# THE LOCATION OF BRITISH GAS OFFICES, WITH SPECIFIC REFERENCE TO EMPLOYEES, REORGANISATION AND TECHNOLOGICAL CHANGE

## VOLUME III

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# CHAPTER XII

# SUMMARY

## Previous Research And The Present Objectives

### Introduction

In summary, this research is a comprehensive study of the structural and spatial changes in the organisation of British Gas since nationalisation (some of which result from technological innovation); the effects of these on the location of its office establishments, the characteristics of its office workforce, and individual office employees. It aims to broaden the applicability of previous office location research, both by drawing upon other aspects of office-related studies and by extending the techniques of empirical research to a single, large, multi-site office organisation, which is nevertheless primarily industrial in character. By these means it is intended to demonstrate a research approach through which the inter-relationships amongst an organisation's office structure, use of office technology, and locations may be utilised in a broadly predictive manner.

In support of the arguments in favour of the applicability of the approach, and findings, to other large organisations a small comparative study is presented concerning the British Electricity Industry.

The study draws upon a wide variety of research relating to offices and office activities, as well as to more general employment and

location research. Literature considered of most relevance to the present study is outlined below, against which are tested the location decisions demonstrated by British Gas.

## Metropolitan Office Location Research

Office location and related research is a relatively recent field of study within which published research burgeoned in the 1960's, in parallel with an accelerating growth in office functions and employment.

Early work in the field may be traced back to the 1920's and the work of Haig, whose model of city structure identifying characteristic clusterings of office functions was followed by the more sophisticated models of Burgess, Hoyt and of Harris and Ullman.[1] This work concentrated upon the description of offices as physical developments : their definition and classification. Later diversifications have included studies which recognise the role of offices in local and national economies as part of regional planning policies, for example Rhodes and Kan, Goddard, and Yannapolis.[2] Many of these studies have focussed upon London, which experienced very rapid growth in office floorspace.[3]

By the 1960's office decentralisation was seen as a panacea for office congestion, particularly within Central London, and Government measures were taken to encourage outward movement. These included office development permits in designated areas and financial incentives. The Location of Offices Bureau both monitored and assisted in this strategy.[4]

Largely as a result of concentration upon metropolitan centres, little research has been directed towards the difference between provincial and metropolitan offices (other than branch offices), although there are some notable exceptions, including work by Croft, Daniels, and Damesick.[5] Certainly the characteristics of these two types of office locations have been little considered within a single organisation. A link with pre-existing research may be created through the investigation of a national office structure in which the various characteristics of different office types and locations may be studied comparatively. By selecting a single large and ubiquitous British industry such comparison is possible across a large number of centres, both metropolitan and provincial. This contrasts with the tendency of most office location studies to concentrate upon examination of quaternary sector offices/functions at a limited number of selected centres.

## The Quaternary Sector

The majority of office studies have concentrated on the quaternary sector: the independent offices providing service functions which differentiates them from other offices within the tertiary sector.[6]

For example, despite recognition of 'elite' and 'routine' functions within all types of organisations in relation to the possibilities for decentralisation, most empirical work has drawn upon the experience of specialist service or 'professional' offices, head offices and similar unattached offices.[7] Few studies have considered attached offices or offices which form an integral part of an industrial organisation: the routine offices in preference or in addition to the purely

head office sites. One of the few models of office location likewise confined itself to the quaternary sector.[8]

Thus the office functions of large organisations which are only partially office based have been largely neglected, despite some work by Gudgin, Crum and Bailey, and Goddard, for example.[9] There is a need for detailed research giving a general synthesis of all aspects of the office function within a multi-site organisation: this study attempts to achieve this goal.

## Patterns of Office Location

The pattern of office location is very much a spatial demonstration of administrative organisation. Hence an examination of the organisation, in this case British Gas, is an important aspect of any evaluation of the office site pattern. Structural changes in the organisation must be evaluated also, since they may affect the pattern of office location. Thus Massam stressed that:

> The evolution of administrative systems can be examined from two main standpoints. The first refers to the spatial pattern of areas and the second considers temporal changes in the control and organisation of the system.[10]

Unfortunately, as Goddard and Morris have noted, "few attempts have been made to set the location of administrative functions within the context of the overall spatial structure of corporate organisations."[11] The nearest studies of this type, often described as the geography of enterprise, or of the firm, are defined by McNee as:

> The understanding of location, spatial interaction or man's organisation of space... enhanced through the study of the major area-organising institutions. The study of one such institution, the corporation, may be termed the functional geography of the firm.
>
> The geography of the firm is an attempt to go beyond the analysis of mere <u>things</u> in economic geography to a consideration of man himself and his social organisations and institutions.[12]

A comparatively small branch of locational studies which adopts this type of approach is the study of public facility location and public administrative systems. As Massam stresses:

> Location theory in economics and geography has primarily been concerned with industrial, commercial and residential decisions. For a complete picture of human organisation we need to develop theories to explain the location of public facilities.[13]

British Gas is a public corporation, a specialised type of organisation differing from other large organisations through the requirements of public accountability. From a research perspective this ensures the availability and comparability of the required data.

The spatial impact and regional importance of public corporations has been largely ignored, as has their general role in the economy. "Nationalised industries occupy a peculiar place in economic discussion. Much of the time it is as if they do not exist at all."[14] Some reluctance to study these industries undoubtedly arises from the political aspects of nationalisation itself; nevertheless, they occupy a vital, and central, position in the economy. Indeed, comparison with the private industrial sector reveals that their form, function, and quintessential development are very similar. An indication of the national

importance of British Gas is given below.

British Gas

British Gas is a major nationally-organised corporation employing some 104,748 persons (61,470 office personnel) and serving approximately 15,712,000 customers. It is the largest wholly integrated gas industry in the world. In Britain it is the eighth largest commercial organisation, second largest in terms of capital employed, and fourth in terms of turnover.[15]

The Gas Industry accounts for some 0.6 per cent of total employment in Britain. There is little regional variation, ranging from 0.4 per cent in East Anglia to 0.7 per cent in Yorkshire and Humberside, the North West and the North. At 31 March 1982 office employees formed 56.5 per cent of British Gas Regional employment (excluding BGC headquarters personnel). Among the Regions this proportion varied from 47.9 per cent in North East Gas to 61.6 per cent in North Thames Gas. As a whole, office employees formed 58.7 per cent of the workforce, a difference accounted for by the high proportion of non-manual personnel at BGC headquarters (92.5 per cent).[16]

Theories of Location

As a large organisation evolves and strengthens its economic position selected relocations of some of its establishments are an intrinsic part of its continuing effective performance. Locational analysts initially recognised the importance of relocation as a

prerequisite to continuing viability, and as a result theories of office location and the dynamics of office movement are derived largely from theories of industrial location analysis and urban studies.

Thus, according to neo-classical economic theory, location results from the economies of distance verses costs: the basic preposition of the urban land market theory.[17] Hence possible locations may be represented by a bid-rent curve, in which accessibility and contact potential are of overriding importance.

However, since the late 1960's many industrial location analysts have adopted a subjectively rational (behaviour) approach which permits recognition of uncertainty and sub-optimal behaviour.[18] These have shown greater concern for the ways in which organisations define locational problems, specifically the manner in which they search for, evaluate alternative, and select, sites. The identification of such processes through which an organisation (British Gas) considers its locational problems is adopted in this study.

## Office Decentralisation

Studies of the office relocation process have centred largely upon various aspects of decentralisation. In its widest sense this is interpreted as the relocation of office functions from highly urbanised areas, or from large urban centres, to smaller centres. It does not necessarily imply a decentralisation of decision-making. Thus a locational regrouping of offices, although perhaps requiring the decentralisation of many employees/jobs, may contemporaneously involve a

centralisation of managerial responsibility and control.

Detailed examples of office relocation procedure have been provided by Norris, and more recently by Goddard.[19] Detailed studies are relatively few, however; most researchers have concentrated upon particular aspects of decentralisation, such as the effects on local economies, on the journey to work of employees, or on the social consequences of relocating office employees.[20] Nevertheless, some common features of decentralisation have been identified: Jones and Hall, for example, have noted that in Britain decentralised firms (including offices) locate in established towns or suburban centres.[21]

In terms of office movements per se, empirical evidence from the United States has indicated that certain types of corporations, including utilities, are becoming more concentrated at sub-regional level, even though this is contrary to the general trend of corporate distribution. In Britain evidence suggests that spatial concentration is occurring in the location of all types of head offices.[22] As a result, it is predicted that regional headquarters should be in large regional centres in association with other large regional offices of similar status, and smaller branches in local centres.

An important factor in relocation decisions, recognised by the studies of linkage, is the need to retain good communications links. The possibilities for office decentralisation in functional terms have been assessed, notably by Pye, in relation to the development of office-related telecommunications. The extent of telecommunications adoption is an essential aspect of office linkages and their location patterns.

The ability to separate routine and elite functions, which have differing communication demands, permits partial decentralisation.[23] Thus, to contemplate moving a headquarters' elite functions demands very careful evaluation of communication networks. Indeed, Evans defined the decision whether or not to move a corporate headquarters as an exercise in minimising the costs of communications, including transportation; an argument well supported by Burns.[24] Clearly this definition may be applied to any administrative/decision-making office.

Other, related, research has been conducted under the umbrella of business and management studies, particularly that concerned with organisations as institutional structures. Simon has been a major advocate of the organisational approach, and of the analysis of decision-making. He has advanced support for 'satisficer' in preference to 'optimiser' decision patterns and thus rejected the theories of purely rational economic behaviour.[25]

There is a need to investigate decentralisation/centralisation processes in terms of both individual and corporate decision-making, since these have been treated largely independently by previous studies.

## Impact of Office Relocation On The Workforce

Decisions by large corporations involving change in location and/or organisation inevitably affect the office workforce and may result in a variety of changes, including residential movement.

Journey to work effects of office relocation have been explored

in some detail, notably by researchers of decentralisation. The majority of empirical studies have found, for example, that following relocation of the work site there will be greater loss of lower grade, clerical employees than of higher grade, professional and executive personnel. It has been found also that the 'separation rate' is positively correlated with the relocation distance. Replacement personnel at established office sites tend to travel shorter distances to work than those subject to relocation from elsewhere and "the increase in the proportion of local recruits... clearly reduce[s] the extent of the catchment areas at most suburban locations."[26] This implies that the longer an office remains at a site the smaller its catchment area becomes, in proportional if not absolute terms.

However, not all journey to work studies have been linked to decentralisation research. Warnes, for example, used census data to investigate journey to work distances of workers of all types and found that the average distance has been increasing. Thompson has developed further the scope of such studies to embrace other characteristics of the workforce, and found that the average commuting distance is "substantially longer" for males than females, and also that married workers tend to commute longer distances than single workers. Rankin, however, found no significant differences in the trip lengths of married and single employees. Also likely to travel further to work are those in higher status employment for, as Daniels noted, these have higher incomes and wider residential choice.[27]

Reorganisation within British Gas sometimes has demanded substantial employee relocation. This provides an opportunity to compare

the impact of these changes upon British Gas office employees with the results of previous work, the latter having focussed primarily on movements from central to peripheral locations.

Journey to work studies often have been accompanied by investigation of residential relocation. Sociological studies of those variables affecting residential relocation have concluded that social factors play an important role in movement decisions. A central aspect of this is 'attachment to place', which Gerson et al have suggested operates through three forces: (1) psychological, (2) social, and (3) economic. They have identified attachment to place as a multi-faceted result of the individual's and the household's social investment and subjective attitudes.[28] Empirical results have indicated that the ties which such home areas exert may represent a barrier to movement, whether of residence or work site, by delineating the employment search area (as found by Adams, Johnston, and Donaldson). Amongst those for whom attachment to place is strong these encourage movement inertia. However, attachment to place does not imply a favourable perception of an area. For example, Hunter found that people who reported 'feeling attached' to residential areas ('neighbourhoods') frequently did not like them particularly and vice versa. A general pattern exists, identified by Gerson et al, that the longer a person resides in an area, if all else is held equal, the greater will be the increase in both the general benefits of remaining and the burdens of leaving. It is suggested that aspects of employment can be major factors in breaking this residential inertia, whether through a change in job status, in work location, or both. However, Rankin found that movements based upon a conscious desire to move nearer to or further from the

work location were relatively few. Nevertheless, such movements do occur; Humphrys, for example, suggested that some employees consciously seek to reside further away from their work site and are willing to travel considerable distances as a result.[29]

A variety of studies (for example by Rossi , Thompson, Lansing and Mueller, and Simmons) have suggested that the propensity to change residence is much greater for the individual in his mid-twenties to early thirties than later in life. Once into middle age he is less likely to move, especially if little movement has been undertaken previously. Change of work location for future management personnel usually occurs with most frequency early in their careers, and is particularly noticeable for the less well educated future manager. Clark, for instance, found that the higher the educational attainment of the future manager the more immobile he is likely to be.[30]

Studies of career progression, particularly by sociologists, have emphasised the differences between 'spiralists' and 'locals'. According to Jennings, spiralists illustrate that "managerial effectiveness is based upon mobility";[31] they are managers or potential managers who increase their social status and career development through spatial mobility. The main features of their life style are subordinated to their career development. In contrast, 'locals' seek to remain within their 'home area' when exercising both residential and employment choices. Likewise Carmichael has noted from his own empirical studies that higher level occupations are accepted as being the most mobile spatially, such that professional and managerial workers have a far wider job search area. Also, he noted a similar distinction beween the sexes whereby

males tend to have a wider job search area than females, particularly married females, for the latter are required to "combine the responsibilities of home and workplace."[32] He concludes that it is at the local level that this occupational effect is likely to be most significant. Similarly, other researchers have concluded that differences evident between male and female office workforces arise largely because of the clerical nature of many office duties performed by women. The majority of women office workers have positions which are "less interesting, less prestigious, and bring lower renumeration." It is to be expected that these are "carried out by women with reduced aspirations."[33]

It has been suggested that differences between spiralists and locals are partly a result of the higher work commitment and the greater overall importance given to work by members of higher skill and socio-economic status groups, identified for example by Sofer, and by Friedmann and Havinghurst. In addition, a number of empirical studies, including those of Clements, Clark, and the Institute of Directors, have found that management personnel are more likely to be qualified, whilst clerical employees have few formal qualifications.[34]

All of these factors affect the response of employees to redeployment/relocation as a result of reorganisation within British Gas. The relationship between residential and work location is complex, and may be attributed not only to measurable qualities such as income, the availability of alternative employment and the housing market (which invite the use of econometric modelling techniques), but also intangible variables which include personal preference, satisfaction levels and aspects of the individual's life cycle. The study undertaken here

facilitates assessment of the role of many such variables without detailing their individual effects.

## Office Premises

The requirements of the office workforce is a major factor in studies of office design, particularly in the adoption of a new office building. Langdon, for example, recognised that offices have two main groups of users, the firm and the employees. The requirements of the firm are:

> First, the office must be as economic in capital and maintenance cost as possible; second, it must be efficient in operation; third, its appearance must project a favourable impression of the organisation to both staff and public.[35]

The needs of personnel must be viewed within "the wider framework of general social needs."[36] Nevertheless, the physical conditions of the working environment remain important. There is considerable evidence to support the need for purpose-designed offices in preference to speculative buildings, both in terms of cost-effectiveness and environmental standards.[37] Since the 1960's there has been growing interest in alternative forms of office planning, with movement away from the traditional cellular office design towards the American, rather regimented, open plan design and the German landscaped or panoramic open offices which emphasise flexibility. Nevertheless, fully effective appraisals of office space and facility requirements continue to be rare, and are actively discouraged by the rented market, where building costs and prestigious appearance and siting take preference over efficiency and flexibility of use.

It has been claimed that "both morale and productivity can be raised more easily by the subconscious encouragement offered by the improved environment standards of the landscaped office",[38] but it is thought by others that office conditions may be only a minor influence on the morale of the clerical workforce; certainly the evidence presented for improved productivity is inconclusive, though this is largely the result of difficulties in measuring the productivity of an office environment.[39]

However, changes in the working environment are often associated with office relocation which at least modifies and at most totally redefines the office catchment area. Inevitably, these moves are associated with turnover of personnel.

Researchers have acknowledged that both work study and communication studies may be utilised in choosing the most suitable type of office building/premises.[40] These examine aspects of the working conditions of employees and the inter-relationships between them, both of which embrace social as well as organisational conditions of work. They may be equally as useful in an assessment of the suitability of existing office premises as in the planning of a new office environment. It is deemed important therefore to include some evaluation of office premises in the present study.

## Longitudinal Studies Of Office Location And The Workforce

A further hiatus in existing research has been the lack of longitudinal studies of relocational processes. Since offices represent

relatively long-term investment, studies of locational change are best undertaken using location records. In examining a nationalised industry this is facilitated by the publication of annual reports (which similarly document major changes in organisation, personnel, and industry objectives).

Also to bridge the lacuna of longitudinal studies, quasi-longitudinal data have been collated concerning the office workforce suitable for analysis using the techniques of 'time-geography'. Again the techniques have been somewhat simplistically employed, but permitting a suitable method for diagrammatically representing what is described as the individual employee's 'personnel history'. This principle of time-geography was first introduced by Hägerstrand in 1962, when he discussed "the web of time-space trajectories described by individuals in the course of their lifetimes," and introduced the "station" concept.[41]

In summary:

> Time-geography is chiefly an endeavour to consider conditions over time and in space simultaneously. Close attention is paid to the sequential courses of events at both an individual and an aggregate level.[42]

This is very much the approach taken in the present study.

## General Objectives Of The Present Research

Most reviewers of office location research have concurred that it has been strongly dominated by empirical case studies. Nevertheless, common features have emerged from these case studies. These, together with the results of related office research, have provided the background

to this present study. This is again largely empirical/descriptive in preference to a theoretical approach. Nevertheless, it aims to widen the scope of office research and to combine the approaches of a variety of office-related fields through concentration upon a single large organisation in order to provide a firm foundation for future research.

## Summary Of Research Objectives

In brief, the research objectives may be stated as:

1. To achieve an integration of studies directed towards either metropolitan or provincial areas by examining all major office sites of a national organisation.

2. To assess the role of technology adoption, particularly of telecommunications, in the evolution of the organisation's location patterns, drawing upon previous research findings relating to the opportunities such adoptions provide for decentralisation/centralisation of office functions.

3. To consider administrative organisation, with particular reference to the spatial structure of British Gas, and to examine the linkages between changes in organisation, technology adoption and relocation. As identified by previous research, decision-making is acknowledged as an important element in these development processes.

4. To determine the characteristics of the office workforce in the

context of a major corporation which has instituted substantial administrative, organisational and spatial change. Particular attention is given to the relationship between office location and employee residential location.

5. To examine office premises as physical structures, in order to measure the importance of their position in the office hierarchy as a determinant of building form and location. Also considered are the facilities provided for employees at the various types of location.

6. To utilise the principles of time-geography, not only as a technique (in simplified form) for examining certain aspects of data pertaining to individuals, but as a general approach in the simultaneous consideration of 'sequential courses of events', the main variables being office location, organisation and technology over the post-nationalisation period.

## Work Undertaken

### Introduction

The research programme has involved three stages (see Fig. 1.1). Firstly, following formulation of the research proposal, the major information sources for British Gas were identified (Stage I). These provide the temporal and spatial information which constitute the four main knowledge fields (Stage II). These are: (1) the location of the offices themselves, (2) the office workforce, (3) organisation, and

(4) technology. Data from these four categories, extracted from the diverse information sources identified, were organised into the various data sets. These comprise the bases from which are drawn the study's conclusions (Stage III).

## Sources Of Information

The main sources of information utilised were:

1. British Gas Annual Reports and Accounts. These have been produced by three bodies or groups of bodies since nationalisation:

   a) The Area Gas Boards (to 31 December 1972)

   b) The Gas Council (to 31 March 1971)

   c) The British Gas Corporation (from 1 April 1971)

2. Gas Consultative/Consumer Council Annual Reports and Accounts.

3. Interviews and questionnaires conducted amongst senior representatives of British Gas at national and Regional level.

4. The British Gas Personnel Management Information System (P.M.I.S.); a computerised record system holding up-to-date information concerning the position, work location, residential location, sex, age and related variables of each employee.

5. Regional personnel files : hand maintained files containing various details including previous positions, work locations, residential locations, and qualifications of each employee.

6. Miscellaneous publications of the Gas Industry, including internal reports and journals.

7. Sources as above, relating to the British Electricity Industry.

Of these, the primary published sources were the British Gas Annual Reports and Accounts. These provide detailed information concerning changes in office location, organisation and technology.

They also monitor employment, consumers, gas sales, and generally provide a wealth of comparative statistical information. The main unpublished sources were, of course, the Industry representatives. Nevertheless, in the formulation of hypotheses and conclusions information has been synthesised from a number of levels of investigation.[43]

## Forms Of Analysis

The data have been utilised to provide a variety of information about British Gas offices. The main types of analysis undertaken were as follows:-

1. The assembly of a detailed description of the structure of British Gas and the influences of various organisational and technological innovations upon it. The historical development of the Industry at Regional level is illustrated with a case study of Wales Gas, with

illustrative material relating to both pre- and post-nationalisation, including a thorough examination of the Regional office workforce.

2. Consideration of the present locational pattern of British Gas and how this has evolved, with reference to the various constraints, possible options and the decision-making processes which have been identified.

Some emphasis has been given to measures taken to attract and maintain key personnel, especially within offices at unpopular locations.

The location requirements of British Gas offices are discussed and illustrated through empirical examination of the processes of relocation, identifying the main periods of this activity. The known relocations of headquarters and major lower level offices are detailed for all twelve Regions. This has revealed some notable trends and features.[44]

These are supplemented by more thorough consideration of major relocational and reorganisational programmes, and some comparisons and contrasts are made with the Electricity Industry.[45] It is hoped by these means to make some progression towards Alexander's plea for studies to progress from a descriptive pattern to an explanatory process approach.[46]

The assessment of the present office location pattern of British Gas comprises three main elements: (a) the incidence of office location changes throughout British Gas; (b) major relocation/reorganisation

patterns; and, in the light of these changes, (c) the consideration given to office employees.

3. Examination of the Regional office workforce in order to identify: (a) any inter and/or intra-Regional variations in the characteristics of the Regional office workforce; (b) residence-work distances and distributions; and (c) the work site and status progression of individual employees (defined as a personnel history).

Both (a) and (b) have been derived from P.M.I.S. data. Examination of the spatial dispersion of office employees in relation to their workplace has been achieved through the geocoding of addresses of each employee within selected Regions, and the subsequent combination of this information with other forms of personnel data. The information for (c) was obtained from personnel records. This examination has been confined to one Region, Wales Gas.[47]

Previous studies of office location have identified the broad factors involved, specifically those of organisation and office function, office technology, particularly telecommunications, and the decision-making processes, including the characteristics of the decision-makers themselves, and features of the office workforce.[48] In order to evaluate thoroughly the office location pattern and processes of locational decisions within British Gas it was deemed necessary therefore to examine four main aspects, each of which has been utilised to varying degrees in previous studies. These are: (1) organisation, (2) technology, (3) the office workforce, and (4) present and previous office location.

Since processes as well as pattern are to be examined, these have been assessed over time, the period being that of post-nationalisation. A largely descriptive study is required since there has been no previous documentation of the post-nationalisation history of British Gas in relation to these factors which influence office location. Nevertheless, this study does attempt to explain and interpret as well as observe the processes of office location change.

## Main Findings

### The Organisational Development Of British Gas

#### Pre-Nationalisation Organisation

When initially established, beginning in the first half of the nineteenth century, gas undertakings were extremely localised and centred at the gas manufacturing sites. Generally, a committee of local interested parties was responsible for sponsoring the company, which was administered on a daily basis by a minimal workforce. However, as demands increased and many gas manufacturing stations grew in size, they increasingly came under the control of General Managers.[49]

The experience and knowledge gained by such managerial personnel and their management teams through operating the many diverse companies existing immediately prior to Vesting Date contributed considerably to the expertise inherited by the Gas Boards. These General Managers became the Local Managers to whom much responsibility and executive authority was delegated in the early period of nationalisation. The

management personnel of the largest pre-nationalisation companies largely assumed the senior positions on the executive boards of the nationalised Industry.

Organisation at Nationalisation

No common formula was adopted for Board organisation, but there were a number of common factors in the style of each Board's approach. Initially each found it necessary to impose a structure which allowed continuation of the gas undertaking as a management unit, but attempts were made to improve facilities by grouping units into Groups or Districts so that they might share the benefits of a larger organisation. These benefits included the provision of specialist services. Nevertheless, the Boards recognised the need for a progressively diminishing emphasis upon group/district boundaries in order to obtain a more positive grouping of undertakings. This was achieved through integration, the concentration upon major production sites and the development of gas grids. At nationalisation, as before, the organisation was necessarily based upon the inherited manufacturing stations (and their intrinsic locational pattern) and the distribution of gas consumers. In summary, the type of organisation each Board adopted at Vesting Date was dependent upon:

a) The diversity, size and numbers of undertakings absorbed; and

b) The characteristics of the Areas, including population density and its distribution, and the terrain.

A further important influence was the emphasis placed on decentralisation of control, implicit in the Act, which the Boards initially interpreted as a demand for a small headquarters staff combined with the delegation of executive authority to local managers, thus establishing the importance of the General Manager.

However, the importance of functionalisation had been recognised even at the time of nationalisation,[50] and the gradual introduction of linear control to supersede geographical organisation has meant the decline of General Management Principles in favour of functionalism.

Creation of the British Gas Corporation
and Structural Reorganisation

The system of administration founded and developed by the Area Gas Boards continued to form the basis for management control following the assumption of control by Regional management teams under the terms of the Gas Act, 1972.[51] This decision by the Corporation to retain the Regional Structure was made on the basis of the need to retain the 'strong local roots' which had been the hallmark of the Industry. Under the 1972 Act Regional Chairmen are appointed by the Corporation (Board Chairmen having been appointed by the Minister responsible for the Industry). These are charged with full responsibility for activities within their respective Regions, within the framework of policies determined by the Corporation and subject to any decisions or directives issued by the Corporation. By these means each Region is intended to continue as an independent management unit under the authority of the Regional Chairman.

However, the head of each function in the Regions (generally termed directors) are charged with joint loyalties : to their Chairmen and to their functional heads at BGC headquarters. As Mills concluded, "inevitably with this change has come a much greater degree of regional dependence on Headquarters for policy decisions and for decisions as to the commitment of major capital expenditure."[52] Although this was primarily designed to permit greater capital investment in new techniques of gas supply, this was achieved through the legislative creation of more centralised control and contributed to the decrease in status (measured in terms of total decision-making autonomy) of the Area Boards to Regional bodies primarily responsible for distribution and customer service, even though initially it appeared that their autonomy was altered very little. Clearly this had great implications for processes of locational change.

Organisationally BGC remains a mixture of the geographical (or territorial) administrative system and the functional administrative system : systems which Pusić described as representing the two extremes of a structural continuum. Comparison of a somewhat simplified diagram of British Gas organisation (based on that presented by Harvey) with recognised models of organisation reveals a considerable similarity with the schema for a multi-structure managerial pattern produced by Handy (see Fig. 5.1). Within this structure British Gas displays in its Regional office hierarchies what Chandler has described as the two major characteristics of modern business enterprise : (1) many distinct operating units, each with administrative offices, a manager and separate accounts, and (2) a hierarchy of middle and senior managers who supervise the work of the units under the organisation's control.[53]

The present Regional structure is generally a three tier organisational hierarchy based upon the Regional headquarters and other Regional sites (including computer centres), the largely multi-functional Area/large District level sites, and the small District level sites, including reporting depots and showrooms, which may be mono-functional. Thus organisation is very much reflected in the pattern of office location.

## Technology Adoption

Technology has affected British Gas in two major ways:[54]

1. Through developments in gas production and techniques of gas transmission. These have been:

   a) Oil catalyst processes, notably the Lurgi process

   b) Importation of liquid methane

   c) Discovery of North Sea natural gas

   d) Development of high pressure pipelines and grid integration

2. Through the adoption and extensive usage of office technology, the major elements of which are:

   a) Computerisation

   b) Telecommunications

Developments in gas production initially permitted, indeed demanded, the wide-scale integration of production sites, the development of major manufacturing stations and the closure of smaller, less efficient sites. The development of gas grids to serve larger areas of supply served by both these major production sites and other fuel sources such as coking furnaces and later natural gas supplies was much facilitated by improved pipeline technology. Processes of rationalisation, already begun in the declining Industry of the 1960's, gained great momentum from these actions.

At first much of this integration developed independent of the office organisation, but since office sites and administrative management teams had evolved as integral parts of the manufacturing organisation the repurcussions were soon evident throughout the organisation structure. Centralisation of staff into larger, and fewer, office sites was made possible by the adoption of developments in office technology and standardised work techniques. In addition, closure of production sites freed land for office development purposes and has much influenced the locational pattern. Greatest technological impact in the office has been from the adoption of computers.[55] Even prior to nationalisation mechanical methods and machinery for accountancy purposes were in use, demanding adoption of standardised work methods. The use of electronic machines began as a logical extension to these mechanical techniques. The changeover to electronic accounting within British Gas proceeded rapidly in the 1960's and the adoption of many new technologies, particularly computers, was an integral part of Board reorganisation during this period. Initially this was an attempt to counteract demands for greater efficiency within a contracting Industry, but subsequent

introductions aided the expansion of an Industry revitalised by exploitation of new sources of gas. British Gas has been very much a leader in the field of computer adoption and usage.[56]

This increased use of mechanisation, followed by electronic developments, was very much dependent upon greater centralisation within British Gas, as promoted by the greater concentration of production at larger sites. Although economies of large scale production of gas were the main motivator for concentration, all aspects, not least the office function (beginning with accountancy) benefitted from economies of scale. This was publicly acknowledged by the Gas Council as early as 1957.

## British Gas Offices : Location And Relocation

### Introduction

It is suggested by previous research findings that an understanding of the location/relocation of British Gas offices and the decision-making process through which these have evolved requires at least three considerations:

1. The motivations and/or demands for relocation
2. The decision processes in relation to site selection
3. The implications of the outcome of (1) and (2) for the office workforce.

Generalisations concerning site selection may be based upon known locational and site requirements and observed processes of relocation. Thus to formulate hypotheses concerning office location it is necessary to identify the pattern of office location. Evaluation of relocation processes demands this is established for a reasonable time period. For British Gas this has been taken as the post-nationalisation period.

## Office Provision at Nationalisation

When the Gas Council and twelve Area Boards came into being on 1 January 1949 they inherited all the properties of the vested companies and based their structure, often to a considerable extent, upon the inherent locational qualities and sub-divisions which were the legacies of these companies. Common to all was the strategy of locating the Board and chief headquarters personnel in the headquarters building of the largest vested undertaking within the Area. Unfortunately for some Boards, the suitability of these premises was very variable, and even from Vesting Date some Boards had their chief officers scattered among a number of small, separate headquarters buildings. In addition, the post-war externally-imposed restrictions upon rebuilding and new building, combined with internal capital limitation, ensured that in some Areas the occupation of such unsuitable office premises, at all levels, continued for some years.

In general, it may be said that where local authority ownership of gas companies was high, the number of large office suites inherited by the relevant Board was low, whereas where gas supply was dominated by one or more large independent companies the office facilities

inherited were generally good.

## Characteristics of the Present Office Pattern

The three main tiers of the office hierarchy have been indicated above : the headquarters locations, the Area/District offices, and the lesser District sites with, as sub-groups of the latter, the reporting centres, operational depots and showrooms. Offices of each tier share common locational characteristics which, although not confined to each tier, nevertheless tend to be associated with the office's function(s) and often reflect aspects of the Industry's history.[57]

The highest tier, the headquarters offices, are invariably sited in the major population centre of the Region or in a recognised over-spill area. The BGC headquarters are accommodated in a number of offices within London. The majority of Regional headquarters have sustained the location of the headquarters of their largest constituent undertaking as vested at nationalisation. This reflects not only inherited office provision but also the locational preferences of senior personnel.

All headquarters offices throughout British Gas have been re-newed since nationalisation, with North East and South East being the only Regions not to have undertaken a physical relocation of their headquarters. However, many of these moves occurred over a minimal distance, and even the latest relocation undertaken by Wales Gas has been only over some five hundred metres. It is purely shortage of land immediately adjacent to existing sites that has prompted locational change by Regional headquarters.

Thus two categories of headquarters locations have been identified:[58]

1. Those headquarters which are located in major population centres, which are frequently the largest centre of population in the Region, but even if not, are sites which were chosen as headquarters locations for the major gas companies in the pre-nationalisation period.

2. Those headquarters which originated in a location similar to those in the first category, but because an enforced replacement single location was unobtainable in the same locality, or for some other related locational planning problem, a new, greenfield site, was chosen in a recognised overspill area for the original location.

There is no evidence that any Regional headquarters has been sited in a totally new area.

Regionally-centralised activities which have different locational preferences (given in sequence of increasing difference in preferences) include the computer centre, the grid control centre, training centres, centralised stores and transport centres. However, given suitable accommodation these may be located on shared sites or even within the same office complex as Regional headquarters. Computer centres are often associated in this manner, arising from the centralisation of decision-makers at headquarters and their close association with computer departments as computer users, as well as from their similar labour-force

demands which are best fulfilled at urban or urban overspill sites. The main deterrent to computer/headquarters co-siting is the particular structural requirements of computer installations. Developments in telecommunications now permit rapid and easy access to computer facilities centralised elsewhere, but this does result in some fragmentation of headquarters personnel. Where accommodation for such purposes is not available within the headquarters hereditament, however, care is exercised in obtaining a suitable location in accordance with the particular needs of the function.

Whereas the initial adoption of computerised techniques created demands for centralised computer staffs and the provision of specialised office premises, and although the demand for a central computer building remains, this no longer needs to be geographically central to the Region, and the proliferation of peripherals permits the dispersal of many of the formerly centralised personnel. Undoubtedly, however, the capital investment undertaken by many Regions will ensure that centralised computer buildings will remain at their existing sites in the medium-term.

Despite the growth of functionalism and a concomitant centralisation of senior functional personnel at headquarters it is probable that excessive agglomeration is restrained through the differing locational preferences of individual departments and the decision-makers and administrators within these departments. Thus, although the headquarters essentially centralise each Region's highest level of decision-makers, the main administrative and routine activities of the operative functions are best located at alternative locations. Non-operative departments, in contrast, are found in association with the decision-makers of other departments whom they serve, and are thus largely

confined to headquarters sites.

Below headquarters level British Gas encourages policies of co-siting (that is, the adjacent positioning of offices of differing organisational status, well exemplified by West Midlands Gas) wherever possible, but only where such sites are suitable for offices of different levels. The characteristics of locations of offices in the lower hierarchies are thus somewhat less distinctive in comparison with each other than in comparison with headquarters locations. In addition, Area and District offices assume different levels of responsibility throughout the Gas Regions, so that in some the Area office division is all-important, as in Wales and West Midlands Gas, whilst in others the Districts form the major office divisions, as in North East and South West Gas. It is therefore misleading to distinguish between the characteristics of Area and District offices on a national scale.

Because of historical influences, particularly the motivation to use old gasworks sites, these lower level offices tend to be in areas peripheral to industrial and/or commercial concentrations. They frequently occur in isolation from other industrial or quaternary offices. The suitability of these locations also arise from the association of such offices with depots. Direct face-to-face consumer contact is not encouraged (this being a role of showrooms), thereby freeing such offices from central urban areas. Nevertheless, access by personnel to consumers is important, for manual workers in particular. As a result Area and District offices are located in association with, but not necessarily within, the Regions' major towns. From these locations they are ideally suited to service the large population and gas consumer conglomerations.

Thus in the location of Area and District offices, which contain the largest numbers of operational personnel, direct access to consumers has a high priority. For the lowest tier of depots and showrooms, the very smallest sites where office personnel are employed, access to consumers in the case of the former and access by consumers for the latter is overwhelmingly important. In broader terms their locational patterns represent the outcome of decision-making procedures which consider factors including the distribution of population, gas consumer groups and hence gas demand, availability of labour, availability of office premises/land for offices development, and the capabilities of inter-office communication and consumer contact.

Throughout British Gas Area and District personnel do not necessarily occupy independent offices : Districts, for example, may be recognised only as work teams formulated within Area offices. This arises because the office hierarchy is primarily an organisational structure which is not necessarily reflected in the physical separation of offices but is evident in terms of employee management, levels of responsibility and the tasks performed by the respective work teams. Likewise in Regions where the District offices dominate the administrative pattern Area offices may be represented only by Area personnel present in selected District offices (these being the District offices in the major towns, as in East Midlands Gas). Thus Area personnel may not actually occupy a separate office building (as occurs in North East Gas) or at the other extreme Area offices may be all important, with District offices being relegated to the status of small reporting offices or operational depots, as in Wales Gas.

In addition, different functions sometimes recognise differing District divisions, for example Distribution Districts may differ from Marketing Districts, as in Southern Gas, whilst South East Gas operates Engineering Areas which greatly differ from its many service divisions. These represent the alternative organisational approaches taken by the functions to best serve their respective operational requirements throughout each Region.

## Periods of Office Relocational Activity

Three phases of relocational activity have been identified, notably for headquarters relocation, but also for major office projects in general.[59] These are as follows:

1. Early-mid 1960's - these relocations were to occupy comparatively basic/functional premises, largely in order to replace very inadequate premises resulting from the inherited situation at nationalisation.

2. Late 1960's - mid 1970's - again the majority of premises occupied during this phase tended to be somewhat basic, many being of open plan design. Many of these movements were associated with reorganisation.

3. Late 1970's - early 1980's - offices occupied during this more recent period were of a much higher standard and design, in response to employee demands for better working conditions.

Processes of Office Relocation

Distinct differences may be identified between the relocation of headquarters and lower level offices. A major difference is that relocations of Regional headquarters generally have not formed part of Regional relocation/reorganisation policies (although South West Gas is a partial exception to this; the reorganisation of the Region originated with the headquarters movement to Keynsham).

Empirical study has revealed that most headquarters relocation is the outcome of a series of pushes away from one (or more) site(s) towards another, more suitable site where existing locational or site problems are overcome. It is notable, however, that headquarters relocation is not the direct outcome of perception of a better site. Thus the search for a suitable site and/or office premises only begins once a decision to move has been taken. The motivations for relocation govern the sites considered consequent to this decision and generally result in short-distance (minimal) movement.

To permit full appreciation of the office locational process it is advantageous to examine the procedures through which recommendations are made in the site selection process, the factors responsible for site selection, and the final outcome of the procedures. In some cases this may lead to a decision to retain an existing office location but to improve its facilities : the search for alternative sites does not necessarily result in relocation.

A most important factor in the site selection process is the

level an office occupies in the organisational hierarchy. A fundemental feature of the Regional structure is the three tier organisational hierarchy already discussed, based upon:

a) Regional headquarters and other sites servicing the whole Region

b) Area/major District level sites (multi-functional)

c) Small District level sites, including reporting depots, small operational centres and showrooms (often mono-functional)

Different types of offices (in terms of the functions they perform) within these three divisions also have varying requirements, but the greatest differences are to be identified between these divisions. This suggests that alternative criteria are applied in choosing sites for different levels in the office hierarchy: differences which may be seen in the type of premises occupied and distinctive patterns of location. Thus the aspatial, hierarchical structure is illustrated by, and may be identified from, the buildings/premises occupied and the location of these offices.

As part of relocation/reorganisation planning many Regions have used consultants.[60] These have been required to appraise the possibilities of different sites and to advise upon the type of buildings constructed, including the preparation of architectural designs, or upon the alterations necessary to existing buildings, as well as advising upon organisational changes. However, strict terms of reference have been imposed upon consultants. In Wales Gas, for example, the consultants engaged to consider

the West Area office suggested their own terms of reference, but these were vetted by the Region which insisted that their analysis be restricted to four sites, each of which was already in its possession and in use. The consultants subsequently considered seven principle factors, and where necessary evaluated these, namely:

1. Road communications patterns
2. Office workforce retention and recruitment
3. Telephone facilities
4. Statutory approvals
5. Regional transport facilities
6. Customer Service and Distribution operational centres
7. West Area conversion to natural gas

Similarly, the consultants responsible for work in connection with the North West Gas Development Plan reviewed the possible strategies under a number of headings:

a) Standards of service to customers
b) Acceptable modern standards of accommodation
c) Flexibility for future changes
d) Employee relocation
e) Industrial relations
f) Management control
g) Operational and administrative efficiency
h) Public image of the Corporation
i) Comparison with other organisations
j) Costs and savings

Again the consultants were required to recommend locations for the offices, but within limits imposed by the Region, the major limitation being the need to minimise capital expenditure (in compliance with BGC ruling). This led to the direction of the search for suitable sites specifically towards land owned by the Region. With regard to the specific sites chosen, a further set of criteria was agreed with the consultants which

may be compared with those imposed by Wales Gas. These required that:

a) Co-siting was to be undertaken wherever possible
b) Consistent accommodation standards were to be adopted
c) There should not be any arbitary relocation, but where necessary relocation should be on the basis of minimising the impact on employees
d) The site should have good road communications, particularly in the case of depots
e) The aim should be to develop sites owned by North West Gas, with the express purpose of overcoming plant sterilisation (by further developing these sites or by disposing of excess land) and criticisms of land ownership
f) The areas should be capable of future expansion
g) If possible, the offices should be attractive internally for occupants, to be achieved by site landscaping and related techniques
h) The offices should be close to local shopping facilities
i) Public transport facilities should be taken into account, to give maximum freedom of access to the sites

A more general examination of locational change in British Gas since nationalisation has led to the identification of a number of factors judged to have encouraged either the relocation of offices, or the re-allocation of office space and additional office provision. These factors are influential at all office levels, although to differing degrees, each being related to features of inherited conditions, organisational change, or technological developments and adoption. Each has been instrumental in directing the locational response of British Gas. These encouragements to relocation are:

a) Unsuitability of inherited premises since nationalisation
b) The increase in the number of specialist services (and employees) at headquarters
c) The growth of functionalism
d) Increasing demands for better quality service
e) The use of computers

f) Telecommunications developments

g) The economic growth of British Gas

The precise influence of each factor varies in relation to office level.

Not surprisingly, there is considerable overlap between these factors identified as encouraging relocation and those which are identified as permitting relocation. These may be summarised as:

a) Availability of finance to construct, or sometimes lease, new offices.

b) Closure of production sites which encouraged the divorce of production and administration functions as well as freeing land subsequently available for office construction. This was the outcome, firstly of new production and distribution techniques, and secondly of natural gas adoption.

c) Developments in communications technology, important for example in allowing increasing emphasis to be placed on contact with customers via the telephone, plus the use of radio-controlled vans which allow emergency, maintenance and fittings work to be carried out from larger, fewer centres, covering greater geographical areas.

d) Changes in organisation away from General Management Principles towards functional management, which emphasised the need for physical proximity of departments in large offices and permitted the closure of many small offices.

These factors, which embrace most of the variables identified as having encouraged relocation, are considered in greater detail below.

Availability of Finance Overall financial control of British Gas is exercised by the Government through the auspices of the Minister for Energy. This is achieved in three main ways:

1. Through the establishment of financial targets
2. Through the imposition of financial borrowing limits
3. By the imposition of tax levies

However, internal financial control over the Regions is exercised by BGC control of capital expenditure. Large capital expenditure of the size required in major building projects, which exceed set limits imposed by BGC, requires BGC headquarters approval via its Special Expenditure Committee. Similar lower limits upon financial expenditure are imposed throughout the management hierarchy and effectively delineate the decision-making potential of each grade in the management scale. Extension of this financial control by the Corporation has been the most serious breach in Regional autonomy in comparison with that of the former Boards.

The enforcement and action of this approval system is well exemplified by the progress and implementation of the North West Region Development Plan. It has required each of the twenty building projects integral to the Plan to be considered on its own merits and in relative isolation from the overall plan, despite overall BGC Executive approval received in May 1978.

Closure of Production Sites Following the cessation of gas manufacture British Gas has retained many sites which, because of the presence of gas holders and related plant, are rendered sterile for disposal purposes. A viable alternative to leaving such sites almost unused is to develop the most suitable for offices and depots. However, the position of such sites has been dictated by locational decisions relating to gas production. These are very different to the requirements of office developments. The use of such sites therefore implies that the office location has been pre-determined by a very different set of locational assessments.

Since gasworks were considered unpleasant because of their smell, dust and smoke they tended to be located on the outskirts of towns and often adjacent to industrial areas. For effluent disposal they needed to be located near water and they also needed transport facilities supplied by road, rail, river or canal to deliver their raw materials which were primarily coal. Later use of oil as a raw material led to location near to oil refinery plants and transport was provided by pipeline. The early emphasis on proximity to a waterway often meant that gasworks were located in low-lying areas, which also facilitated gas flow. These were often industrialised areas, many of which, with the decline of waterways, have become areas of industrial decline and general urban decay. This type of location is neither the typical nor the ideal environment for the officer worker ; a position further aggrevated by the frequent separation of such sites from retail centres.

Developments in Communications Technology The various types of telecommunications equipment used by British Gas form vital parts of its communications system. In summary, this system consists of:

a) Messengers/internal post

b) External postal services

c) Telex

d) Telephones

e) Teleprinters

f) Facsimile transmission

g) Micro-processor networks

h) VDU-mainframe networks

i) Short-wave radio telephone systems

j) Micro-wave networks

These assist British Gas to overcome the problems of distance between its offices and allow the benefits of centralisation to be obtained without operational isolation. They have permitted a reduction in the number of office sites, an increase in employee concentration, and dispersal of these office sites.

For example, in the consumer contact functions, particularly the interface sections of Finance, Distribution and Marketing, telephones play a vital role in: (a) customer service, (b) customer accounts enquiries, and (c) emergency services.

Thus developments in the communications system had two diverse effects. The first was to permit the reduction in the number of office sites required, allowing the centralisation of personnel which was required for the adoption of computer technologies in particular. The second was to largely confine face-to-face contact with customers to showrooms, with enquiry offices concentrating on telephones and written

communication media. The maintenance of showrooms in consumer-accessible retail areas is obviously important, the centralisation of office staff representing a concentration of personnel previously employed at fragmented offices attached to showrooms.

Although computerisation initially demanded increased centralisation, in the late 1970's developments in remote terminals created opportunities for the decentralisation of work stations. BGC itself has considered the possibilities of typists working from home terminals, for example. However, inertia created by the possession and occupation of existing offices (the pattern of which is the result of centralisation/concentration) has discouraged the introduction of extensive work decentralisation. The only steps towards such a policy have taken place within the existing office structure by the reallocation of work. For example, remote terminals for enquiry purposes have been increasingly installed in showrooms and District offices, whilst the remote entry of data has been introduced to Area and District offices.

Changes in Organisation With the creation of the Area Boards, the first organisational change to affect the undertakings was the increased uniformity which was introduced : amalgamation of uneconomic units into larger units continued as in the pre-nationalisation period, but with increased emphasis upon specialisation and uniformity of methods. However, as Boards grew in strength and control, largely manifest by increases in headquarters size, the need for major reorganisations was acknowledged.

All Boards/Regions have undertaken at least one major

reorganisation, but these have been introduced over a variety of time scales. Some, for example Wales Gas, introduced sweeping changes throughout their territory at one time, others, such as South West Gas, introduced a programme of changes which has taken a number of years to implement throughout its territory. These reorganisational programmes have been combined with relocational processes of varying degrees, although these rarely include headquarters offices.

An underlying trend in these reorganisations has been the growth of functionalism ; a streamlining of control permitting an effective specialisation within each department, albeit with integration at various levels. It has been accompanied by centralisation of organisational control, held by a group of specialist personnel. The dissolution of Area Boards and the establishment of the Corporation, which assumed the highest level of functional responsibility and control, effectively completed this centralisation process in national terms.

## A Summary Of The Major Findings

A number of substantive findings have been made regarding British Gas offices. These are summarised below, together with a discussion of their implications for office studies in general.

### Office Relocational Activity

Factors have been identified which (a) encourage relocation, and (b) facilitate relocation activity, although obviously a number of factors are common to both.[61] Also distinguished are factors which

discourage and prevent or delay such activity, namely: (a) legislative control (mainly on building activity), and (b) financial constraints.[62]

Largely as a result of the interaction between these factors encouraging and discouraging relocation, activity has occurred during distinguishable phases : the early-mid 1960's; the late 1960's-mid 1970's; and the late 1970's-early 1980's. These phases differ, for example, in the types of relocation undertaken, their primary motivations/ purpose, and their mode of introduction, as well as differing in the number and types of personnel involved. Since many of these factors affect other large office organisations then it is likely that related patterns of activity may be distinguished, certainly improved working conditions has been a feature of most large office organisations.

A particular feature of British Gas relocational activity has been the differences between headquarters and lower offices relocation. The latter have occurred most frequently in relation to Regional reorganisational/relocational projects (examples of which have been examined in detail).[63] Since these differences arise from differing structural needs similar differences must exist in other office organisations. The concentration of research upon headquarters offices has led to considerable neglect of other offices which, as has been demonstrated by British Gas, contain a high proportion of the total workforce and may be important sources of employment in small urban centres.

## Office Location Patterns

The geographical incidence of British Gas offices is, in general

terms, similar to that which may be projected from existing studies of office location, except for the influence of its land holdings. Thus the major headquarters offices are sited in major towns : London in the case of BGC, representing the national level, and in major provincial centres at Regional level. Area/District offices are sited within their territorial areas of responsibility and bear some relationship to branch office location, particularly in that the location decision-makers are largely located at headquarters offices, and not within these offices themselves. Nevertheless, the specific location of these offices results from an amalgam of variables, largely dominated by land ownership, the influence of the major decision-makers, and previous location patterns (including inheritance).

It is not suggested that the influence of such variables is unique to British Gas; senior decision-makers in particular have been identified as major influences on relocational sites in previous studies,[64] but the combination of the high level of land ownership and its specific locations, the pattern of previous locations and aspects of the Industry's development are specific to British Gas. Even so, similar constricting and influential variables undoubtedly operate in the locational decision-making of other large organisations and their identification should form an integral part of any assessment of such activity.

At a wider scale influences have been identified which have been suggested by previous research, not only as features of existing office locations, but as influences on future locations and the possibilities for reorganisation of office structures. Thus advances in office

technology, and particularly the application of telecommunications developments, have been advocated as stimuli to both office decentralisation and employment concentration, whilst more latterly these have provided opportunities for functional fragmentation. Such trends have been identified within British Gas, especially with the operation and extensive development of computerised operations. Their integral role in office reorganisation and the wider scope they provide in locational choice has been detailed for British Gas, illustrating their widespread influence which undoubtedly operates in a similar manner in other multi-site office organisations.

Periods of relocation activity have been found to be linked to the economic progression of British Gas : when the Industry was in decline resources for office provision were limited and this was reflected in office design and relocational/reorganisational implementations. In times of expansion office provision has been of a high standard and considerable attention has been paid to the production and implementation of development programmes. Clearly there is scope for more attention to be paid to standards of office provision and changes in this provision in relation to the economy of the organisation.

Pugh et al have already provided statistical evidence which suggested causal links between structural variables such as functional specialisation and centralisation of decision-making with organisational features including origin and history, ownership and control, size, technology and location.[65] Investigation of British Gas has confirmed this, and emphasised the need to focus upon the office as the prime manifestation of these variables.

## Characteristics Of Office Premises

Distinct differences have been found in comparing office premises of the different hierarchical levels. For example, headquarters offices are largely multi-storey buildings, sited near to, but not necessarily within, areas dominated by office activity and often with associated problems such as inadequate car parking facilities. These buildings are frequently leased and not specifically designed by British Gas. Area offices, in contrast, tend to be single or two-storey structures largely designed specifically by the Regions, often on Regionally-owned sites, and frequently some distance from recognised areas of private and public-sector office activity. Smaller office premises are almost invariably sited on British Gas land and built to British Gas designs, but with the office premises themselves forming only a part of the development which acts as an interface with operative personnel and activities.

British Gas headquarters are thus typical of head offices in general. The neglect of non-headquarters offices in previous research has resulted in the non-recognition of distinctive characteristics of such offices. However, comparison with the Electricity Industry has indicated strongly that similar differences to those identified within British Gas may be found for the majority of large office organisations within their office hierarchies.

## Characteristics Of The Office Workforce And The Residence-Work Distance

Characteristics of the workforce differ at the various hierarchic levels of office activity; indeed, these may be used as a major indicator

of each office's status within the hierarchy. The location of Higher Management employees provides an indication of decision-making activity: the higher the proportion of Higher Management, the more important the establishment in the organisation. Functional representation is also an indicator of office status, with the operational departments increasingly dominating employment with decreasing office status. Throughout British Gas the operational functions account for more than three-quarters of office employment.

It is suggested that the width of functional representation may be used as a measure of office status within the organisational hierarchy: mono-functional offices represent the lowest level, whilst full representation only occurs at headquarters. The adoption of this approach over a range of office organisations would aid considerably the comparative ranking of various provincial office centres, for example.

General features of the British Gas Regional office workforces are that the Staff group forms at least four-fifths of total employment, with almost two-thirds of the remainder being Senior Officers and just over a third Higher Management. In comparison, only half of BGC headquarters employees are Staff, whilst more than a fifth are Higher Management. This illustrates the degree of centralisation at BGC headquarters, and the strong hierarchical structure of British Gas.[66]

The ratio of male : female office employees is approximately 3 : 2, but the proportion of females increases with increasing importance of the office in the hierarchy. Nonetheless, the vast majority of females are in Staff positions.

These characteristics of the British Gas office workforce are similar to those of most large office workforces. That is, there are significant numbers of women employed, largely in clerical positions; decision-makers are largely centralised at headquarters offices; groups of 'spiralists' and 'locals' may be identified; and managerial employment is associated with educational attainment and/or widespread experience, largely within British Gas itself.[67]

Nevertheless, reorganisation has created differences in the workforce. For example, the larger centralised offices contain higher proportions of females and have larger representation of younger personnel. In contrast, where small, very localised office sites have been preserved (notably as reporting centres) office employees are more likely to be men, to be older, and to have been employed by British Gas for some time. They often represent the remnants of those previously subjected to relocation. Thus long service is more evident proportionately at the smaller office sites where these have been least affected by relocation.

However, the overall effects of office relocations appear to be slight, and rapidly decrease in evidence over time. Detailed examination of workforces at relocated British Gas offices has illustrated that some male personnel will continue to travel from the previous location area to the new site on a long-term basis,[68] but these represent a very small proportion of the total office workforce and are insufficient to influence the average residence-work distance. Female personnel are more likely to seek alternative employment and are generally not prepared to undertake longer journeys to work. However, given the shorter average employment period of women and the relative ease of replacing clerical personnel

this is only likely to cause very short-term problems.

In conclusion, fears concerning the long-term effects of relocation processes would appear to be unjustified. However, in British Gas as amongst most employers, there is a prevailing fear of unfavourable employee reaction to relocations and increasing attention is being given to employee participation (albeit at a low level) in the relocation process subsequent to site selection. The aim is to preserve the workforce for the initial post-relocation period. Assessment of employee potential in the relocation area illustrates the long-term objective of replacing at least a large proportion of clerical employment with personnel obtained in the relocation area. Higher level personnel are, of course, more mobile and, given financial inducement, will both relocate with an existing employer and undertake residential relocation in order to take up a new position within the organisation.[69] Since the workforce composition is continuously subject to change, the aim during relocation is to preserve the rate of turnover and not to preserve the workforce as at the point of relocation, or at any other arbitary time period.

In general terms, the distance distribution of office employee residences in relation to workplace is similar in each Gas Region, and represents the natural catchment area. The main catchment area for the majority of offices is defined by a 10 Kilometre radius, but the proportions residing within this distance do vary both inter and intra-Regionally. This proportion is greatest, for example, in those Regions with least concentration of employees, that is, those with lower average numbers employed at each office site. In terms of absolute numbers employed at

sites, at intra-Regional level the proportions residing more than 10 Kilometres away is greater at sites employing less than thirty personnel than at those with thirty but less than one hundred employees.[70]

One factor responsible for this is the different residence patterns displayed by the three grades of office personnel, with Higher Management, and to a lesser extent Senior Officers, having greater average residence-work distances than Staff. In addition, the residences of males are more widespread than those of females, and it was found that sex is a more important determinant than work level in the residence-work distance.

The observed patterns of residential location largely conform to the results of previous research, including that into employees at decentralised sites. The general pattern of residence-work distance shows a strong negatively skewed pattern, as has been observed by previous journey to work studies.

Positive evidence was found for life cycle influences upon residential location and changes in employment, as first suggested by Rossi. Generally, the most important employment linked residential movements were found to be undertaken by men (as previously identified by Thompson): there are obviously strong differences between the sexes in the motivations for residential movement. It was observed also that residential movements are sometimes associated with increases in work status (as found by Humphrys). Nevertheless, as both Brown and Parnes have suggested, the majority of residential movement was not <u>directly</u> associated with employment.[71]

## The Main Factors Influencing Office Location

In addition to information concerning office location itself and the employment provided therein, both empirical and normative research previously conducted into office location has indicated the need to consider organisation and technology. Assessment of these within British Gas has identified, firstly, the importance of the movement from purely hierarchical General Management Principles to functionalism. That is, the process through which linear control has superseded geographical organisation, resulting in the greater concentration of both managerial decision-makers and the majority of clerical personnel at larger office sites.

Also noted is the growing similarity in organisation of the twelve Gas Regions, initially resulting from similarities in their response to post-nationalisation problems, but more recently because of the imposed control of the BGC. Nevertheless, comparisons with other similar industries (illustrated by the British Electricity Supply Industry and Gaz de France)[72] revealed many aspects of organisational development to be common in such large industries, notably the movement towards functionalism. Obviously, developments in gas supply have played an important part in the time scale of this process for British Gas. Distribution of responsibility through the office hierarchy does differ, however, and the localised nature of British Gas is still preserved in comparison with other industries, though to a reduced degree.

Secondly, as in other industries, the centralisation of employment and the accompanying organisational changes have been dependent

upon technological developments, notably computerisation. Technological advances are now such that decentralisation should be encouraged, but is not evident. These developments are in effect restricted by the large scale locational inertia created by the very extensive existing investment in the present office structure. The response of British Gas is thus to reallocate work responsibilities to best effect amongst the existing office structure.

Thus, given possession of widespread office premises, an organisation may undertake change in work task location within its present office structure, but creating organisational changes of the type normally associated with the development of decentralised and/or branch offices. British Gas illustrates the technical changes in the post-war office environment which have profoundly influenced the types of personnel required and their working conditions.

## Implications For Future Research

The above findings have largely supported those of previous office studies, notably of location and the journey to work. More importantly, however, this study has demonstrated the advantages of combining a variety of approaches to office research (organisational, sociological, economic, historical and locational) and applying these to the study of a single large organisation. The extension of this technique to other organisations is recommended to test the hypotheses advanced relating to the role of the internal economy of British Gas in its office development programmes and the construction of the office hierarchy in functional and employee terms.

It is suggested that the main diverse strands of office research, which to date have been pursued in parallel schools of research, should converge to produce the type of study undertaken here. It is through a number of such studies that a wider and more developed theoretical basis for office research, and location research in particular, may be constructed, applicable not only to quaternary offices but to the variety of commercial, industrial and independent offices amongst which there has been too little comparative research. The present research has sought to advance studies of office location in this direction.

## NOTES

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43. For fuller details of the sources utilised, see Chapter I, pp. 26-39.

44. See Chapter V.

45. See Chapter VI.

46. Alexander, Office Location and Public Policy, pp. 10-11.

47. Part (a) is presented for selected Regions in Chapter VIII and part (b) in Chapter IX. Parts (a) and (c) for Wales Gas are presented in Chapter II and Chapter X respectively.

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