectly, in the records of our villages. The feelings of parents towards children, of the young for the old, of humans for animals, of the wealthy towards the poor, are all expressed in deed and word. Often the remarks are in highly charged court settings, or couched in the formal prose of standard phrases. Thus there are great barriers to understanding. Yet the whole realm of the study of hate and love, of warmth and coldness which has begun to attract historians, can be given an added dimension through detailed local studies.

A few preliminary and very tentative impressions may be recorded. Certain historians, assuming that our ancestors approximated to certain stereotypes of peasants, have imagined that Elizabethan villages were filled with cold, aggressive, loveless people. What is striking about our first impressions from both Earls Colne and Kirkby Lonsdale is that it was not at all like that. The society was not disintegrated and hostile; it was united and integrated by many bonds, though they are the relatively unusual ones of money, writing, courts, occupations, friendship. There were, of course, quarrels and even armed encounters. Yet the society, looked at cross-comparatively, appears if anything to have been highly ordered and even highly controlled. Perhaps it was rather formal and rigid in certain respects because of the elaboration of etiquette, of courts, of officers; perhaps it was reserved in a way which struck foreigners sometimes as unfriendly, lacking the demonstrativeness of many races, but it was scarcely filled with hate and bitterness. Throughout the documents there are frequent glimpses of humour, of tolerance, of mutual understanding and of affection.

The impression we have is that we are dealing with a society where the poor, the old and the young were, to a certain degree, protected by Church, State and Community, where neighbours felt responsibilities for each other, and where there was a good deal of warmth in human relationships. Since most of our intimate detailed material is of a negative sort - the records of courts and crime - this is especially impressive. There is certainly no evidence of a thick atmosphere of distrust and intrigue, or age-old vendetta and feuding. The geographical mobility allowed people to move and escape. Perhaps the passionate emotions of intense devotion were muted, but correspondingly the negative hatreds were also absent. It is easy to slip into misinterpreting this, as people still do, as lack of emotion. It is more that the emotion is steady, even, widely distributed and muted - like the English climate and English cooking. The best analogy is of a complex game, where people tried constantly to defeat opponents, but with certain mutually accepted rules. Good reputation for honesty, decency, thoughtfulness and kindness were far above those for naked force. It was not ultimately winning, but how one won that counted. After all, in this mobile situation, the winner today might be a loser tomorrow and one should therefore treat a defeated opponent with magnanimity. The keynote was tolerance and affection, calmness and a sense of proportion. Although many did not live up to this, it was quintessentially demonstrated in the ideals of the nonconformist sects, and particularly the Quakers. It was shown in the absence of inquisition, torture, the unbridled use of force in social relationships. The curious combination of warmth and economic competition that we find in the nineteenth century in Dickens or Trollop, in the eighteenth century in Austen, is not an inaccurate representation of the emotional structure of the earlier formation.

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PROCESSING HISTORICAL DATA BY COMPUTER

S.J. Harrison and J.E. Styles 1979

The system described here is a research project, constantly evolving, and so this is just a description of one stage of its evolutions. Apart from the vagaries of the machines used the major considerations that have influenced the development of the present method of processing are: purity of data, and expense - both financial and computer resources. It is hoped that this manual will be a full enough description of 'our system' to enable even the complete beginner to historical or anthropological computing to understand how it functions.

The initial state of processing the data

Ideally for the purposes of accuracy the data used should be pure, that is neither abstracted nor re-ordered. As in ideal this is impossible to achieve, as something will always be lost in changing a hand written document into a machine readable form, but with the use of a few conventions the data has been kept as close as possible to its original form. The data is in the form of transcripts, xeroxes or microfilms of the original documents. If the documents are too large to make a hard copy of they are recorded on tape cassettes, and then converted into hard copy by audio typing.

Conventions in transcribing and typing

The conventions hereafter described are necessary for the computer processing of the material. Standardization is particularly important in the treatment of numbers; to distinguish dates from sums of money, for example. Before interrogating the data, it is checked by a parsing program (for fuller description see below). This converts the data into machine readable form. If it finds words or numbers in a form that it can't understand, it rejects the data, indicating the suspect passages with a series of error messages.

Spelling

Accuracy and utility have to be weighed and certain conventions adopted when transcribing, particularly in the case of spelling and punctuation. As the spelling in the documents is sometimes not even consistent, it has been decided with the exception of proper names, to standardize spelling to modern spelling. Archaic forms such as 'hath' and 'saith' and dialect words have been kept. A dictionary of these 'odd words' called .oddwordsoec has been constructed for reference. Capital letters suffer from the same inconsistencies in the original, and have been confined to proper names of people and places (to facilitate searches in the computer). The saints and Jesus Christ are therefore in lower case to separate them from the people. Titles such as Mr. Rev. and Lord also are all in lower case to separate them from the name, viz mr Abbott, and rev Adams. As the punctuation in many of the documents is missing or inaccurate, rather than re-punctuate and hence possible change the meaning in most cases the commas and fullstops have been left out.

Comments

Due to their great age and careless storage in the past some of the documents are damaged in some way, either torn, rotted or blotched by damp, so that certain passages and words are unclear. In these cases comments about the state of the document can be inserted, the comments placed within '~ ' signs, viz ~unclear~, or ~torn~, so that they can be distinguished from the text. If however only one word is unclear, and can only be guessed at, the symbol '#' directly after the word shows it to be questionable, such as Burton#. In some cases only one letter is unclear so that it could read Bufton, Burton, or Button the symbol '=' shows which letter is questionable, viz Bu=ton.

Abbreviations

To save space some abbreviations have been used, but apart from an aversion to changing the data, it has been found that while typing it is quicker to type the long form than try to remember a long list of the short forms. So the shortened forms have been kept to the minimum and used for frequent words where the meaning is clear. Widow for instance is shortened to wid, deceased to dec, yeoman to yeo etc.. The long formularized feast day names have been shortened: the annunciation of the blessed virgin mary to annun, the feast of st john the baptist to stjn, the feast of st michael the archangel to mich and christmas to xmas. The importance of shortening the feasts when used as a specific date will become clear in the section on dates. Short or rare forenames are written in full, but the common names like William and Richard are shortened to Wm and Rich - in fact this is no great change from the original where these forms are commonly used instead of the full form. Experience has shown that there is some ambiguity in forenames and surnames, and the use of relative position and name lists alone were found to be insufficient to resolve name lists alone were found to be insufficient to resolve name lists alone were found to be insufficient to resolve this. So it was decided to add a hyphen to the end of each forename to distinguish it from a surname, e.g. Rich- Rich for Richard Rich.

Data address

A document is located at a record office by its record office code, which is separate from the text. To find a document in the computer an address is also added that is independent of the text. In this 'address' the information that describes a document is on four levels preceded by these dollar signs \$\$\$, \$\$\$, \$\$ and \$ separated by blank lines. The first level \$\$\$\$ is at the beginning of each set of data and refers to that particular file name e.g. \$\$\$\$parish. The second level, of \$\$\$ level, has the record office code after the three dollars e.g. \$\$\$D/209. It can also be followed by any comments on the document, for example if it is in English or Latin, and if it is in poor condition e.g. \$\$\$D?P209 in latin particularly torn. The third level, or \$\$ level, refers to the page, slide or folio number and can be composed of numbers or letters e.g. page1. The fourth level \$ is the most important as it refers to the date of the document, and is written for example as \$6/4/1700. This sets the date for the text below until the next date is set. All the data in the text below is set at the '\$' date, and if only a partial date is given in the text the month or year is picked up from the '\$' date above. Not all documents refer to one date, some refer to a date range, for example "John Smith overseer from April the sixth 1700 to the twenty ninth day of September of the same year", in these cases the both dates are entered at the '\$' level separated by a hyphen viz \$6/4/1700-29/9/1700. The great advantage about the dollar system is that it is beyond the text and therefore does not effect the integrity of the data. For example the address of a document could be written as:

\$\$\$\$parish

\$\$\$D/P209 in English damaged slightly

\$\$page1

\$6/4/1700

As it is too clumsy to refer to different levels as '\$\$\$' or '\$' etc. each level has been given a name which describes its function. So that \$\$\$\$ is known as FILE, \$\$\$ as REF, \$\$ as PAGE and \$ as DATE. It should be added that these four levels need not be added manually if the next block of data has the same address as the previous, that is to say when the next document is on the same page or at the same date etc. the address will always be left unless specifically changed. These four levels describe the address of each document. There is however a fifth level, that of the entry. Whenever a block of data is separated by a blank line it is called an entry, one whole document can be an entry as in a will, or a document can contain many as in each event in a parish register. Although no dollar sign is placed before each entry it is in a sense there, and is known like the previous levels by its function - ENTRY. As \$\$\$ or REF labels each document, so ENTRY labels each small block of text within each document. A fuller explanation of its importance will be made in a later section.

Data Conventions

The most complicated of the conventions are those for dates. In all cases the ecclesiastical year is converted to the civil year prior to entry, as two incompatible systems would have made dating

impossibly complex for use with a computer. Regnal years are entered in a modified form of the usual convention (see below for full list), that is to say with the year of the reign first, then the abbreviated name of the monarch, and lastly the number of the monarch. So that the twenty sixth year of the reign of Elizabeth the first is written as 26Eliz1. When a full date is known it is written in figures with the day, month, and year delimited by /, e.g. 1/2/1234. If in the document only part of the date is given, for instance just the month and the year as in "in the month of April in the year of our Lord 1666", it should be written /4/1666. This is understood by the computer to mean in between the dates 1/4/1666 and 30/4/1666, that is the first and last day of the smallest or most precise time given - here the month of April. If only the year is given it can be written without the delimiter /, for example 1666. Similarly this is taken to mean a date range between the first and last day of that year. In the event of the year not being given the computer assumes it to be the year of the last date set. (The date is set as explained above).

As the documents are not always clear the same convention used for an illegible character can be used for an illegible figure. So if a smudge is over the day it is written for example as =/4/1666, which is then understood as the date range between the first and last day of that month. Although it is understood within the computer to mean the same as leaving the day out, it does register that a day was given in the document. Not all dates though have to be written in this form with figures, some are partially or wholly in words. The exceptions involve certain feast days, and the 'next' and 'last' features. The words 'next' and 'last' are written in the year position after the final /, and are used when they occur in the text e.g. the first of April last - 1/4/last/ The year of 'last' or 'next' is taken to be the previous or following one to that set at the DATE level in the address. Movable feasts such as easter and whitsun are converted prior to entry, with the help of the handbook of Dates (?) However, certain feasts such as the quarter days are frequently used and as fixed days can be understood by the computer. The quarter days mass, annun or Ladyday, stjn, and mich are written immediately before the / before the year, and understood as 25/12/, 25/3/, 24/6/, and 29/9/ respectively for each feast. So, "the feast of saint michael the archangel in the year 1600", should be written as mich/1600. The feast and year together separated by a / enable it to be recognized as a date, mich 1600 with no / is understood to mean only the year range. 1600 with no / is understood to mean only the year range. The shortened forms described in the section on abbreviations are important because the computer can recognize the one word in this position as a feast date, the long form having spaces between the words can only be understood as text not as a date. Other feast days used are martinmas, lammass, and candlemas, or 11/11/, 1/8/ and 2/2/.

Format =	the day / the month	/ the civil year
	1 -> 31 / 1 -> 12	/ 1 -> 9999 (e.g. 1234)
1--	blank / blank	/ blank
A	= / =	/ =
l	I _____ I / regnal yr monarch no.	
t	I	
e	annun	/ next
r	candlemas	/ last

n	ladyday	
a	lammas	
t	martinmas	
i	mich v	stjn
e	xmas	
l		

I__

List of all recognized monarchs

Anne1	Jane	
Edw1		Jas1
Edw2		Jas2
Edw3		Mary1
Edw4		PhM1 (Phil and Mary)
Edw5		Rich2
Edw6		Rich3
Edw7		Vict1
Edw8		WmM1 (William and Mary)
Eliz1	Wm3	
Eliz2	Wm4	
Geo1		
Geo2		
Geo3		
Geo4		
Geo5		
Geo6		
Hen3		
Hen4		
Hen5		
Hen6		
Hen7		
Hen8		

Other numerical conventions

All numbers within the text other than dates are written in full except when they can be used in mathematical calculations. In these cases a number is typed as a figure followed immediately by a qualifier. Figures without qualifiers are not accepted within the text. The amounts such as money, length, weight etc. all have their own qualifiers. It may be noticed that many of the qualifiers appear to have more than one equivalent. This is due to two major reasons, firstly the system was developed by more than one person over several years and hence variations crept in, but secondly

others are due to the computer only reading the first four letters of the qualifier, so that ange and angel are seen to be equivalent.

Money

In the case of money the qualifiers correspond to the coinage given in the text. Amounts are not converted prior to typing, so forty six shillings are written as shillings, and not as two pounds six shillings. Similarly neither are marks, angels and nobles converted to their shilling and pence equivalents. The qualifiers are:

guinea = gns, guin or guinea	pound = li
mark = mark	
angel = angel or ange	
noble = noble or nobl	
shilling = s	
penny = d	
halfpenny = h	
farthing = f	

For example six pounds seven shillings and eight pence halfpenny is written as 6li7s8d1h, with the qualifiers immediately following the figures and with no spaces in between. If spaces are included they are each assumed to be separate amounts.

Area

The measurement of area is complicated by some units varying over time. Also the qualifiers do not necessarily follow the text, where a measurement is given as being something and a half the 'half' is converted prior to typing. The area qualifiers are:

Square yard = sqyd
square foot = sqf or sqft
square inch = sqin or sqi
virgate = virgate or virg
acre = acre or a
rood = rood or r
perch = p

An acre and a half (or one acre two roods), is therefore written as 1a2r, again with no spaces in between.

Length

Length is also complicated by having more than one name in the text for one measurement. Rods

poles and perches are all the same (about five and a half yards), but rod was chosen to represent all three, as perches had been used as a measurement for area. Rod is written in full to separate it from rood which is written as 'r'. The qualifiers are:

rod/pole/perch = rod or rods
fathom = fm
yard = yard, yd, y, or yrd
foot = foot, feet or ft
inches = in or i

One rod one foot can be therefore written as 1rod1ft, and one fathom six inches as 1fm6in.

Weight

The qualifiers used with weight are quite straight forward, except that bushels are used as both measurements of weight and dry volume. These have been included only in dry measurement. So that where a mixture of bushels and stones is given they cannot be written as one measurement. The weight qualifiers are:

hundred weight = cwt
stone = stone or ston
pound = lb
ounce = oz

Five pounds six ounces are therefore written in the usual way as 5lb6oz, and six hundred weight as 6cwt.

Dry Volume

Dry volume has only two qualifiers, although it should perhaps also include the weight qualifier stone. The two qualifiers that are accepted are in fact the same amount, they are bushel and strike.

bushel = bushel or bush
strike = strike or stri

Hence six bushels are written as 6bush and two strikes as 2stri.

Liquid Volume

Liquid volume is very rarely used in the data, but it appears in some accounts when the smallest amount mentioned is a pint. All the qualifiers are therefore of amounts equal to and greater than a pint. The qualifiers are:

gallon = gallon or gall
pint = pint or pt

For example one gallon six pints can be written as 1gall6pt.

Time

Time is used with a year as the largest unit, and is used in situations such as age, length of time doing something etc. The qualifiers are:

year = year, years, yr, or yrs.
month = month, mont, mth, mths, mnth, or m.
week = wk
day = day or days

There is such a range of possible qualifiers because the system grew up without any standard being applied for some time. To use an example though, if in a document it says "died unapprised aged six years two months", it is written as "died unapprised aged f6yr2mth" (or 6years2mnth depending on the qualifiers chosen). Also if it says "to be paid at the age of twenty one years", it can be written as "to be paid at the age of 21yr".

Miscellaneous Conventions

Until now most of the qualifiers have referred to measurements ranging from time to area. One exception is of course money, which can hardly be termed a 'measurement'. A further exception falls under a miscellaneous heading, and refers to units of hearth tax. The qualifier used is:

unit of hearth tax = ht

Hence having one hearth, and so being liable for that amount of tax, is written as 1ht.

Further examples of these conventions can be seen in a mock will below.

Data Input

Until now it has been assumed that the data is typed, the conventions used when transcribing and typing have been discussed, but no mention of how the typed data is fed into the computer has been given. There are two major methods of 'input' into the computer, one being 'online', the other 'offline'. Both have their own advantages and disadvantages. The former involves sitting at a terminal and directly typing information in, which is then relayed through the communications system to the IBM370/165. The disadvantage of this is that if the computer breaks down while transmitting work can be lost. To feed the information in again involves having to start back at the beginning, this is wasteful of time. The advantages of online input are that being direct no time is

lost in getting the data into the machine, and that it can also be corrected at the same time as entry saving time in editing later.

Offline input is not as direct as online, and covers cards, paper tape etc. which are fed into the computer via a queue at the computer centre. The greatest advantage of this kind of input is that it involves a physical backup; cards or tape can easily be re-read in should any catastrophe happen and the data be lost in the computer. They also can be stored, allowing the work to be repeated quickly and easily. Cards however have the disadvantages of being expensive, and are restricting in size as information has to fit onto eighty columns, and to fit these columns the data has to be juggled and re-ordered, also they have only upper case. Luckily this is not necessary because conversely paper tape which is cheap, has no restrictions about size, so that one can type four or five hundred lines without worrying about columns, or any other restrictions. The ITEL machine used by this project is basically an IBM electric typewriter with a paper punch, which produces a hard copy to check against the output from the computer. The paper tape produced is wound up and marked clearly with the userid (each user has a user identifier, based on his or her initials and digits up to four characters e.g. jes1), and the name of the file to which the data will eventually go, for example, .parish. Due to the vagaries of the computer world there are a number of different codes, and the code of the paper tape from the ITEL is different from that of the reader, so a separate leader tape is necessary to run a job to translate the code from the ITEL into IBM code, file the information away, and produce a copy of what was filed. The leader tape also ensures that data on any new tape is added to the end of the set of data already in the computer. It can then be added to in this way until a usable block has been formed.

The copy of what was filed is now known as the output, and is printed on one of the printers in the 'User Area' of the Computing Service (This is the system here in Cambridge). The output is marked with the userid of the person who submitted it. By the use of these the computer operators post the outputs in the 'output tanks' which are open files in the User Area, in an alphabetical order by userid.

It was mentioned at the beginning of this manual that this is a description of and an ever changing system, an example is that recently, due to the availability of new methods, we have been able to use a totally different method of input. The methods described above involve using one large computer only. It is now cheaper to replace complicated mechanical devices such as an ITEL papertape punch or card punch with a small computer with a cassette or in our case a floppy disc. This can be used to store a block of data, edit it and transfer it to a larger computer. The partially edited date is transferred via a special cable to the Cambridge Ring. The Ring is comprised of several small computers linked together in a 'ring' which together act as a large computer. It seems likely in the future, with the falling price of small computers and the rising prices of mechanical input, that many departments or research groups will possess their own small computer linked to others in this way.

APPENDIX H

THE ORIGINS AND ORGANIZATION OF RESEARCH

Alan Macfarlane

Foundations of the research: 1964-1971

Like all good stories, this one really has no beginning and no foreseeable end. For the present, however, I will begin my overview of the history of the research as follows. It should be stressed that this is a personal and individual account. Others engaged in the project would no doubt see it differently.

In the course of a doctoral thesis on witchcraft in England in 1964, I began to work on the cross-fertilization of anthropology and history by trying to bring together the work of anthropologists on witchcraft with the historical materials for Tudor and Stuart England. In this I was inspired and encouraged by my supervisor, Keith Thomas of St John's College, Oxford. Mr Thomas was especially interested in the application of anthropological theory to historical materials. In order to establish the social background to witchcraft in Essex villages I began to investigate local records. The excitement of the first realization of the wealth of material contained in wills, parish registers, ecclesiastical court records and other sources, particularly when all of them were combined, led me into a pilot and partial reconstruction of three Essex villages, notorious for their witches. These were Hatfield Peverel, Little Baddow and Boreham. Some of the methods which were later developed began to be worked out here. For instance the idea of obtaining microfilms of documents, cutting them up, mounting them as slides and projecting them on a wall at home. Also devised was the important idea of using small cards to abstract the names of people in a variety of documents. The work was clearly very strongly influenced at this point both by research methodology learnt at Oxford in connection with the D.Phil., and particularly the application (via Brian Harrison) of the Webb's famous dictum "one fact one card". It was also

influenced by the initial work of the Cambridge Group. Peter Laslett and E.A. Wrigley at the Group were opening up new historical worlds and new methods. Particularly influential was the adapted methodology of 'family reconstitution', brought from France. This involved bringing together three bits of information: a baptism, a marriage and a burial, were abstracted from the original register and then combined. It was clear that is this generated a vast amount of extra information in relation to parish registers, the potential if one were to join together **all** types of records would be immense.

Thus by 1967 when I went to do an M.Phil. in anthropology at the London School of Economics three things were obvious to me. Firstly, that local records in England were very rich in potential and many sources existed which historians had hardly begun to work with. Secondly, that these sources could only be properly used if a new method was developed by which to analyse them, primarily consisting of a flexible way of breaking them down and combining them. Thirdly that just as anthropological theories had opened up new dimensions in the historical study of witchcraft, so they could likewise do in relation to a number of other themes, for instance kinship, marriage, sex. During 1967 and 1968 further records for the three Essex villages were collected and analysed with the help of my sister Anne Macfarlane and my mother Iris Macfarlane. Impressed by the Essex materials, Iris Macfarlane had begun to investigate the materials in her own local record office at Kendal. This coincided with the deposit of several important collections of material, including the Fleming archives. The Fleming papers contained lists of inhabitants for a number of parishes, the fullest of these was for Kirkby Lonsdale in Westmorland. So by the end of 1968 when I left for Nepal to undertake anthropological fieldwork, the collection and analysis of materials for Essex and Westmorland villages had started, though on a small and part-time scale. Two anthropological-type analyses of the Essex material had also been attempted, on witchcraft and incest. The first would appear as a book, the latter as craft and incest. The first would appear as a book, the latter as an M.Phil. thesis. The final strand at this time which would have a considerable influence in the future was a study of the seventeenth century diary of Ralph Josselin of Earls Colne. I had encountered the diary, a partial transcript of which was deposited in the Essex Record Office, while studying witchcraft. What started out as an article on Josselin turned into a series of articles and finally a book. This book, retrospectively, was important in two respects. Firstly it drew my attention to the marvellous diary which I would alter help to edit for publication and thereby to the parish within which it was written, Earls Colne. Secondly, it was a simple experiment in applying the idea that numerous topics could benefit from the comparative anthropological treatment. Hence the work was subtitled 'An Essay in Historical Anthropology'.

Growing familiarity with English historical documents and specifically the records of particular Essex and Westmorland parishes made it clear that the framework of questions hitherto established by historians needed to be extended to make sense of the material. Only a few of the topics which could be covered using such sources had so far interested historians. Social anthropologists appeared to have considered many of the themes not covered and so, after attending lectures at the Oxford Institute and reading introductory anthropology, I undertook a two-year course in anthropology. Here the basic grounding was laid. Yet in anthropology is it especially important to practice the craft. In order to gain the experience of living in a world which, physically at least, shared many of the problems faced by seventeenth century English villagers. I decided to undertake

fieldwork. Between December 1968 and February 1970 I lived and worked in the foothills of the Annapurna mountains in central Nepal. With my wife Gill, I made a study of the Gurung people. Using all available historical materials as well as observation and questions, I attempted to make a study of all aspects of Gurung life. In the subsequent published analysis I concentrated on demography and economics, but in order to understand these it was necessary to study religion, kinship, politics and all other aspects of the society. In 1970 I analysed the Gurung material in a preliminary way, setting it consciously alongside the English material which I had already assembled. Thus, by this day, interest had focused on three geographical areas - Essex, Westmorland and Nepal - and on the development of a new methodology of historical reconstruction, as well as on the theoretical interlinking of history and anthropology.

It was clear that such work required very considerable and sustained effort. How much effort would be involved was not at that time apparent. Most historians or anthropologists work on their own. Given the enormous amount of material which I wished to use to examine new directions in social history, the single-handed approach was patently inadequate. Some help had been kindly given by members of my family on a part-time and usually unpaid basis. They transcribed documents, drew maps, sorted cards. It became obvious that someone dedicated to the emerging project was needed. This need was filled by Sarah Harrison, then a part-time teacher. Between November 1970 and September 1971 she learnt to read the early documents and began to transcribe the parish register and other documents for Kirkby Lonsdale. It was at this time that I decided to undertake a detailed study of that parish, incorporating the bits of material which had already been accumulated. We walked the parish a number of times, drew maps and took photographs, and began to build up a picture based on the 1695 listing. Sarah Harrison left her job in July 1971 to work exclusively on this research and from October 1971 to September 1981, a period of eleven years, she worked full-time on it.

Establishing the project: 1971-1976

For the first year Sarah Harrison was employed by King's College, Cambridge, where I had become a Senior Research Fellow in History. During this first year, with the help of Iris Macfarlane, Mrs. Harrison did the bulk of the editing work on the diary of Ralph Josselin, which the British Academy had asked me to prepare for publication. This was combined with further work on Kirkby Lonsdale. The work on Earls Colne, Kirkby Lonsdale and the Gurung village was now in progress and I decided to apply for proper funding. An application for a four-year grant was made to the SSRC to last from September 1972 to September 1976. The aim of the project was to "further integrate the historical and sociological study of pre-industrial societies by undertaking a total reconstruction of three communities". These were the Nepalese village, the three contiguous Essex villages of Boreham, Little Baddow and Boreham, and Kirkby Lonsdale. The work was to complement that of the Cambridge Group and to study topics such as kinship, marriage, sex, mortality patterns, and domestic economics in a local setting. One full-time person (Sarah Harrison) and one half-time (Iris Macfarlane) were to be employed for four years. The material was to be assembled in a converted barn near to one of the sample villages where a workshop would be set up which people could visit to see the records. Some of the material it was stated, was to be

computerized.

During the first year of the project (1972-3) we gathered a good deal of Earls Colne and Kirkby Lonsdale data and finished editing Ralph Josselin's diary. I decided to abandon the study of the three Essex villages, whose records were not fully satisfactory, and to study Earls Colne instead, then thought to have a mid-period population of about 1,000 persons. We improved the hand methodology considerably, for example adding a colours code for the name index. Several people, including John Marshall, Peter Laslett, and Roger Schofield visited the new centre. On the computer side, I decided that the problems of indexing and linking the records would require more expertise than I could muster. King's College Research Centre agreed to fund a computer Analyst/Programmer for one year. Charles Jardine was appointed, to start in November 1973.

In the second year (1973-4) the immense size of the material became apparent. We concentrated on Earls Colne almost exclusively. Originally we had intended to limit ourselves to the period 1500-1750, but since there were excellent manorial records from 1380 onwards it became clear that we would need to start earlier. We also needed, because of high geographical mobility, to look at some of the records of neighbouring communities. We concluded that "data collection is a far more laborious task than anticipated". The manual indexing of the material continued and by the end of the year an early version of the Earls Colne name index had been created. Again, however, it became apparent that such indexing "is a far larger task than originally envisaged".

The major theoretical advances in the year were in the development of methods of storing and analysing historical documents with a computer. Originally I had merely seen the computer as a statistical tool; we would feed in linked abstracts about people, code them and put them on cards, and then the computer would run statistical programs on them. In his first year, Charles Jardine transformed these aims into something more exciting. He began to think in terms of automatic record linkage, of inputting the full text of documents. In order to do this in 1974, many things which we now take for granted had to be invented. We started with a very ancient paper-tape flexowriter as an input devise. Charles Jardine had to design and implement his own system of indexed sequential access to large files on disc. He had begun to design and implement a preprocessing program which would accept "almost encoded historical records". Thus the important co-operation between historians and computing experts had begun. Located in King's College and funded by the S.S.R.C. and King's Research Centre in tandem, the project was becoming more ambitious.

I had already decided to move the proposed research centre from the barn in Westmorland down to Cambridge. This would make it more easily accessible to students, make it easier to use computing resources etc. Towards the end of 1974, the material, now already many filing drawers of cards etc. was transferred from King's College to the Department of Social Anthropology where I had become a University Lecturer in Social Anthropology. I had been given a room with a computing terminal and plenty of space, with a separate room for Charles Jardine. Dr. J.K.M. Moody of King's College and the Computer Laboratory throughout this period acted as our formal adviser.

In the third year (1974-5) we continued to fill in the gaps in the Earls Colne records and by the end of the year the bulk of the records had been collected. The amount of the material, we reported, "continues to amaze us". We made extensive use of photographic and tape-recording methods in collecting material. We continued the indexing, improving the Westmorland index and elaborating indexes for Earls Colne. During this year the name index more than doubled in size. It was divided into christian names, though then linked. The place index was extended, sub-divided into 'from' and 'to' indexes, indexes to rentals. Certain subject indexes had been commenced and we had begun to map the fields.

The major theoretical advance was the growing realization that it is absolutely essential not to alter the original records. Mrs Harrison had spent much time typing in documents such as manor court rolls in a restructured form, altering the order of the information so that it was easier to read. Yet when we came to try to put the logical structure of the documents into the computer, we realized that this was often impossible from the form we had devised. Ambiguities which are absent in the original document began to creep in. It became apparent that most of the original records were written in a highly precise, unambiguous way and their terminology and syntax could not be improved. We therefore reverted to typing as close a copy of the original as possible. This meant a considerable amount of reworking of the data, but still by the end of the year, Mrs Harrison had typed about three-quarters of the Earls Colne manorial material for the period 1550-1750.

The major theoretical advances in the second year continued to be in the application of computers. King's College had extended funding for a second year and Charles Jardine had continued to work with us. During this year it began to appear essential to explore the possibility of typing the whole of the documents, however long and complex they were, in a machine-readable form. One would hope to create within the machine an exact, if artificial, representation of the semantic structure of all the links and attributes implicitly in the historical records. The attempt was based on the belief that there really is a translatable logical structure in historical records, which can be precisely and unambiguously defined. Charles Jardine decided to follow the more difficult course of looking at the more complex classes of social and economic records and to work out a way of putting in the tangled legal processes and descriptions of property into the computer. A number of months, for example, were spent in trying to specify the semantic structure of a conditional surrender to several heirs. A formal language and syntax into which the historical documents needed to be converted before being put into the machine was worked out. There was very little theoretical work in this field on which Charles Jardine could draw and so the system had to be literally invented from scratch. We put in documents for a three year sample, for 1589-1591 for Earls Colne as an experiment and were satisfied with the first results.

In the final year of this project (1975-6) we continued to collect material for Earls Colne and to index it by hand. The greatest amount of effort went into collaborating with Charles Jardine on the computing side, which was for a third year funded by the Research Centre at King's. By the end of 1975 a working input system had been devised, but it suffered from two disadvantages, one practical and one theoretical. The practical difficulty lay in the fact that, since the documents had to be re-ordered while being typed into the machine, only someone who fully understood them could

prepare them for the computer. The second disadvantage was that while the data model dealt with land and people very well, it left court cases, particularly the rich material in ecclesiastical and leet courts, practically unutilised. To deal with both these problems an attempt was made both to improve the model and also to divide the typing in of the documents into two stages. The first stage consisted of an exact, verbatim, transcription, with only spelling (except names, or odd words) modernised, but no reordering of the text. This could, in theory, be done by someone who did not understand the documents. The meaning is conveyed by special syntactic marks which are inserted as a second state by someone who can understand the context and meaning of the historical records. The first nine months of 1976 were spent in formulating such a model. The information put in thus would finally be held, it was hoped, in a data base, and an enquiry language for searching it would be developed.

At the end of the four-year SSRC project (September 1976) we concluded that the major practical problem we had encountered was the sheer size and amount of data. This was combined with higher standards of indexing and the shift from abstracting only a part of a document to doing the whole document. These changes meant that, whereas we had originally estimated that a single parish would take about five-man years to analyse from start to finish, we now estimated that "twenty man-years is required to undertake a total reconstruction" of a parish of a thousand or more persons. This forced us to abandon the indexing of the Kirkby Lonsdale material and to concentrate on Earls Colne. It was clear that this was work for a team. Yet the excitement of combining the hitherto undreamt of riches of local records with the growing power of computers (developing extremely rapidly in the 1970's) encouraged us to continue with the project. We applied for a continuation of the grant.

The final phase: 1976-1983

In the continuation of the project, we originally envisaged a joint project with Professor J.R. Goody, including work on the Human Relations Area files, demographic surveys in various parts of the world, as well as our historical records. The SSRC panel which made a site visit advised us to split the tasks and encouraged us to submit an application on our own. We did so, asking for funding for five years from October 1976. The aims of the continuation are succinctly put in the abstract of research as "to exploit local historical records in order to use them for the study of landholding and inheritance, kinship, marriage, fertility, mortality, geographical mobility, sexual behaviour, crime and social control. The analysis will focus on two English parishes, Earls Colne in Essex and Kirkby Lonsdale in Cumbria. The combined population of approximately four thousand persons at any point in time will be studied over the period 1400-1851. The method will consist of entering the material from the records into a computer, altering the original text only by adding punctuation to indicate the logical structure. Programs will be written to perform record linkage and to store the material as a structured database". The staff consisted initially of Charles Jardine and Sarah Harrison, both full-time, the applicants being myself and Mr. Jardine. In the event, the SSRC agreed to fund the research for three years in the first instance and we were asked to concentrate on Earls Colne.

In the first year of this project (1976-7), computing again formed the bulk of our work. We had developed an acceptable input format; now there was the task of converting our huge mass of Earls Colne documents into machine-readable text. This was to be done by using a bracketing system devised by Charles Jardine. We were very fortunate at this state in obtaining permission to use the Computing Service PDP11/45 and Vector General graphics computer, with light pen and keyboard, which made editing much quicker. A special purpose editor was written by Mr. Jardine. We also obtained the use of a visual display terminal with local editing facilities. Even with these more sophisticated tools, it was clear that putting in and bracketing the data was a huge task.

In the original application to the SSRC it was envisaged that because of the difficulties associated with data input the project "would require someone who not only has skill in palaeography, but also understands the computer input language and knows the meaning of the documents". This was an admitted weakness in the proposal as it put a considerable strain on this one person and also made any informed criticism impossible. Furthermore, as Mrs. Harrison had also developed the manual indexing system which we hoped to use as a check on any results that came from the computer, the idiosyncrasies of the hand index were known only to her. In January 1977 we planned to start typing in large amounts of data into the computer. We had thought of using **ad hoc** typing assistance but were, in fact, fortunate in finding someone who could not only type but also had finished a degree in anthropology and was interested in learning about historical documents. We decided to employ Jessica Styles (later King) at first on a temporary basis for three months. During this time she learnt how the manual indexes worked, and proved very efficient with computer processing and adding syntactic marks to the data. In short, we found someone who could take an equal share in the preparation of data, giving us a double check on accuracy. As a result, by the end of September 1977 we had typed three and a half million characters of data into the computer and had edited part of this. Jessica Styles had become a full member of the project by the end of this year.

We now had a satisfactory input system, but as data poured into the computer a new problem loomed ahead; how to hold it so that it could be searched rapidly. It was a lucky coincidence that it was at this very time that one of the most exciting developments in computing was the research into database systems.

When we wrote the 1976 application we did not have access to a suitable database system and though that we should either have to write our own or wait for one to come on the market. In fact, nothing suitable would come onto the market for years, and indeed nothing is available yet. To write one ourselves would have been impossible, for Charles Jardine was already fully occupied on data input and problems of record linkage. We were therefore extremely fortunate that through the advice of Dr. J.K.M. Moody the project was joined by Tim King who started a Ph.D. on database systems in October 1976. He was funded by a CASE (Collaborative Award in Science and Engineering) studentship which gave him special access and collaboration with IBM. As a result of an agreement between Cambridge and IBM, we were able to make use of an experimental database system which it had taken many computer programming man-years for IBM to develop at their IBM UKSC at Peterlee. This system, PRTV was run on the IBM 370 at Cambridge. Tim King built on

this earlier research and started to write a database system in BCPL which fused a command language similar to PRTV. Jardine and King spent a week in Peterlee and began to collaborate closely in the work. The parsing and input programs began to be fitted with a potential database system. Thus by the middle of 1977 the project had reached its maximum size. Tim King was informally attached while writing his Ph.D., while Jessica King, Sarah Harrison and Charles Jardine were fully employed.

The collection and transcription of data for Earls Colne was continuing alongside the input of the data into the machine. The two major sets of records which had not been transcribed by the start of this phase of the work were the manorial records for the period from 1380-1550 and many of the longer documents in the central courts, deposited in the Public Record Office. Neither of these types of record were easy to use. The former because of the abbreviated latin in which they were written, often in faded script, the latter because court cases were difficult to find and extremely lengthy when found. We were able to solve the former problem through the help of Mrs. Cherry Bryant. She magnified the medieval account and court rolls by using a slide projector at home (suitably located in Casterton, a chapelry of Kirkby Lonsdale) and tape-recorded a translation. The contents of the tape were then typed into the computer by the team at Cambridge. The accurate and steady flow of this material was extremely valuable. Over the next three years we would also come to grips with some of the voluminous records in the Public Record Office, and particularly some very long and important cases in Star Chamber, Requests and Chancery. This was only possible by tape-recording them once again, and then typing the material directly into the computer.

The project was now a large and complex one, with six people associated with it full-time or part-time. It was allocated increased space in the Department of Social Anthropology when the basement became available in March 1978, two offices, an archive room, a computing area. The Computer Service loaned us a private disc pack for our data. The SSRC recognized this expansion and importance by appointing a steering committee for the duration of the project. This committee provided us with guidance. Two or three times a year over the next five years it would visit Cambridge for the day and hear reports on our work and advise us on how to proceed. We found the necessity to justify what we were doing not only in annual report, but to a group of experts appointed by both the history and computing committees as the SSRC most valuable and their suggestions were most useful. At one point the changing composition of the committee, and a certain amount of dispute about whether our project was mainly historical and substantive or computing and methodological, caused some confusion. On the whole, however, the relations between the project team and committees were cordial and stimulating. Various members of the SSRC secretariat attended the meeting including David Allen, Chris Caswell and Michael Wood. David Allen throughout this and earlier phases showed an especial interest in the project and was most helpful to us in suggesting ways to go. Of the members of the Committee, the most active, naturally enough, were the three Chairmen, who put a great deal of effort into guiding us: these were Roderick Floud, Tony Coxon and Michael Drake. Others who played an active part included Roger Schofield and Joan Thirsk.

In the second year of this phase (1977-1978) we set ourselves the ambitious target of typing and

parsing approximately one hundred years of Earls Colne data. This was achieved. In this year we realized the importance of making a distinction between surnames and forenames and a program was written to distinguish them. We were beginning and transcribing central and early records. We also benefited from having an SSRC linked student, Mary Bouquet, working on a Ph.D. in the Department alongside us. We used some of our methods on nineteenth century Devon material, just as another SSRC student, Rab Houston, used some of our programs on his Scottish data.

During this year we loaded about 250,000 words of text interspersed with 67000 bracket pairs, about 8% of our total records, into two test databases. It was loaded into the IBM UKSC Peterlee Relational Test Vehicle (PRTV) and a system (CRTV) written by Tim King. The result of the tests showed that CRTV was more reliable than PRTV and was running nearly twice as fast in Cambridge. IBM withdrew PRTV, but generously encouraged us to continue work based on it. Charles Jardine used CRTV for some preliminary work on automatic record linkage and produced some abstracts from records which, incidentally, were also extremely useful for our hand indexes.

By the mid summer (1978) Tim King had started to develop a more sophisticated database system, called CODD (COroutine Driven Database) which made use of coroutine processes to provide both greater efficiency and more flexibility of use. Charles Jardine collaborated with Tim King on this. The Dictionary system used for storing the text of the input was re-written and a spelling check program was written. A fivefold increase in efficiency was achieved. King and Jardine also started to develop a query language. This language, Cambridge Historical Information Programming System (CHIPS), was, as far as we know, the only procedural one available for querying a relational database system. The existence of a procedure (or subroutine) definition mechanism was crucial for our purposes, enabling us to define procedures tailor-made for our particular application of our database.

By the end of the third year (August 1979) when Charles Jardine finally left the project to take up a post as a computing officer in the Computer Laboratory at Cambridge, we had reached the following state. We had developed the input format and parsing programs. We had developed a prototype database system. We had begun to work on a query language for interrogating the material. We had collected the material for Kirkby Lonsdale 1500-1750, Earls Colne for 1380-1750 and for the Nepalese village. We had put about 100 years of the Earls Colne data into the machine. We applied for a two-year extension, or rather asked that the grand be made five-year one as we had originally planned, so that we could complete the task. We hoped to input all the Earls Colne materials back to 1380. We would refine the database system and the query language and we would begin to undertake substantive analysis. This extension was granted and the team consisting now of Dr. T. King, Mrs J. King, Mrs S. Harrison and myself, with the assistance of Mrs C. Bryant, worked for a further two years together. These continued to be productive and busy years with an enormous amount of work being put in by the full-time employees in the team, often working long hours at computer terminals. The detailed description of what was finally achieved constitutes the majority of the report, so we may be brief here. By the end of the project, we had typed in all the material for Earls Colne, 1380-1750 roughly 3,200 words of text, into the computer. All had been bracketed, cleaned up and checked. A microfiche edition of all this data, with certain indexes, was in process

of publication. The database had been improved and the query language was operational. Further analysis of the problems of record linkage had been undertaken.

The project was now at the state where it was beginning to be possible to really use the carefully collected material. It was at this point that the research environment and particularly the funding of the SSRC changed dramatically. When the project was set up and when I applied for the last two year extension I envisaged that the study we were making would be the first of many. I believed we would be pioneering methods which could be used by other similar groups. This now appeared unlikely. It became obvious that this was an unique study. We also believed during the middle of the project that the SSRC itself would be able to provide some permanent support for the suite of programs we were writing and the set of data which we were accumulating. Indeed, we had explicitly asked for this assurance in our application. We wrote (1978 Application, p.18) "We envisage the possibility of turning the project into a Designated Research Centre in computing and the social sciences...If the SSRC feels that such a future move is impossible, then the question of this extension becomes problematic. Data and programs as complex as those which we are elaborating require maintenance, use and development as with any other package. Although Dr. Macfarlane will be in Cambridge, in all probability, for a number of years, neither he, nor the University Computing Service, can undertake to maintain such a system. The application for an extension should therefore be seen as part of a longer plan". The SSRC, aware of this problem, commissioned a report from Professor Johansen, who visited us during these years. We held various meetings and made a detailed application for an interim solution by asking for a five-year computer post. Yet nothing emerged from all this in the worsening financial situation. Once it became apparent that future maintenance and use of our system would largely depend on the private initiative of members of the team and could not be guaranteed, we were forced to devote more attention to providing data and indexes in a non-computerized form. This would make it possible for as many historians and others as possible to use the material. Hence the microfiche publication of the data.

Finally, in order to tidy up loose ends, I requested and obtained a small grant for one year from April 1982. This was to enable us to use the query system and to write a manual describing how it worked. This was done. It was also to enable us to see, now that all the data was in, whether record linkage was possible by machine. It finally emerged that it was not feasible, but we were fortunate that Dr. Tim King, now teaching at Bath, and Mrs. Harrison, now employed elsewhere, were prepared to give a considerable amount of time to complete record linkage. This was done by using the computer to provide the material which the human takes the decision to link or not to link. Jessica King started to undertake certain substantive searches.

Thus we have finally achieved our aim. We had devised a way of getting historical records into a computer without pre structuring them, to hold them in a database, to link together references to people and thus provide a linked database, and to query this data. Copies of the data and programs will be lodged at the SSRC data archive and perhaps, in years to come, the cost of hardware will drop so much that it will be possible to revive all the data and programs and run them on a small computer.

My aim throughout the project has been more than methodological. I wanted to develop indexing methods and computer systems so that I could understand the past, and particularly the past as it is reflected in our village documents. Throughout the project, therefore, I have tried to study problems of various kinds in the wider setting of anthropology and history. Some of the topics which interest me are described in another part of this report. The fuller analysis of topics which I have analysed are contained in a number of articles and books whose titles are appended to this report. Here I will merely mention that my understanding of many topics had been immeasurably deepened by the study of local documents and by the discipline of having to explain to a computer the precise nature of such documents. During the course of research which formally and informally had lasted from 1964 to 1983, with SSRC funding for the last ten years (making this perhaps the longest project in the history of the SSRC), I have published full-length monographs on a number of topics. I have studied witchcraft and magic (1970), family life (1970), resources and population (1976), property and individualism (1978), law and disorder (1981). I have also written two books on our methodology and sources (1977, 1983). Finally, I have helped to publish all the Earls Colne data on microfiche and the full text of Josselin's diary separately (1976). A comparison of the earlier and later works in this series will indicate some of the ways in which working on the Earls Colne material has changed our ideas about the nature of the past. Some suggestions about future directions of substantive analysis, now that we have all the data more or less available, is contained in the report itself.