

Bulletin of the group
for the study of
Irish Historic Settlement

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GROUP FOR THE STUDY OF IRISH HISTORIC SETTLEMENT(founded 1969)Aims

1. To produce and circulate useful information concerning Irish historic settlement.
2. To promote and co-ordinate studies of particular aspects of settlement.
3. To express opinions on matters of historic settlement which are of national and local concern and, where necessary, to press for action.

Information

The formation of the Group stems from the belief that the study of settlement is inter-disciplinary and that there is a great need for a group to act as a focus for everyone in this field, including economic and social historians, archaeologists, geographers, architects, surveyors, planners, school teachers, students, and all others who, as active members of local societies, have an interest in the subject. The name of the Group is left deliberately wide so that all shades of interest, rural and urban, may be included. The programme of the Group includes the production and circulation of an annual Bulletin and an annual weekend conference to focus attention on a particular theme and area.

Membership

Membership (annual subscription £3.00) is open to all who are prepared to support the aims of the Group. Enquiries should be sent to the Hon. Secretary who will be pleased to send further information. Bankers' order forms are available from the Hon. Treasurer for those members who would prefer to pay their subscriptions by this method. Members receive all publications of the Group. The annual report on Excavations edited by the late T.G. Delaney has not been published recently but it is hoped that an omnibus edition will appear in the near future.

G.S.I.H.S. Officers and Committee, 1982-83

President	:	Dr. B.J. Graham
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Communication

All communications should be addressed to the Hon. Secretary, Dr. T.B. Barry Department of Medieval History, Trinity College, Dublin 2 with the exception of subscriptions which should be sent to Ms. N. Crowley, Prospect Lodge, Kilcohan, Waterford. Limited backnumbers of Bulletins 1 - 5 (1970-2 and 1977-78) are available from the Hon. Treasurer at a cost of £1.00 per copy (including postage).

THE ANNUAL CONFERENCE : 1982'The Medieval Settlement of the Galway Region' : 8th-10th October

Over fifty members and friends enjoyed a most stimulating and informative conference at Flannery's Motor Inn in Galway. The introductory lecture on the region was given on the Friday evening by Professor Etienne Rynne of U.C.G. in which he concentrated on the major sites we were to visit with him on the following day - Athenry and Abbey Knockmoy.

The first lecture on Saturday by Professor G. MacNiocaill of U.C.G. gave us an insight into the economic development and the social structure of the medieval port of Galway. This was mainly based on the surviving medieval documentation, which has been comprehensively researched by Professor MacNiocaill. The lecture gave the members of the group an impressive demonstration of Professor MacNiocaill's contribution to the forthcoming Irish Historic Towns Atlas fascicle on Galway. The second lecture by Mr. Paul Walsh, M.A., of the Ordnance Survey, was a well illustrated survey of the archaeology of the city. By his lecture, and later by his leading of the walking tour of Galway city on the Sunday morning, Mr. Walsh greatly impressed the members of the conference with both the quantity and the quality of the surviving medieval fabric of the city.

The final lecture was given on the archaeology of the Norman settlement of Connacht by Mr. Patrick Holland, B.A. of U.C.G. This talk widened our horizons beyond the immediate locality of Galway City, and revealed how the Archaeology Department of U.C.G. were using their £40,000 grant from the O.P.W. to carry out a survey of field monuments in the area. Mr. Holland concentrated his paper on a discussion of the distribution and morphology of the major types of Anglo-Norman earthworks, such as motte and bailey castles, ringwork castles moated sites and deserted medieval villages. He also investigated the distribution and chronology of the early Anglo-Norman stone castles of the region.

The afternoon was fully taken up with a comprehensive tour around Athenry - the castle, walls and towers, the Dominican friary and the market cross. We are grateful to Professor Rynne who led this excursion, and who also took us to see the Cistercian foundation of Abbey Knockmoy nearby. The day was completed by our Annual Dinner in the hotel.

The final morning of the conference was taken up by a walking tour of Galway city led by Mr. Walsh. Many members of the group remarked that this was the best city tour of all our conferences. The conference concluded with a committee meeting and the Annual General Meeting, at which it was decided that the next conference will be in Louth. The group would like to thank Mr. Tom Fanning of U.C.G. for so successfully organising the conference from the local end.

Dr. T.B. Barry,
Hon. Joint Secretary.

SOME SOURCES FOR LOCAL STUDIES, CIRCA 1600-1850W. NOLAN

This paper is concerned with the more significant sources which are available to the researcher working at the local scale in Ireland on the period 1600 to 1850. The data assessed reflects a bias in favour of material with an assumed geographical content.

1600-1700:

A comparatively rich store of both manuscript and published source material is extant for the seventeenth century. Many state and regional surveys¹ originated in the great political upheavals which culminated in land transfers on a major scale. State papers² record the activities of various administrations and 'enlightened' tourists³ and resident litterati⁴ were prolific analysts of the state of society. Material written in Irish⁵ has been largely neglected but it is an essential prerequisite for any understanding of this century. Regional sources consist of the records of the great Anglo-Norman Lordships⁶ and the documents of the newly emerging landed gentry.⁷ Here we are concerned with the Civil Survey, Down Survey and Books of Survey and Distribution.

The Civil Survey:

The Civil Survey was the first of the major enquiries undertaken by the Cromwellian Government in Ireland. After the close of the Confederacy wars, the victorious Cromwellians confiscated the lands of their rivals, who included native Irish and descendants of Anglo-Norman families. Apart from information acquired in the course of the military campaign the new Government had little detailed, accurate information on the location and contents of the confiscated lands. There was another more important reason for beginning the surveys. The army in Ireland had been financed by 'adventurers' from the City of London and elsewhere in England. These individuals had invested in the wars on the understanding that if the Cromwellians were victorious they would receive payment in the form of Irish land. Furthermore the soldiers who had fought the Irish wars were to be paid for their services by land in lieu of money. These were the factors which led to the massive undertaking of compiling the Civil Survey for a ravaged and despoiled countryside. The Survey was by Inquisition and was termed the 'Civil' because it was made under the jurisdiction of special courts called Courts of Survey and concerned the Civil Authorities. These Courts were to find out and write down the possessions of landowners and the tenures and titles of their estates.

The Civil Survey was completed for the whole of Leinster, Ulster (with the exception of the Barony of Farney, Co. Monaghan) and Munster (with the exception of Clare). In Connacht only the county of Leitrim was surveyed. Twenty-seven counties were included in the survey. The Strafford Survey which had been compiled c. 1636 was available for the five remaining counties in Connacht. The copies of the Civil Survey have had a turbulent history. In 1711 a fire in the Surveyor-General's office destroyed all of the Civil Survey that was in public custody. In 1817 a total of eighty-four copies of the Survey were discovered in the library of Viscount Headfort at Kells, Co. Meath. These manuscripts were deposited in the Public Records Office and a new set was copied from them and placed in the Quit-Rent Office. This was fortunate because the destruction by fire of the Public Records Office in 1922 led to the loss of the official set. The part of the Civil Survey which has survived covers the following counties: Munster - Tipperary, Limerick, Waterford and part of one barony in Kerry; Leinster- Dublin (except the Baronies of Newcastle and Uppercross), Kildare (except the Barony of Ophaley), Meath and Wexford (except Forth); Ulster - Donegal, Derry and Tyrone.

The Civil Survey commenced in June 1654. The barony was the basic territorial division utilised and the Survey was by Inquisition. Local juries composed of the 'most able and ancient inhabitants of the country' were sworn in.⁸ The Survey consists of the written testimony of these landowners who had the countryman's intimate knowledge of locality, boundaries, contents of their countryside and proprietors. The Survey begins with a detailed description of barony boundaries, based it would seem on an actual preambulation by the jurors. These descriptions indicate the great variety of named objects in a sparsely settled landscape. The 'meares and bounds' were demarcated by items such as 'a ditch called Oldgrange', 'the lands of Ballyamuck', 'a buish called skasnatri tierny', 'a little foord called Aghvellanapissoge', 'the heighway', 'a gutter', 'brooke', 'shrubbs', 'bog called Moneffylene'. Barony acreages were estimated and the important settlement features listed. The evaluation of land use was arbitrary but nevertheless constitutes an important index of the elements of significance in mid-seventeenth century agricultural economics. The jurors' estimate of land quality for the upland barony of Slieveardagh in Southeast Tipperary is a good example of their methodology. 'Wee conceive', they write, 'ye one half to be arable, a third part of the whole good pasture, and a sixth part of the whole to be redd bogg, shrubby boggs and very coarse pasture interlaced with some timber woods'. The

subdivision of the barony into parishes and the division of the parishes by 'Townships or villages' localises the data and this is one of the primary attractions of the Civil Survey for the historical geographer or the historian working on this more intimate scale. The following example of the Survey's format will serve to illustrate the extent of the evidence on proprietorial geography settlement, land quality and valuation of land.

Proprietors names in 1640	Denomination of lands	Number of plant. ac- res	Lands pfitable and the quantity	Lands unpfit- able and the quantity	Value of ye whole & each of the sd lands
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Edmund Kearney of Knockanglass Gent. Irish Papist	Knockanglass halfe a colpe	A.R.P. 800-0-0	A.R.P. Arable 500.0.0 Pasture 280.0.0 Ashwood 20.0.0	000	li.s.d. 30.00.00
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We can see the enormous amount of geographical information which therefore exists for the parts of the country surveyed. Amongst other items, we have a detailed list of landowning families, the extent of their possessions, the kind of tenure whether Gaelic or English by which they held their lands, the valuation of their lands, the area under timber and all other items which were of interest and value to surveyors in the middle of the seventeenth century. Not only does the survey comprehend things relating to human activity but it also describes physical features and the quality of soil.

The Down Survey:

The Civil Survey formed the basis of subsequent enquiries in the seventeenth century. On the 11th of December 1654, Sir William Petty contracted with the Government to 'admeasure all the forfeited lands according to their natural, artificial and civil bounds and to state whether the land is distinguished into wood, bog, mountain, arable, meadow, and pasture.' Petty agreed to perform the survey 'within one year and one month, provided the weather was agreeable and the Tories quiet'.⁹

The most important difference between the Civil and Down Surveys is that in the Civil Survey areas were estimated by jurors, whereas in the Down Survey, lands were measured by trained surveyors and plotted down and reproduced on paper. Petty's surveyors were selected from the disbanded military and Trinity College students. They were expected to 'endure travaile, ill-lodging and dyett as also heat and colds, being also men of

activity, that could leap ditch and hedge and could rustle with the several rude persons with whom they might expect to be often crossed and opposed'.

The Down Survey is a mapped record of landownership and selected items of settlement and topography. The Survey was basically concerned with lands which were confiscated after the Cromwellian victory. It is not uniform in detail as lands classified as Protestant lands were not measured or subdivided. According to their instructions the Surveyors were 'to protract your work upon single sheets of large paper by a scale of forty perches to an inch' and 'to set down the surrounds laid down into the barony plott by a scale of eighty perches to an inch'.

The Geography of the Down Survey:

The divisions used in the Down Survey were the barony, parish and townland. Forfeited land was identified and located for townlands and this information was portrayed on parish and barony maps. In contrast to the Civil Survey there is very little detail on boundaries. A general description of the quality of the soil followed.¹⁰ We find that the soil in Fassadinin barony, Co. Kilkenny 'is generally good arable, meadow and pasture much shrubby heathy and mountainous pasture and some wood but very little unprofitable land'. The rivers in the barony were then enumerated and the introduction concluded with a list of parishes and an 'Index of Observations' in each of them. The survey was concerned with a great variety of settlement items. These included castles, churches, bawns, corn mills, tucking mills, thatched stone houses, houses with chimneys, thatched houses and cabins. The barony was then subdivided into parishes and a detailed analysis of the forfeited lands in each parish followed. Parish boundaries were described, the soil was assessed and the number of forfeited townlands listed. The surveyor then proceeded to look at settlement. In the parish of Donaghmore, north Kilkenny, the Survey recorded that 'there is at Ballymartin the old bawne and some thatch cabbins, at Bellaragget (modern Ballyragget) a castle and bawne some thatch houses a Corne mill and a Tucking Mill in repaire. At Donaghmore an Old Church in little repaire a thatch house and some cabbins'. The most important part of the survey followed and the information about landownership was presented in tabular form.

Numbers in the Plott	Proprietors	Denominacion of Landes	No. of acres by Admeasurement	Landes Profitable	Landes Unprofitable
1	Thomas Shortall Ir. Papist	Nicholastowne	65.0.00	65.0.00 arable	---

The Numbers in the Plott' referred to the location of the lands in the parish maps. Profitable lands were classified as arable, pasture, meadow and wood. The only unprofitable land recognised by the surveyors in Fassadinin was the natural waste of mountain. The maps of the Down Survey are an important addition to our knowledge of this period. Maps collate a number of disparate items and make it easier to compare the geography of a place at different times. The Down Survey barony map is a synopsis of some of the information returned in the parish 'Plotts and Bookes of Reference'. Parish divisions are shown and these are further subdivided into townlands. Some items of settlement such as castles and churches are depicted by a rough sketch and hill land is also shown. Rivers and roads complete the detail in the Barony map. The parish maps are more detailed and the information concerning landownership and land quality is inscribed on them.

What survived of the Down Survey in 1711 was destroyed in 1922. Substitute copies fall into three categories: (i) copies of parish maps made in 1787 by the Hon. R. Rochfort, Surveyor General, which now form the Reeves collection in the National Library of Ireland; (ii) A series of Barony maps known as 'Hibernia Regnum' compiled from the Down Survey parish maps and representing the survey as a whole in diminutive form; (iii) The Quit Rent Office maps and tracings. From these sources the Down Survey was reconstructed and superimposed on the original Ordnance Survey, Six inch maps for counties Tipperary, Carlow, Roscommon (part of), Wexford, Louth, Dublin and Clare and also for the Liberties of Kilkenny. This composite map represents the landscape c. 1654 and c. 1840.

Because it locates the estates of forfeiting proprietors on parish maps, the Down Survey is an important record of land-owning patterns in the pre-Cromwellian era. These maps and accompanying reference tables provide the researcher with a base for the measurement of change on a spatial and temporal basis.¹¹ It is also possible to classify land use by area and to locate and distinguish between various items of settlement.

Apart from the composite maps referred to above, parish maps and 'terriers' are available in manuscript form mainly for the counties of Cork

Donegal, Derry, Down, Armagh, Tyrone, Dublin, Leitrim, Queens County (Laois), Kilkenny, Limerick, Longford, Westmeath, Offaly, Tipperary, Waterford and Eastmeath (Meath). Fifteen of these volumes are in the National Library of Ireland and the remaining two are in the Public Records Office of Northern Ireland.

The Books of Survey and Distribution:

These books recorded details of the distribution of forfeited land under the Acts of Settlement and Explanation. The first three columns in the Books are exactly similar to those of the Down Survey. The fifth column shows whether the townlands of the Down Survey were subdivided as a result of confiscation and in some instances provides evidence of the creation of new land divisions. The sixth column lists the proprietors of land c. 1670. After the proprietors name there is a symbol which indicates the legal basis of the new title.

The purpose of the Books of Survey and Distribution was to establish an official record of landed proprietors and their respective estates. They were used to impose the acreable rent called the Quit Rent, which was payable yearly on lands granted under the terms of the Acts of Settlement and Explanation. The fire of 1711 in the Surveyor and Auditor General's Office destroyed the official copies of the Books of Survey and Distribution, but fortunately complete duplicate copies have survived. One of these sets, known as the Taylor Books after the official who helped in their compilation, is now in the Royal Irish Academy. The remaining sets are in the Public Record Office in Dublin. Four volumes of the Books have been published by the Irish Manuscripts Commission: Roscommon (1949), Mayo (1956), Galway (1962), and Clare (1967). The following example from the published Books of Survey and Distribution for Co. Galway indicates the type of information contained in them:

Co. Galway: Killcoonagh Parish : Clare Barony

No. of Reference in ye Alphabett	Proprietors Names Anno. 1641	Denominations	Number of Acres unprofitable
290	Redm ^d M ^c Ulick Roe Burke Thomas M ^c Ulick Roe Bourke Moyler M ^c Rich ^d Bourk Redm ^d Bourk 1/3 Tho. M ^c Ulick Bourk 1/3 & Moyler M ^c Rick ^d Bourk	Laughill 1 Quarter whereof arrable cont. Underwood pasture being Stony 1/3 pt wast containing.	083.0.00

No. of acres profittable	No. of profittable Acres disposed of on ye Acts.	To whom soe disposed with their Title whether by Decree, Certificate or Patent, References to ye Record thereof.	No. of Book or Roll & of ye Page or Skin	No. of ye pfittable acres remaining undisposed
037.0.00	121.0.00	Coll W ^m Legg <		
218.0.00	134.0.00	Dominick Skerrett ✕		

It is possible from this to discover to whom, if anyone, the confiscated lands were granted so that we have a record of landowners for 1641 and c. 1670. Because the Books of Survey and Distribution are available for the whole country, they have preserved the placenames of the smallest territorial divisions. This Survey demonstrates that the primary interest of the conquerors was in land. There is nothing in these books concerning settlement.

We also have another source to complement the Books of Survey and Distribution. These are the Lodge Transcripts of the Records of the Rolls in the Public Records Office¹³. Volumes XI, XII, and XIII of the Lodge Mss. list the lands and hereditaments granted under letters patent of Charles II in virtue of the Acts of Settlement and Explanation. These give the names of the new proprietor, the barony, the townland in the barony, the number of acres by plantation and statute measure and the rental of the new lands. They also record the date in which the grant of lands was enrolled in the Record of the Rolls, the official record of land grants in the kingdom and subsequently evidence of title to land.

These great seventeenth century surveys are important records for the student of settlement and society in this period. They tell us much concerning the origin, location and function of both rural and urban settlement items. Overall they reflect the undeniable fact that the wealth of Ireland was her 'profitable land' and this category of land was assiduously located and enumerated.

Documentary Sources relating to Estates 1700 - 1850:

Estate papers and particularly those which contain some cartographic records are a major source for the student of settlement. From the middle of the eighteenth century, estate management was organised on a more businesslike basis and improving landlords began to hire cartographers to survey estates and construct estate atlases. Apart from national cartographers such as Bernard Scale, many local

draughtsmen were employed in drawing up inventories of the landscape of landlordism.¹⁴ The more important maps¹⁵ for the eighteenth century belong to the cartographers Bernard Scale and John Rocque and the military surveyor Charles Vallancey. Rocque's greatest contribution was his Exact Survey of the city and suburbs of Dublin, compiled in 1756. He also compiled many estate maps for wealthy patrons such as the Duke of Leinster. Scale's Hibernian Atlas was published in 1776 and his work on the Devonshire estates in Co. Waterford now forms one of the richest regional collections to have survived intact. Vallancey was primarily interested in the strategic significance of settlements and their precincts. Another series of maps which help to illuminate aspects of settlement and communications in the eighteenth century are the Road Maps of Skinner published in 1778.¹⁶ The development of Dublin in the late eighteenth century is partly documented in the maps belonging to the Domville estate.¹⁷

The existence of estate papers depends on a great variety of fortuitous factors. A recent publication by W.A. Maguire¹⁸ deals with the various types of material in the estate papers belonging to the third Marquess of Downshire (1809-1845). The Downshire estate consisted of some 115,000 acres dispersed through the counties of Down, Antrim, Wicklow and Offaly. The papers consisted of 40,000 documents dating from the early seventeenth century to the early twentieth. Dr. Maguire classified the documents as follows: 2,000 title deeds; 5,000 leases; 750 maps; 1,000 volumes of accounts and about 30,000 letters. Documentation such as this, though not specifically concerned with settlement, should have information on the contribution of the landlord to the shaping of the landscape. Furthermore, they outline more than the material fabric of town and countryside and tell us much about economy and society. In my own work on Fassadinin barony in North Kilkenny¹⁹, the uncatalogued family papers of the Wandesfordes of Castlecomer were an invaluable source. Not only was it possible to estimate the contribution of the landlord to the development of the estate but also to assess the landlord's perception of his estate and tenantry. Estate papers and maps bridge the gap between the state surveys and the seventeenth and nineteenth centuries. The Wandesforde papers were utilised in dating town buildings and identifying town builders in Castlecomer. An analysis revealed that the term, landlord town, was in this instance a misnomer and that the town was built by leaseholders or middlemen. The appellation, landlord town, fails to describe the diverse social and economic fabric of settlements such as Castlecomer. The zonation of land-use produced striking localised patterns. The central

part served commercial functions, symbolised by the dominant position of the market house and business premises. The Big House and Protestant Church were located to the east, cut off physically by the River Dinin. The houses between the landlord and commercial sectors were inhabited by the middle elements, prosperous tenants, land agents, colliery proprietors and the medical doctor. Southwards was the site of the Catholic Church and associated educational structures. The town peripheries beyond here were characterised by transient cabins built by speculators or squatters. The military barracks guarded the western approaches and the northern suburbs were characterised by a mixture of substantial and transient dwellings.

1800-1850

The Ordnance Survey and the Primary Valuation of Tenements:

The townland maps on the scale of six inches to one statute mile were completed for the whole country by 1846.²⁰ It was particularly opportune that the mapping programme was undertaken when the country had its maximum recorded population. The survey presents a detailed inventory of the physical and cultural landscape with a uniform degree of thoroughness. Territorial divisions from the intimate scale of the field to the country were defined and delineated. Items of settlement whether relict or functional were recorded for posterity. The Ordnance Survey placenames represent a linguistic compromise and the survey was not devoid of social and economic interest. The Ordnance Survey letters contain the correspondence between the field researchers and the director and present a picture of an Ireland, difficult to detect in the mass of state and estate documentation. The field surveyors included two outstanding and energetic Irish scholars, John O'Donovan and Eugene O'Curry.

The Primary Valuation of Tenements: Griffith's Valuation:

Because of the role of Richard Griffith, mining and canal engineer and commissioner in charge of the Board of Works Relief Department during the Famine, in directing the Valuation it is commonly referred to as 'Griffith's Valuation'. Land and buildings were valued separately. In rural areas the valuation was carried out on a townland basis. In towns individual tenements were arranged according to streets. The following example taken from the General Valuation of Rateable property for the barony of Fassadinin indicates the type of information recorded in the valuation books.

No. and letters of Reference to Map	Parishes, Townlands and Occupiers	Immediate Lessors	Description of Tenement
18	Mary Gorman	Thomas Kavanagh Esq.	House, Offices and Land.

Content of Land			NET ANNUAL VALUE		
			Land	Buildings	Total
A	R	P	£. s. d.	£. s. d.	£. s. d.
34	2	11	28. 0. 0.	2. 0. 0.	30. 0. 0.

These books were prepared for baronies which were subdivided into townlands, civil parishes and electoral divisions of the poor law unions. The numeral in the first column referred to the location of the individual tenement on the six inch to the mile townland maps. The division of a tenement into sub-tenancies was indicated by the use of letters and holdings-in-common were bracketed together. This enables us to estimate the extent of these practices on a barony basis. The names of the occupiers and lessors are of great importance. They allow the historical geographer to reconstruct patterns of land ownership and occupation and can also be utilised as a measure of either continuity or change. In 'description of tenement', a distinction was drawn between tenements which consisted of land only, and those on which a house or other buildings were located. Buildings which served religious, commercial and administrative functions were also identified. However, the commercial functions of buildings were not always listed. Retail outlets for basic commodities such as tea and alcoholic drink, for example, were not identified. The net annual value of a tenement was defined as, 'the rent for which one year with another, the same might in its actual state be reasonably expected to let from year to year with cost of repairs, insurance, maintenance, rates, taxes and all other public charges except the tithe rent being paid by the tenement'. Land was valued at the price per acre proportionate to the number of cattle and sheep it may be capable of grazing during the year, according to the usual price per head in the neighbourhood for grazing. The quality of the 'herbage' and 'permanent' improvements such as roads, drainage and fences were to be taken into account.

The Valuers operated a sliding scale of allowances in respect of what were termed 'peculiar local circumstances'. When these circumstances, for example, relative location, communications, climate, elevation and shelter were favourable to agriculture, land values were correspondingly increased. On the other hand when local circumstances were unfavourable, land values were reduced. Land valuation was, to an extent, an indication of soil fertility. The valuation of buildings was ascertained separately from land and censuses compiled from 1851 onwards contain a summary of the total valuation of townlands and civil parishes.

References:

1. R.C. Simington, (Ed.), The Civil Survey, Irish Mss. Commission, 10 vols.
2. Calendar of State Papers, Ireland; Journals of the House of Commons of the Kingdom of Ireland, Dublin, 1796-1800, 19 vols.; Statutes at Large Passed in the Parliaments held in Ireland, Dublin, 1780-1801, 20 vols.; Journals of the House of Lords of Ireland 1634-1800, Dublin, 1779-1800, 8 vols.
3. F. Moryson, An Itinerary Containing his Ten Years Travel through Germany Ireland etc., Glasgow, 1907-08.
4. E. Spenser, A View of the Present State of Ireland in 1596, London, 1934 (Renwick edition).
5. A de Blacam, Gaelic Literature Surveyed, Dublin 1929.
6. E. Curtis (Ed.), Calendar of Ormond Deeds 1171-1603; Dublin, 1932-43, 6 vols.
7. Prior-Wandesforde Mss. (uncatalogued), N.L.I., c 1630-1969. See also Analecta Hibernica, 15, 1944; 20, 1958; 25, 1967 for a survey of documents in private keeping.
8. These examples are taken from R.C. Simington (Ed.), The Civil Survey A.D. 1654-56, County of Tipperary, Vol. 1, Dublin, 1931.
9. T. Larcom, History of the Down Survey, Dublin, 1857; S. O'Domhnaill, 'The Maps of the Down Survey', Ir. Hist. Stud., iii, 1942-3, pp. 381-92.
10. Ms. 720 (N.L.I.), 'Parish Maps with Terriers Showing Forfeited Lands in Queens Co. and Co. Kilkenny, Commonly known as the 'Down Survey' Executed under the direction of Petty c 1654' (copied O'Brien, 1786).
11. See for example, W. Nolan, Fassadinin; Land, Settlement and Society in Southeast Ireland, c 1600-1850, Dublin 1979.
12. Books of Survey and Distribution, Co. Galway, Dublin 1962.
13. Lodge Transcripts of the Records of the Rolls (P.R.O.I.).
14. A comprehensive list of estate plans, reports and rentals are located in R. Hayes (Ed.), Manuscript sources for the Study of Irish Civilization, Boston, 1965.
15. J.H. Andrews, 'Ireland in Maps : A Bibliographical Postscript', Irish Geography, 4, 1962. Irish Maps, Dublin, 1978, Two Maps of 18th century Dublin and its surroundings by John Rocque, Lympe Castle, 1977.
16. A. Skinner and G. Taylor, Maps of the Roads of Ireland, Dublin, 1778.
17. Domville Mss. (N.L.I.).
18. W.A. Maguire (Ed.), Letters of a Great Irish Landlord, Belfast, 1974.
19. Nolan, 1979, op. ct.
20. J.H. Andrews, History in the Ordnance Map, Dublin, 1974; A Paper Landscape, Oxford, 1975.

THE DISCOVERY OF UNRECORDED SITESP. HEALY

One of the most rewarding exercises in field archaeology is the study of maps and aerial photographs with a view to the discovery of unrecorded sites. This is an aspect of archaeology which combines the pleasure of working in the field with training in the powers of observation. Familiarity with large scale maps is essential and where possible the use of aerial photographs is recommended. There are many sources from which clues can be sought which may lead to such a discovery, and these may be summarized as follows:

1. The study of placenames;
2. Examination of details on Ordnance Survey maps;
3. Knowledge of the type of terrain in which certain classes of monuments are likely to be found;
4. The use of aerial photographs;
5. The use of a probe in soft ground;
6. Information from local residents;
7. Accidental discovery of ancient objects;
8. Casual perambulation.

The Study of Place Names

Many of the Irish words which commonly occur in place names are a clear indication of the present or former existence of an ancient site. For those who are unfamiliar with the Irish language a booklet by P.W. Joyce entitled Irish Local Names Explained is recommended. Such words as cairn in a place name should always be investigated particularly on a hilltop such as the townland of Carnhill near Skerries, where no cairn is now to be seen but where there was certainly one existing when the name was first applied.

The words sidh or tuaim would indicate the existence of a fairy mound or of a tumulus. The names applied to ringforts, rath, lios, dun, cashel and caher are among the commonest in the country and examples are to be found in all areas.

Clues which might lead to the discovery of megalithic tombs are less common, although the townland of Ticloy (Tig Cloc Stone House) in Co. Antrim would appear to refer to the monument there. A more subtle name is that of Carbad More townland in Co. Mayo, the location of a fine

dual court tomb with a rectangular enclosure in the centre and a circular court at each end which almost certainly inspired the name 'Big chariot or waggon'. The townland of Longstone in Co. Tipperary is a small hill on the summit of which is a ring barrow. There is no stone there now, but the probability is that it was standing in the middle of the ring barrow. Local information would verify this.

The names applied to early monastic sites, Kill, Teamhall, Tige and Disert, are found all over the country and in most cases the actual site is still visible. In the absence of historical records it will often be found profitable to pay a visit to the modern Church of Ireland premises. In most cases this will have been built on the site of a pre-reformation church which in turn was built in the early monastic enclosure. Pre-reformation church sites can usually be recognised by the presence in the burial ground of memorials to both protestants and catholics.

Examination of details on Ordnance Survey Maps

The 6" Ordnance Survey map should be examined for any circular field or enclosure or for any unaccountable circular curve in a fence, boundary or road. A few years ago the inspection of a number of small circular plantations in the townland of Coolmine, Co. Dublin led to the discovery of the site of the ancient church founded by St. Mochua which went out of use in 1486. The site was not recorded although it was well known locally to be a burial place.

At Dowry Hill, Co. Wicklow a semi-circular loop in an otherwise straight fence was found to be half of a large circular enclosure on a hill top site, the other half of which was quite clear on the ground but not prominent enough to be treated as a feature by the surveyors. In the centre was a small cairn.

Small circular enclosures were often made to protect groves of young trees from cattle, but their banks are usually much slighter than those of ringforts. On the Ordnance sheets steep banks or mounds of soil are indicated by hachures and it is always worth while to examine these on the ground, even when they are not marked as antiquities. In the Rathfarnham area, a fine motte and bailey was indicated as a natural ridge and a small tumulus in the same area was simply indicated by hachures.

Sites marked as ringforts may sometimes be something different, as in the case of the partly destroyed cairn on the summit of Golden Hill in Co. Wicklow. The townland of Rathbeale lies to the west of Swords.

The site of the rath is not known, but the country road which crosses the townland forms an unaccountable semi-circular loop which was probably made to avoid cutting across this earthwork.

Knowledge of the type of terrain in which certain classes of monuments are likely to be found

This can be the source of much interest and pleasure on a country ramble. The knowledge that passage grave type cairns are usually found on mountain or hill summits, and that they occur in groups, can lead to the discovery of additional sites, by the inspection of every summit however inconspicuous in an area where some of these sites are already recorded. A fine cairn with part of a kerb was discovered on the summit of Lugnagroagh, Co. Wicklow, by working on this system.

It is a useful exercise to inspect all hill tops, even in areas where there are no known passage graves, as pre-historic man had a preference for hill top sites and many are distinguished by ring barrows and small cairns. Cist burials are also found on hill tops but are not always obvious on the surface.

Other types of sites which can often be discovered are ancient, cooking places usually known as fulachta fiadha, which are nearly always located in marshy areas and usually in sandstone districts. After they had gone out of use the mounds of burned stones became grass grown and are usually quite prominent features in rushy areas. Once such mounds have been located the existence of charcoal and burnt stones can be easily verified. They are nearly always horse shoe-shaped with a hollow in the centre.

The use of aerial photographs:

These will often show up features which are quite invisible on the ground, such as levelled ringforts, old field boundaries and disused roads. The standard scale for the photographs produced by the Irish Air Corps was formerly 6" to the mile which was very convenient when transferring features to a 6" O.S. map. The use of a strong magnifying glass is essential if small features such as hut or house sites are to be located, and huts as small as 3m. diameter can be detected with a glass. A hut as small as this was noted in a clearing in Ticknock Forest, Co. Dublin but when tracked down on the ground it was found to be a derelict forestry shelter built of sods.

On the other hand an aerial photograph revealed a huge circular enclosure on the lower slope of Mount Pelier in ground newly ploughed for the planting of trees. The trees are now grown but no trace of the enclosure can be seen. This feature was beside a large standing stone with which it probably had some association.

Other smaller scales are now in use, but when examined with the aid of stereoscopic equipment the smallest feature will stand out with amazing clarity. A series of oblique aerial photographs taken by Dr. J.K. St. Joseph of Cambridge is also available in the National Museum together with an excellent index.

The use of a probe in soft ground

A light steel rod two metres long with the top bent into a hook or ring is an essential instrument when trying to follow the line of an ancient road or togher across a bog. The general line may be picked up on an aerial photograph, or parts of it may be visible on the ground, but to survey such a feature to a large scale it is necessary to peg out the line and it is here that the probe is needed. This was the method used to survey St. Kevin's road which crosses the mountains through Wicklow Gap, and which in low areas was covered with up to three metres of peat. It is always obvious whether it is stone, timber or gravel that is being struck and for this reason a probe can be a great help when investigating crannog sites, wooden toghers, or stone boundary walls underneath the surface of a bog.

Information from local residents

No matter what method is being used to locate unrecorded sites, enquiry from local residents must never be overlooked. Not only will they probably be able to supply additional information about the site under investigation, but they may also be able to give directions regarding other sites, or old field names like Fortfield or Chapelfield which could lead to further discoveries. A statement about a stone with a square hole in it recorded by a schoolchild in an essay on local history written for the Folklore Commission, led to the discovery of an unrecorded cross base at Carrickmines.

Discovery of ancient objects

Sites of archaeological importance will often be brought to notice by the discovery of some ancient object which may lead to further investigation. In 1957 the chance find of a piece of decorated cross slab in a back garden at Balgriffin Park, Co. Dublin, led to the identification of the site of an early church dedicated to St. Sampson,

all trace of which had disappeared more than a century before and the exact location of which was not recorded.

Casual perambulation

To the archaeologist or student who enjoys a walk in the country, every outing can become a search for unrecorded sites. These are less likely to be found on tillage land but in areas which for one reason or another have been left undisturbed for centuries. Such areas may be parts of large estates, and are often in the form of shrubberies or plantations, such as the woods at Malahide Castle where a very fine bowl barrow is hidden away and unrecorded.

The lower slopes of mountain ranges, above the level of enclosed fields and too stoney for reclamation, are also promising territory and it is on this type of ground that many well known megalithic tombs are located. The best time to examine such areas is after a mountain fire when all heather and furze have been burned away. It was under these conditions that the site at Piperstown Co. Dublin, where two low mounds had been previously recorded, was found to comprise a group of seven hut sites and eight cairns.

MAPS AND THE IRISH LOCAL HISTORIANJ. H. ANDREWS

Ireland's cartographic history is best conceived not as one period following another but as a number of parallel chains or streams, each representing a separate category of maps. These sequences of events began at different times and in different circumstances, and the contents of any one stream were liable to change through absorption into neighbouring channels or by replenishment from new sources. But each series remained identifiable for a long span of years - in most cases at least until the end of the nineteenth century - as the expression of a distinctive cartographic purpose and as the source of distinctive hazards for the historian. At the same time there are certain features of map history that transcend the kind of thematic classification put forward in the following paragraphs. Whatever their character and function, the maps of any given category tend with the passage of time to become more numerous, larger in scale, more accurate, more comprehensive, more easily dated and placed in their historical context, and in general more readily understood by the modern reader. This does not necessarily mean that earlier maps are less useful to the historian than later ones. The cartographic record often deteriorates as it is followed backwards, but other kinds of record may deteriorate even faster. Moreover improved efficiency among cartographers was often achieved at the cost of increasing standardisation, so that in any map category the earlier specimens may be wider in thematic range than the later, and therefore richer in pleasant surprises.

Since Irishmen have no native cartographic tradition, our maps began where foreigners began, on the coast. The Dutch, French and British charts of post-medieval times had important Spanish and Italian precursors that carry the record of our ports and harbours as far back as the early fourteenth century.¹ The mapping of the interior came later, the earliest good examples being associated with the Tudor conquest. These early general maps, whether national or regional, were produced and preserved in somewhat unsystematic fashion, with many variations in scale, in date and in territorial coverage, but being mainly intended for official use they were most numerous in areas of political and military disturbance and comparatively rare in peaceful districts like the English pale. Today they must be sought in the manuscript rooms of the British Library, the Public Record Office (London), the National Maritime Museum, and Trinity

College Dublin,² for few sixteenth and early seventeenth century general maps were printed in their own time, and those not the best. In fact it was not until after the appearance of John Speed's Theatre of the Empire of Great Britain in 1611 that any published map of Ireland began to command respect among a wide circle of knowledgeable readers. Thereafter the demand for newly-constructed outlines of the country and its regions suffered a sharp decline, and most seventeenth and eighteenth century publishers were content to introduce comparatively minor (but still historically interesting) alterations to some ready-made model.

Local researchers, with no bibliographical guidance in this field apart from an occasional exhibition catalogue,³ have tended to disregard the kind of map that shows the whole country within a single frame, but separate representations of Ireland, like that of Henry Pratt published at a scale of c. 1:350,000 in 1708, could be remarkably elaborate and circumstantial even after it had become customary to issue the most detailed available information in the handier form of county maps. The latter make their debut between book covers, some in William Petty's county atlas of 1685 and its derivatives⁴, others as folding plates in the topographical writings of Charles Smith and Walter Harris.⁵ From 1750 onwards, however, single-sheet or multi-sheet maps of individual counties become increasingly common many of them on scales larger than 1:100,000. Printed town plans have a somewhat similar history, beginning as insets in Speed's provincial maps or as illustrations to historical narratives⁶ before gradually establishing themselves as an independent cartographic genre. The difference between counties and towns is that while the former have been comprehensively listed by E.M. Rodger⁷ the student of Ireland's urban cartography must take his chance with local bibliographies of widely varying merit.⁸ Such bibliographies seldom point out that all copies of the same printed map are not necessarily identical, although in fact it was by no means uncommon for a printing plate to be corrected or revised between issues without any alteration to its title and date.⁹ For the historian of towns and communications, in particular, it may be advisable to compare a number of copies.

For maps of more specialised character, manuscripts remained the appropriate medium until late in the nineteenth century. Irish military surveying begins in Tudor times with narrative battle plans and engineers' fort plans (including manuscript plans of fortified towns), the latter reaching a peak of accuracy and comprehensiveness in the surveys done by Thomas Phillips in 1685.¹⁰ From the 1760s this kind of large-scale site plan was supplemented by manuscript military surveys depicting more extensive tracts of country at scales of c. 1:80,000 or larger.¹¹ The military surveyor's somewhat specialised notion of relevance inevitably

sets a limit to the historical value of his work, but in Ireland it is safe to describe the results as under-used as well as under-documented.

The sequel of military conquest was civil colonisation, an activity which left its own cartographic trace in the plantation surveys first described by W.H. Hardinge.¹² Petty's famous 'Down' admeasurement was only one in a long succession of surveys of forfeited estates, many of them showing boundaries and acreages at scales of c. 1:10,000, that began in Elizabethan Munster and ended with the Trustees' Survey of 1700-3. Many of these plantation maps have been lost, but their influence may be seen in some of the private estate surveys commissioned by the new proprietors. This is especially true of the kind of estate map - a disappointingly high proportion of the whole - that shows little more than the outer limits of a townland or tenement. At the other extreme are the surveys of John Rocque, Bernard Scale and their successors, in which the landscape comes alive with all the detail and precision of a coloured air photograph.¹³ Some estate maps are in the manuscript rooms of major libraries, others remain in private hands. The best starting points for a search are R.J. Hayes's Manuscript sources for the history of Irish civilisation (Boston, 1965) and the pamphlets on maps issued by the Public Record Office of Northern Ireland.¹⁴ With the entrenchment of the Irish estate system there finally emerged the scholar's map, often made by clergymen or country gentlemen from motives of disinterested curiosity or in association with some kind of social or economic survey. The maps in the Dublin Society's Statistical Surveys (1801-32) and in W.S. Mason's Parochial survey (1816-19) are by no means negligible examples, despite their generally rather small scales.

After the union of 1801 the government began to take a wider and deeper interest in Irish cartography. At first private surveyors were given official employment on specific projects like the mapping of the larger peat bogs in 1810-14 and of the crown lands in the 1820s. Then, in 1824, the Ordnance Survey was imported from Britain to provide comprehensive national coverage on a gradually widening range of scales. The results, with original publication dates in brackets, may be summarised as follows: towns, 1:1056 or 1:500 (1840-95), enclosed and built-over areas, urban and rural, 1:2500 (1864-1913), the whole country 1:10,560 (1833-46), 1:63,360 (1855-62), 1:253,440 (1839). Further details of these maps, including subsequent revisions, have been given by the present writer elsewhere.¹⁵ They left no more room for privately published county maps on medium scales in the manner of the eighteenth century, but there remained a steady flow of non-Ordnance Survey charts, estate maps, town plans and small-scale general maps, some by commercial cartographers and some by other government departments, which continued until the end of the Victorian era and in

some cases until the present day.

Next to the coastline the most commonly represented features on early maps are the names and boundaries of territorial divisions. Counties, baronies, and native 'countries' were depicted by many Elizabethan cartographers, often with the names of their dominant families, while townlands or their local equivalents figure prominently on the Ulster plantation surveys of 1609,¹⁶ as well as in the fragmentary survivals of the earlier Munster surveys. Parishes are shown on the Down Survey maps and reappear on many county maps of the eighteenth and nineteenth centuries. In ordinary topographical surveys (as distinct from plantation and estate surveys) the boundaries were sketched in between the appropriate settlements or physical features; such work was usually done with care, and some surveyors admitted defeat in cases of uncertainty rather than resorting to conjecture. For plantation and estate purposes, most boundaries were individually measured with chain and circumferentor, and the acreage inside them determined by graphic or trigonometrical computation before being written in figures on the map. It was not unusual for roads or streams to be shown where they coincided with a tenurial boundary, but the representation of punctiform boundary markers such as trees, raths, rocks or hill-tops is less common on Irish property maps than might be expected. Nevertheless it is usually possible to tell whether or not a boundary on an old estate survey coincides with any of the boundaries in the modern landscape. Often, of course, it does not: apart from alterations agreed among landlords and tenants, many changes were made from 1825 onwards by the government's boundary department working in conjunction with the Ordnance officers.

The Ordnance Survey agreed with Petty that in a series of maps on different scales each map should proceed one step further down the territorial hierarchy than the map on the next smaller scale. Thus counties are named and delimited on Ordnance maps of 1:633,600 and over; baronies at 1:253,440 and over, parishes at 1:63,360 and over; townlands at 1:10,560 and over. There are also two useful sets of published Ordnance Survey county indexes: one in a single sheet at scales from 1:190,080 and 1:95,040, showing parishes and baronies; the other at 1:63,360, showing townland boundaries and 1:2500 sheet lines. The exact acreages of all the above-mentioned areas are specified to the nearest statute perch on the 1:10,560 maps and their indexes, and the acreages of individual fields are given on the 1:2500 maps. The Ordnance Survey also issued a number of special maps showing the various new territorial units, such as poor law unions and district electoral divisions, that were introduced in the course of the nineteenth century. In addition to these public legal boundaries, the boundaries of individual tenements are shown in colour on a set of 1:10560 maps preserved in the Valuation Office, Dublin.

Towns and villages appear on early small-scale maps as diagrammatic clusters of buildings, though on the first marine charts it was common for the name to be recorded but not the town. Among individual buildings, only castles and churches were systematically marked and identified, Richard Bartlett in Ulster being almost unique among Tudor cartographers in the attention he paid to houses of lesser importance.¹⁷ Even as late as 1654 Petty was arranging for the Down Survey to include not all houses, but only those that were 'known', and a comparison of his results with those of contemporary non-cartographic surveys suggests that the 'known' examples were only a small proportion of the total. With those estate surveyors who were inspired by plantation cartography it thus becomes questionable whether every small building is meant to be shown on their maps, especially as some of these men are known to have used a technique of measurement that did not necessarily bring them within sight of every part of the survey area. After some experience the student of local history will gain confidence in his own judgement as to how much comprehensiveness was intended, and achieved, in any given early map - though he may fail to inspire a corresponding faith among the more sceptical of his fellow historians. The same problem of incompleteness arises in the interpretation of early plans. No doubt the number of houses distinguished in the plans of Speed and his contemporaries was roughly proportional to the number of households in the town, but it would be dangerous to base an estimate of absolute urban population on the hypothesis that these two numbers were identical.

The early map-maker's habit of drawing houses in profile or in bird's eye view may give a useful indication of a building's character and general appearance; but when it comes to interpreting architectural detail considerable allowance must be made for artist's licence, as can be seen by comparing different versions of the same building on duplicate copies of the Down Survey. On the whole, the larger the building, the more accurately the early cartographer will show it. The change of planiform cartographic symbolism took place gradually: it came earliest in town plans, latest in the depiction of large and elaborate single buildings such as churches and country mansions, the latter appearing in 'scenographic' form as late as the middle nineteenth century. In some of the earliest Irish examples of the planiform style, produced by Thomas Phillips in 1685, the building blocks are variously coloured in carmine and grey, and this distinction recurs frequently up to and including the time of the Ordnance Survey. Its significance is seldom made explicit, but in general carmine seems to indicate houses of superior

value while grey or black is reserved for cabins or for non-residential buildings.

The functional differentiation of particular sites in early cartography by symbols or descriptive writing is naturally dependent on the scale and general comprehensiveness of the individual map. Perhaps the oldest convention applied to Ireland (it was used by Mercator in 1564) is the representation of bishops' and archbishops' seats by single and double crosses respectively; but symbols for lime-kilns, charcoal furnaces, iron works, wind mills and water mills all occur on Irish maps at least as early as the 1590s and make sporadic appearances on plantation and estate surveys throughout the following century. After 1700 the map-maker's vocabulary was further enlarged to take in markets, barracks, schools, fair grounds, milestones, turnpike gates, bleach greens, mines and even the occasional 'fire engine'.

Woods and to a lesser extent bogs figure in Elizabethan regional maps as rebel refuges or as obstacles to the movement of the queen's army. In the seventeenth-century plantation surveys, timber is given prominence as an economic resource that was now being rapidly consumed, while bogs were classed as 'unprofitable land', the use of a broken line to distinguish bog edges from townland boundaries being at least as old as the Munster plantation. With few exceptions, arable and pasture begin as written annotations rather than as drawing or colouring; dividing-lines are seldom placed between these two categories, for many early Irish surveyors interpreted 'arable' in its literal sense of what was capable of being ploughed. Even when distinctive symbols for tillage and grass become popular in the later eighteenth century they must be treated with some reserve. In the large-scale estate maps of John Rocque and Bernard Scale these symbols carry conviction; so do the field names supplies (all too rarely) by these cartographers and the several different kinds of fence symbol with which they separate the grass and furrows. It is wishful thinking to read the latter as evidence for 'rundale' cultivation, though in some cases they do seem to show the direction actually followed by the plough. On many other later eighteenth-century estate maps, such as those produced by the Frizell family of land surveyors,¹⁸ the 'fields' look much less plausible and were perhaps not intended to be taken literally, any more than they are so intended in Rocque's printed county maps or in the military surveys of the generation that followed Rocque. Even the Ordnance Survey vacillated in its treatment of field patterns: fences were almost wholly omitted from the 1:10,560 maps published between 1833 and 1835, and the propriety of mapping openfield baulks was still under discussion among senior Survey officers as late as 1903.

Until the nineteenth century the mapping of the Irish cultural landscape was largely a matter of social class: the higher the status of its owner or occupier, the more carefully a feature was surveyed. It is thus not surprising to find that demesnes and private parks - often accompanied by the names of their proprietors - are more fully represented than any other kind of rural land use. Deerpark walls appear on maps that show no interest in ordinary fences, such as the Down Survey and the early county maps, while from 1750s onwards the avenues, groves and lakes of the gentlemen's pleasure ground **are** rendered in a way that often gives a realistic impression of their lay-out.¹⁹

Considering how much time the early surveyor must have spent riding or walking, his neglect of roads is one of the puzzles of cartographic history. With a few exceptions, among them the maps of Richard Bartlett, the only lines of communication to appear with any frequency before 1650 are bridges, 'passes' (through the woods) and causeways. Even on the comparatively large-scale maps of the Down Survey roads are scarce, and liable to stop short in the middle of nowhere. It is at the other end of the cartographic spectrum, on the small single-sheet maps of Ireland produced by William Petty, Christopher Browne, Robert Morden, John Seller and others, that the country's major highways first make their appearance; each of these cartographers gives his own selection, unfortunately without saying how he knew which roads to select. After 1700 roads appear in growing profusion on Irish maps of almost every kind, including the special strip maps published for the use of travellers in 1778 by George Taylor and Andrew Skinner. From the same period come many surveys of intended lines of new road, like those made by the Irish post office in the years following 1805.²⁰ Present and future were also recorded (though not always clearly distinguished for posterity) on contemporary maps of canals and harbour works. The independent railway survey, however, is hardly known in Ireland; like several other kinds of map familiar in nineteenth-century Britain, it was rendered unnecessary by the excellence of the Irish Ordnance Survey.

As well as more orthodox topographical data, many early map-makers showed at least a passing interest in such unexpected topics as geology, flora and fauna, local history and legend, antiquities and old places. The Tudor period alone yields cartographic information about Kerry diamonds near Tralee, coastal erosion in Wexford, bird life on Ben Bulbin, Scotsmen's signal fires on the coast of Antrim, the wrecks of several Armada ships, and the method of cursing practised on the islands of Inishmurray. On later maps, this kind of adventitious information tends generally to diminish, and to consist mainly of marginal views of local scenery. But as late as the 1820s an enthusiastic amateur was mapping hotels, grocers'

shops and bathing places in the parish of Magilligan, Co. Londonderry, and adding for good measure the heights at which grain could be grown on the mountains; while the Ordnance Survey officers forgot their usual austerity when they annotated their own maps with the landing place of the French in 1798 and the birthplace of Oliver Goldsmith.

In conclusion, there is room for only a few brief hints selected from the large amount of advice that is now available in print for the local historian who seeks to work with early maps.²¹ Whatever the subject of the inquiry, do not dismiss any class of cartographic source material in advance. Do not assume, for example, that regional and national maps necessarily have less local interest than local maps; or that small-scale maps are necessarily less informative than large-scale maps. In fixing the chronological position of a map, remember that the date of the information it communicates may be quite different from the date at which it was drawn. Distinguish between originals and copies, and look out for the errors that are almost inevitable in the transition from the former to the latter: even the Ordnance Survey could misread 'flour mill' as 'flax mill' when processing its own field data for publication. Try therefore to find the most original version of any map, but do not neglect derivative versions, for many copyists contributed valuable details of their own. In particular, do not despise printed maps as necessarily less authentic than manuscript maps. Of any map, ask how it was made and why it was made, and remember that map-makers are human.

1. T.J. Westropp, 'Early Italian Maps of Ireland from 1300 to 1600, with notes on foreign settlers and trade', Proc. R. Ir. Acad., 30 C, 1913 pp. 361-428. The most recent guide to other work on this subject is W.A. McComish, 'Early Maps of Ireland in the Andrews Collection of the Royal Geographical Society', Geogr. Jour. 134, 1968 pp. 306-8.
2. R. Dunlop, 'Sixteenth Century Maps of Ireland', Eng. Hist. Rev., 20 1905, pp. 309-37. For more recently discovered maps, see G.A. Hayes-McCoy, Ulster and Other Irish Maps, c. 1600, Dublin, 1964.
3. J.H. Andrews, Ireland in Maps, Dublin 1961; A. Bonar Law, Three Hundred Years of Irish Printed Maps, Belfast, 1972.
4. W. Petty, Hiberniae Delineatio, reprinted with introduction by J.H. Andrews, Shannon, 1969.
5. G.L.H. Davies, 'The Making of Irish Geography, IV: the Dublin Physico-Historical Society', Irish Geogr., 12, 1979, pp. 92-8.
6. G. Story, A true and Impartial of the Most Material Occurrences in the Kingdom of Ireland During the last Two Years, London, 1691.
7. E.M. Rodger, The Large Scale County Maps of the British Isles, 1596-1850, Oxford, 1972, 40-45.
8. Published lists of early maps exist for Belfast, Carrickfergus, Cork, Dublin (only a few especially well-known maps included), and Waterford. For references see J.H. Andrews, 'Ireland in maps: a bibliographical postscript', Irish Geogr., 4, 1962, p. 239. By far the best cartobibliography of an Irish town is that of Londonderry by the late W.S. Ferguson, which unfortunately remains unpublished.
9. For an example, see J.H. Andrews, Two Eighteenth-Century Maps of Dublin and its Surroundings, Lympe, 1977.
10. National Library of Ireland, Dublin, MSS 2557, 3137.
11. J.H. Andrews, 'Charles Vallancey and the Map of Ireland', Geogr. Jour., 132, 1966, 48-61.
12. W.H. Hardinge, 'On Manuscript Mapped Townland Surveys in Ireland of a Public Character, from their introduction to 23rd October 1641', Proc. R. Ir. Acad., 8, 1861-4, pp. 39-55. 'On Manuscript Mapped Townland Surveys in Ireland of a Public Character, embracing the Cross, Civil and Down Surveys, from 1640 to 1688', Trans. R. Ir. Acad., Antiquities, 24 (1873), 3-109; 'A Concluding Memoir on Manuscript Mapped and Other Townland Surveys in Ireland, 1688-1864', Ibid., 265-313. For a guide to more recent studies of the Down Survey see note 4 above.
13. J.H. Andrews, 'The French school of Dublin land surveyors', Irish Geogr., 5 1967, 275-92.

14. Public Record Office of Northern Ireland, How to Use the Record Office, nos. 11-18, Maps, Plans and Surveys, Belfast, 1972.
15. J.H. Andrews, History in the Ordnance Maps: an Introduction for Irish Readers, Dublin, 1974.
16. J.H. Andrews, 'The maps of the Escheated Counties of Ulster, 1609-10', Proc. R. Ir. Acad., 74 C, 1974, 133-70.
17. K. Danaher, 'Representations of House on Some Irish Maps of c. 1600', in G. Jenkins, Studies in folklife: essays in honour of Iorweth C. Peate, London, 1968, pp. 91-103.
18. Illustrated in F.H.A. Allen and R.J. Hunter, 'The Estate Maps of Trinity College', Hermathena, 98, 1964, pp. 90-91.
19. E. Malins and the Knight of Glin, Lost Demesnes: Irish Landscape Gardening, 1660-1845, London, 1976, p. xv.
20. Illustrated in J.H. Andrews, 'Road Planning in Ireland Before the Railway Age', Irish Geogr., 5, 1964, Plate 2.
21. Much of this literature is cited in J.B. Hurley, Maps for the Local Historian: a Guide to the British Sources, London, 1972.

NORTHERN IRELAND SITES AND MONUMENTS RECORDA. HAMLIN and A. GIVEN

One of the results of the 'rescue archaeology' boom of the 1970s in Britain was the growth of archaeological Sites and Monuments Records. Faced with the impossibility of preserving or excavating every threatened site, workers realised that it was essential to have a basic record of the whereabouts of all known sites, against which background priorities could be discussed and decided. Although the Royal Commissions on Ancient and Historical Monuments had been recording since the first decade of this century in Britain, and the Archaeological Survey in Northern Ireland since 1950, this detailed county by county cover only partly filled the need because of its slow pace. In the 1970s money was diverted away from excavation towards rapid survey and the compiling of Sites and Monuments Records which now exist for most English counties, ranging in sophistication from simple card systems to computerised records.

Against this background, work on the Northern Ireland Record began in the Archaeological Survey (Historic Monuments and Buildings Branch, DOENI) in 1975, and stage 1 was completed in 1978, since when its reproduction and circulation have been in hand. The Record is in three parts: a full OS map cover at six inch or 1 : 10,000 scale on which all known sites are marked and numbered, a key list of numbered sites for each map and a record card for each site providing a key to other information held including bibliography, photos, plans, field notes. Cards are stored in alphabetical order by townlands.

A sites and Monuments Record seeks to bring together, store and make available basic, but not necessarily detailed, information about all known archaeological sites. The starting point for the Northern Ireland Record was careful scrutiny of all editions of OS Six Inch maps, a basic source for any local study, together with information from the 1940 Preliminary Survey of Ancient Monuments of Northern Ireland and earlier topographical and archaeological works. Field survey material is detailed for those areas where the County survey has recently been active, especially Counties Armagh and Fermanagh and the survey of South Antrim began in 1978. As this survey work proceeds, the OS Memoirs are quarried, parish by parish, a wonderfully rich source for County Antrim. Information in the Record on sites in the other counties is much less detailed. Certain individual research projects have been fed into the

Record and some field notes and drawings generously deposited in it.

The total of sites now reached is about 9,000 emphatically a minimum figure, as new sites are constantly being found by ground survey and through air photographs. The total includes monuments and buildings to the early 17th century, also some penal sites, holy wells of uncertain date and landscape features of more recent times which sometimes resemble antiquities, especially ornamental 'tree-rings' which can be confused with raths/ringforts. The Record does not at this stage cover historic buildings, industrial monuments or individual finds of archaeological material.

The Record has applications in three main directions. Internally it is already an Archaeological Survey's invaluable basis for dealing with incoming enquiries and it provides essential preliminary information for inspectors going out into the field. Secondly it is an aid to protection, a rescue tool. Unlike most of the British Records which are kept at a single base, the Survey has circulated the maps and lists, the key to the whereabouts of sites, to a wide range of government land-using agencies, seeking early warning of any developments which may involve monuments. It will also gladly supply copies of individual maps and lists to any members of local societies who are willing to exercise some surveillance over sites in their areas and report back news of finds, new sites or threats.

The circulation of maps and lists is being done on a restricted and confidential basis. We are most anxious that they should never be misused as a guide to the whereabouts of hunting grounds for treasure hunters. Under the 1971 Historic Monuments (NI) Act any excavation for archaeological purposes is illegal without a licence from DOENI, issued only to trained and experienced excavators. Digging, therefore, to search for objects as a result of using a metal detector is illegal in Northern Ireland, and also in the Republic. A sad feature of the 1970s was the realisation that attempts by archaeologists to make sites better known, understood and appreciated, through books, articles and guides, could serve also to point metal detector-users to those sites. The Sites and Monuments Record will function successfully as a rescue tool only if its confidentiality is respected. The third purpose of the Record is to provide a research source. The maps and lists provide a key to the whereabouts of sites, but for more detailed information the research worker may have to consult the full Record at the Archaeological Survey's HQ in Balmoral Avenue, Belfast.

The work of compiling the Record, particularly the intensive study of maps, has underlined the potential importance of 'indoor archaeology', not sufficiently exploited in the past. Seeing how the bend of a lane or hedges preserves some trace of a long-vanished but recorded earthwork invites speculation as to the significance of similar topographical oddities with no known monumental associations. Place-names can suggest otherwise unrecorded sites, like lis townlands with no known fort and Shankills where church or graveyard sites remain to be pinpointed. The siting of monuments in relation to townland, parish and barony boundaries is an interesting subject of study. Early map editions can also show buildings which disappeared from later sheets yet may leave traces on the ground which are easily mistaken for antiquities.

The members of the Archaeological Survey cannot hope to follow up all such leads in the field, and the need is clearly for locally based people to pursue all sources of information in their areas: to tap local traditions, collect field and place-names, record some of the oral knowledge that is gradually lost as generations pass. In doing this they will also help to keep alive or arouse local interest and pride in monuments and concern for their preservation. Although for its compilers the completion of stage 1 of the Northern Ireland Sites and Monuments Record was something of a landmark, the Record is really only a beginning, certainly not an end in itself, and we hope it will provide a starting point for many local archaeological and topographical studies.

Note: The Record is in the charge of Mrs Anne Given at Archaeological Survey, 66 Balmoral Avenue, Belfast BT9 6NY (telephone Belfast 661621).

IRISH MUSEUMS AND THE RESEARCH STUDENTD.R.M. WEATHERUP

A museum is defined in the Oxford Dictionary as 'A building or a portion of a building used as a repository for the preservation and exhibition of objects illustrative of antiquities, natural history, fine and industrial art or some particular branch of any of these subjects'. (The Oxford English Dictionary, 1970 edition, volume VI, p. 781) but more important than this basic definition is the fact that museums are buildings where such objects, or specimens as they are called in museum parlance, are preserved, exhibited and used. It has become recognized in Ireland in recent years that this concept of museums even at its broadest is too narrow, so in this survey that promulgated by the International Council of Museums has been used. Article 3 of the I.C.O.M. statutes states that 'a museum is a non-profitmaking, permanent institution in the service of society and of its development, and open to the public, which acquires, conserves, researches, communicates and exhibits, for purposes of study, education and enjoyment, material evidence of man and his environment'. Realizing that students might well benefit from this more liberal interpretation, the survey on which this paper is based has been extended to cover many institutions which would not hitherto have been considered.

The purpose of museums, is better expressed by the phrase 'the responsibility of portraying the nation's history through the evidence of physical objects', used in their study of the National Museum of Ireland by members of the Institute of Professional Civil Servants (Museum Service for Ireland, Dublin 1973, p. 7) for the core of the museum is its collection of specimens, although a library, archives and photographic files are essential for the specimens to be adequately utilized. It is now widely accepted that they are used primarily for educational purposes and one aspect of this is the advantage that can be taken of them by those interested in history, pre-history, folklife, natural history and art. The extent of this usefulness is naturally controlled by the size and scope of the collections of each museum, but generally there is an increasing willingness amongst members of the museum profession to assist and encourage the interested amateur as well as the academic student.

It has got to be realized that finance is fairly, or unfairly, restricted and that the officers of the museums in Ireland have many other aspects of their craft to pursue and consequently the amount of time that they can give

to enquirers, even the most dedicated and painstaking enthusiasts, is limited. The availability of museum collections and records and of the expertise of the staff is thus not unbounded and it must be emphasised that the work of searching, copying and abstracting from the collections and museum records will therefore fall to the lot of the enquirer. Once the possible use of the specimens, records, photographs etc., has been examined and decided the work will have to be done by the researcher himself or herself. None the less a keeper, assistant or curator can usually be relied upon to find time to discuss, advise and criticise the progress of such work and guide those unaccustomed to such activities into the best ways of following their lines of enquiry.

The building up of the collections, the recording of the changing scene by photography, tape-recording and transcribing, the preservation, cleaning, cataloguing and storing of specimens and their use for display together with the preparation and publication of catalogues and guides, the going forth to investigate finds, see potential donors and attend sales are all facets of museum work. The organizing of temporary exhibitions, the production of film strips and sets of colour transparencies for use by school groups are becoming more prominent features of museum programmes and also demand more time from the staff. These, as well as the more general tasks of administration, maintenance and research, are all time consuming and must be fitted into the work schedule so that the student can expect only a share of the limited time available.

Meeting people is one of the most pleasant aspects of museum work and the image of the potty curator closeted with the absent minded professor in some dark office at the end of the dreary galleries containing rows of sombre cases is, it is to be hoped, gone for ever. With the formation and acceptance of professional display teams in the larger institutions, the growing use of conservation laboratories and the introduction of administrative officers more time has become available to the keepers and their assistants to concentrate on enlarging the collections of specimens and to the study of their contents. This has led to brighter, more informative and less crowded display to an increase in the publication of research papers and to more understanding in dealing with enquiries. The innovation of an information officer, as for example in the Science Museum in London, is now spreading across Great Britain and should lead to easier access for research students to the material but may well result in a reversion to

less contact between curatorial staff and the general public.

The steady growth of visits from schools, colleges and local societies, etc., (helped by the changing methods of education with increasing emphasis on written dissertations and projects undertaken by study groups at all levels and ages) has brought the younger generation to use museums for more than shelters or play-grounds on the way home from school, and it has also helped to make museum professionals more aware of the legitimate needs of students of all ages.

The facilities available in an Irish museum depend on the size of the institution and so vary from place to place. The following is a list of museums and like institutions which have intimated that they are in a position to help students.

NATIONAL GALLERY OF IRELAND, Merrion Square West, Dublin 2.

Status: National Institution.

Director: Mr. Homan Potterton.

Assistant Director - Vacant; Research Curator - Michael Wynne

Cataloguer - John Hutchinson, Librarian - Anne Stewart.

Opening hours: Monday to Wednesday and Friday to Saturday

10 a.m. to 6 p.m., Thursday 11 a.m. to 9 p.m. and Sunday 2 p.m. to 5 p.m.

Subject: Fine arts.

Area served: The Country.

Reference library: There is a reference library on fine arts available from 10 a.m. to 5.15 p.m. Monday to Friday.

Photographic collections: Information available on application.

Facilities are offered to research students: Details on application to the Director.

NATIONAL LIBRARY OF IRELAND, Kildare Street, Dublin 2.

Status: National.

Director: Mr. Michael Hewson

Opening hours: Monday to Friday 10 a.m. to 10 p.m. and Saturday 10 a.m. to 1 p.m.

Subjects: General, specializing in all aspects of Irish studies.

Area served: National and International readership.

Photographic collections: Extensive.

Facilities offered to research students: Catalogues, backup reference works, photographic service, etc.

NATIONAL MUSEUM OF IRELAND, Kildare Street, Dublin 2 (also Merrion Square and 7-9 Merrion Row, Dublin 2).

Status: National.

Director: Brendan O'Riordain, M.A., M.R.I.A., Keeper, Irish Antiquities.

Division - Michael F. Ryan, M.A., Keeper, Art and Industrial Division - John Teahan, M.A., Keeper, Natural History Division - Dr. Colm O'Riordan.

Opening hours: Tuesday to Saturday 10 a.m. to 5 p.m. and Sunday 2 p.m. to 5 p.m.

Subjects: Archaeology, folklife, numismatics, fine arts (exclusive of painting and sculpture), zoology and geology.

Area served: The Country.

Reference library: Very limited access in case of post graduate students.

Photographic collection: Large collection of negatives in respect of archaeology, folklife and fine arts.

Facilities offered to research students: curatorial assistance, access to collection under strict supervision. No access to files (abstracts only).

THE HERBARIUM; National Botanic Gardens, Glasnevin, Dublin 9.

Status: National.

Director: Mr. Aidan Brady.

Other staff: Miss Maura Scannell, Mr. Donal Synnott and Dr. E.C. Nelson (Taxonomist).

Opening hours: Monday to Friday 9.15 a.m. to 5.30 p.m.

Subjects: Botany.

Area served: World-wide.

Reference library: For accredited students by arrangement only.

Photographic collection: Botanical manuscripts.

Facilities offered to research students: Curatorial assistance and access to collections to accredited students.

ULSTER MUSEUM, Botanic Gardens, Belfast BT9 5AB.

Status: National.

Director: Dr. W.A. McCutcheon, M.A., F.S.A., F.R.G.S.

Antiquities Department: Keeper - L.N.W. Flanagan, B.A., F.S.A.,

Assistant Keepers - R.B. Warner, M.A. (later antiquities), P.C. Woodman, Ph.D., B.A. (Prehistoric antiquities), Research Assistant - Mrs W. Glover, M.A.

Art Department: Keeper - E.V. Hickey, B.A., Assistant Keepers - S.B.

Kennedy, B.A., A.R.D. (modern paintings), Miss E. McCrum, M.A. (costume), M. Robinson, N.D.D., (applied art, glass and pottery), Research Assist-

ants - M. Anglesea, B.A., M. Litt. (prints and watercolours), J. Watson, Esq., B.A. (modern art), Miss E. Black, B.A. (old masters).

Geology Department: Keeper - P.S. Doughty, M.Sc., F.M.A. (palaeontology and stratigraphy), Assistant Keeper - R. Nawaz, M.Sc., Ph.D., F.G.S. (mineralogy).

Botany and Zoology Department: Keeper - D.G. Erwin, B.Sc., Assistant Keepers - P. Hackney, B.Sc., A.M.A. (botany), M. McKee, B.Sc., (zoology) and R. Nash, B.Sc. (entomology).

Local History Department: Keeper - Dr. W. Maguire, Assistant Keeper - B.S. Turner, B.A. (local history), Research Assistants - J.N.H. Nesbitt B.A. (history and local history), R.J. Heslip, B.A. (numismatics), Museum Assistant - T. Wylie, (military history).

Industrial Archaeology Department: Assistant Keeper - A. Montgomery.

Opening hours: Weekdays 11 a.m. to 6 p.m., Sundays 2.30 p.m. to 5.30 p.m.

Subjects: Archaeology, art (fine and applied), botany, zoology, geology, technology and local history.

Area served: Regional.

There is a reference library available for students.

Photographic collections: (a) Extensive photographic documentation of collections and items in the region. (b) Extensive written documentation of collections and items in the region. (c) Photographic collections (e.g. Welch collection).

Facilities offered to research students: (a) Access to staff and study collections available on request. (b) Occasional part-time employment of students.

ULSTER FOLK AND TRANSPORT MUSEUM, Cultra Manor, Holywood, Co. Down. (also at Whitham Street, Belfast).

Status: National.

Director: G.B. Thompson, O.B.E., M.Sc., F.M.A.

Department of Buildings: Dr. R.A. Gailey and Dr. P. Robinson.

Department of Material Culture: Mr. J. Bell, Mrs L. Jones, Mrs J. Dixon and Mrs J. Morris.

Department of Non-Material Culture: Mr. A. Buckley, Miss L.M. Smith, Miss F. Scullion and Mr. G.B. Adams.

Department of Transport: Mr. R.B. Beggs, Mr. M.D. McCaughan and Mr. R. Galbraith.

Library/Archives - Mr. A. McClellan, Department of Education - Mr. A. Anderson.

Opening hours: Folk and Transport Museum, Cultra 1st October to 30th April
 Monday, Thursday, Friday and Saturday 11 a.m. to 5p.m., Tuesday and
 Wednesday 11 a.m. to 5 p.m., Sunday 2 p.m. to 5 p.m. 1st May to 30th
 September, Monday, Thursday, Friday and Saturday 11 a.m. to 7 p.m.,
 Tuesday and Wednesday 11 a.m. to 9 p.m., Sunday 2 p.m. to 7 p.m.
Transport Museum, Witham Street, Monday, Tuesday, Thursday, Friday and
 Saturday 10 a.m. to 6 p.m., Wednesday 10 a.m. to 9 p.m.

Subjects: Ulster and Irish folklife, Irish transport history.

Area served: Ulster and in some respects (e.g. transport) Ireland.

Photographic collections: Green collection of photographs, dialect archive,
 family name archive, general archive on material and non-material culture,
 some taped dialect and folk music.

Facilities offered to research students: Curatorial assistance, access to
 reference library and archives, access to stores in certain circumstances.
 (Normally facilities are available only between 9 a.m. and 5 p.m. from
 Monday to Friday.)

PUBLIC RECORD OFFICE OF NORTHERN IRELAND, 66 Balmoral Avenue, Belfast BT9 6NY.

Status: National.

Deputy Keeper of the Records - Mr. B. Trainor; Research Assistant - Mr. G.J.
 Slater in public search room.

Opening hours: 9.30 a.m. to 4.45 p.m. (documents may be ordered up to 4.15 p.m.)

Subjects: All aspects of Irish history.

Area served: Northern Ireland.

No reference library.

Photographic collection: Two major photographic collections - Cooper of
 Strabane and Allison of Armagh and prints for all Irish towns from the
 Lawrence Collection in National Library can be obtained.

Facilities offered to research students: Access to collection, but a
 research topic may be discussed with the Research Assistant in search
 room.

PUBLIC RECORD OFFICE OF IRELAND AND STATE PAPER OFFICE, Four Courts,
 Dublin 7 and Dublin Castle, Dublin 2.

Status: National.

Keeper of State Papers and Deputy Keeper of Public Records - B. MacGiolla
 Choille. Archivists - Dr. Philomena Connolly, Dr. Sean Connolly,
 David Craig, Frances McGee at the Public Record Office and Kenneth
 Hannigan and Caitriona Crowe at the State Paper Office.

Opening hours: Monday to Friday 10 a.m. to 5 p.m.

Subjects: Records of central Government and private records from 1790 with a small percentage of earlier records.

Area served: The Country.

Reference library: Yes.

Photographic collection: Archives and small number of photographs.

Facilities offered to research students: Advice and access to records and other reading room facilities. Copying on paper or film of records.

HERALDIC MUSEUM, Genealogical Office, Dublin Castle, Dublin 2.

Status: National.

Chief Herald: Donal Begley.

Opening hours: Monday to Friday 9.45 a.m. to 1 p.m. and 2.15 p.m. to 4.45 p.m.

Subjects: Heraldry.

Reference library: Yes.

Facilities offered to research students: Curatorial assistance, access to collections.

ARCHBISHOP MARSH'S LIBRARY, St. Patrick's Close, Dublin 8.

Status: Public library.

Keeper: Canon J.S. Brown, M.A., B.D., Deputy Keeper - Rev. C.R.J. Bradley, M.A., Assistant Deputy Keeper - Muriel McCarthy.

Opening hours; Monday 2 p.m. to 4 p.m., Wednesday, Thursday and Friday 10.30 a.m. to 12.30 p.m. and 2 p.m. to 4 p.m., Saturday 10.30 a.m. to 12.30 p.m.

Subjects: Manuscripts and printed books on theology, science, mathematics, travel, navigation, music, surveying and classical literature relating to the 16th and 18th centuries.

Facilities offered to research students: Access to collections for research purposes only.

HUGH LANE MUNICIPAL GALLERY OF MODERN ART, Charlemont House, Parnell Square
Dublin 1.

Status: Municipal.

Curator: Ethna Waldron; Secretary - Patricia Flavin.

Opening hours: Tuesday to Saturday 10 a.m. to 6 p.m., Sunday 11 a.m. to 2 p.m., closed Monday.

Subjects: Modern art.

Area served: The Country.

Reference library: A limited library available.

Facilities offered to research students: Access to collections and files on artists.

CHESTER BEATTY LIBRARY AND GALLERY OF ORIENTAL ART, 20 Shrewsbury Road,
Dublin 4.

Status: Public.

Librarian: Dr. P. Henchy, LL.D.; Islamic Curator - Mr. D. James, Far Eastern Curator - Miss J. Chapman.

Opening hours: April to September Monday to Friday 10 a.m. to 1 p.m. and 2.30 p.m. to 5.30 p.m., Saturday 2.30 p.m. to 5.30 p.m. October to March Monday to Friday 10 a.m. to 1 p.m. and 2.30 p.m. to 5.00 p.m. Saturday 2.30 p.m. to 5 p.m.

Subjects: The Chester Beatty library is a highly specialized institution with a collection of Oriental and Western printed books, manuscripts and miniatures.

Area served: Ireland and overseas.

Facilities offered to research students: It is a research institution of importance willing to help students who must, however, have a letter of recommendation before being allowed to study any manuscript.

ROYAL DUBLIN SOCIETY, Science Section, Thomas Prior House, Ballsbridge,
Dublin 4.

Status: Private society.

Science Officer: Dr. R.C. Mollan

Opening hours: Monday to Friday 9.30 a.m. to 11 a.m.

Facilities offered to research students: Scientific periodicals - photocopy service, catalogue available on application.

GEOLOGICAL MUSEUM, Department of Geology, Museum Building, Trinity College,
Dublin 2.

Status: University museum.

Director: Professor C.H. Holland; Curator - Miss V. Burns. Lecturers usually deal with inquiries relating to their own particular fields.

Opening hours: Visits by appointment only. School groups are invited to visit the museum on Wednesday or Thursday afternoons by appointment.

Subjects: Geology and related subjects.

Area served: World wide, but mainly Ireland.

Reference library: Departmental library.

Facilities offered to research students: All available facilities by arrangement.

WEINGREEN MUSEUM OF BIBLICAL ANTIQUITIES, 5036 Arts Building, Trinity College, Dublin 2.

Status: University museum.

Curator: Rev. J.R. Bartlett, B.Litt., M.A., F.T.C.D.

Opening hours: By appointment with Curator.

Subject: Palestinian archaeology.

Area served: No particular geographic boundaries apply.

Reference library: A small departmental library, dealing mainly with Old Testament.

Photographic collection: A collection of photographs relating to the excavations of Tell ed Duweir.

Facilities offered to research students: Bona fide research students who need to study the pottery and artefacts in the Museum will be given access and whatever assistance the Curator can give them.

DEPARTMENT OF IRISH FOLKLORE, University College Dublin, Belfield, Dublin 4.

Status: University department.

Head of Department of Irish Folklore: Professor Bo Almqvist. Dr. Seamas O'Cathain, Dr. Caoimhin O'Danchair and Mrs Patricia Lysaght.

Opening hours: Monday, Tuesday, Thursday and Friday 2:30 p.m. to 5.30 p.m.

Subjects: Irish folklore.

Area served: Ireland (and to some extent Scotland and the Isle of Man).

Reference library: Library facilities not available to undergraduates.

Extensive collection of photographs, plans, sketches, diagrams and other pictorial representations of the visible aspects of tradition.

Facilities offered to research students: Access to manuscript collection and manuscript index and the library during normal opening hours subject to availability of staff.

CLASSICAL MUSEUM, University College, Belfield, Dublin 4.

Status: University museum.

V.D. Connerty, M.A. Curator and C.V. Walthew, M.A., Ph.D.

Opening hours: On request.

Subjects: Classical Greek and Roman pottery and coinage.

No reference library.

No photographic collection.

Facilities offered to research students: Access to collection and curatorial assistance.

GUINNESS MUSEUM, St. James's Gate Brewery, Dublin 8.

Status: Private.

Curator: Peter Walsh.

Opening hours: 10 a.m. to 4 p.m.

Subjects: Brewing, coopering, transport, industrial archaeology and old Dublin.

Area served: Mainly Dublin.

Reference library: Yes.

Photographic collection: Guinness photographic archive. Manuscripts, documents and books relating to brewing in Ireland.

Facilities offered to research students: Curatorial assistance and access to collection, files, xerox and photographic facilities.

THE LINEN HALL LIBRARY, 17 Donegall Square North, Belfast BT1 5GD.

Status: Private Society.

Librarian: Mr. J.R.R. Adams, Deputy Librarian - Mr. T. Killen.

Opening hours: Monday to Friday 9.30 a.m. to 6 p.m., Saturday 9.30 a.m. to 4 p.m.

Subjects: Publications relating to Ireland.

Area served: The Country.

Reference library: Extensive.

Photographic collection: Small photographic collection and large postcard collection, etc.

Facilities offered to research students; Full access, assistance and photocopying.

THE ROYAL ULSTER RIFLES MUSEUM, Regimental Headquarters, The Royal Irish Rangers, 5 Waring Street, Belfast BT1 2EW.

Status: Regimental (Army).

Hon. Curator: Lt. Colonel W.R.H. Charley, J.P.

Opening hours: 10 a.m. to 12.30 p.m. and 2 p.m. to 4 p.m. Monday to Friday with prior notice.

Subjects: Army. 83rd and 86th Regiments, Royal Irish Rifles and Royal Ulster Rifles.

Area served: World wide.

Reference library: Yes.

Photographic collection: Albums, scrap books, war diaries and regimental muniments.

Facilities offered to research students: Curatorial assistance.

COMBINED IRISH CAVALRY MUSEUM, Carrickfergus Castle, Carrickfergus, Co. Antrim.

Status: Military (Army).

Staff: The Regimental Secretaries.

Opening hours: Monday to Friday in Winter 10 a.m. to 4 p.m., Saturday and Sunday 2 p.m. to 4 p.m. Monday to Friday in Summer 10 a.m. to 6 p.m., Saturday and Sunday 2 p.m. to 6 p.m.

Subjects: Military uniforms, medals and regimental property, etc.

Facilities offered to research students: No assistance at Carrickfergus, but assistance can be given through Regimental Secretary or by writing to the 5th Royal Enniskillen Dragoon Guards, The Castle, Chester CHI 2DN and the Queen's Royal Irish Hussars, 5 GT Scotland Yard, London SW1 2HJ. North Irish Horse enquiries should be sent to 'D' (NIH) Squ. RY, Dunmore Park, Antrim Road, Belfast BT15 3FP.

LISBURN MUSEUM, The Assembly Rooms, Market Square, Lisburn, BT28 IAG, Co. Antrim.

Status: Borough Council Museum.

Curator: B.J. Mackey, B.A.

Opening hours: Monday to Friday 9 a.m. to 5 p.m. (Office only).

Subjects: Mainly local history.

Area served: North West Down and South West Antrim.

Reference library: A reference library is being built up.

Photographic collection: Not yet catalogued.

Facilities offered to research students: The Curator will help any students in whatever way he can.

ARMAGH COUNTY MUSEUM, The Mall East, Armagh BT61 9BE, Co. Armagh.

Status: Branch of the Ulster Museum.

Curator: D.R.M. Weatherup, F.M.A.

Opening hours: 10 a.m. to 1 p.m. and 2 p.m. to 5 p.m. Monday to Saturday inclusive. Closed Sunday and certain Bank holidays.

Subjects: Prehistory, history, folklife, costume, natural history and

art.

Area served: County Armagh and surrounding districts.

Reference library: Available for consultation by students.

Photographic collection: Collection of black and white negatives and colour transparencies. Archives - relevant to the collection including letters etc., by George Russell (AE) and material concerning other Armachians.

Facilities offered to research students: Curatorial assistance, access to reserve collections and files. Work supervision and students room available.

THE PLANETARIUM, College Hill, Armagh.

Status: Independent, Department of Education financed.

Director: Terence P. Murtagh.

Opening hours: Monday to Friday 10 a.m. to 5 p.m., Saturday 2 p.m. to 5 p.m.

Subjects: Astronomy, Planetaria and related subjects.

Area served: Northern Ireland.

Reference library: Yes.

Photographic collection: Astronomical slides, 35 mm colour (approx. 8,000).

Facilities offered to research students: Assistance given where possible.

REGIMENTAL MUSEUM, Royal Irish Fusiliers, Sovereign's House, The Mall, Armagh.

Status: Army.

Curator: Major G.A.N. Boyne and also Mrs A. McKearney.

Opening hours: 10 a.m. to 12.30 p.m. and 2 p.m. to 4.30 p.m. Monday to Friday.

Subjects: History of the Royal Irish Fusiliers and military history since 1793.

Reference library: Yes.

Photographic collection: Albums of photographs covering regimental personalities and events since 1865. Documents relating to regimental affairs.

Facilities offered to research students: Curatorial - on a personal basis.

HERBARIUM, PLANT PATHOLOGY AND ENTOMOLOGY DEPARTMENT, Oak Park Research Centre, Carlow, Co. Carlow.

Status: Part of Semi-State Research Institution.

Curator: Dr. C.O'Rourke.

Opening hours: 9 a.m. to 5 p.m. Monday to Friday.

Subjects: Specimens of plant diseases.

Area served: Irish and world wide material.

Photographic collection: coloured slides (35 mm) of common disease specimens and fungus card index.

Facilities offered to research students: Open to all qualified personnel by personal attendance, or by posted specimens.

CORK PUBLIC MUSEUM, Fitzgerald Park, Cork.

Status: City Museum (but receives financial contributions from the County Council and from Cork Vocational Education Committee).

Curator: Seamus O Coighligh, Assistant Curator - Aodh O Tuama.

Opening hours: October to May, Monday to Friday 11 a.m. to 1 p.m. and 2.15 p.m. to 5 p.m., Saturday 11.30 a.m. to 1 p.m. June to September, Monday to Friday 11 a.m. to 6 p.m. and on Wednesday 8.30 p.m.

Subjects: History of the development of Cork, Irish history, natural history and archaeology.

Area served: Munster.

Reference library: Small at the moment but in the process of development.

Photographic collections: Photographs of Irish historical interest, (particularly 1916-1922), Old Cork prints, old theatre bills and programmes, literary, architectural and commercial (Cork Butter Market) documents.

Facilities offered to research students: Curatorial assistance and access to collections.

CRAWFORD MUNICIPAL ART GALLERY, Emmet Place, Cork.

Status: Local Authority.

Curator: Diarmuid O'Donobhain; and one library assistant.

Opening hours: Monday to Friday 10 a.m. to 5 p.m.

Subjects: Paintings, sculpture and applied arts.

Area served: County and Province of Munster.

Reference library: Yes.

There is a small photographic collection.

Facilities are offered to research students.

HERBARIUM, University College, Cork.

Status: University museum.

Dr. John P. Cullinane (Part-time Curator), and Mr. Paul Murphy, M.Sc., (Assistant lecturer).

Opening hours: on request.

Subjects: Botanical Herbarium.

Reference library: Yes.

Facilities offered to research students: Full university facilities, but no full-time staff, so curatorial assistance is at a low level.

KINSALE REGIONAL MUSEUM, Kinsale, Co. Cork.

Status: Regional.

Hon. Curator: Michael Mulcahy; Assistant Curator - Eugene Gillen.

Opening hours: 10.30 a.m. to 12.30 p.m. and 2.30 p.m. to 5 p.m. on weekdays.

Subjects: All aspects of life in the town, port and region through the centuries.

Area served: The region of Kinsale.

Photographic collection: Small photographic collection, old Corporation and other local records.

Facilities offered to research students: Research students are facilitated as far as possible.

JAMES JOYCE MUSEUM, Martello Tower, Sandycove, Co. Dublin.

Status: Semi-State.

Curator: Robert Nicholson.

Opening hours: May to September, Monday to Saturday 10 a.m. to 1 p.m. and 2 p.m. to 5.15 p.m., Sunday 2.30 p.m. to 6 p.m. October to April by appointment.

Subjects: James Joyce, his life and work.

Area served: International.

Reference library: Yes, in progress of development.

Facilities offered to research students: Curatorial assistance, access to collections and files, reading room and saleable material.

FERMANAGH COUNTY MUSEUM, Castle Barracks, Enniskillen, Co. Fermanagh.

Status: County.

Curator: Helen Hickey, Museum Assistant - Vera Watters.

Opening hours: Tuesday to Saturday 10 a.m. to 12.30 p.m. and 2 p.m. to 5 p.m.

Subjects: Archaeology, history and folklife.

Are served: Western region of Ulster.

Reference library: Yes.

Photographic collection: Old Lawrence, Welch and other photographs of the area. Colour transparencies of local interest.

Facilities offered to research students: Facilities available for students - Curatorial assistance etc.

GALWAY CITY MUSEUM, The Spanish Arch, Galway, Co. Galway.

Status: City Corporation.

Honorary Curator: Professor Etienne Rynne.

Subject: Material associated with the history of Galway City.

Area served: Galway City.

Facilities offered to research students: Personal and written enquiries dealt with.

SHRULE CASTLE LOCAL HISTORY MUSEUM, Shrule Castle, Shrule, Galway, Co. Galway.

Status: Private.

Director/Curatory: Mr. L.B. Mayer-Jones, B.Sc.

Opening hours: Open all year.

Subjects: Geology, folklife and local history.

Area served: South Mayo and North Galway.

Reference library: Yes, largely historical and anthropological.

Photographic collection: Slide collection. (personal).

Facilities offered to research students: Curatorial assistance and residential facilities.

MUCKROSS HOUSE FOLK MUSEUM, Killarney, Co. Kerry.

Status: Society. Administered by a limited company - The Trustees of Muckross House, (Killarney) Ltd.

Manager: Mr. Edmond Myers, B.A.; Assistant Manager - Mrs Geraldine Maguire and Miss Margaret Healy.

Opening hours: Easter to 31st October 10 a.m. to 7 p.m. daily; 1st November to Easter 11 a.m. to 5 p.m. (except Monday).

Subjects: Folklife principally.

Area served: County Kerry.

Reference library: Yes.

Photographic collection: Small photographic collection.

Facilities offered to research students: Curatorial assistance to research students from Monday to Friday 9 a.m. to 5.30 p.m.

ROTHE HOUSE MUSEUM, Parliament Street, Kilkenny, Co. Kilkenny.

Status: Society museum and headquarters of Kilkenny Archaeological Society.

President: Mrs Mary Kenealy; Hon. Curator - Mrs K. Lanigan; Hon. Secretary - Mrs W. Phelan; Librarian - Rev. Sean O'Doherty.

Opening hours: 1st April to 31st October 10.30 a.m. to 12.30 p.m. and 3 p.m. to 5 p.m. Rest of year, Sunday only 3 p.m. to 5 p.m.

Subjects: Archaeology, local history and folklife.

Area served: Kilkenny County and surrounding area.

Photographic collection and archives: Photography - Crawford survey 1946;
Archives - McAdams City and County Tombstone records, Kilkenny Journal
Files from 1767 and Cronin newspaper cuttings.

Facilities offered to research students: Access to collection and library
by request. Small room available for study.

IRISH VETERAN CAR MUSEUM, Ivyleigh, Portlaoise, Co. Laois.

Status: Private.

Hon. Curator: Denis Lucey.

Opening hours: By appointment only.

Subjects: Veteran transport.

Facilities offered to research students: The Hon. Curator will help
students of early transport history and will reply to written enquiries
with stamped addressed envelopes.

CRAGGAUNOWEN MUSEUM (THE HUNT COLLECTION), National Institute of Higher
Education, Plassey House, Limerick and Quin, Co. Clare.

Status: Private - Craggaunowen Project.

Hon. Curator: Dr. Patrick F. Doran.

Opening hours: 9.30 a.m. to 5 p.m.

Subjects: Archaeology and Irish and European art objects.

Area served: Irish Mid west.

Reference library: Small but developing.

Facilities offered to research students: Assistance given and access to
collections.

LIMERICK MUSEUM, 1-2 John's Square North, Limerick, Co. Limerick.

Status: Corporation Museum.

Curator: Larry Walsh, M.A.

Opening hours: Monday to Friday 10 a.m. to 1 p.m. and 2.15 p.m. to 5 p.m.

Subjects: Archaeology, folklife, corporation and city antiquities, some
natural history and ethnography.

Area served: Mid-West Region (Counties Limerick, Clare and North Riding of
Tipperary).

Reference library: At present reference library in City Library, Perry
Square.

Photographic collection: Approx. 500 photographs of field monuments,
(uncatalogued as yet), photographed in 1920s and 30s some miscel-
laneous archival material.

Facilities offered to research students: All resources made available
to students and enquirers.

INNISKEEN FOLK MUSEUM, Inniskeen, Dundalk, Co. Louth.

Status: Society.

Curator: Thomas J. Quinn.

Opening hours: By arrangement.

Subjects: Folklife, Patrick Kavanagh, trades.

Area served: South County Monaghan and North County Louth.

Reference library: Works of Patrick Kavanagh.

Photographs: There is a limited collection.

Facilities offered to research students: Curator will assist research students provided advance notice is given.

MONAGHAN COUNTY MUSEUM, The Courthouse, Monaghan, Co. Monaghan.

Status: County.

Curator: Aidan Walsh, B.A.

Opening hours: Tuesday to Saturday 10 a.m. to 1 p.m. and 2 p.m. to 5 p.m.;
Sunday 2 p.m. to 6 p.m. (June to August only).

Subjects: Archaeology, folklife, local history and art.

Area served: County Monaghan.

Reference library: Yes.

Photographic collection: Classified collection of prints, postcards and negatives.

Facilities offered to research students: Curatorial assistance and access to collections and to classified indices.

SLIGO COUNTY MUSEUM, Stephen Street, Sligo, Co. Sligo.

Status: County.

Curator: Miss Nora Niland, B.A., F.L.A.I.

Opening hours: 10 a.m. to 1 p.m. and 2 p.m. to 5 p.m. Tuesday to Saturday inclusive.

Subjects: Archaeology, folklife and history.

Area served: County Sligo.

Reference library: There is a substantial collection of books, manuscripts, paintings etc. commemorating the Yeats family and their contemporaries.

Photographic collection: Photographic material of local interest generally is housed in the Museum. The Yeats Room houses a substantial collection of relevant photographic material.

Facilities offered to research students: Research students are given every possible assistance. Yeatsian scholars have access to the material in the Yeats Memorial collections. Facilities are also provided for research in the field of local history generally.

CASHEL DIOCESAN LIBRARY, John Street, Cashel, Co. Tipperary.

Status: Private.

Honorary Custodian: Very Rev. D.G.A. Clarke.

Opening hours: By arrangement only.

Subjects: Theology, history, law and belles lettres.

Facilities are available to research students by arrangement with the Dean.

COUNTY LIBRARY AND MUSEUM, Castle Avenue, Thurles, Co. Tipperary.

Status: County.

County Librarian: Dr. D.J. Kinnane; Assistant Librarians - Anne Connidan and Martin Maher; Library Assistant - Patricia Ryan.

Opening hours: Monday to Friday 9.30 a.m. to 1 p.m. and 2 p.m. to 5.30 p.m.

Subjects: Folklife, archaeology and antiquities.

Area served: County Tipperary.

Reference library: Yes.

Photographic collections: The Lawrence collection of photographs of Tipperary. A wide range of manuscript and printed material relating to County Tipperary.

Facilities offered to research students: Access to collections and files, and assistance given.

ULSTER AMERICAN FOLKPARK, Camphill, Castletown, Omagh, Co. Tyrone.

Status: Charitable Trust.

Chief Executive: E. Montgomery, Esq. D.S. MacNeice, B.A., F.R.I.C.; John Gilmour, B.A. and John Haughey, M.A.

Opening hours: Summer 10 a.m. to 5 p.m. Winter 10 a.m. to 3 p.m.

Subjects: A museum of Ulster Emigration to America dealing with both the old and the new world.

Reference library: Yes.

Photographic collection available.

Facilities offered to research students: Curatorial assistance by members of staff.

OLD ATHLONE SOCIETY MUSEUM, The Castle, Athlone, Co. Westmeath.

Status: Society.

Honorary Curator: Mrs Mary Monahan.

Opening hours: June to September inclusive 11 a.m. to 1 p.m. and 3 p.m. to 6 p.m.

Subjects: Folklife, archaeology, local crafts, industries and anything pertaining to Athlone and district.

Area served: Approximately 25 mile radius from Athlone.

No reference library.

Photographic collection: Good collection of photographs of local places, events and people etc.

Facilities offered to research students: Access available by appointment with the Secretary.

4th FIELD ARTILLERY REGIMENT MUSEUM, Columb Barracks, County Westmeath.

Status: Private.

Hon. Curator: Lt. Kieran M. Milner.

Opening hours: Viewing by appointment 10 a.m. to 8 p.m.

Subjects: Military history.

Area served: No specific area.

Reference library: Military subjects only.

Large collection of photographs.

Facilities offered to research students: Full access to all material, photocopies of documents and copies of photographs on request for a small fee.

COUNTY MUSEUM, Castle Hill, Enniscorthy, Co. Wexford.

Status: Private, voluntary committee.

Curator: Rev. A. Scallan, P.O.; Hon. Secretary - Fintan Murphy;
Chairman - Nicholas Mernagh.

Opening hours: June to September 10 a.m. to 6 p.m., October to May 2 p.m. to 5.30 p.m.

Subjects: Folklife, archaeology and maritime and military history.

Area served: County Wexford and bordering areas.

Photographic collection: Limited at present to some old drawings, photographs and maps relating generally to Enniscorthy.

Facilities offered to research students: Apply to the Secretary.

THE IRISH AGRICULTURAL MUSEUM, Johnston Castle, Wexford.

Status: National Co-operative.

Curator: Dr. A.M. O'Sullivan.

Opening hours: Monday to Friday 9 a.m. to 5 p.m.

Subjects: Agricultural and rural life in general.

Area served: The Irish Republic.

Reference library: Yes.

Photographic collection: Small archive of manufacturers' catalogues covering farm machinery, hand tools and domestic hardware.

Facilities offered to research students: General assistance only at present.

ARKLOW MARITIME MUSEUM, c/o The Old Technical School, St. Mary's Road, Arklow, Co. Wicklow.

Status: Private, Arklow Maritime Museum Committee.

Hon. Secretary: Mr. William Roberts, Sea Road, Arklow.

Opening hours: June to September inclusive 10 a.m. to 5 p.m.

Subjects: Maritime history of Arklow.

Area served: Arklow and immediate area.

Photographic collection: Many photographs on display in museum.

Research students should apply to the Hon. Secretary.

It would thus seem that the student can obtain assistance to a varying degree throughout the country with, not surprisingly, a concentration of facilities in the larger cities. I should like to thank all those already hard-pressed officers of the museums and kindred institutions for finding time to give me the information recorded above or, equally importantly, intimating that owing to the nature or size of their museums no special arrangements for students were possible.

NATIONAL MARITIME MUSEUM, Haigh Tce., Dun Laoghaire, Co. Dublin.

Status: Society museum is operated by the Maritime Institute of Ireland and contains the Institute's headquarters and library.

Opening hours: April to September 2.30 to 5.30 p.m. daily (except Monday).

Subjects: All aspects of the Irish maritime heritage.

Area Served: The Country.

Photographic collection: Yes.

Facilities for research students and assistance: Yes.

Hon. Research Officer: Dr. J. DeCourcy Ireland.

THE USE OF AERIAL PHOTOGRAPHS IN LOCAL STUDIESBRIAN GRAHAMUlster Polytechnic

Although maps are the most commonly available and easily used source of geographical information for the study of a particular area, aerial photographs, if rather less familiar are often as valuable. At the least, they provide a complement to maps and at best permit a substantially enhanced degree of interpretation of the landscape of a particular area compared to that which could be obtained from cartographic sources alone. Vertical air photograph coverage now exists for almost all of Ireland although scales vary. The several types of readily available photographs, their use in the study of the local area and the sources and organizations from which they are available, are discussed below. More esoteric variants such as infra red photographs are not included because they are not immediately available on any significant scale to the public.

Types of Aerial Photographs

Aerial photographs can be divided into two simple classes, defined by the method in which the surface of the earth is photographed from the aircraft;

- (a) verticals; in this instance, the camera is theoretically pointing vertically downwards and the resultant photograph resembles a plan of the ground;
- (b) obliques; in this type of photograph unlike the vertical, the camera on the aircraft is pointing at an angle to the ground and the photograph is consequently similar to the view of a section of landscape obtained from a high vantage point.

Both types of photographs are available for areas and landscape features in Ireland.

Vertical photographs are taken by a camera on a plane which is flying in a long straight run across the landscape and the coverage of the photographs is continuous for the length of this run. In published sets of verticals, there is generally an overlap between adjacent photographs in the same strip of approximately sixty per cent and of about twenty-five per cent between contiguous photographs in adjacent runs. The most extensively available scale of vertical coverage for Northern Ireland is 1:20,000, while the Republic has been surveyed at a scale of 1:30,000

(approximately three inches and two inches to the mile respectively).

Study of a single vertical conveys relatively little information relating to three-dimensional features of the landscape such as relief or buildings. However, the purpose of the overlap in adjacent photographs is to exploit the property of stereoscopy. If the two adjacent verticals, either in the same or contiguous runs, are used in conjunction with a simple instrument known as a lens or pocket stereoscope or with a more complex scanning mirror stereoscope, the area covered by the photographs can be observed in three dimensions. It should be noted, however, that heights, and slopes are exaggerated in stereoscopic vision although they remain relatively correct. Verticals can be used for mapping purposes but it should be remembered that while scale is correct at the centre of the photograph, there is some distortion towards the edges,

Whereas verticals usually cover a general area of landscape, obliques are more commonly taken to depict a selected feature. These are easier to interpret than verticals because the height and scale of the foreground object is apparent. However, it must be remembered that the area shown on a square or rectangular oblique photograph is, in reality, trapezoidal, the scale of the background being approximately twice that of the foreground. Therefore, while obliques are particularly useful in the study of a selected landscape feature, their complicated problems of scale variation make them much less useful than verticals for mapping purposes.

Using Aerial Photographs in the Study of Local Areas

Aerial photographs, both vertical and oblique, are particularly valuable in the study of the human geography of a landscape. It is, for example, a simple process to examine the street plan of a town, agricultural land-use field systems or communication networks in an area if vertical air photograph coverage is available while the relationship of such features to the local topography is much more readily appreciated from the study of a stereoscopic pair than from a two-dimensional map. In Ireland, oblique photographs with their normal concentration upon a single feature are particularly useful for the study of historical features of the landscape. Rather more information can often be obtained from aerial photographs of such features than could be gained from field examination alone. For example, shadows, cast under a low sun by a feature such as a bank or ditch, often so insignificant as to be almost invisible at ground level, can be readily interpreted from air photographs. Thus a far more complex and complete plan of an archaeological site can be drawn up than could be obtained from a field survey along. Again, differences in soil and vegetation which are imperceptible at ground level, appear on air photographs. This allows the identification of archaeological sites which may have been ploughed out despite the absence

of surviving remains on the ground. Such traces may also appear in aerial photographs of arable areas; in this case the feature is known as a crop-mark. Many archaeological sites have, in fact, been recorded for the first time by aerial photography.

Features of the physical landscape of an area can also be examined particularly on verticals with their property of stereoscopy. Not only can mountains, hills and river valleys be mapped or examined but smaller-scale physical features such as river terraces, drumlins and eskers can also be recorded. Rivers, lakes and reservoirs are especially obvious as the water absorbs light and therefore appears almost black on the photographs. For the same reason of light absorption, chlorophyll-rich vegetation also appears as dark areas as does grassland. Arable areas are generally much lighter in tone although it requires considerable experience of aerial photography to identify individual crops.

Sources of Air Photographs for Ireland

A complete vertical aerial photograph survey of the Republic has recently been finished and photographs are available from both the Geological Survey, Baggot Bridge House, 84/86 Lr. Baggot Street, Dublin 2 (01-603420) and the Ordnance Survey, Map Sales Office, Phoenix Park, Dublin 8 (01-213171). The Geological Survey also publish a very useful booklet on aerial photography which includes information on how to order specific photographs, using the photo index map.

There is no complete coverage for Northern Ireland although a wider variety of scales is available. Almost all the north is covered at a scale of 1:20,000 and most of the populated areas are covered at 1:9,000 1:10,000. Photographs at 1:5,000 are available for most urban areas. Details and photographs can be obtained from the Ordnance Survey of Northern Ireland, Ladas Drive, Belfast 6 and photographs are available for inspection at the Public Record Office, 66 Balmoral Avenue, Belfast 9. The principal source of oblique photographs is the University of Cambridge Committee for Aerial Photography, 11 West Road, Cambridge CB3 9DP. This organization has several thousand photographs of Ireland which include settlements, sites of archaeological interest and social and economic features of the landscape. They can also supply verticals of some selected topics. A collection of these photographs is located in the National Museum of Ireland, Kildare Street, Dublin 2 and some have been published in E.R. Norman and J.K.S. St. Joseph, *The Early Development of Irish Society; the Evidence of Aerial Photography* (Cambridge 1969). Finally, limited numbers of obliques, mostly of towns, are available from Aerofilms Ltd., 4, Albemarle Street, London W1X 4HR.