An investigation of contemporary public building design with particular reference to disabled peoples' design needs and designer awareness.

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AN INVESTIGATION OF CONTEMPORARY PUBLIC BUILDING DESIGN WITH PARTICULAR REFERENCE TO DISABLED PEOPLES' DESIGN NEEDS AND DESIGNER AWARENESS

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'through painting i am trying to express
my concern about my physical handicap of
walking this however is not my principal concern
i would like to think that i am concerned about
thoughts and feelings of the human condition
like determination the images of ladders legs
and shoes which i have created in my paintings as well
as an intense use of colour serve as means of communication'

carrie ann thomson june '92

(the 7 paintings illustrating each chapter
were taken from carrie ann thomson' s
post graduate diploma exhibition
at grays school of art aberdeen)

ABSTRACT

An Investigation of Contemporary Public Building Design with Particular Reference to Disabled Peoples' Design Needs and Designer Awareness

Joanne Milner

The **hypothesis** presented in this study is to test the theory that:

designers do not give adequate consideration to the needs of people with disabilities and that they perceive of people with disabilities as a separate minority who require 'special' provision. Within this context it is suggested that building designers would be more able to serve the needs of people with disabilities if building design education incorporated a more holistic and user-responsive syllabus.

The research project, designed to test the above proposition, falls into two principal Sections. Section 1, developed as an inter-disciplinary study, drew documentary and research evidence from a wide variety of fields. The evidence, culled from fields, largely considered disparate and unconnected, was then examined in the light of the relationships which became apparent from the adoption of a broad, sociological epistemological approach.

The etiology of building design as it relates to the needs of people with disabilities, once developed, informed the methodology of the second, empirical Section, Section 2, which was three-tiered. The first stage of which, comprising a base-line survey, was conceived with a view to gauging not only the degree of congruence between designers' perceptions of need and actual need as expressed by disabled building users, but current demands in terms of patterns of building use, accessibility and expectations, and likely trends in the future. The survey was designed to operate within a holistic

framework, which by means of stages two and three of Section 2, examined the access awareness of architecture schools, and the effectiveness of a series of incremental educational techniques formulated to familiarise design students with the design requirements of a heterogeneous public. Functioning as a bridge and conduit, between the user and building designer, the broader contextual approach, comprising the sum of the three stages, thereby facilitated the participation of both parties, the initial building user survey informing the later surveys of designer awareness.

The overall findings and recommendations thus arise from the fusion of the epistemological and empirical evidence derived from the two Sections.

DECLARATION

The candidate has not, while registered for this Ph.D. submission, been registered for another award of a University during the research programme.

None of the orginal material in this thesis has been used in any other submission for an academic award. Acknowledgements for assistance received are given under the heading acknowledgements, and any excerpt from other work has been acknowledged by its source and author.

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Table of Contents

Chapter One

A Chronology of Architectural Theory, Education and Practice as it Relates to the Design Requirements of Building Users, and in particular Disabled People.

Chapter Two

Design as a Social Process

Chapter Three

Disability as a Social Issue

Chapter Four

Access Legislation : Towards a Universal Approach

Chapter Five

Access Requirements of People With Disabilities : A Research Review

Chapter Six

A Regional Survey of the Building Design Needs and Attitudes of Disabled People

Chapter Seven

Universal Design : Awareness Within Architectural Education

Chapter Eight

Recommendations and Conclusions

List of Tables

Chapter 5

Chapter 6

Chapter 7

List of Figures

Chapter 1

Chapter 6

Chapter 7

Appendices

Appendix A (Chapter 6)

Appendix B (Chapter 7)

8. Comparison of increase in scores of Treated and Control Group1

9. Comparison of pre-test scores of Control Group1 and 2

10. Comparison of pre-test scores of Control Group2 with post-test scores of Control Group1

Introduction

In recent years another 'ism' has been added to the list of types of discrimination which serve to undermine the life chances of marginalised sectors of the population, including women and black people. 'Sexism', 'Racism' and Ageism' are terms with which we are now familiar, but are we so familiar with the term 'Able-bodiedism' ? Perhaps not; for this is a new term which has been added to the vocabulary of discrimination. It is a word which reflects the increasing visibility of people with disabilities, and the recognition that just as there has been a gender-blind approach to defining social need in the past, so there has been a disability blindness.

This has become increasingly clear through the writings of Oliver who in his edited collection 'Social Work : Disabled People and Disabling Environments' (1991)(1) identified the need to re-define and re-conceptualise disability. It is argued by Oliver that a systematic stigmatisation of people with disabilities mediated by institutionalised discrimination has served to segregate disabled people. This social process, has since time immemorial, individualised social responses to disabled people's needs, defining those needs as inherently biologically created rather than socially created. This bias has in turn generated predominantly medical responses to disability, which like gender and race is a social construct. This focus on the individual has to date, consistently failed to address the root of a problem which lies in the socio-structural processes of society, legislating against those who are less physically able by restricting access to such primary resources as education, employment, transport and the built environment.

And it is with this latter factor that this thesis is principally concerned, for although access to the built environment is just one of a number of the important factors listed above, which militate against the self-determination of people with disabilities, it plays a crucial pivotal role which, if addressed would go some way towards facilitating integration in all spheres. The research project examines the architect-disabled person dialectic and assesses the effectiveness of public building design as it relates to the needs of disabled people.

The built environment has been identified by Goldsmith, (1968)(2); Thomson (1979)(3); and Silburn (1988)(4) as particularly problematic for people with disabilities. It has been found that there is a lack of congruence between building design and need as expressed by disabled people, evidenced by architectural barriers which serve to impede or even prohibit access. This lack of fit between design and user is exemplified, by London's award winning refurbished fruitmarket 'Covent Garden', which placed specially designed toilet facilities 'for disabled people' at the foot of a flight of stairs. While this mistake was later expensively rectified with alternative provision, it is a mistake which as the above research has shown is all too common. It indicates not only the inadequacy of access legislation but a lack of empathy, a lack of awareness on the part of designers of the needs of disabled people.

The above example illustrates an oversight or neglect of disabled people's design requirements and clearly highlights the necessity of extending consideration of architectural barriers from individual people with disabilities to architects' attitudes and the formal social processes, or milieu responsible for engendering inaccessible environments. In short, the application of a sociological perspective was required; which telescoped from the individual to the general, a perspective which necessitated setting designers' conceptions of building users, and architectonic solutions in a social context. Only from this standpoint would it then be possible to determine the extent to which design for people with disabilities deviated from more orthodox approaches. Thus it is from this macro stance of design for building users, including people with disabilities, that the major influences which have shaped designer awareness are evaluated, and the social survey and experimental methodologies thematically linked. Indeed, just as an aerial photograph offers the opportunity for a cartographer to map out geographical characteristics and relationships not readily identifiable from ground level, so a textual overview has been adopted as the guiding principle of this thesis to offer the opportunity to identify and connect the main strands of oppression directed at disabled people as they relate to the built environment, and in particular the design of public buildings.

The key social forces influencing building design are dealt with by each chapter. Chapter 1, by painting a historical backdrop of architectural and parallel vocational educational movements from Vitruvius writings in 27 B.C to the present day, offers a setting in which a chronological

appraisal of design as it relates to building users may be teased out, permitting further comparative analysis with disabled people. A more specific examination of designer's conceptualisations of the building user is contained in Chapter 2, again drawing comparison with people with disabilities. This Chapter further relates such conceptualisations to architectural education and applied social science.

Chapter 3 traces the social process of the stigmatisation of disabled people and the institutionalised discrimination spawned by the deeply entrenched ideology of 'disability as a tragedy', an ideology which conflicts with the more recently advanced notion that disability stems as from 'disabling' environments; designer responses are textualised. Chapter 4 examines design legislation and its effectiveness in improving access in terms of disabled peoples' design requirements; the move away from the discriminatory practice of structurally individualising the needs of disabled people to a more integrative social, less medical approach, discussed in Chapter 3 is further linked to design legislation and the emergence of the philosophy of Universal Design. This recently developed philosophy promotes integrative, holistic design solutions, which are flexible enough to permit a greater number of behavioural options and so accommodate those people who are, by virtue of physical or sensory impairment, more environmentally sensitive.

These issues informed the critique developed in Chapter 5 which assesses the research previously undertaken in the field of access for disabled people and the design of public buildings. The main findings serve as a basis for the base-line survey methodology described in Chapter 6. This chapter presents the methodology and results of a large scale survey designed to elicit current patterns of building use and attitudes expressed by disabled people. The experimental research documented in Chapter 7 is formulated by the guiding principles established in the preceding chapters. Design students are exposed to a sequence of applied social science pedagogical techniques, which are based on the philosophy of Universal design. The findings are intended to serve as an educational model, and as a basis for further related research.

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Chapter 1

A Chronology of Architectural Theory, Education and Practice as it Relates to the Design Requirements of Building Users and, in Particular, Disabled People

1. Introduction

The Standard College dictionary describes 'fine arts' as *"those arts which are purely aesthetic or expressive, including painting, drawing, sculpture, and architecture, and sometimes including literature, music, drama and dance."* However, although architecture may share the same classification as the other arts, it cannot be *"purely aesthetic or expressive"*, as architecture serves the dual role of being a social art which is also necessarily utilitarian in function; as Aldo van Eyck stated,

> *"There is no such thing as a solid teapot that also pours tea. Such an object might be a penetrating statement about something (and thus perhaps still a work of art) but it is simply not a teapot since it cannot pour tea. Nor is there, nor will there ever be such a thing as a building which is intentionally either absurd, trivial, incoherent or disconcerting that is still a building".* (1)

To Aldo van Eyck, an architect is charged with a social responsibility, as a manipulator and controller of environments, facilitating and supporting social life. Thus the role of designing should also be equated with that of enabling; helping rather than hindering the intentions of the building users and occupants. To overlook, undermine or disregard this responsibility is to erode the essential function and usefulness of the building, thus, to continue van Eyck's metaphor, limiting its ability to pour tea. An extreme instance of the latter arising when the users are perceived of as *"static admirers of buildings as art"*(2) rather than as active participants. As Lee observed, *"human behaviour should not be a response to but an interaction with the environment"* (3)

An architect's concept of the function of the built form is married to his/her concept of who and what the design requirements of the people occupying spaces are. These conceptions are far from fixed and are shaped by not only the personal experiences of the designer, but by the historical, cultural, social and economic influences acting on the design process.

Design vocabulary reflects the changing definitions over time, of the role of the architect, who she\he is designing for. Indeed, the very notion of building users as distinct from the client emerged less than a century ago(4).

'Patrons' earned a place in architectural history through promoting and commissioning the more prestigious design projects. According to Kostof, they included amongst their wealthy ranks,

> *"emperors, abbots, rich merchants, captains of industry, and the occasional heiress, philanthropist or poet"* (5)

In the early Middle Ages, the Greek meaning of the term architect, or 'architekton', referring to one who directs craftsmen or 'tektones', was lost. The architect during this period was largely regarded as a craftsman, involved in both the design and construction of buildings. Such craftsmen would often travel in groups to work on the larger projects, groups, which slowly developed into craft-guilds. However, by the late 13th century, the position of master-craftsman emerged, which was more or less interchangeable with the original term, although, a degree of manual building work was still undertaken. Mechanical arts were considered much inferior to Liberal arts, and so, the identities of architects deriving from Medieval times were rarely recorded. The patron's title often substituted as the principal creator of certain buildings.

> *"It was Abott Suger who took all the credit for inventing Gothic at St. Denis in the 1140's; if he ever consulted an architect, he did not think it necessary to mention the fact in that effusive account of his cleverness he penned so diligently. Kostof* (6)"

However, although the patron was often well versed in design principles and actively collaborated on the design process, this practice was to peak during the Renaissance, when there was greater universality of knowledge, and the architect slowly regained control of the drawing board. The quattrocento, saw the championing of the architect as individual. The self-determining architect, fashioned after the Greek and Roman role models, strongly opposed the medieval guild system on the grounds that it was too restrictive. The aim was to raise the practitioner's social standing by linking the discipline to the rational or 'higher' sciences and disassociating it from more 'lowly' building work. As Alberti wote,

> *"it is not a carpenter or joiner that I thus rank with the great masters in other sciences; the manual operator being no more than an instrument of the architect""*(7).

Notwithstanding Alberti's attempts to upgrade the profession as a whole, the traditional master-craftsman was well established, creating 'buildings' not 'architecture' for the vast proportion of the population who could not afford an architect, and existing in tandem with the architect as scholar, for centuries to come.

The building designer pursued reputation and status through the creation of 'beautiful' buildings. Here, architecture was largely perceived of as art. If the buildings were conceived as monuments, the public, were spectators, only referred to in the abstract, or in the words of Kostof, as *"shadowy, clumps of figures who only obscured the elemental agon of patron and architect"*(8). Although the patron, like the client, may engage and pay for the services of an architect, the terms patron and client are not interchangeable, as the patron could also be perceived as a benefactor bestowing wealth and favour on his/her chosen projects. Kostof explains,

> *"Andrew Carnegie was the patron of all those libraries, but their clients were the cities that accepted his largesse and conditions attached to it".*(9)

The 19th century witnessed major technological advances, which significantly impinged upon the Beaux Arts conception of the architect as aesthete. Removed from the more practical concerns of building and in the face of increasing knowledge specialisation, the traditional architect was ill equipped for the task. The role of the architect in the modern sense of the word, emerged as pluralistic, embracing not only such considerations as city planning but also the construction industry.

Given the plurality of the designer's role, it is important to clarify the definition of the terms 'Architect' and 'Building Designer' adopted by this thesis. Whilst it is recognised that the boundaries separating the related disciplines falling under the rubric of 'building design' have been eroded, and that the generic term of 'building designer' may therefore seem more appropriate, the use of the term 'Architect' within the context of this research project, in order retain a consistent degree of specificity, refers only to the traditional conception of the 'Architect' as master craftsman. The term 'Architect' when used in this sense embraces the notion of the architect as one who designs plans of edifices and whose design authority outweighs that of the master builder, who is principally concerned with construction; these roles which complement rather than duplicate each other. Accepting the intimate and inter-related nature of the building design disciplines, it is therefore important to stress that although this thesis deals specifically with the profession of architecture, this does not preclude its relevance to all disciplines related to building design.

Turning now to the client, if the client prior to the turn of the century, commissioned a design, it was likely that it was his/her intention to occupy it. The client in more recent times could be anything from the building dweller to, as noted by Sommer, "*an anonymous hospital board, city agency, or corporate group designing a facility for others*"" (10). It was now incumbent upon designers to expand their frame of reference, previously narrowed to the relationship between architect and client and/or patron, to encompass and describe the mass of people, for whom the client intended the designs. The building 'users', 'residents', 'occupants' and 'inhabitants' became liberated from

the tangential vocabulary of the past, and apparent to the designer, as the people who moved through and occupied architectural spaces. However, 'users' had to wait until the mid '60's to assume 3-Dimensional status, and achieve at least a voice in the design process.

Analysis of the everyday vocabulary employed by designers clearly reveals an absence of terms referring to people and highlights an oversight of behavioural considerations within the design process until very recently. Indeed, some architectural critics(11), have gone so far as to suggest that the requirements of ordinary users have long been subjugated, as the architect has largely aspired to create for a privileged and powerful elite. It is argued that the 'fine arts' or 'formalist' tradition within architecture conceals another tradition, a tradition of restricted access for many, but of segregation for disabled people in particular, who may be rendered at an extreme disadvantage by an uncompromising built environment. The inevitable conclusion is that the disabled person, who by virtue of physical or sensory limitations, is less able to adapt to restrictive environments, must confront the reality that designers, by dint of their heritage, may often either be ill-equipped or reticent to make provision for his or her needs.

2. Renaissance Rationalism

> *"I believe in those who built the themae, the Pantheon, and all those great works but I believe much more in reason than I do any person"* (13) Alberti

Alberti's architectural writings, penned during the Renaissance, echo throughout history, as they elegantly encapsulate a belief system that was to set forth a standard against which architecture was measured, and which remained largely unchallenged until the advent of Modernism in the mid' 19th century. Alberti looked back to what were considered the Golden eras of Greek and Roman art and architecture, eras which enshrined mythology in what was to become an idealised formal representation of

nature. It was believed that the application of logic could transcend and improve nature to create true beauty and perfection, *"intellectual principals of symmetry were imposed to correct imperfections or irregularities such as occur in ordinary human beings"*(14). As Winkelmann wote in 1755,

> *"To know and study the works of the Greeks, their masterpieces reveal not only Nature in its greatest beauty, but something more than that; namely, certain ideal beauties of Nature which, as the old commentor of Plato teaches us, exist only in the intellect."*(15)

Alberti drew inspiration for his classic text on the principles of architecture from Vitruvius, also an architect, whose treatise De Architectura is one of the few technical writings on the subject which dates back to Roman antiquity around 27 B.C.(16). Vitruvius used the statement by fifth century B.C. Greek philosopher Protagoras, *"Man is the Measure of all things"* as the linchpin of his theories. Favro asserts that Vitruvius, by interpreting this to mean that man be used as a system of proportional measurement, failed to grasp the true sociological meaning, that man inextricably interacts with everything.

> *"As a sophist, his (Protagoras) statement reflects a change of philosophical focus from the study of nature to the study of man and his relationships".*(17)

The idealised human form was considered the perfect unit of measurement, to be geometrically translated into a pattern of grids or circles, rendered down into constituent units, such as a head or a foot and transmuted as a rule, into the built form. According to Vitruvius,

> *"When they wished to place columns in that temple, not having the proportions, and seeking by what method they could make them fit to bear weight, and in their appearance to have an approved grace, they measured a man's foot step and applied it to his height. Finding that the foot was the sixth part in the height in a man, they applied this proportion to the column...so the Doric column began to furnish the proportions of a man's body, its strength and its grace."* (18)

This theory of humanism applied to buildings, if Favro's contention is correct, could not be further removed from the notion originating from Protagoras, for within this context, man to Vitruvius is an object, "*which is intensified by the use of humans as physical models and metaphors"(19).* The images generated by Vitruvius, of a musclebound male figure thrusting arms and legs apart, constrained within a square or circle, have been compelling enough to capture the imaginations of designers throughout the centuries. As Kostof commented,

> *"it seemed to make up for the willful way in which architects chose to ignore what humans actually did, or would have liked to do, in the designed environment"* (20)

Furthermore, Kostof goes on to cite Vitruvius' rather extreme theory, that,

> *"if a man be placed flat on his back, with his hands and his feet extended, and a pair of compasses centred at his navel, the fingers and toes of his two hands and feet will touch the circumference of a circle described therefrom" and further, that the same spread-eagled man would also yield a perfect square, in as much as "the distance from the soles of the feet to the top of the head" would equal the breadth of the outstretched arms".*(21)

This was the birth of the architect's most enduring homunculus, fashioned out of nature, but sculpted to create an uncanny perfection, non-existent in the natural world. Has this figure risen up in the shape of Michelangelo's David to haunt the minds of architects of the future?

Vitruvius and Alberti advanced theories which would today be considered largely elitist, deriving from the hierarchical and class divided societies in which they were based. Both architect-authors sought not only, to elevate the discipline of architecture, but did so for personal recognition. For Alberti, fame brought the twin rewards of status and immortality,

> *"what manner of man he would be thought...how much applause, profit, favour and fame among posterity will he gain when he executes his work as he ought, (and) if he goes about anything...unadvisedly...to how much disgrace, to much how indignation he exposes himself...he must, deliver his name with reputation down to posterity."* (22)

It was believed that the goal of posterity could only be attained by the creation of memorable buildings, which would stand as the embodiment of a highly esteemed set of principles, referred to, in the Quattrocento as 'virtu' and 'magnificentia', and which stand as the equivalent of *"power, honour, morality, and virtue"* and *"loftiness of thought or action"* respectively " (23).

The concepts which the building metaphorically conveyed were deemed of far greater importance than any other considerations. This led to an overweening concern with appearance, to the detriment of the building use, which was often overlooked. Indeed, the form became disassociated from the function in the mind of the architect. Favro notes, *"behind the incomplete front elevation, the Pallazzo Rucellai remains a hodgepodge of disorderly rooms and spaces"*(24). Furthermore, the emphasis on concepts within the design process also contributed towards a lack of interest in the finished product, and served to remove architects even further from any feedback and awareness of user satisfaction and design effectiveness.

Alberti exhorted practitioners to seek favour with high ranking patrons and/or clients, whose learning, wealth and status it was believed, would confer such aristocracy with a highly developed sense of the aesthetic, who would be well placed to realise, promote and admire the grand schemes created by architects. In this society, just as beauty was equated with goodness, so wealth and position were perceived to denote intellect and discernment.

The working classes were rarely referred to in the treatise, and when they were, it was in a derogatory light intended to compare unfavourably with the many positive attributes of the noblemen. Alberti commented, *"the meaner sort build only for necessity, but the rich for pleasure and delight* " (25). The poorer sections of the population were catered for in design terms, only if by doing so, the needs of the wealthy were served more effectively. For Favro, the poor were 'commodities' to be controlled, and directed as potential 'assets' or 'liabilities'. In one telling passage Favro states that,

> *"Since unproductive, unsightly cripples detract from a city's stature, Alberti urges ruling princes to order cripples and other undesirables to work at a trade in order to stay in the city. They should place those who cannot work in hospitals out of public view; 'by this means the city is not offended by miserable and filthy objects'."*(26)

Nothing, it was clear, should interfere with the aesthetic properties of the building; myth, ornament, decor, symmetry, situation and grandeur were just some of the constituents required to create a work of consummate splendour. Perfection was perceived of as a purity of form, to be achieved only through the application of pure logic by man, by a process of wresting it from unruly natural elements. Further, it was believed that such perfection would be sullied by mean compromise. The aim explained Alberti, when commenting on churches, was to *"have every part so contrived and adorned, as to fill the beholders with awe and amazement...and almost force them to cry out with astonishment*(27)

The marked social stratification so characteristic of both eras, called for the strict application of rules, and architecture was no exception. An individual's ranking within society was reflected by the exact style of building which she\he inhabited, which was graded in direct proportion to social position and wealth, even down to the size of lintel or portico. Furthermore, the building's layout on the ground, as Anstey observed, *"defined the relative positions of individuals within society and therefore took on symbolic significance"* (28).

Certainly, the formal rules of proportion imparted by Vitruvius and Alberti are so strict as to forbid any adaptation, not just because to Alberti, *"to deviate from an established custom generally robs a thing of its whole beauty"* (29), and may contravene what is socially deemed to be appropriate, but also because, the authors relate the principles of 'virtu' and 'magnificentia' through anthropomorphized Greek and Christian mythology to building design. Hersey explained,

"When the rules are broken we are to regard the result not as solecism but blasphemy. Vitruvius' minuteness, his admonitory tone, his frequent invocations of the gods, give his text the quality of the seemingly endless dietary taboos in Deuteronomy 14 and Leviticus 11, or the long lists of prohibitions in some Orphic or Pythagorean sect". (30)

2.1 The 'Ideal' Versus the Building User

The precepts espoused by both Vitruvius and later Alberti, went some way towards developing a formal theoretical framework for a system of proportion, harmony and geometry, based on the obsessive preoccupation with the notion of the ideal, the perfect. The concept of 'the ideal', has several origins, the principal two stemming from Greek philosopher, Plato, and the Roman author, Pliny. Plato's 'Theory of Ideas' asserts that true reality lies in the the essence of an idea, whilst, the physical world represents only an imperfect copy of the unflawed original. However, the more effectively the copy mirrors the idea, the closer it accords with perfection. This thinking lies behind the use of architecture to convey and refine various aspects of nature, including humans, their proportions and attributes, such as strength, grace, and virtue.

To Pliny, the concept of the ideal is one which refines nature; it is the sum total and synthesis of many perfect parts. The tale, he related, was often used to support the theory of the ideal. Pliny tells of how Zeux was commissioned to paint a picture of Helen for the temple Hera in the city of Croton; from a selection of girls he chose the five most beautiful. He then composed his picture from a selection of the parts, such as the mouth or legs, which he considered were the best of each. The two visions of the ideal largely subsumed into one in the later 'prototype of perfection,' to be developed in the theory of Classicism and Neo-classicism (31).

Thus the main theories which underpinned traditional European architecture, from the Renaissance onwards, albeit in often hybrid forms, rest on an overriding concern with

appearance, to the detriment of function. These appearances had the twofold effect of serving as monumental conduits, conveying rationalist, symbolic representations of divine perfection, which expressed, as Anstey noted,

> *" in times of despair when the physical order of a society had been torn apart ...a talisman of hope , both as a record of a magical past and as a means for realising a better future"* (32)

Appearances also metaphorically served to 'elevate' the status, power, and intellectual discernment of the patrician classes. But what of those people, Cuff's 'hidden users', who did not belong to the aristocracy, whose design needs were rarely considered, except passively , as 'appreciative admirers'? How did they cope with the slopes, steps and stairs so integral to a monumental architecture? Being mere humans and inherently flawed and of all shapes and sizes, they must have experienced access difficulties not so dissimilar to those in contemporary times, or perhaps to an even greater extent given the exaggerated building proportions and technology appropriate to the day. Indeed, in such a class conscious society, the imposing monoliths must have served to not only impress but to subjugate , as a permanent reminder of low station, and invoke feelings of helplessness. However, if as Favro claimed, the intention was to control through design, then those who were most subject to behavioural manipulation were people with disabilities, who would not only experience uncompromising design but also the stigma of being considered by architects like Alberti, as *"unproductive,...., unsightly,...., undesirable,...., miserable and filthy objects"*, and who were even regarded as even natures' rejects, the physical antithesis of perfection. Given the entrenched belief in the ideal, to designers and nobility alike, disabled people posed not only an eyesore but a significant threat, to their dominant belief system.

3. Architectural Education : The Development of the Classical Academic Doctrine

Adopted by Academies of Art, the first of which emerged in the 15th century as a meeting place for groups of humanists, Albertis' and Vitruvius' set of principles, by mid' 17th century, through Lebrun's teachings, exerted considerable influence on the development of the academic doctrine, Classicism. Lebrun, when appointed director in 1663, of the Academy of Painting and Sculpture in Paris, established strict control over artistic production and matters of taste. Indeed, his belief that all art could be rendered down to codified and rational precepts, soon emerged as the orthodox theory taught by the Academies, and was officially recognised as academic institutions charged with promoting and developing the arts as distinct from the sciences.

In 1671, the Academie Royale de l'Architecture was also established in Paris. Operating independently from the Academy of Painting and Sculpture, under the aegis of Jacques-Francois Blondel, as Academy Professor from 1762-1771, it was to have a far-reaching effect on subsequent architectural education. Indeed, in 1743, J-F Blondel had implemented the first full-time School of Architecture, with a fully devised and interdisciplinary curriculum, in contrast to the part-time pedagogical responsibilities of the Academie. Published in three volumes, Blondel's 'Cours d'Architecture' sets out his educational programmes, which pioneered a conservative although pluralistic system. Blondel's beliefs were strongly classical in emphasis, his only aim, he claimed, *"was the perfection of the arts"*(33). His expressed enthusiasm in his writings for two leading classical architects, Mansart and Perrault, is believed to have been influential in launching Neo-classicism. Neo-classicism flourished as an extreme and purified form, classicism in this context: the passion for all things Antique (Greek and Roman art being regarded as exemplars), became over refined as dogma. Academies also increased in number and influence during this period, becoming central to intellectual life.

Until the 18th century, there existed no term which specifically described the grouping of 'arts'. However, in 1746, 'Les Beaux Arts reduit a un meme principe', by Charles Batteax, classified the arts in terms of beauty. Those categorised as the purely beautiful comprised, sculpture, painting, music and poetry, and those that combined beauty and utility, confused architecture and eloquence(34). Here architecture was identified as having a functional as well as expressive purpose, but this definition was soon replaced by Diderot's Encyclopedie ou Dictionnaire raisonne des Sciences, des Arts et des Metiers 1751, which described what was now known as The Fine Arts or Les Beaux Arts, as the five arts (painting, sculpture, architecture, poetry and music)(35).

By the end of the 18th century, the French Revolution saw a marked resistance to the Academies, which, perceived as bastions of bourgeois privilege, were dissolved, only to be reinstated in 1816, as the Academie des Beaux-Arts. E-L Boulee, largely responsible for implementing the policies of the new system, had presided over the final years of the old Academy of Architecture. Thus, according to Collins, he and several like minded colleagues,

> *"formed the bridge between the old school and the 19th century Ecole des Beaux Arts; and it was their political sympathies with the new regime which put the organisation of the new school in their hands"(36).*

The classical aesthetic doctrine stemming from the Renaissance, and Greek and Roman Antiquity, inherited a belief system which, nobility aside, did little to further the design needs of a heterogeneous population. This was the normative system of values subsequently enshrined in the Beaux-Arts method of architectural education, which was to remain entrenched and prevail as the traditional form of education well into the 20th century. Boulee's and Blondel's neo-classical writings largely served as its basis.

3.1 The Beaux - Arts System

The newly established Ecole des Beaux-Arts compared unfavourably with Blondel's private school, where all tuition took place under the one roof. The Ecole des Beaux-Arts, however, carried out both preliminary instruction and design instruction in private ateliers. This practice, Cassidy believes, only served to disorientate students, as *"it was neither school nor office and lacked the discipline of both"*(37). The Ecole also lacked the private school's comprehensive and integrated curriculum, which included such practical elements as masonry, joinery, carpentry and quantity surveying(38). While building construction was touched on, it concentrated almost exclusively on classical theory which entailed an eclectic historicism, as Cassidy described,

> *"History varied from a soothing travelogue to a systematic and thorough analysis of outstanding moments and their relationship to the time"*(39).

Architecture was treated in much the same way as pure art, with a strong emphasis on two-dimensional aesthetic qualities, producing students who were highly accomplished at drawing and winning prizes. As Cassidy noted, *"the thought of actually constructing a building one had designed was very Non-U at the Ecole.*(40)" The Beaux-Arts educational system rapidly found favour with the new French regional schools, and at the turn of the century, was exported via American graduates of the Ecole des Beaux-Arts in Paris to the first American schools. Indeed, a Society of Beaux-Arts Architects (SBAA) was set up, which by 1911 had infiltrated and converted all the American schools, including MIT, Illinois and Cornell which had begun to develop their own more farsighted curricula. The SBAA fully endorsed and disseminated all the principles of the French Ecole, in particular, the extremely competitive predilection for 'grand-prix-hunting' as Cassidy termed it(41).

Britain meanwhile operated the fairly adhoc pupilage and apprenticeship systems. The former requiring the pupil to pay for office tuition, whilst attending either drawing classes at the Academy, or a private architecture course. By 1882, however, the Royal

Institute of British Architects, at the behest of the now largely corporate clients, recognised the increasing need for a standardised code of practice and implemented compulsory professional qualifications. This fact, coupled with the Academies' inability to cope with the growing number of students, reinforced the demand for a professional school of architecture. The Architectural Association responded first, followed by Liverpool School of Architecture in 1894. And so, the British architectural education system as it is known today, emerged, indebted to a large extent, to the French system for the development of its Fine Arts emphasis which was first supported by Blomfeild, and later within the University schools by Reilly and Richardson(42). Indeed Blomfeild's expressed aims largely exemplify the art bias, so characteristic of this method,

> *"The student must study the anatomical structure of the building, the disposition of its planes and masses, the proportions of its parts, the materials and their treatment, and all from the point of view of the artist, who some day may be called upon to solve a similar problem*(43)."

The highly influential Beaux-Arts system, perpetuated the perception of 'the architect as artist,'and sought an ideal of beauty, through formal and decorative elements, by focusing on design and historical exemplars, within the curricula. What has now been dubbed as 'fancy dress architecture', reinforced the notion that function was of secondary importance to appearance, which as Brown commented, *"could be best encouraged by the glorification of the individual through the granting of honour awards*(44)." Just as function was subjugated, so were the user requirements.

3.2 The Bauhaus School and the Emergence of Modern Architecture

The Beaux-Arts system was not without its critics, however, of whom, one of the most vocal and erudite was William Lethaby. Lethaby rejected the education system's narrow

preoccupation with the past, which he claimed ill prepared students for, what was now a changed society. He questioned why architects should dip into history for period styles totally unsuited to the new types of buildings now required, such as railway stations, hospitals and factories? Lethaby appealed for a complete reappraisal of all education, which if vocationally oriented, he believed, should be closely linked with the relevant *"systems of production and action"*, not least architectural education, which should be related to industry. Further, he criticised, educational theory for looking backwards not forwards,

> *"It is an education in appreciation and in knowledge of what has been written. It is by its very nature retrospective and at best introspective,the proper introduction to a life of contemplation.*(45)"

The RIBA, however, continued to support the traditional bulwark of prescriptive codes and principles of good taste, and failed to respond to Lethaby's vision, although later Lethaby was to see many of his recommendations realised, by a very different route, and by a group more sympathetic to his aims. Profoundly influenced by the work of William Morris, and following in the foot steps of like minded contemporary Charles Ashbee, who founded the Guild and School of Handicraft in East London in 1888, Lethaby went on to set up the London Central School of Arts and Crafts in 1894. Morris, who pioneered this new school of thought, sought, in an age of mass produced goods, to restore the old medieval craft guilds. It was the only means, he was convinced, by which the link between Fine Arts and craft could be rebuilt, and achieve his socialist goal of liberating workers from machines to enjoy the pleasures of reacquainting themselves with the skills of the past. Writing on the aims of this movement, Cassidy explained,

> *"They were looking for quality, straightforwardness, and usefulness, they demanded a more intimate relationship between the world of things and the world of men, a relationship that had been destroyed by the division of labour in industrial England*(46)."

To Cassidy, it was Lethaby's belief in the machine, unlike his colleagues, which established the relationship between "the English Romantics and Gropius". Lethaby saw the machine as a symbol of the culmination of man's talents, a fusion of elegant design, function and progress.

Unfortunately, the Arts and Crafts Movement spawned by Britain, failed to influence an intransigent RIBA, but it did take root in Germany, when architects, Henri van de Velde and Peter Behrens, were appointed to head the Grand Ducal Art School at Weimar and the Dusseldorf School, respectively. Both were strong followers of the British movement. Indeed, Van de Velde went on to found the Weimar School of Arts and Crafts in 1903.

In 1907, The Deutscher Werkbund was set up in Munich, by Walter Gropius and Peter Behrens, a former teacher. This was to become highly influential as the prototype for modern architecture, and prompted the spread of Arts and Crafts centres throughout Germany. At last, Lethaby's dream of collaboration between industry, designers and craftsmen was almost realised, although not entirely, because as Gropius himself noted,

> *"the academic spirit was too firmly implanted for that practical training to be more than a dilettante smattering. The first attempts to get away from 'the art for arts sake' attitude failed because they had not planned on a sufficiently wide front and did not go deep enough to touch the root of this evil*(47)."

In 1919, an opportunity arose for Gropius to follow through his goals as he saw fit; at Van de Velde's request, he was appointed directorship of The Grand Ducal Art School, which he amalgamated with the Weimar Academy of Fine Art, creating a high school for design, Das Staatliche Bauhaus Weimar. The aim of the Bauhaus school was to merge all the arts, including handicrafts, to bring about, in the words of Gropius, *"a modern architectonic art, all embracing in its scope"*(48).

Expressionist artists, Kandinsky, Klee, Feininger, architect Marcel Bruer, and typographer Herbert Bayer were members of the distinguished teaching staff. The original expressionist programme, however, following the influential residency of Theo van Doesburg and the appointment of Moholy-Nagy in 1922, was streamlined to forge the link between designers and industrial design, and to create machines and products of an unadorned, geometric purity. To Bruno Taut, architectural design was the final synthesis of each of the varied disciplines,

> *"At this point, there will be no boundaries between the crafts, sculpture and painting; all will be one: Architecture"*(49).

Such anti-classicist polemic represented a radical departure from tradition; no longer was the architect exhorted to compete, and aspire to personal greatness by works memorable because of their scale and 'beauty'. The onus was now on the architect to collaborate as a member of an interdisciplinary team, albeit with architecture elevated as the principal goal, collectively achieved. Indeed, as Kostof points out, although collaboration is an ostensible aim, the architect's prime position as the key player remains little changed from the days of Alberti.

> *"Far more comfortable than the idea of a team of equals fretting over a design solution was the idea of the architect as the guiding spirit of the Gesamtkunstwerk. Painters, sculptors, craftsmen of various sorts, a constellation of talents fixed and empowered by the architect's vision-that was an acceptable extension of creative company, as long as the primacy of the architect did not suffer undue compromise.*(50)"

The overriding vision was of social equality and betterment, to improve, through good planning, serviceable, efficient designs, and materials appropriate to function and the technology of the day, the quality of life for all. The number and type of designs falling within the Bauhaus frame of reference, reflect the consideration of lifestyle as a priority, and range from city planning and housing schemes, to a variety of domestic products, including, textiles, furniture, and electric light fittings. All were created as a coherent collection, and with the same distinctive economy of detail. The extent of this guiding

philosophy is described by Colin St. John Wilson,

> *"A whole body of ideas was at stake, social, technical, and formal. In this body of ideas, all elements from door-handle to city plan were so bound together that the form of a chair could even project implications for the form of a city. Stakes of this order demand a kind of Hippocratic oath, and this is to be exercised in a realm hard to define, which borders simultaneously upon aesthetics, morality, and politics, and can best be described by the word 'probity'*(51)."

In 1925, political pressure forced the dissolution of the Weimar school. However, by 1926, the Bauhaus had moved to a new school in Dessau, designed as a co-operative venture by Gropius, his staff and students. It was during the period 1925-1930, that Bauhaus was to earn its world famous reputation, as pioneer, amounting to nothing less than the revolution of a new aesthetic.(52)

The Bauhaus syllabus, in contrast to the Beaux-Art tradition, sought, in the first three years of training, to establish a strong practical basis. Students carried out laboratorary experiments, were supervised by a master craftsman and artist, and became familiarised with design, theory and application. Knowledge of materials, their use, and methods of production were juxtaposed with history, sociology and psychology.

The first period was the equivalent of a general arts and crafts diploma, where the student upon successful completion received a Journeyman's certificate. Given that the received wisdom at Bauhaus was that architecture ranked highest of all arts, the student was only permitted entry to the final two years of specific building design to gain an architectural diploma, if she\he had demonstrated ability in all aspects of design. This period, according to Cassidy,

> *"focused on architecture and construction and was conducted as an apprenticeship within the master's studio and research shop.*(53)"

Certainly, the Bauhaus syllabus was far removed from the Beaux-Arts competitive system of 'drawing board architecture', with little consideration of social and cultural

context, function or the construction industry, pointing the way forward to a more multidisciplinary approach to design. However, it did have drawbacks, one of which was the omission from the programme of mathematics and technical engineering. Further, and more pertinent to this thesis, there was an excessive preoccupation with 'functional' considerations which failed to take account of the real needs of building users.

3.2.1 ' Functionalism ' Versus the Building User

During the decade 1923 to 1933, when the Bauhaus school was finally closed down by the Nazis, a new phase in modern architecture emerged, with the Bauhaus in the vanguard. Such was the rigorous refinement of this movement, that it has since been coined 'Functionalism'. However, this term is somewhat a misnomer, being often used as a synonym for Modern Architecture or interpreted in a literal sense. In fact, it can be variously defined, as it represents a fusion of ideological thinking, including social, cultural, political, historical, economic, aesthetic and scientific factors.

Thus the word 'function' was a highly charged blanket term, used to convey a combination of any number of above factors or just one of them. Function took on a symbolic resonance and acted as a litany for modernist architects; this can be seen most clearly when examined against the socio/political backdrop of the day, a backdrop which has been largely overlooked, as Roger Montgomery noted,

> *"architects, critics, and the general public tended to understand Louis Sullivan's 'Form follows function' and Le Corbusiers's 'A house is a machine for Living' to mean what they said in everyday terms.*(54)"

The many connotations attached to the term by Bauhaus, perhaps best illustrate the inadequacy of literal interpretation. This is exemplified in a telling article, "Bauen" (Building), by Hennes Meyer, whose directorship, largely led to the progressive purism

and concern with 'functionalism' within the school.

> *"All things in this world are the product of a formula: (function + economics) so none of these things are works of art: all art is composition and necessarily opposed to function, all life is function and therefore inartistic. The idea of the 'composition' of a seaport is enough to make one double up with laughter.*(55)"

This polemic, when examined within the artistic context of the day, is paradoxically a distillation and architectural manifestation of the De Stijl cubism expounded by Theo van Doesburg and Suprematism, as its purest form, and Moholy-Nagy's Constructivist Elementarist work, which were to have such a profound influence on Bauhaus design, rendering it down to blocks of primary colour, and stark linear representations. Sommer explains further,

> *"The aesthetic aspect of construction became exclusively a problem of proportions of building cubes and of elements of the outer walls, such as floor heights, articulation of windows, and intervals between supports. Architects assembled two-dimensional plans of houses and models of buildings by the same collage techniques used by Mondrian.*(56)."

Thus it was not that Meyer had rejected art, as he himself claimed, but that he had assimilated and unwittingly applied a new set of aesthetic norms to form, evolved to be closely consistent with 'function', as he saw it. The Bauhaus school, aside from a handful of pioneer modern architects, including Le Corbusier, Frank Lloyd Wright and Alvar Aalto, stood out in splendid isolation from the official architecture of the day, which had moved on from Neo-Classisicm, Neo-Gothic, Art-Nouveau and Neo-Baroque to an amalgam of old and new styles, in what has been called the New Tradition. This marked a gradual change in establishment thinking, borne out of architects' classical training, an acknowledgement of the necessity to adopt a style more appropriate for modern times, and an unwillingness to adopt an increasingly abstract 'functional' architecture with little iconographic relevance. Frampton describes this style as *"consciously modernised historicist buildings...which were far from being historically determined in their overall approach*(57)".

The isolation of the modern architects was thoroughly intentional as they sought an alliance with social democratic politics and to dissociate from traditional art and architecture, which were believed to represent the misappropriation of power and capital. The joint goals of social and political reform were rendered all the more potent, given the rise of fascism throughout the West during this period. As Wilson commented,

> *"Surely it was not on stylistic grounds that the Nazis closed the Bauhaus, and not for nothing did Corbu refer to 'ce futurisme bien dangereux', for Corbu as for the Nazis, forms contained dangerous implications of a way of life*(58)."

Just as architecture should serve people, through housing programmes, according to socialist principles, so should art, and should be harnessed to engender a social unity; this standpoint dates back to William Morris. Indeed, the extreme doctrine as held by Meyer, and the Suprematists, was that the very concept of art was elitist and as such superfluous; life and art were one and the same. As Van Doesburg and Van Easteren commented,

> *"We must realize that life and art are no longer separate domains. That is why the 'idea' of 'art' as an illusion separate from real life must disappear. The word 'Art' no longer means anything to us. In its place we demand the construction of our environment in accordance with creative laws based upon a fixed principle. These laws, following those of economics, mathematics, technique, sanitation, etc.,are leading to a new plastic unity*(59)."

Outlined in the above statement is a further important ideological strand, rationalism, which is linked with art, architecture and the attainment of socialist goals. Not only was there a move towards towards the clinical aesthetic of mass production and an appreciation of the clean, elegant, smooth lines so integral to technology, but as Montgomery points out, *"In its extreme form this view had cubism in painting prefiguring quantum mechanics in physics*(60)." In this context, Science and Art are reconciled, conjoined by universal 'fixed laws' working towards the same end; with art, *"liberated from the constraints of tradition and the cult of individuality"* (61)."

Given the espoused social goals, the movement now looked towards social science to provide information on the basic human requirements, in terms of space allocation, lighting and heating. Montgomery outlined this point and cites Gropius' 1929 writings on 'Sociological Premises',

> *"The sociological facts must first be clarified in order that the ideal minimum of a life necessity, the dwelling...may be found...an entirely new formulation is required, based on a knowledge of the natural and sociological minimum requirements, unobscured by the veil of traditionally imagined historical needs*(62)."

Unfortunately, at this early stage although Gropius posited the need for research evidence, his ideas failed to be followed through(63), and it was not until after the second world war, that architecture ventured into a serious alliance with Social Science.

Clearly, the designers were searching for a formula, a set of 'user-need' prescriptions which could be applied to any given design situation; the 'ideal minimum requirements' to create the ideal form, to be standardised for use by all.

Paradoxically although the modern designers no longer sought to cater for a powerful elite, they shared a common bond with their classical predecessors; the desire to create the perfect form, wrought from a set of universal laws. Indeed, Le Corbusier drew inspiration from the Beaux-Arts Classical 'Elementarist' principles advanced at the turn of the century by Julian Guadet, and the Humanists, as evidenced by his 1931 Palace of the Soviets project, and his 1929 Ville Radieuse (Radient City) plan, with distinctive anthropomorphic metaphors, as described by Frampton,

> *"His (Le Corbusier's) explicatory sketches of the period...show the isolated 'head' of the sixteen cruciform skyscapers above the 'heart' of the cultural centre, located between the two halves or the 'lungs' of the residential zone*(64)."

These principles anticipated the rebirth in 1942 of Le Corbusier's modular man, derived from Vitruvius' enduring homunculus, which has changed little from the spread-eagled

heroic figure of old, but with one arm upheld instead of two, symbolises not the idealised glorified individual, but the idealised 'everyman'. To Hellman he represents, *"the Modern Movement's crudest manifestation of an abstracted ideal, his arm lifted in dumb submission*(65)". This proportional system, according to Kostof,

> *"gives us a series of predetermined lengths generated by the application of the golden section (0.618) to the height of a six foot man*(66)."

Notwithstanding the recognition on the part of designers, that the needs of all people be met, this homunculus, it could be argued, served to promulgate a widespread misconception of the average building user as young, able-bodied, six foot and male. Indeed, Kostof further adds the telling comment, that *"the modular,...is certainly familiar as the architect's own likeness in photographs*(67)."

The failure to grasp the heterogeneous make-up of society reflected a failure to communicate effectively and directly with building users. This neglect was due to a deterministic belief on the part of designers that they were 'professionally equipped to understand user needs better than the user himself'(68), and so, in the best interest of the users, if built environments were planned according to the same common denominator maintaining a prescribed minimum quality of life, denizens would soon learn to adapt and fit in to their *"safe, sanitary, sunlit zoos*(69)." There was also the added complication, contrary to the architects' statements suggesting otherwise, that the stark cubic 'zoos' were three-dimensional sculptural exhibits, defying anyone to defile their linear purity with the inevitable clutter that comes of habitation. As Sommer put it, *"It was considered unethical for the viewer of a work of art - or occupant of the building - to alter in any way the final positioning of the components or to make decisions regarding the outcome*(70)."

Furthermore, prior to the first world war, architects largely catered for 'gentry', and as they derived from a similar socio-economic background, were conversant with their

clients' needs. However, the architect now served a much wider social spectrum, designing for many people with lifestyles and requirements with which s/he was unaccustomed, giving rise as Lippman pointed out, to a restricted dialogue and *"frustration...at attempting to meet such unexpressed needs,"* and *"a taste gap...where tensions are likely to be felt as a result of discrepancies between specialists' conceptions of 'good' architecture and popular tastes*(71)."

So where did the person with disabilities fit into this 'functional' equation? They did not, for designers had not moved as far away from the fine arts perception of architecture as they thought, and the less than perfect physical reality of people with disabilities simply did not accord with their idealised vision of housing schemes and city scapes for a homogeneous population. The visions may have embraced everyone, as opposed to a handful of powerful individuals, and the game plan may have changed, but the original rules remained intact, from the quest for the ideal, aesthetic form, function, user, self-image, professional-image, to universal laws. Kostof's eloquent explanation of the neglect of building users is worth quoting at length,

> *"Modernist rhetoric waxed eloquent about the needs of users. It represented architecture as the vehicle of social welfare and set public housing as the highest priority of architecture. But there was no question of consulting with the user of housing estates during the course of their design. No one bothered to explain why, since the picture was too obvious. Users were not a stable or coherent entity. And users did not know what they wanted or, more importantly, what they should have. Their collective needs, interpreted by the architect and the sponsoring agency, would be codified in the 'program'- as had been the case with hospitals, schools, and prisons in the past. The fit might not be comfortable at first. The setting might appear alien to our habitual ways. The fault was with our habits. We would learn to adjust to the new Wohnkultur because it was based on rationally derived standards. Existenzminimum, the space allocation that conditioned our living unit, was a scientific datum.*(72)"

Prior to the second world war, the functionalist dictum 'the object of nature is man, the object of man is style', held sway, within the modern movement; However by the end of the war, following the emigration of the key protagonists at Bauhaus to the United States (Gropius and Marcel Bruer moved to Harvard, Mies van der Rohe to Illinois

Institute of Technology, and Moholy-Nagy to the Chicago Institute of Design) the movement lost its intensity. Although it became far more influential, and rapidly supplanted the Beaux-Arts educational system, building design also reflected this change; the New Tradition gradually gave way, and even the skyscrapers lost their classical motifs.

4. The Alliance Between Building Design and Behavioural Science

"We shape our buildings and afterwards our buildings shape us" (Churchill 1944)

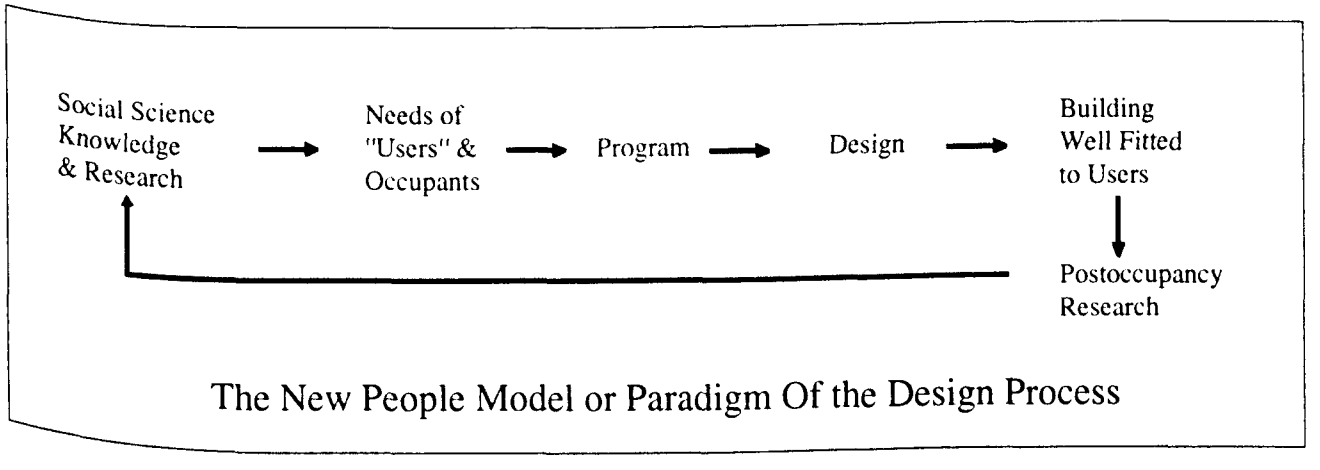
Winston Churchill's oft' quoted phrase, taken from his speech marking the start of the restoration of the House of Commons, after it was bombed in 1941, also marked the start of the alliance between Social Science and Building Design(73). Connections between the two disciplines pre-dating this point can be made (Chicago School, Park et al.1925) but the atmosphere of post-war social democracy generated a demand for increased knowledge about the social effects of the physical environment(74).

Research undertaken in the 1940's by Leon Festinger examining patterns of interaction in student housing, demonstrated a correlation between proximity of front door placement and friendship levels, thus establishing the link between environment and behaviour and prompting a reevaluation of environmental determinism(75). This reevaluation signaled a new wave of thought about the socio-psychological effects of the built environment. Craik and Canter(76) attribute the growth of such environmental responsiveness in part, to the trend of upheaval in post-war planning. Urban renewal and new towns demanded large scale resettlement and posed many new questions about the influence of design on building inhabitants. Reappraisal of this nature was further necessitated by technological advances. An example cited by Craik and Canter was the

advent of the totally controlled environment, air conditioned and windowless. They further suggest that how people interact with their surroundings was no longer purely just a question of physiology, of comfort and satisfaction, but of a number of more subtle variables. Noise, air-pollution, and lighting are just some of the factors, which research has shown link design and poor health.

However, given the shortage of skilled practitioners during the 50's, person-environment considerations did not properly take root until the early 60's, when behavioural research was carried out at the University of California, Berkeley, on proposed designs for new dorms. 'Dorms at Berkeley', published in 1967, pioneered 'post-occupancy evaluation' or POE, a highly influential and positivistic model of the design process, which incorporated a follow-up stage of users' views, creating a feedback loop into future designs to increase the degree of congruence between buildings and people(77). This was the first time that users or occupants of buildings emerged as distinct from clients and patrons, and consulted as to their design needs. The arrival of this new model (as shown in Figure 1) was timely, coinciding with the 1968 demonstrations demanding social and political reform.

Figure 1: The New Paradigm of the Design Process



Throughout Europe and the United States, against this background of protest for civil rights, urban regeneration, and an end to the Vietnam war, architecture students called on the educational authorities to develop socially relevant curricula and community architectural organisations. In what has since been described as the death of Beaux-Arts, and thus of the perception of architecture as art, the Ecole de Beaux-Arts students' occupation of the school served as a landmark in the move toward a more people oriented architecture.

The appearance in 1969, of Philip Boudon's study of Le Corbusier's Pessac housing, only served to compound the need to apply the paradigm, within the context of social research. Created in the 1920's, this estate exemplified 'functionalist' aspirations, and after 40 years of use, Boudon laid to rest the notion of the user conforming to modular man proportions and behaviour; indeed s/he could not have departed from the ideal conception more, as Kostof shows,

> *"The architect had provided people with stark, modernist, value-free containers, which were at once tecnologically justified 'machines to live in' and aesthetically disposed, cubist arrangements of closed and open volumes. Here working class families were to install themselves, and fit into the quotidian details of a modern life. What they did instead was to rebuild the containers little by little, so that the architecture would accommodate their actual needs. They narrowed and framed the windows; they blocked off the empty spaces beneath the trademark Corbusian stilts that held aloft the house cubes; they sealed the see-through roof terraces; they appropriated their unit with their favourite trees and shrubs; and they built common sheds, unmindful that these would impair the purity of the design. The users had struck back at the most celebrated architect and planner of modern times. Had he not himself once said resignedly, in speaking of Pessac, 'You know, it is always life that is life and the architect who is wrong?'*(78)."

The late 60's and early 70's saw not only the formulation of person-environment theory, and in particular the emergence of environmental psychology, with the publication of books and the institution of specialist organisations and journals, such as Man and His Urban Environment (Michelson 1970), Environmental Psychology (Proshansky et al 1970), and the Environmental Design Research Association (EDRA), but the incorporation of social science into the architectural curricula. However,

mainstream sociology at this point was a rapidly expanding discipline in its own right, and did not pursue the alliance as far as it might, The American Sociological Association for example, created the Environmental Sociology section, which, as its title suggests was very broad, focusing on the natural environment largely to the exclusion of the built environment. Furthermore, sociologists Gutman (1966), Gans (1968) and Keller (1968) argued that the physical environment should not be viewed as the principal determinant of behaviour, and was of secondary importance compared to cultural factors(79). Environmental psychology evolved to largely fill the gap vacated by sociology, and encompassed many related disciplines in the behavioural science field, the more physical and environmental of which embrace architecture, surveying, interior and landscape design and engineering. The subject areas dominated by social considerations including, sociology, psychology, anthropology, psychiatry, human geography and ergonomics. To Lee the merits of increasing the cross-fertilisation of knowledge are self-evident,

> *"It is generally recognized that academic and professional demarcation lines are often arbitrary, and if too much attention is paid to them, the growth of knowledge and the spread of techniques are hindered.*(80)"

Behavioural science and in particular environmental psychology, have shown the way for a multi-disciplinary approach to design, serving to identify key attitudinal factors, so important for understanding and improving the quality of experience within primary environments. Schools, hospitals and shopping centres have all been subject to such research(81).

However, notwithstanding the significance of the design of primary environments on behaviour, environmental psychology has carried out little research on disabled peoples' design needs. "Designing for the Handicapped" edited by Bayes and Franklin, 1971(82), one of the few research publications in this field is dated, adopting a "separatist" approach to disabled users, and the notion that "special" groups of people require "special" provision as opposed to an expansion of normal design parameters. A

glance at the contents page, lists headings referring to buildings for *"Gifted children"*, *"The mildly mentally subnormal"*, *"The mentally ill"* and *"The blind and partially sighted"*, all of which may now be perceived as compartmentalising humanity into readily labelled, and potentially stigmatised groups.

Aside from Bayes and Franklin's edited collection, the only British studies during this period, to investigate people with disabilities' design requirements, stemmed from architecture (83,84) and planning (85). Although such research pioneered a previously unchartered field, and served to highlight the necessity of access considerations, all failed to draw on social science and the traditional background of research methods and theory which it had to offer. The POE paradigm, for instance, was at this point rapidly gaining credibility as a popular research tool to gauge user needs, but not only did none of the studies apply this approach, but they also neglected to acknowledge its existence. This was an oversight which not only illustrated the nascent character of the relationship between disciplines, but also the perception of disabled people as separate from the population at large, with highly specialised needs to be served by segregation, which did not fall into the remit of participative design.

Behaviour, Ferguson(86) noted, now ranks alongside cost, durability, efficiency and aesthetics as a fifth dimension to the four standard guiding principles of design. However, if full integration of disabled people is to be achieved, it is important that further user-oriented research be carried out, which applies the recent philosophy of "normalisation" for people with disabilities. It is not enough that behavioural considerations be appended to the whole, as an optional extra, rather they should be assimilated to become a natural element of the essential design vocabulary.

However as Albrecht observed, environmental psychology's case study approach has led to a neglect of structural analysis.

"Writings about participatory design have focused either on justifying its use or on presenting individual projects in a case-study manner. No attempts have been made to establish a theoretical foundation for participation in architecture. What is needed are communication theories, studies in consensus building and normative concepts about communities(87)."

According to Mayo, although social science gained *"a permanent foothold within schools of architecture, and social research gained legitimacy"*, it was never fully developed and became *"internalised"* to the extent that, *"the empirical research of social scientists outside of architecture had become ignored by architectural researchers ...and the traditional disciplines of the social sciences were often seen as being of marginal importance.*(88)"

Notwithstanding the limited scope of research spanning the social science/building design schism during this period, interest in social science survey techniques to gauge user needs proliferated, not only in schools of architecture but architectural practices. Indeed, it was one of the principal American practices SOM (Skidmore, Owings and Merrill)(89), influenced by this social climate, who were responsible for sealing the fate of Priutt-Igoe, a celebrated monument to modernism transformed into a symbol of urban decay; dynamited in 1972 because it was insupportable as a place of habitation, and in the words of Jenks, *"it was finally put out of its misery. Boom, boom, boom...*(90)." To Jenks, the death of Pruitt-Igoe marked the failure and death of 'functionalism', and the advent of Post-Modern architecture.

Certainly, its demise vividly conjured up the growing disaffection of the time, with what was regarded as a deterministic *"tyranny of the drawing board*(91)" by architects who had for too long neglected their social responsibility to consult with building users. Robert Goodman's "After the Planners"(92) and Oscar Newman's "Defensible Space"(93) demonstrated in language palatable to designers, through quantitative evidence, the necessity of applying the new model to the benefit of the occupants and the longevity of the building.

However, Mayo maintained, that both works *"lacked an essential ingredient, a political critique*(94)," which may be one important explanation as to why the application of the paradigm, was less than effective; grounding in the epistemological framework of 'communication theories, consensus building and normative concepts about communities', recommended by Albrecht (95) may have been more appropriate. This point was also advanced by Buchanan, who believes that although architectural education is the best medium in which to promote such theoretical evaluation, it, however for a number of reasons fails to do so effectively,

> *"Unfortunately academics are not usefully developing and applying new theory in some synthesising and profoundly illuminating yet integrative projects that might be universal in the usefulness and satisfaction offered. Instead theory tends to be the refuge of obfuscation, esotericism and one-up-manship in which teachers carve a safe haven in which to hide their inexpertise and lack of real commitment to architecture and the welfare of mankind. This is perhaps one of the profoundest failings of architectural education today - and one from which stem so many of the others that afflict both schools and practice*(96).

The theory proposed by Albrecht, is based on Etzioni's concept of an active society, a concept which resides in his statement,

> *"Man is 'not' unless he is social, what he is depends upon his social being, and what he makes of his social being is irrevocable bound up to what he makes of himself*(97)."

So, although an individual may appear to perform autonomously, action largely stems from a societal milieu, and social change is most likely to be generated from this basis. As Albrecht put it, *"the transformation of self is deeply rooted in community transformation."* An 'active society' is thus a transformed society, empowered but also enabling, ensuring the activation of its members. However, the increased knowledge and power required for this process of realisation, which society currently has, may also be used as forces of instrumentalisation leading to the reduction of objectivity and passivity. It is thereby necessary within this context to balance and spread evenly such development; in short, consensus-building is crucial.

The ingredients required to engender the desired active state, according to Albrecht are,

> *"A self-conscious knowing actor and commitment. These two guide the third component, power. Without consciousness and knowledge, the collective actor is unaware of his identity to act; without commitment to purpose, action lacks direction; and without power, the most incisive awareness and firmest commitment will be futile*(98)."

Power followed by communication, to bring about consensus are the most important 'implementing' factors. To Etzioni, the notion of power or control equates with action, which when combined with consensus-building, creates the idea of 'societal guidance'. Consensus-building must be a flexible and continuous process, which is responsive to changing requirements, and which does not constitute merely having similar opinions. Indeed, it is often the groups with the most similar goals, who are most in conflict, on competitive grounds. Moreover as Albrecht explains,

> *"there is a trade-off between control and consensus; that is for any given level of activation, the greater the consensus, the less the need for control, and the less the consensus the more the demand for control..., in situations in which both consensus and control are high, more change can be guided without an increase in alienation than when both are low*(99)."

Albrecht relates this theory to architecture, which he argues should be more receptive to societal change, if it is to maintain its authority and control, and will be at risk from outside influences if it remains intransigent. By this he means, not one sided authority in the patriarchal sense, rather authority in the sense which comes of being empowered by knowledge, but he adds a caveat, *"the power of architecture indeed can only come from convincing argumentation and not from claiming to be a privileged social institution*(100)."

Thus architecture, by means of participatory design, may tap into and respond to the groundswell of users' opinion. However, too often, this process of negotiation has been cynically appropriated by new intermediaries for politico-economic ends, spawned by the ever increasing sophistication of the building process and by the same token

division of labour. As Montgomery illustrated,

> *"In the United States today, almost nothing gets built without multiple levels of political involvement, both formal and informal. The Byzantine apparatus of public regulation overland and development is perhaps only the most obvious manifestation of this change. Regulation has created very substantial numbers of middle-professional jobs. All sides in the process have to employ technical experts both to manage the bargaining process and to provide technical analysis and representation. Negotiation, and the kinds of expertise it requires, draws far more on the person-environment relations model of architecture than on the traditional perspectives*(101)."

This point was also reinforced by Tom Woolley, an architect with extensive experience of participatory design, who lamented,

> *"What I see time after time, is that resources do not go directly to local people but to professionals, middle men who decide what is best for people but who are not really accountable to user needs*(102)."

Thus it is important that architecture responds to actual needs as expressed by building users, rather than 'artificial' or perceived needs, which calls for the implementation of the model of active orientation to be brought into play, enabling users to take a more proactive role in the process.

Woolley, argues the case, that local people on a grassroots level receive guidance to build up enough knowledge and initiative to establish a degree of independence and a resource pool of 'socialised expertise'. This is particularly applicable to people with disabilities, who have been largely excluded from any form of representation in participatory design, and who as sensitive indicators of design limitations, have intimate and extensive knowledge of the built environment, but have been consistently denied the opportunity to express their views. Furthermore, Woolley claims, from his research analysing degrees of user satisfaction in participatory housing, that the,

"strongest correlation seemed to be between control and initiative taking and high tenant satisfaction. The more tenants took initiative to get the project going, and the more they felt in control of the day to day decisions, the more satisfied they were with the eventual project. They understood why their scheme had taken the form it had and appreciated faults and successes and they were thus committed to it. The less the initiative and control the less the satisfaction.(103)."

Albrecht however, contends that just as an authentic dialogue be extended to the community, with the aim of engendering advocacy, so architecture as a discipline should begin to address the fundamental questions of *"its consciousness, identity, purpose and sense of direction, and equally crucial about its own power for implementing ideas*(104)."

4.1 The Post Modernist Backlash

The necessity for re-evaluation within a historical and sociopolitical context is particularly pertinent given the prevailing culture of the post-modernist backlash against social science in architecture. The current resistance to social concerns has arisen due to a number of related factors including,

* The failure of the POE programme to live up to its initial promise as a simple antidote to urban problems(105).

* After the novelty wore off, the increasing perception on the part of designers that they were forced into the unpalatable portion of becoming amateur social scientists. Mayo observed,

"the post-modern movement has been a call among architects to get back to the art of doing architecture. This movement has not only displaced the popularity of the social science movement within architecture but has also distanced architectural academia from the social science disciplines. As a result, students in the architectural studio are more interested in playfully designing building as sculptural forms, than they are in meeting the social need of users or understanding the cultural and political character of their work(106).

* The reluctance of designers to undertake and assimilate social survey research which they felt was overly positivistic, reductionist and compromised professional autonomy(107). As Cuff pointed out,

"Since architects started becoming architectural specialists, architects have had to defend against Philistine intrusions into pure design. It has become clear, that human action considerations have all the appeal of a draft horse at Preakness(108).

* The disaffection of designers with the sterility and sociopolitical doctrine of the modern movement(109).

* The desire of designers to shake off the role of social responsibility, serving the economic impetus of conservatism and reverting to their traditional role 'as decorators of the milieu of elites'. As Montgomery noted,

"In the rise of new opportunities and the decline of social pacification, the rise of of post-modernist concerns with the aesthetics of style, corporate identity packaging, elite environments should come as no surprise(110)."

* A general mood of resignation and fatalism in a post-industrial, technocratic complex society, begged the question by Aldo van Eyck, *"If society has no form, how can architects provide its counterform?*(111)". Inherent in this question is the notion that the iconography of the past was imbued with meaning or social authenticity, and reflected the traditional values of the age. So, our pluralist culture is echoed by a pluralist architecture, whereby architects do not just dip into the bag of assorted period styles which were available in the historicist heyday of Beaux-Arts architecture, but have an even wider bewildering range available. Peter York,

speaking at a lecture on post-modern style commented,

> *"One of the implications of infinite choices and the disappearance of traditional obligations is a very different view of time. I think that very relevant to lots of architectural preoccupations too; a situation where you have no clear historical sequences in culture, no straight line evolution, the very idea of choosing a lifestyle. These are only possible when all sorts of traditional structures have broken down. In America certain ideas and styles which were once based on realities and obligations have now become a sort of intellectual fancy dress, and optional*(112)."

* The tendency of designers to operate in a vacuum, overlooking or playing down the importance of the social, cultural, and technological influences to impact upon the building design process; giving rise to an erroneous perception of history, which as Max Bond explained should,

> *"be viewed as a dynamic process of which we are part, and in which there are many forces at work, but not as something abstract, almost a static picture, in which we point to various episodes*(113)."

This perception of history, described by Broches, as *"a series of consumable allusions that one picks or disregards at will*(114)" has led to a vindication on the part of the architectural discipline, enabling it to divorce design from what is socially or technologically appropriate with impunity. Such a preoccupation with form to the detriment of content, and the pursuit of 'individualistic self-expression' or fame, as observed by Albrecht, might be considered a reconstituted Beaux-arts approach to design. Indeed, the depth of current feeling about this trend within architectural education, inspired the following invective by Peter Buchanan,

> *"This attitude, justified as tolerance and respect for relativism and pluralism, is of course the cop out of the uncommitted - one of the commonest student complaints about their teachers. As a result the architectural studio often resembles a kindergarten of uninhibited free expression - except that the finger painted smudged pencil finish overlies hours of painstaking drafting and the wackiest schemes tend to be the most self-consciously trendy, if not downright derivative. The emphasis on unshackled and uncritical creativity has led much student design far from the fundamental disciplines of architecture and into the realms of bad art... people mistake a simple plan for a simplistic one and fail to understand the richness of restraint.Instead willful and unresolved*

complexity is mistaken for invention and the plan degenerates into a gratuitous play of geometry or a flurry of wiggles and splashes - in other words mere graphics not architecture. Confusing graphics with architecture that must be judged as (potentially) constructed and experiential reality is a prime curse of architectural education today - and of architecture too(115)."

* Even style which may appear authentic or socially-rooted can be deceptive, amounting to nothing more than a synthetic and cynical attempt to mollify users. 'Clean green' and 'environmentally friendly' designs often fall into this category, being offered up as superficial and short term solutions to critical issues. Distressed polystyrene beams and moldings exemplify the current desire to create not fast food but fast environments, environments that lack the inspiration and creative integrity of the designer, who works to generate not art, but illusion by numbers. This tendency to design to a formula is noted by Davis,

"For a very short period, if you put solar collectors on your buildings, you had a little halo around your head, though you might be just as silly a technocrat as someone building an etcetera building in a place where it has no business to be. This kind of 'hippy technocrat' mixture has become a little obvious now, but what you might call the 'hippy humanist' hasn't become quite so blatant yet. There are still a lot of people who think that if you use rough-sawn red-wood, sandpaper it round instead of sharp at the corners, and use stained glass and leaded windows and all that stuff, that somehow the thing has become human...when it may be just as deeply alien as anything else(116)."

The social implications of the post-modernist backlash relate back to Albrecht's belief that there is a constant conflict between power through control and power through consensus, the latter remaining more problematic and thus more difficult to implement, so, often giving way to the former. Overweening management, Albrecht argues,

"diminishes one of the main characteristics of an active society - its responsiveness - and cause internal rigidities, objectivization, and alienation - all of which the active society wanted to prevent in the first place(117)."

So, the current retrospective tendency by designers, to narrowly conceive of architecture 'as an ability to decorate sheds', and underrate the importance of a collaborative more socially responsive approach, places the profession in an invidious position, at risk from the rapid development of related professions who are more flexible and less conservative. Effective communication is imperative if consensus is to be achieved and dominance defused, communication which spans the varied belief systems and values of not only the conflation of disciplines but the building users.

5. Conclusions

The foregoing analysis documents a chronology of architectural movements as they are represented in pedagogical theory and practice dating from the writings of Vitruvius in 27 BC to present day Post Modernism.

The concept of the creation of an 'ideal' image projected through the built form, whether it accorded with classical or functionalist doctrines, dominated building designers' thinking, and helped to promote an overriding concern with appearance to the detriment of content, and the overall effectiveness of the completed building. Monumental appearance also reflected power, status and defensive strategy by using steps, slopes and stairs as devices to metaphorically 'elevate' the client's status.

This guiding philosophy, the perception of architecture as art underlies the development of building design, and design education from Beaux-arts to Bauhaus, perpetuating a vision of the perfect or most 'beautiful' building into which fits an enduring but misguiding image of the perfect homunculus. This homunculus represented the idealised human form, with standardised proportions, bearing little relation to the actual heterogeneity of human form and physical ability.

The analysis reveals that building design has been significantly shaped by social forces, forces which have served to relegate the actual needs of building users, subjugating them to a peripheral or even ephemeral status within the building design process. This is particularly true for people with disabilities, for if nature is perceived of as imperfect, to be improved upon by the application of rationalistic laws, then those who are physically less able or visibly 'flawed' were regarded as even nature's rejects, and as contravening the entire belief system. Such a potent stigma is reflected by design provision which has served to segregate people with disabilities, thereby rendering them invisible, and powerless.

By the end of the second world war, social science and building design forged a tentative alliance, which for the first time in architectural history recognised the need to investigate the social effects of the built environment in order to generate more accommodating design. This prompted the emergence of participative design and the Post-Occupancy Evaluation model; designed as a research tool, to tap into and feed back users opinions into the design process; representation from disabled people was however, largely overlooked.

Although the rapid expansion of person-environment considerations led to the incorporation of social science within the educational curriculum, and the widespread belief that POE was a panacea for the now much documented urban problems, the initial enthusiasm was short lived and replaced by a significant disaffection with social concerns.

Social science may have gained a permanent foothold within architecture but it not only failed to inspire designers, and, aside from the Marxist and feminist critiques, but it failed to promote structural theoretical evaluation. Designers have now turned away from social obligations back to a reconstituted Beaux-arts approach, or Post Modernism.The renewed emphasis on self- expression and conceptual form is echoed within architectural education, detracting from the much needed multi-disciplinary, more

user-responsive approach.

A radical reappraisal of the current philosophy which serves to exclude, or impede, a significant proportion of building users, is required, all of which presents a considerable conceptual challenge. This is however, imperative, if architecture, in an increasingly consumer led culture, and an age of technological and bureaucratic complexity, is to maintain its current portion of authority, encouraging a more realistic and empathetic understanding of the diverse design requirements of building users and in particular disabled peoples.

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Chapter 2

Design as a Social Process

1. Introduction

"Architects 'out of touch' with public says survey"

The above byline culled from a recent edition of Building Design, which goes on to report that research undertaken by Gallup and the Henley Centre for Forecasting, canvassed the opinions of a not inconsiderable sample of 1,382 respondents, and concluded,

> *"In two out of three building categories the public thought architects were unaware of their tastes and needs. In the case of houses 58% thought designers were out of touch and 51% in the case of public buildings*(1)."

Furthermore, a 1991 study by Chartered Surveyor Vail-Williams of 58 companies occupying the much vaunted corporate offices of Broadgate and Stockley Park in London, found that,

> *"occupiers rated architects the worst of all professionals in the development chain in terms of their perceived willingness to listen to or think of the end user*(2)."

The above examples clearly reflect a mood of deep public dissatisfaction with the current quality of the built environment coupled with a low regard for the architectural profession. This dissatisfaction recently came to a head in what is now widely known as the 'monstrous carbuncle' speech by Prince Charles, who strongly rebuked architects for perpetuating what he perceived to be the ugly, jarring face of modernism, and allowing it to run rampant and unchecked over the cityscape.

The intervention by the Prince, and his plea for a reinstatement of the more 'aesthetic' classical architectonic principles of the past(3), touched the largely untapped groundswell of user opinion, and won widespread popular support. The then president of the Royal Institute of British Architects (RIBA), Max Hutchinson, fueled the debate with a measured response; the Prince of Wales, he claimed, was playing directly into the 'facadist' hands of post-modernism, and repeating the mistakes of the past by marginalising the needs of people.

> *"The criticisms of the anti-modernists are based almost entirely on the appearance of our built environment and not how it functions. The users of these buildings are simply not in the equation. The argument, for many of the prince's supporters, begins and ends with the contributions an individual building - that is, the outside of it makes to its surroundings*(4)."

Hutchinson sees the answer as lying not in post-modernism or the resurrection of the doctrinaire architectural orders, as post-modernism amounts to little more than *"an aberration, an absence of being"*, with a more *"flexible, adaptable"*, environment commensurate with the 21st century. Recommended is a reappraisal of modernism by a new generation of architects, unscarred by polemics, unlike their modernist predecessors, who, as Hutchinson put it,

> *"went into hiding after popular fundamentalists, brandishing copies of the Essex Design Guide, sentenced them to death for having read the Satanic Vers une Architecture*(5)."

This call for a 'neo-modernism', reawakens an old debate instigated in the late 60's, by Team X, which included Aldo van Eyck amongst its distinguished ranks. Team X, aware of the mounting criticism of the sterility of modernism, was the first architectural group to attempt a social critique of building design. The overall humanist aspiration, and consummate goal was represented by Van Eyck's evocative notion of *"built homecoming"*.

"Start with this - Make a welcome of each door and a countenance of each window. Make of each a place, a bunch of places for each house and each city, for a house is a tiny city, a city a huge house. Get closer to the centre of human reality and build its counterform.(6)."

To Van Eyck and Hutchinson, modernism is not dead; what is required is a further, more effective refinement of functionalism which bridges the art, science or classical, romantic divide, and which acknowledges the reality of the social context in which architecture is based. Indeed as one commentator cautioned, when pronouncing a death, it is always best to check whether the subject is clinically dead.

This school of thought is also shared by Woolley, who stresses the need to re-examine architecture from a socio-historical perspective, with a view to building on the lessons of the legacy of the past to inform the shape of the future.

"I think we need to be more involved in discovering roots and traditions over the last hundred years in which designers have worked with progressive social forces to create a more humane and democratic approach to design. Far too much debate takes place at a sterile, superficial, stylistic level and many community architects somehow stand to one side and adopt a neutral or pragmatic position, leaving it to the Prince of Wales to stand forward as a critic. Instead we need to engage in debates about what kind of architecture we want, and encourage the lay groups we work with to do so also(7)."

The increasing public mistrust and malignment of architects, triggered off by the "monstrous carbuncle" speech, has served to exacerbate a deepening crisis within the profession which has spread to its very core, architectural education. The threat of Government cutbacks in course expenditure and length, underlay the Cambridge Education Conference held in March 1991 which was billed as the successor to the milestone 1958 Oxford conference. As commentators argued, it signified the desultory nature the architectural profession and the important watershed it had now reached.

"The vigorous pluralism some applaud covers a desperate lack of any really convincing direction- or understanding of what architecture really is and should be about. A profound process of stocktaking is desperately needed. Much useful thinking and theory in the culture at large could be very usefully brought to bear on this crisis. Unfortunately, professional bodies are not really

interested in pursuing such a stocktaking. They wish to present a front of confidence and, besides business matters, are more interested in celebrating achieved fame than in questioning its basis(8)."

However, the current crisis has not been defused, and is likely to continue, if as Albrecht warns, architecture does not begin to recognise the strength of consumer demand, and to re-address some of the very complex social issues, which Hutchinson et al (9) pointed out have in the past been subverted.

This argument is particularly relevant for people with disabilities who are becoming increasingly vocal about their need to be perceived, not as a special and separate group but as an integral part of the population at large. Not only has this process of community integration been reflected by significant changes in social policy but it has now also permeated through to building legislation, particularly in the USA, where the 1990 American Disabilities Act (ADA), has extended wideranging anti-discrimination protections to disabled people; this major measure, is likely to be followed by European and British legislation.

The emergence of the consumer, or alternatively, civil rights movement, Sommer points out, also coincided with intensified interest in behaviour - environment interaction and the development of the Post Occupancy Evaluation (POE) programme, lending it greater momentum.

"The consumer movement has been described as an organised expression for an improved quality of life, and to the list of consumer rights was added 'the right to a physical environment that will enhance the quality of life'(10)."

However, just as building users have been found skeptical as to architects' awareness and ability to meet their needs, so, building designers are often dismissive or ambivalent about 'consumer demand'. An editorial comment in the Architects' Journal preceding a series of articles on the education debate, makes telling reading,

"The public has no interest in the process of construction. For the most part it believes that architects are only responsible for the appearance of buildings. And a large section of it believes that architects should be servants who simply do as they are told. In this view the architects job is to find out what people like and reproduce it - a 'demand-led' architecture to borrow the jargon of the marketing men. There is no place for creativity or invention since the public can only like what it already knows. Demand-led architecture is to real architecture what junk mail is to a free press(11)."

If the editor above believes that building users' expressed needs pose a threat to the essential creativity of the designer, and the production of 'real architecture', how much more profoundly will s/he and fellow architects feel this, when confronted with the wishes of marginalised disabled people labelled as of minority status?

It may be that, given the lack of environmental education at primary and secondary level, the public is relatively unsophisticated in matters of taste. It may also be the case that participatory design places greater emphasis on function rather than form; as Sommer argued, *"imagine a food critic whose main concern is with the appearance of the containers in which the food arrives*(12)." However, to discount wholesale consumer opinions, without further analysis or commitment to dialogue, and to describe them as the equivalent *"of what junk mail is to a free-press"*, is, when in a position of actually defending architecture in the light of public criticism, sadly wanting. If as the evidence suggests, this attitude is not untypical of the profession at large, it is of little surprise, therefore, that building users, including people with disabilities, have reached the level of disaffection they appear to have.

So, how can architects become more aware of peoples' needs and create a more socially responsive environment? How can they begin to move some way towards achieving Van Eyck's vision of 'Built Homecoming', which for people with disabilities is not just desirable but imperative, as a means of appropriating self-determination? How can the degree of fit between design and user become more congruent?

2. Intuitive Versus Objective Knowledge

> *"On April 11, 1958, a group of 53 architects, builders, teachers and administrators met at Magdalan College, Oxford to discuss the future of architectural education in Britain. The fear of a return to pre-war unemployment, the experience of wartime research into building methods and the ideal of a scientific approach to modern architecture all led those responsible for post-war reconstruction to feel that the next generation of designers should be drawn from an intellectual elite now made possible by a government - induced expansion of higher education* (13)."

What is now widely referred to as the 'Oxford Conference' set the direction for the architectural education system with which we are familiar in Britain today, for not only did it serve to dissolve the traditional apprenticeship method of training but it also recommended that all schools of architecture operate within Universities or their equivalent in order to ensure that academic as opposed to professional standards held sway. There was little dissension as it was generally assumed that an infusion of rationalist theory would greatly add to the overall standard of building.

However, recently critics (14, 15) have argued that the existing approach as it relates to design is not based on science but a dilute pseudo-science, inappropriate for such a dualist discipline as architecture. Believing that students misguidedly perceive of design as a set of physical problems to which design solutions may be readily anticipated, matched and managed, Joiner & Daish assert that,

> *"design education often fails to demonstrate that knowledge about manipulation of physical things can only be effective in a simple and static society. Such education limits architects abilities to respond to complex and changing social situations. It results in design professionals who can only talk to themselves* (16)."

Moreover, Cuff's findings (17) expose the misconception of design as a lone, sedentary, largely drawing board based activity; a series of tape recorded design sessions between architects and clients reveal that whilst it is the architect who must eventually give 'spatial expression' to the many interjections from various professional

representatives with a vested interest in the project, those individuals nevertheless significantly shape the design.

I would argue that all these factors may blinker students and practitioners to the reality of design, which is a far from fixed, evolving social process, and necessitates the ability to communicate with a team of people often with very different value systems, who may have a not inconsiderable influence on the final plan.

More and more, it is likely that people with disabilities will figure among the many participants who contribute to the design process; but, if as Cuff's evidence suggests, it is the case that architects tend to respond negatively to others' opinions as either unwelcome interference or "constraints", this attitude may be further exaggerated in relation to disabled people, who, as part of the growing consumer movement, are becoming increasingly vociferous and concerned about their right to an accessible built environment, and less ready to be disregarded. As Cuff explains,

> *"In contemporary America, architecture has been pushed into the public domain, which in conjunction with broad social and economic forces, has led more clients to be less willing to subsidise architecture for architecture's sake. The schools do very little to prepare would-be architects for the crowds of participants that will have a say in their projects. Frustration with the current circumstances has led to reactionary discussion in schools and among architect-heroes of returning to an architecture about architecture*(18)."

To Cuff, the academy bears little relation to real life practice, where in such an insulated, artificial, 'hothouse' environment, design activity remains largely pure, unfettered by business interests, with the student competitively pursuing his/her creative autonomy as a primary goal; this as Woolly further adds, *"encourages a distant perception of people's needs(*19)".

This archetypal school of thought derives from the pioneer work of Shon, who first elucidated a number of problems arising from the placement of architecture schools within the essentially positivistic milieu of Universities. Furthermore, during the period,

according to Symes(20), academic pedagogical approaches to architecture fell under the aegis of academia and were little researched and therefore insufficient to act as an "intellectual basis" by which to further develop research or new courses appropriate to architectural training.

The relocation, was intended *"to appropriate the prestige of the University*(21)", and borrow the tradition of academic theory, and was ill-prepared and therefore failed to become compatible and reconcile with the largely studio-based, strongly practical component of *"artistry"* within the activity of design ie; the inherent dynamic process of intuitive problem solving similar to that employed by *"painters, sculptors, musicians, and dancers".*

This historical development gave rise to the current situation, where although architectural education has ostensibly adopted the tenets of rationalism, these, as they relate to design, are largely undeveloped, and are superficially incorporated into training courses which serve not to clarify, as originally intended, but to obfuscate what Shon identified as the *"messy, indeterminate zones of practice"*. The resolution he claims requires alternative problem solving styles.

> *"these indeterminate zones of practice - uncertainty uniqueness, and value conflict - escape the canons of technical rationality. When a problematic situation is uncertain, technical problem solving depends on the prior construction of a well formed problem - which is not in itself a technical task. When a practitioner recognises a situation as unique, she cannot handle it solely by applying theories or techniques derived from her store of professional knowledge. And in situations of value conflict, there are no clear and consistent ends to guide the technical selection of means*(22)."

To Shon, analysis of the 'artistry' employed by skilled practitioners yields valuable insights into the nature of management techniques. Design in this context entails a process of 'reflection-in-action' whereby the designer although informed by experience, revises his thinking minute by minute to cope with often unfamiliar, changing situations, just as *"a baseball player adapts his pitching style to the peculiarities of a*

particular batter or situation in a game(23)." As Sutton explained,

> *"Solutions cannot be arrived at in a purely logical, linear manner because design choices are, by nature, expressions of subjective preferences. The designer ultimately must assess a battery of disconnected information, take an intuitive stance about a set of conditions, and utilise informed but personal priorities in order to construct a solution from virtually unlimited design choices*(24)."

However, although the designer is at once drawing upon a repertoire of personal knowledge, this is necessarily coupled with objective knowledge, which, far from being mutually exclusive, is inextricably related, but which may be conflicting, with one or the other predominant at any one point.

Given the studio's overriding emphasis on individualism and intuition, it becomes apparent why many designers have long neglected and\ or rejected academic positivism, and in particular the advances of social science, which represent an in-depth level of systematic, analytic research with which designers may be unfamiliar, and which does not appear to readily lend itself to more personal methods of problem solving. Indeed, Woolley cites the evidence of Darke, in support of the argument that architects, encouraged to defend their original ideas, are informed less by rational investigation and 'contradictory information' and more by subjective preference. The lack has given rise to the unrealistic studio environment, as Woolley noted,

> *"which has an introverted preoccupation with image, worship of architectural heroes, and a reproduction of current fashionable styles, rather than an attempt to rigorously develop solutions to problems from first principles*(25)."

Robert Pirsig's "Zen and the Art of Motor Cycle Maintenance," one of the most interesting dialectics on this debate, vividly describes the psychology of resistance to scientific values, an analysis exemplified by the marked ambivalent thinking of architects.

"That attitude is not hard to come to. You go through a heavy industrial area of a large city and there it all is, the Technology. In front of it are high barbed wire fences, locked gates, signs saying NO TRESPASSING, and beyond, through sooty air, you see ugly strange shapes of metal and brick whose purpose is unknown, and whose masters you will never see. What it's for, you don't know, and why its there, there's no one to tell, and so all you feel is alienated, estranged, as though you didn't belong there. Who owns and understands this doesn't want you around. All this technology has somehow made you a stranger in your own land. Its very shape and appearance and mysteriousness say, "Get out". You know there is an explanation for all this somewhere and what its doing undoubtedly serves mankind in some indirect way but that isn't what you see. What you see are the NO TRESPASSING, KEEP OUT signs and not anything serving people but little people, like ants, serving these strange, incomprehensible shapes. And you think, even if I were part of this, even if I were not a stranger, I would just be another ant serving the shapes. So the final feeling is hostile(26)."

Such *"Hostility"*, as expressed by the post-modernist movemnent, has been directed towards Social Science, with the resultant effect that architects have tended, as Cuff described, to perceive of the demands of attendant users as often little more than *"constraints"*, or to reiterate the earlier derogatory term, *"junk mail"*.

Just as Freud in 'Beyond the Pleasure Principle'(27), developed the theory of a death instinct 'thanatus', which is not mutually exclusive to the life force 'libido', but when not dysfunctioning actually sustains a symbiotic relationship with it, by remaining in constant friction, vying for dominance, so the relationship between objective and intuitive knowledge, is held in tension but finely balanced. Such a reconciliation was also envisaged by Pirsig,

"The Buddha, the Godhead resides quite as comfortably in the circuits of a digital computer or the gears of a cycle transmission as he does at the top of a mountain or in the petals of a flower. To think otherwise is to demean Buddha and to demean oneself(28)."

So how can the two worlds come together? How can the controlled 'virtual' or 'sub-world' of academia become more consonant with the social variability and practical orientation of architectural practice? How can practitioners' often anti-positivist stance be replaced with a deeper appreciation of its relevance and relationship to personal knowledge?

3. Towards an Applied Social Science

It is clear that if practitioners' analytical, rational abilities are to be developed, to redress the balance between the art\ science polarity, greater stress must be laid on the integration of academic theory with architectural education. In particular how are the social science components to be integrated if they are to be effective as a means of not only defining the problems, which architects as spatial manipulators are best placed to resolve, but also of facilitating the interpretation and undertaking of design as a social process?

Given the rather loose and nebulous nature of the term Social Science, it is first necessary to describe what is meant by the term within the context of this thesis. It refers to a group of related disciplines, including Sociology, Psychology, Anthropology, History, Political Science and Economics, all of which share the commonality of the systematic study of social phenomena. Furthermore, the term Pedagogy, often used in this project in conjunction with Social Science, refers to the science of teaching, to the process of instruction and training.

If social science is to rise to the challenge of relating human needs to spatial design configurations, it must first address the communication gap between disciplines, and reappraise its ability to function effectively as a conduit or investigative tool, as differences lie not only in the problematic domain of apparently conflicting value systems, but in language. For social science language, is often as Sutton notes,

"discursive" and theory laden. Such demonstrable lack of insight into the highly visual and practically oriented language of designers, is a point also argued by Sommer,

> *"Consulting with architects made me aware of the different problem solving styles in our respective professions. Many of us in the social sciences has become spatial illiterates. We could not express ourselves visually or graphically. We had developed abstract and critical faculties at the expense of our imagery. This was evident in our teaching. A blind student could get as much from a psychology lecture as a sighted student. Social science journals are largely replete with tables and numbers. Most of the slides I have seen at social science meetings have depicted columns of numbers. This does not seem to be the optimal use of visual presentation*(29)."

Moreover, it is not just a more visual emphasis that is required, but overall, a more creative, 'arts', as well as scientific orientation, which draws on the abstract symbolic, psycho-social dimensions of fiction, as architect Robert Kliment's keen enthusiasm for literature suggests,

> *"I've always found the social sciences excruciatingly dull and irrelevant for our work as architects. But on the other hand, Henry James captures the subtlety and delicacy of patterns of people's behaviour that one aspires to in one's work. And they are delicacies that seem logical. James' work has a seamless texture between the diagram - the intellectual and formal structure - and its continuing elaboration and refinement. We aspire to this in our office. The works of Trollope and George Eliot, especially in Middlemarch,...the wonderful way plot and character are woven together*(30)."

The value of such literature, as an heuristic device, as a means of enhancing students' awareness of architecture set within a socio-cultural context, has not escaped Lifchez, who has incorporated it into his highly innovative education programme.

> *"Architecture has different roles in fiction and non-fiction, and both offer instruction to the architect in how to consider the client's world in the design task before him. In non-fiction - biography, autobiography, travel- buildings and settings are observed as parts of an individual's history and to be considered for their effect upon the subject's cultural and social underpinnings. In fiction the designer is shown ways to think more psychologically, to consider function in terms of both overt and covert behaviour, in terms of the individual acting alone and in relationship to others*(31)."

Notwithstanding Lifchez' alternative applications of social science, the largely disjointed, reductionist and colourless methods normally employed, have done little to inspire imagination and accord with designers' thinking, as Joseph Esherick's criticism of the case-study methods, favoured by environmental psychology, bears out.

> *"We should teach how to observe people, how to talk, but more important, how to get to people's feelings about things. There may be some stable material you could teach, probably physical things (you can only stand so much glare; if your living room gets below 40 degrees your going to be cold...). But not those damn studies that show where people sit in libraries and show how they behave in elevators. We should put those in a zoo*(32)."

Interestingly, Esherick makes a plea for a more direct, interactive approach, appealing to designers' preference for practical, experience based knowledge. Indeed, aside from failing to communicate in a language palatable to designers, social scientists are also guilty of neglecting to apply their knowledge to the largely studio based and experiential learning programmes so characteristic of architectural education.

According to Woolley(33), as approximately 70 per cent of students' time is taken up with studio work, often carried out in isolation at the student's home, educational research should be directed at improving interdisciplinary methods in this area. Tailoring social science to the more practical demands of the studio, observed Juhasz, necessarily entails realignment from the study of what people do, to the study of what people ought to do, the primary design consideration.

> *"The architect has only a limited interest in what people do. The architect's interests focus equally on issues of what people would do in circumstances not yet imagined or what people ought to do in new, exciting and liberating circumstances*(34)."

Applied studies are an area, however, hitherto largely neglected by the purist methodological language of academia; this leaves a narrow basis from which to form a starting point. However, just as social scientists would benefit from a deeper understanding of architectural systems, so architects would similarly benefit from a

knowledge of social science. Mayo contends that designers are confused about what social science can offer, leading to a tendency to,

> *"want to use sociologists as technical consultants. Architects ask "if we design the space this way, can we expect a better social activity?" The question is naive and perhaps unanswerable to the satisfaction of an architect. The profound gap that architects have created is their lack of realising the value of theory within the social sciences*(35)."

Social science theory, if applied to design considerations, would alert architects, as Joiner & Daish argue, to reappraise their current solipsism, step outside of the closed professional network of entrenched thinking and become more sensitive to the *"social processes of satisfying the objectives, values, interests, and images of others*(36)."

3.1 Developing Empathy

> *"Many architects and teachers, and so of course students, seem incapable of reading a plan properly. They cannot look at it and see in the minds eye (or feel in the gut) the choreographed flow of movement and how this presents people to, or hides them from each other; nor the interactions elicited between adjacent and sometimes even distant activities; nor the way these vary through day and are enhanced and frustrated in different ways by the building*(37)."

Buchanan's observation is particularly pertinent to matters of access, where designers are even less familiar with, or misguided about the needs of people with disabilities.

Indeed, one oft-quoted problem in local government planning departments, is that whilst designers may attempt to comply with the minimum design prescriptions by the provision of disabled toilet facilities or a ramp at the front entrance of a building, too often their basic lack of understanding, or preconceptions of disabled peoples' design requirements, is combined with a neglect of more sophisticated considerations, such as auditoria with accessible seating next to family and friends, or accessible squash courts. To Albrecht the key to consensus, and shared goals, resides in Freidmann's notion of

dialogue which focuses on "the 'otherness' of people" and,

> *"presumes a relation in which thinking, moral judgment, feeling, and empathy merge in authentic acts of being; that is, total communication is the ideal in mutual learning. But this kind of dialogue also presumes not only a relationship in which conflict is accepted, but a relationship of reciprocity, mutual obligation, and commitment, and finally a sense of partaking in the interests of others*(38)."

Achieving a more empathic sense of the 'otherness' of people is placed by Albrecht under the rubric of 'social learning'. Social learning is aimed at increasing awareness of building users and commensurately improving design congruence; it necessitates the break down of communication barriers, encouraging the free-flow of dialogue between users and designers. Reconciliation, therefore hinges on the transformation of the existing relationship between architect and significant others.

This an often unequal relationship, particularly when lay people are involved as design participants, as the design practitioner is predisposed towards the service mode of thought, which largely holds in low esteem, views of non-professionals. This relationship is based on a striving for dominance, on the part of the designer, through a process of coercion and 'artful persuasion'. Such a tactical imposition of authority, Albrecht notes, *"requires role behaviour that excludes ethical concern and de-emphasises feeling and empathy*(39)."

Moreover, the emphasis within existing studio practice, which actively encourages students to arrive subjectively at one 'original' design solution and to competitively defend it against criticism, fosters a closed attitude, one which sees interjections not as constructive opportunities for improvement but as unwelcome interference. Indeed, this approach, a legacy from the Beaux-arts school of thought, also serves, as Shon observed, to encourage mystification of the design process, a game which he labelled *"mystery/mastery"*, a game which focuses on the intuitive components of design and which by nature, defies objective scrutiny.

> *"designers sometimes mystify their artistry, treating it defensively as an indescribable something that either one has or has not*(40)."

This tendency towards possessiveness militates against collaborative team work, creating an atmosphere of resistance to the notion of participatory design, and particularly the accommodation of the views of people with disabilities.

To promote a greater degree of responsiveness, and an atmosphere conducive not to resistance but positive regard, as Woolley stressed, it is essential to *"make design processes more transparen*t(41)", and thus facilitate lay understanding of complex concepts. As Joiner and Daish pointed out,

> *"It is not good enough to simply assume that some people can't read drawings. Students need to be able to integrate the issues of communication into their design activities*(42)."

However, it is not only the contrasting knowledge systems between design practitioner and user, which need to be addressed, but the jargon laden, design-speak, so much the common currency of professionals, which serve to further obfuscate any attempts at real communication. As Albrecht noted,

> *"There is a current tendency to use formal and stylistic references in such a way that only initiates understand the 'message', even when elements of the vernacular are applied(*43)."

It is clear that pedagogical techniques need to focus on the development of social skills promoting students' empathic awareness of other people, on the value of their contributions, and on clarification of the design process by improved methods of communication, encouraging a more reciprocal, egalitarian approach to design.

This revision, would benefit from the further incorporation and expansion of interdisciplinary studies in the curriculum, and in particular, project work in the studio.

4. The Value of Sociology within an Interdisciplinary Curriculum

Muir recently cited the three principal aims of interdisciplinary methods, which offer an inroad by which to initiate a deeper knowledge of the social processes of design, and hence a starting point for 'mutual learning'.

> *"First, to establish at an early stage that architecture shares a common-culture with other members of the built environment team. This context enables the architect to develop a clearer definition of his/her own role. Second, to develop an understanding of how to work as a member of a group comprising other members of the building team and to develop a common language; and third, to ensure that problems are defined collectively and that the architect uses all his/her specialist skills within this framework*(44)."

It is further argued, that far from having a constraining effect on the artistic integrity of the designer, interdisciplinary methods, to the contrary, can engender innovation through a more flexible and responsive approach, an approach which challenges the barriers created by role stereotyping.

A course can be divided into three stages: foundation, consolidation of specialism and interprofessional collaboration. Interdisciplinary studies have an important place, at any stage, and can be fed in via a variety of teaching methods. However, Muir stresses that the foundation is perhaps the most important, as it is at this formative point that attitudes are shaped.

A recent research report (1991)(45), investigating interdisciplinary studies in the built environment, found that the ostensible goals expressed by the many subjects related to the built environment, including architecture, revealed a high degree of similarity, even

if in practice, goal synchronisation was seen be to lacking.

> *"Overall it is clear that the orientation of most courses is to develop understanding through an analytical approach to problem solving, based on appropriate bodies of knowledge, using relevant theories and principles, so that students can form independent judgments and communicate their ideas effectively*(46)."

The project further stated that all the courses tended to draw from a common core of teaching techniques such as lectures, small group teaching, project/studio work and/or workshops; although,

> *"they differed in the weighting given to different activities. The more design-based courses emphasise project/studio activities; the more engineering-based emphasise lectures and workshops* (47)."

This clearly presents an opportunity for cross-fertilisation of knowledge through shared media. Indeed, the report goes on to show that not less than twenty three subjects can be defined as areas of commonality between design disciplines, including building process, communication, history, law, and sociology. However, perhaps most pertinent to this study, is underlined the need for the further development of sociology within this context.

> *"Seven professions include sociology in their syllabuses, others place it in the context of management and the engineering professions study aspects of the subject through 'the engineer in society'. With the exception of the landscape syllabus, it is clear there is considerable scope for the development of an approach to the study of sociological issues, if not a specific syllabus for all professions*(48)."

Sociology with this pluralist framework, should be directed towards the precise needs of design and embrace the differing teaching styles, characterised by lectures or studio work. Further, its application should be consistent and compatible with the methods favoured at foundation, intermediate and advanced levels of learning. For instance, the basic principles of user oriented design, should be disseminated by lectures and group teaching throughout the earlier stages of the course, followed by studio projects later

on. Sutton recommends that,

> *"A behavioural curriculum could begin in the early years with introductory concepts of behaviour, continue with training on how to cull out the architectonic concepts into spatial relationships and experimental effects, and culminate with training in collecting and analysing systematic data about the programmatic needs of the many building types and user groups found in this country*(49).

However, it is not enough to focus on disabled peoples' design requirements as a specialist branch of design, to be considered within projects aimed at creating schools, residential homes or workplaces for 'people with special needs'; these projects, notwithstanding their merits, often serve more to marginalise than integrate. Rather, if this specialist approach is to be adopted, it should be placed within a well grounded context, emphasising the importance of user accommodation, of the advantages of design based on a philosophy of inclusion as opposed to exclusion.

Moreover, environmental accessibility is a nascent and little developed field which would benefit from further in depth analysis, whether on a large or small scale. This analysis if undertaken in the form of directed projects, would have the three fold effect of not only serving to enlighten students and equip them with evaluative skills but would, if fed back into either a school resource library or the professional body of research literature, significantly contribute to the development of access as a social issue.

This point was also mooted in 1981, by Owen Luder, the then president of the RIBA, who, aware of the recommendation by the Silver Jubilee Access committee that *"architectural and Design schools give more emphasis to the problem of access in their professional training"* (50), stressed that this concern should be of fundamental importance to the architect and should be conveyed through training, not as a separate subject, but as an underlying philosophy applicable *"to all circumstances."* (51)

However, although Luder's proposal for the wholesale adoption of the principles of barrier-free design as a fundamental philosophy, applied in place of most specialist projects, may be laudable and indeed, an ideal goal to strive towards, the reality as evidenced by the Silver Jubilee report's findings, is that given such low levels of access awareness, the issue must be tackled by a many pronged approach.

Avoidance of merely promulgating a separatist approach to access concerns, requires informed guidance, that is, a competent degree of conceptual and technical understanding of the area on the part of architectural teachers. How can the currently flawed cycle of erroneous misinformation about disabled people's design requirements be checked, and the revised philosophy of inclusion, assimilated? Such a conceptual challenge necessitates the development of appropriate strategies for communicating the idea by palatable, 'sexy' means to educators, who in turn can begin to design relevant, innovative and effective teaching methods with these objectives at the fore.

However, the 'Janusian' and ambiguous nature of architecture, its lack of a parent discipline and hence of established antecedent knowledge base has meant that unlike similar professions such as medicine or engineering, its pedagogical structure has remained largely undeveloped. Juhasz further examines the reasons underlying architecture's reluctance to undertake self-appraisal, which as this thesis has shown, has had far-reaching implications for, in particular, the education system and the development of knowledge about its relationship with the societal medium in which it resides.

> *"When University administrators declare periods of self-examination (prior to budget cutting), architecture schools, with or without spurious ties to engineering or the fine-arts, tend to fare badly. Part of the reason is their inability to articulate - in words or in their works - what architecture does that is neither engineering, nor applied art, nor applied social science. There is no refereed "journal of architecture research," the one that made a halting start and died an inglorious death was the "behaviour architecture" mold. There is no such journal because, at the moment , there is no "field" to research, since no one knows the connections, the family tree, the attachments of architecture."* (52)

Woolley also supports the above argument by noting the significant lack of interest by designers in educational theory, in direct contrast to other academic disciplines.

> *"While specialist teachers of computer-aided design, technology, history and professional studies, meet regularly, there are few academic conferences in the UK on the teaching of design in architecture."*(53)

This is true for studio teaching methods in particular, which by nature, given both their prominent position and intuitive bent within an essentially academic milieu, may be largely isolated, and misconceived by the rest of the academic establishment. They may be misconceived as not just an unnecessary waste of resources but as strongholds subverting the rationalistic principles which are held so dear.

However, notwithstanding the fragile foundation upon which the bulwark of design education sits, pioneer research examining not only how architects visualise building users and how such perceptions shape the design, but educational methods devised to raise students' awareness of disabled peoples' needs in particular, has been undertaken by Raymond Lifchez and colleagues of the University of California. This setting has established a tradition of civil rights and saw the emergence of the first Independent Living Centre for disabled people. The architecture department is no exception and its strong theme of person-environment relations reflects an unusually well developed social science alliance.

Lifchez has honed in on the lack of empathy for users demonstrated by architecture students and the extent to which this has served to create a gap between the perceived and actual needs of people. By developing studio based applied social science techniques and specialising in participative design with disabled design consultants, Lifchez' work has proved exceptional in forging inroads into previously uncharted territory.

4.1 Assembling Users for Buildings

Just as it is true that the designer brings to the design process not a blank mind, but a mind informed and bubbling over with personal, cultural and social experience, so it is true that she/he must also become aware of this fact, cognizant of its potency. Making more explicit the often unconscious, unexpressed, sublimated attitudes and feelings which inevitably colour creative output, is the challenging first and most important step towards initiating change and the adoption of a more objective approach. Lifchez contends that it is only through carefully devised and controlled methods which confront and contradict preconceptions, tearing down the detrimental stereotypes and replacing them with more complex images, consistent with a complex social reality, that designers can begin to affect positive results more congruent with user requirements(54).

The inclusion of alternative concepts must be introduced as early as possible to the design curriculum, as it is at this beginning stage that students are most susceptible to new ideas. Indeed, research has shown that students when evaluating holiday chalets were more able to predict the design preferences of users than trained architects, and indeed an inverse correlation was found between number of years served as a student and the ability to determine lay needs. The report concluded,

> *"the hypothesis was formed that specialised architectural education and training may divorce the architect from the man in the street*(55)."

Thus, given its formative role in establishing the early concepts which shape the design process, the vocational educational training of designers is the most promising starting point by which to inject, not the traditional approach which underrates and neglects human activity, but a more user oriented philosophy into the profession, one which accommodates people with disabilities as matter of course.

However, as Ellis cautioned, this process, potentially presents a number of difficulties.

> *"But programs, which would benefit greatly from some barefoot empiricism, usually take shape around department tradition/ and or faculty interest, experience or the exigencies of last minute course preparation. The effects of this for things social is that they are pre-structured by the organising content of the studio. Thus relatively unexamined images and assumptions about human activity are buried so deep in the program that new and contradictory information cannot compete in that magical internal process which ultimately guides the student's designing eye*(56)."

Thus it is not enough that the student's assumptions be overhauled; it also necessary to pose the same questions of the teaching staff responsible for developing course content. Only then, when an acceptable level of recognition on the part of the staff has been achieved, can a programme be devised which is relevant and effective at awareness raising.

Such a programme must also take into account the designers' strong visual sense, the tendency to conjure up actors to people designs or stage sets from a social vocabulary of images, or as Ellis described it, a *"pool of life-conduct images."* This includes the size and heterogeneity of the stock, reflecting not only the designers vocational training, and socio-cultural milieu but also his/her biography.

The value of imaginatively projecting people into an environmental frame, is little recognised by social scientists, who coming from a positivist stance, rarely opt for such visualisation. However, if and when they do, as in ethnography for instance, they tend to endow their actors or rather subjects, with a very strict set of criteria within which to operate. Cuff cited Alfred Shutz' interesting contention that social scientists' invented beings are far from authentic, being two-dimensional and frozen in time and space, held in suspended animation until the social scientist *"puppeteer"* breaths a kind of consciousness, albeit of a *"specious"* variety, into them.

"These models of actors are not human beings living within their biographical situation in the social world of everyday life. Strictly speaking, they do not have any biography or history, and the situation into which they are placed is not a situation defined by them but their creator, the social scientist. He has created these puppets or homunculi to manipulate them for his purpose. A merely specious consciousness is imputed to them...which is constructed in such a way that its presupposed stock of knowledge at hand...would make actions originating from it subjectively understandable, provided that these actions were performed by real actors within the social world. But the puppet and his artificial consciousness is not subjected to the ontological condition of human beings. The homunculus was not born, he does not grow up, and he will not die; he has no hopes and no fears; he does not know anxiety as the chief motive of all his deeds. He is not free in the sense that his acting could transgress the limits of his creator, the social scientist, has predetermined. He cannot, therefore, have other conflicts of interests and motives than those the social scientist has imputed to him. He cannot err, if to err is not his typical destiny. He cannot choose, except among the alternatives the social scientist has put before him (57)."

However, if Schutz' criticism is true for social scientists, then how much more true is it for designers, who may be more adept at thinking in visual terms, but terms which, given a lack of knowledge about social life, are severely limited and one rather than two-dimensional. As Cuff observed, although the homunculi borne of the social scientist is relatively unevolved, at least it has reached vertebrate stage, unlike the architects' species.

"The architect's homunculus is sometimes featureless, emerging first as disembodied actions among a design's details. Actions float free...Unlike the social scientist's invented actor consciousness does not appear to be a common feature of the architect's homunculi. Indeed, in moving through designs with some architects one gets the impression that an indistinctly motivated lump of somatic stuff- born in and taking shape in bubble diagrams- is being conducted via arrows along paths of circulation to loci of living, eating, and bathing. This little puppet, though animated by the designer tends to be passive and unobtrusive of the design's flow(58)."

Thus, social scientists' characters, at the behest of their creator, are at least propelled through text in a systematic, constructed way according to controlled variables. Their experiences constituting a closer approximation to reality than Cuff's abstract *"somatic lumps"*, who may or may not be endowed with an identity. This identity, if present, is likely to mirror the mono-dimensional attitudes of the architect.

Furthermore, just as the social scientist is given to endowing their primary consideration, 'people' with a quasi-consciousness, so, the architect is given to endowing 'buildings' with the same by anthropomorphising built form with human characteristics, which are usually his/her own and mark a corporal extension of the designers' preference, as evidenced by the intriguing but familiar throw away comments by designers, such as "*the building wants to be that tall*".

Using a system of "*imaginative self-projection*", the designer, Cuff suggests, casts "*a dreaming eye floating disembodied and assembling information for the designer and the designed*". Thus designers may tend to sculpt form and the inhabitants in their own image. This point was also advanced by Penton, who observed,

> "*buildings are largely designed by and for the fit male between the ages of 18 and 45, who is neither very tall, fat or left-handed*(59)"

Tad Williams, a prominent New York architect also offers a vivid account of the significance of the iterative nature of self-projection throughout the design activity.

> "*I am my audience. If you are your own audience, you have to listen very carefully to yourself, your innermost feelings, in order to know who that audience is and how to satisfy it. It's truly not something that can be described; its something which ultimately has to be felt and reflected upon, which cannot be done quickly. Its the memory within you about how something seems.That memory can have to with proportion, or a sensual condition, a social condition, and I don't think its ever only one of these things, its a collection of different things*(60)."

Indeed, Ellis makes a point of exposing students to their own strong self-as designer bias, which so often takes precedence over a projective self-as user knowledge, by recommending that they put user needs to one side, and concentrate simply on producing free sketches "*unencumbered by responsibility*". He further adds,

> *"Keeping these images at hand throughout the course has at least the value of distinguishing between what "belongs" to the student and what "belongs" to the problem. It can also free students to accept their biases and use them productively rather than spend weeks on end pretending that they what they long to do is justified by what they say they've learned about real or imagined uses to which their building will be put (and inventing agile descriptive phrases to support this longing* (61)."

It may also be that the mono-dimensional homunculi ascribed to the design activity, like the building, are architectural products, aesthetically fashioned as the ideal occupants to decorate the form, not so dissimilar to the letraset assortment of casual young people with brief cases or umbrellas ready to disport their elegant selves on designer park benches or tree lined city boulevards. As one architect tellingly remarked,

> *"When I'm doing urban type work, I tend to draw Gordon Cullen people. I hate Jacoby people*(62)"

Thus the homunculi represent a synthesis of self, client, culture and tradition, all of which are in a state of constant flux, one taking priority over another to accord with an individual designers' particular bent. However, the architect-user dialectic is rarely informed by social science, as Cuff explained,

> *"Since there is a commonly held belief that people in society are unpredictable, the architect's responsibility is the specific human situation at hand or in architecture's formal tradition. The supposed instability of social life leads architects to search for direction within their souls or the building's. This is inspite of the fact that patterns of social relations like the family, neighbourhood, the work unit, or friendship are by no means elusive constructs*(63)."

Furthermore, if it is accepted that self-concept significantly determines the course of spatial manipulation, then it also follows, that it is important to examine the recruitment system within schools of architecture and the means by which selection may be accessed by less advantaged sectors of society. Women for instance, currently comprise only 8 per cent of architectural practitioners. As Woolley notes,

"Few women and hardly any young black people (particularly those with a lower income background) have any chance of getting into architecture. We talk of working in the inner city and with community groups, but few young people from such areas, many of whom might be better suited to the demands of design participation, have the chance to become architects(64)."

However, if women form such a minority proportion of architects, what of people with disabilities ? The answer is a negligible proportion, for they suffer discrimination on all counts, economic, social and environmental, inspite of their wide and intimate knowledge of the built environment. Certainly, an alternative vision offered by those more sensitive to architectural constraints, would do much to shake up and challenge the mono-dimensional perceptions shared by such a large percentage of designers.

4.2 Investigative Tools

To Lifchez and Ellis, the most effective means of enhancing and injecting realism into students 'imageabilty', their projective sense of habitation of their designs by users, is by exposure to social science research techniques. These techniques, have been finely tuned for design application, and in particular, the studio. However, Ellis stresses an important caveat,

"There is no mechanical way to extract design beginnings or endings from this information (research findings). Rather it establishes an agreed upon set of real life scenes, thoughts, interchanges and the like from which inclinations are drawn. This conclusion is based on my own conception, developed over the last ten years, of how the creative process in the craft of design works. Too much has been made of anthropometric detail. Handrails and cupboard heights for the feeble elderly and fixturing for nursery school children are cookbook stuff. As in dreams the inventive mind makes up things without any immediate self-consciousness of where the details come from or why they fit together as a whole. Most accounts are ex post facto at best. It is simply safest and best to ensure that included among the image sources of the student are those from relevant life(65)."

Certainly, given the anti-positivism of many designers, their resistance to what are perceived of as constraining design prescriptions, this plea for a deeper knowledge of

the social life they are intended to qualitatively maintain and/or improve, constitutes a basic foundation from which to more effectively inform the design process. Thus if an empathetic understanding is realised, technical guidelines or academic references will assume greater relevance and can be consulted if and when necessary, as useful evaluative aids.

This approach has been crystallised in the aims of the recently formulated philosophy of 'Universal' or 'Integrated' Design. Universal design marks a move away from a separatist approach to design for disabled people. It signals a reconceptualisation of people with disabilities, not as a 'special' group, but as people whose needs fall into the more sensitive end of a physical/sensory continuum, and so are more sensitive to spatial arrangements. Universal design thus extends the parameters of spatial synthesis to create a greater design flexibility thereby accommodating those people previously excluded. This marks the move towards a revised more holistic approach, and departure from the use of strict design prescriptions, it is slowly permeating all new access legislation. However it can only be effectively applied if the designer intuits the needs of people with disabilities.

Although the explicit philosophy of Universal Design post-dates Lifchez research, the guiding principles espoused are very much reflected within the corpus of his research, and thus appropriate to its application and promulgation. Indeed, Lifchez developed a programme specifically aimed at raising awareness of disabled peoples' needs, which he described, as a process,

> *"in which the designer and his informants reveal themselves to each other, becoming increasingly conscious of how they use and view the current settings in which their lives unfold; of how these settings, if they were to change might better accommodate their real needs; and of how such changes might actually be expressed - how these new settings might look and function. In the course of this process, the designer gradually sheds his assumptions about his informants and their needs, as his informants clarify who they are*

and what they want from the environment. In developing an empathy for disabled people, the designer's major responsibility is to maintain a receptivity. The major assumption behind the use of these techniques is that they can help establish a trust between the designer and his informants that will lead to their revealing what is genuinely significant to them about their lives and interactions with the environment(66)."

The programme fell into four broadly defined incremental stages, each employing a selected number of techniques designed to act as 'projective tools', eliciting via indirect experience, such as documentary evidence, visual media, through to the more direct experience of participative inquiry, a well grounded concept of the 'otherness' of people and hence an appreciation of their respective environmental needs.

1. Using Existing Information

reference to relevant literature :

fiction,biography, technical,academic.

2. Interviewing Disabled People

in situ interview :

observation and discussion within respondent's environmental setting, gauging accessibility

performance interview :

observation of respondent's performance in situ

ethnography :

exposure of designer to respondent, within environmental setting over longer time frame

environmental history :

charting environmental history of respondent, gauging satisfaction

3 . Visual Documentation

photography :

records and identifies access problems, useful as illustration of difficulties from disabled person's perspective

film journal :

as above, simulated eye view and time lapse techniques useful data/ evidence

4 . Scenarios and Modelling

developing scenarios:

dispelling stereotypes by encouraging visualisation of heterogeneous variety of people enacting 'story-lines' within given environmental settings

developing new environment :

through modelling

application of scenarios to models :

of proposed buildings - two dimensional model mapped with labels designed for ease of communication - three-dimensional models with refined scenarios and scaled photographs of users - useful for testing out assumptions about dimensions.

detailed models of particular spaces :

within three dimensional model - larger scale allows further consideration of spatial dimensions in relation to human activity

Such 'tools' may be used as the means to strengthen the concept of research, indicating to students the complexity, and uncertainties of social life and hence of the data collection and empirical analysis required for predicting the performance of buildings, through Post Occupancy Evaluation. Rationalist logic, tempered by sociology, if 'applied' to design, can offer few simple and clear cut solutions but can act as a

natural interface between the 'exact' sciences and the 'fluid' arts. In this setting students can begin to develop not only a shared dialogue with 'others', but through the process of active involvement, learning-by-doing, begin to approach problem solving in a more analytical way, which far from negating intuition, and the flowering of creativity, through their fusion, augments scope for increased design alternatives. In this way, social science concepts are transformed from their dry, abstract, and bookish character borrowed from the exact sciences, to those which have a living, breathing significance and which may be given spatial expression. This is elegantly summed up by Lifchez,

> *"Unquestionably social scientists have contributed to the humanising of our concept of architectural design. But we might ask whether some of their message is lost when social factors pre se are introduced in the design studio. For architecture students tend to express a certain disquiet at the mention of 'pure' social science concepts, sociological and psychological materials that have not been translated into design factors. Indeed, if students are to develop a coherent conceptual framework, it seems that social factors must be transformed into design concepts, since otherwise students tend to fear that social science might straight jacket their architectural creativity. This dangerous misconception about client accommodation as antithetical to creative expression can be dispelled only by teaching students how to be client-conscious and make beautiful buildings at the same time* (67)."

He also stressed the importance of fully addressing the early introductory components, before moving on; without a thorough understanding of context, students cannot even begin to know what questions to broach in the later stages.

Interestingly, the above programme, although comprehensive, does reveal a notable omission, simulation exercises, that is, the role playing of people with disabilities. Simulation exercises are among the most well known examples of awareness raising techniques, and therefore should be taken into consideration by any programme designed to impart social, experiential skills.

Lifchez (68) subsequently incorporated and refined the programme into a full scale research project, to investigate principally not only how well the programme might transfer as a model for adoption by other schools, and *"develop a method for placing*

client accommodation at the heart of the studio curriculum", but also its effectiveness as a means of raising the awareness of architecture students of the needs of people with disabilities.

4.3 Student Awareness : A Research Project, Berkeley, California

This section offers a full critique of the work of Raymond Lifchez, at the University of California. A comprehensive evaluation of his research has been undertaken in order to establish the basis for the social experimental methodology formulated in this research project. This area of the project, described in Chapter 7, evolved from the pioneering framework laid down in California.

The experiment at Berkeley, ran for eighteen months, spanned six academic quarters, involved 326 students plus 30 disabled people. It was planned that following an initial trial period of 4 months, the project be implemented by 4 other North American Schools of Architecture.

The project was to be tested for suitability as a pedagogical exemplar, as it was considered important that the highly innovative courses and expertise developed at Berkeley be disseminated to other educational establishments. To overcome an inherent difficulty of becoming too specialised and esoteric, Lifchez believed it necessary to communicate, not only to those who for good reasons of their own may have opted to pursue a particular interest in the field, but that it was indeed, imperative to reach as many design students as possible, including those with little interest. Mindful of this concern, he noted,

> *"We did not want our course to be seen by others as a special course in barrier-free architectural design. Such a perception would hinder our effectiveness in teaching students that access for physically disabled people is fundamental, not incidental, to the design of a building, whatever its purpose*(69)."

The awareness raising course took place over eleven weeks and was undertaken by studio based classes of 60 to 80 students throughout 6 terms. The desired end product of the course differed little from normal project work, in that students were issued with a design brief to be completed throughout a term; it was the focus on the process, which was unusual, a process which principally involved *"the writing of hypothetical client biographies, the active participation of physically disabled design consultants, and the establishment of design teams*(70)."

By way of familiarising students with the role of the six consultants, and as a means of testing initial awareness as expressed in design terms, a week long sketch problem was assigned. This served as a dry run introduction to the aims and methods of the large scale project which followed. Students were divided into groups of six to eight, and worked on a brief which required plans for a multi-purpose block comprising residential, recreational, and commercial functions. The chosen site was real and based in the local area, and students were encouraged to apply the varied investigative techniques in order to,

> *"familiarise themselves with the neighbourhood and its diverse ethnic enclaves, age cohorts, and income groups so that they could write and refine a set of credible biographies for their hypothetical clients. As the designs evolved they were to write scenarios that showed the clients in their new environment*(71)."

The scenarios were opened up to criticism by the disabled participants, who were able to challenge preconceptions about the imagined users. As one consultant observed,

> *"The power of the course was that students started out with flat, bland client biographies and developed richer, more lifelike characters and situations. By working with consultants from the start, when the biographies were being developed, students had a chance to discuss different ways to view people's needs, and they worked at understanding people before they built their design models, before they committed themselves to a design solution that they would have a stake in defending simply because they created it* (72)."

Indeed, deeply ingrained assumptions about the lifestyle it is important to lead as a disabled person, were confronted with such challenging questions as,

> *"Well, all right, I can get in the door, but what if I want to go to bed with someone else in a wheelchair? How many chairs can fit into that tiny bedroom?*(73)"

The revised scenarios were then used to inform the production of a three dimensional model, scaled to an eighth-inch, which housed scaled furniture and photographs of the hypothetical users. These served as a valuable projective aid, not only for the students who were able to test out their assumptions, but also for the consultants who were able to interpret the plans and thus reciprocally enter into the dialogue. At times the degree of involvement on the part of the students was such that they,

> *"rigged up mirrors to enable wheelchair users to see into the models, and to devise tactile cues to aid blind consultants in their critiques*(74)".

It was hoped that by working in teams, and in collaboration with the design consultants, students would begin to develop the social skills of negotiation, reconciliation and recognition of the value of the contributions of others. As Lifchez put it,

> *"Their analytic skills would be sharpened as they had to explain and defend their assumptions and choices to teammates, as teams discussed, argued, synthesised, refined or rejected individual members proposals. But the inherent 'messiness' of team work also required students to cope with the nonrational and irrational, with one another's emotional and intuitive energies*(75)."

Furthermore Lifchez was very concerned to stress that the focus on people with disabilities, should foster breadth not narrowness of approach, and that their needs be examined within a holistic framework.

> *"Within this context of client accommodation, we wanted our students to come to perceive the special needs of physically disabled people as a particularly pointed and complex instance of a universal concept: Every client has some special needs and preferences, which the good architect will discover and work from. In this way we felt we could achieve our second principal objective, to place the environmental and psychosocial needs of physically disabled people into the mainstream of the architectural curriculum. For although our design consultants were physically disabled, our course was not intended to isolate the problems of the physically disabled but rather to integrate those problems into the general set of problems every architect faces*(76)."

The experiment was successful in one of the two main aims; student levels of awareness of user requirements were demonstrated through a variety of tests, to have increased significantly, throughout the course of the term. This was indicated by not only attitudinal measures, which registered positive changes in perception towards people with disabilities but carried through to the architectural designs, which suggested according to Lifchez, an *"imaginative and practical integration of people and the environment."* The course overall inculcated a humanising influence on the students performance.

Notwithstanding the overall rise in user-responsiveness, a number deeply entrenched biases were still evident within the final designs; however, they were no longer the basic omissions so glaringly apparent in the initial sketches, but were more subtle, and nevertheless important for the users concerned. As Lifchez noted,

> *"Although we had hoped that students would acquire through conversations with the design consultants some sense of the multiple physiological problems that accompany disability, it seems that students were too reserved to ask questions that might be perceived as too personal. As a result, their designs for paraplegics and quadriplegics made no provisions for the indispensable attendants. And students incorrectly assumed that wheelchair users could simply be hauled from one spot to another without physical hazard or inconvenience*(77)."

It may be that only a more sustained level of input throughout the entire curriculum, taking shape as a philosophy permeating all the subjects, could iron out the deep rooted resistance against user concerns and in particular the needs of people with disabilities.

One introductory course should serve only as the starting point, which is reinforced by a consistent concern, echoed through all teaching, including the studio based project work, in particular live or 'real' projects.

Lifchez, in a candid account of the early stages of the project, offers a detailed explanation as to why the other main objective, the transfer of the course as a model, largely failed. It was aborted after only one term in all schools but Berkeley. Unfortunately the many reasons cited for its discontinuation, lack of physical access, organisational difficulties, political agendas, and most pertinent, a lack of staff awareness, suggests that initial fears of unique specialisation at Berkeley were not unfounded.

Berkeley, has been at the forefront of the world disability rights movement for almost 25 years, and is equally well known for its philosophy of 'hippy' humanism which permeates the accessible University, its environs and courses. Given such a user-oriented tradition, the levels of staff and correspondingly, student awareness within a Department of Architecture, renowned for its interdisciplinary command of the field, must largely outstrip all other schools. It may be that the philosophy was such a natural, almost unconscious element of the department's thinking that, they were out of touch with the true extent of the lack of cognisance and indifference of most practitioners to the issue. As Lifchez lamented,

> *"Of course we had fully expected the classes to differ. But we had hoped that the multicampus experiment would demonstrate that our methods could be successfully adapted to each school's particular pedagogical philosophy and curriculum. We had known all along that any curriculum innovation would inevitably produce some degree of interdepartmental squabbling and student perturbance, and we never assumed that every instructor, consultant, and student would saintfully sacrifice his or her personal agenda for the good of the project. But we had thought that the core objectives of the project would be faithfully fulfilled*(78)."

This last sentence is perhaps most revealing, as it indicates that *"the core objective of the project"*, that is, dissemination of the principles of accessible design, was subject to ambiguity and misinterpretation (sometimes even wilfully so) by the four other schools, which did not have the facilities (ie; accessible studios), or knowledge base, to carry through the proposals.

However, the failure of this major component of the project did provide some illuminating insights into the nature and extent of knowledge held by the schools of architecture and the problems of transferring a project; these required not only high levels of consensus and subject familiarity for implementation but complex testing procedures applied to very large groups of students on a frequent basis.

From the outset, when students carried out the preparatory sketch problem, contradictions within the project became apparent; although the intention was that "*this design was produced unselfconsciously by students...who were not instructed to pay close attention to access considerations*", they were also confronted by the unfamiliar sight of a disabled design consultant, whom it was stressed, *"could help bridge the students' experience of people with different needs in carrying out the sketch problem*(79)", this perhaps not explicitly but certainly, implicitly initiated a focus on accessibility. This focus was to create a certain degree of confusion amongst not only the students, but Lifchez aside, all concerned. As one observer noted,

> *"There was a barrier between the design consultants and the students and all the teaching staff, with the exception of Lifchez, which resulted in the covert exclusion of the consultants, since they had not been told exactly what they were there for. Lifchez, in his anxiety that the theme of disability would stigmatise this course and thus jeopardise the validity of the subject he hoped to establish in the standard curriculum, had not told students much about the project or the intended role of the design consultants* (80)."

This difficulty was dealt with by fully familiarising everyone at the beginning of each course with the aims of the research project and the roles of the disabled design consultants. Inspite of the positive advantage of airing underlying conflict and its effect

on the smooth running of the project, it may also have served to inevitably undermine the 'validity' of the research, as Lifchez feared, by alerting students to the desired end product, and so biasing the results, which arguably might have been borne as much of students' aims to meet with the approval of the research team as of the educational effects of the programme.

The text "Rethinking Architecture: Design Students and Physically Disabled People", offers a broad overview of the project from the perspective of not only Lifchez, but the design students, fellow staff, and the disabled design consultants, and additionally updated pedagogical recommendations. However, although offering an interesting and discursive analysis of attitudinal change, it yields only a superficial methodology and break down of the hard results.

Such a broadbrush review is surprising, given the battery of nine methods of evaluation, including five indirect assessments and four direct assessments, which range from the application of pre- and post questionnaires, a semantic differential test, analysis of daily journals, to in-depth interviews. Certainly, the assessments, when taken as a whole, were intended as a thorough means of gauging sensitisation. However, it was not only their number which may have contributed to the difficulty of project transfer, but also the frequency with which they were applied. Indeed, by Lifchez' own admission,

> *"the monitoring process, which had to be attended to almost daily, was problematic. It made the course different from the school's other studio courses and made some students express doubts (which others probably silently shared) about our 'real' objectives in teaching this course: Were they our student's or our research subjects?*(81)."

Moreover, the post-questionnaire was later withdrawn as students resisted what they termed 'psychological overload'; as Lifchez pointed out, this may have been as much due to architecture student's anti-positivist stance as to respondent fatigue.

Given the unique character and relevance of the project for the future of architectural education, a more detailed scientific presentation of the results would have been an invaluable addition to the architectural discipline's research foundation. However, a number of important questions are still left unanswered, and indicate certain inconsistencies in the methodology.

Although we know for instance that 326 students undertook the introductory course, does this figure include all the students in the department? Did the stage in their studies at which they took this course have an effect on the results? The original training programme, compiled before the implementation of the project, was a standard feature of the Berkeley curriculum. Had some students been exposed to this at an earlier point? If so, how did this influence the findings as the students may have already, prior to the programme, a well established knowledge base in the area.

Simulation exercises, just as in the original programme, failed to be included in the list of techniques applied in the experimental course. The omission may be the cause of a number of doubts expressed by Lifchez as to their effectiveness.

> *"Simulation workshops in which able-bodied people temporarily 'try-on' a disability by using wheelchairs or blinders offer participants some firsthand experience of the physical and emotional aspects of disability. But this tactic often backfires, as it can generate so much anxiety that the participant over-reacts, unable to understand or even believe that any but 'supercrips' venture out alone or at all. For during a short-term simulation a participant cannot develop adequate compensatory skills; nor does simulation enable participants to bear the weight of cultural and social prejudices and expectations*(82)."

It may be that simulation workshops have such drawbacks, but just as with the other techniques, it is likely that these can be mitigated to large extent, by a judiciously worded introduction, which takes into account the short term nature of such exercises. At the very least they offer a controlled opportunity for students to experience and develop a sensitivity toward the often barrier ridden built environment, and a sensitivity to the steps, slopes and stairs as an impediment to mobility.

Given the current inaccessibility of so many schools of architecture, simulation techniques may in the more extreme cases provide a substitute for the studio based use of disabled design consultants. Indeed, they are already adopted on a more widespread basis by those schools who are interested in access concerns. The positive testimony offered by the Dean of the Department of Architecture, University of Arizona, who has instigated a training course incorporating disabled role-playing, is a case in point,

> *"I brought in films that covered handicapped access, but it never seemed to work - you'd see the same insensitivity come out in design projects over and over again. I finally concluded that the only way to be sensitised to things you normally never experience is to go out and experience them yourself*(83)."

The benefits are further recounted with some enthusiasm by the deans' colleagues who add,

> *"I've found that many students come back from this course as outspoken advocates for the disabled".*
>
> *"An editor at the University of Arizona press once told me that its easier if you tack a picture of the typical reader you're writing for over your desk. I think it's the same with design. Architects have an easier time designing when they can imagine the user*(84)."

Such enthusiasm for this method suggests that if carefully devised, it might serve as a more feasible procedure for adoption by schools of architecture with less experience of access issues, and be incorporated into alternative awareness raising courses, extending and developing Lifchez' precedent, for a more popular application.

Whilst it may be desirable to include disabled design consultants within studio project work, it is often far from practicable; access difficulties are self evident but there is also the likelihood of a lack of awareness on the part of the staff, who may be ill prepared, either socially or academically to successfully integrate people with disabilities into the class. This task requires some skill and training as Lifchez found out, as it necessitates peeling away the deep seated prejudices which might account for certain almost subliminal behavioural acts which force distance between the consultants, staff and students.

"Our roving site observer noted that even after the term was well underway, the studio space was cluttered and no attempt was made to make it accessible to a consultant who used a wheelchair : a certain, if perhaps unconscious expression of the students' and instructors' hostility toward the project (85)."

Furthermore, it may be preferable for future courses to integrate disabled participants with their more able-bodied counterparts, particularly if they are contributing on a long term basis, as this would strengthen the theme of inclusive rather than specialist design.

Overall, Lifchez' project was a unique product of a rarefied, humanistically oriented environment, an environment, or rather a centre of excellence, which had at its disposal an established resource pool of expertise, not only on the part of the instructors but also the consultants, who were highly assertive advocates of disability rights, or in 'Berkeley speak', 'crips-lib'. Whilst the awareness raising programme was shown to be an innovative and successful exemplar of applied social science, incorporating many pioneering methods such as the use of disabled design consultants, and client biographies, it failed to transfer as a model for adoption by other schools of architecture because of its strong reliance on the specialist skills of the department, and the complex testing procedures. The findings offer a number of pointers for the development of a future model, less ambitious and more simply constructed, targeted at the largely limited resource and awareness levels of architectural schools.

Clearly, studio based educational interventions are necessary, which employ the use of a mixed range of design participants, including people with disabilities, drawn from the locality, who can contribute to the design process, and encourage a shared dialogue and the development of students' understanding of their needs. This practice may also be extended into a liaison with community design organisations and the development of 'live' projects, which serve not only to aid the more disadvantaged, but also to lend an authenticity and relevance to group project work.

However, further research is required to examine the curriculum content and the training courses favoured, with a view to gauging cognisance within schools of architecture, in order to develop an appropriate programme. Such a programme, from the scant evidence currently available on the schools' preferred choice of methods, might include simulation exercises, which appear a viable option.

A thorough introduction, employing various forms of documentary evidence, such as literature sources, contact organisations and video and photographic presentations was also shown to be an essential first step, without which the students would have little grounding in the challenging concept of inclusive design. This would also enable students to place design in context, and thus undertake various research methods with a clear sense of their objectives, in order to evaluate more effectively the required design solutions. An introductory course comprising these basic principles could thus be devised and tested for more widespread application.

5. Conclusions

Recent evidence clearly reflects a mood of increasing public disaffection with the current quality of the built environment coupled with a low regard for the architectural profession. Indeed, the outcry of resentment triggered off by the Prince of Wales 'monstrous carbuncle' speech was such that it served to exacerbate a deepening crisis within the profession, a crisis which spread to its very core and prompted the Cambridge Education Conference 1991, which called into question the training of architects, and its ability to meet increasing consumer expectations. Furthermore, research findings demonstrate a lack of congruence between the building designer's perception of need and actual need as expressed by the building users. The limited evidence available has shown this to be particularly true for people with disabilities, who are becoming increasingly vocal about their need to be perceived not as a 'special'

and separate group but as an integral part of the population at large.

It is argued that given the formative role of architectural education in shaping awareness of user needs, this is the most promising starting point in which to infuse a more socially responsive philosophy. However, pedagogical theory as it relates to design is little developed and riven with contradictions, contradictions which have engendered a general antipathy towards academic/social science positivism, which is widely believed to be incompatible with the intuitive individualistic approach fostered within the design studio.

It is clear that if architecture is to become more relevant to social reality and user accommodation, greater stress must be laid on the integration of social science theory within design education. However, if social science is to function as an investigative tool instigating a user-designer dialectic, it must begin to address the communication gap between disciplines and develop a shared language, applied to design pedagogy.

It is contended that only through an appreciation of the 'otherness' of people, through an empathic awareness of their needs, can designers begin to design more effectively, translating user requirements into more enabling design configurations. Such an understanding can be infused through the direct application of a series of social science research techniques devised to systematically break down detrimental preconceptions about users, and through the development of students' analytical skills facilitating a comprehension of the complexity of social life. This comprehension, if fully assimilated by carefully formulated pedagogical methods, will take shape as a philosophy underlying and informing the entire design process.

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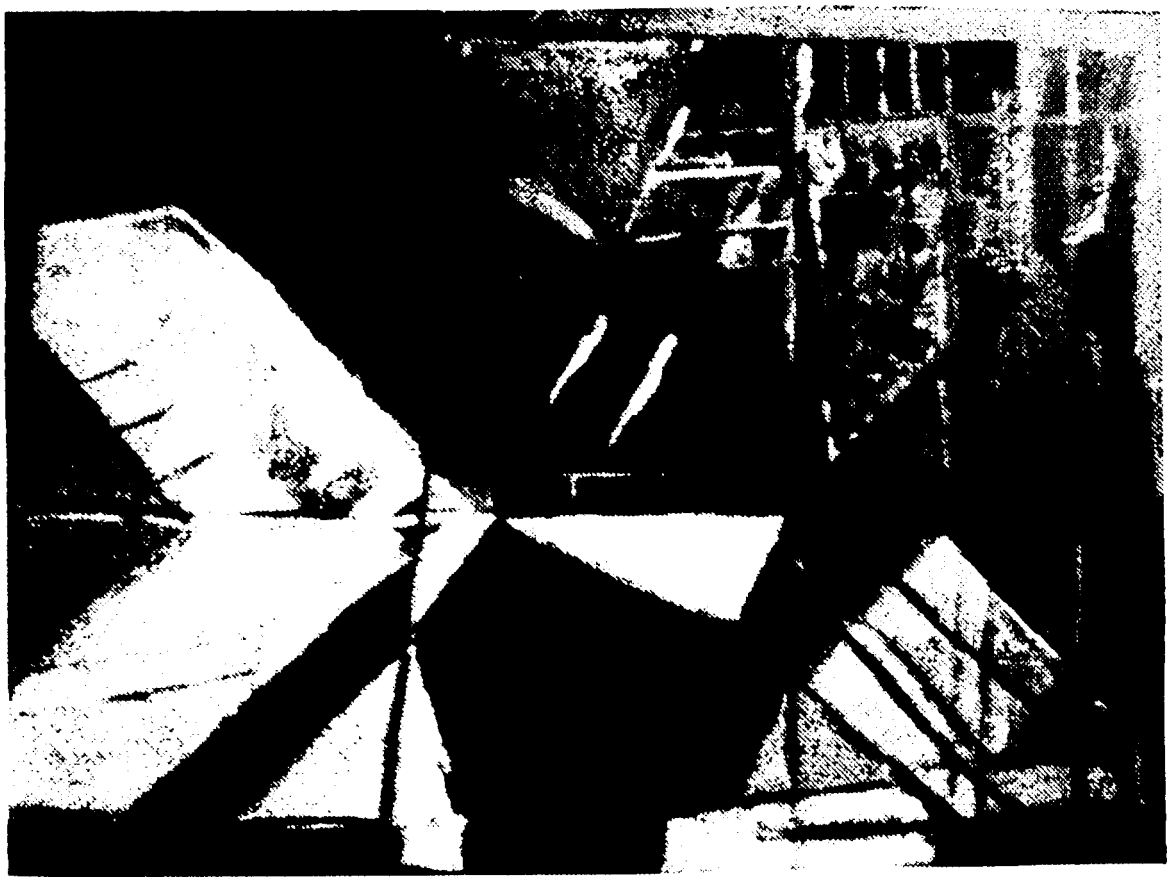
Chapter 3



Disability as a Social Issue

1. Introduction

> *"If it is true that each of us carries around an implicit theory of human personality or behaviour based on continuing experiences, and which we use to gauge and evaluate people we first meet, it is probably no less true that architects, designers and planners have built into this theory something about people in relation to places and spaces*(1)." Harold Proshansky

The built environment is shaped by designers imbued with the ideological thinking of the day, since thinking is subject to sliding and relative scales as to what social meaning can be ascribed to what objects, and this subsequently determines human behavioural reactions to the objects. Definitions are a means of expressing norms in a social context, and reflect their inherent value at any given time. This process is further elucidated by Lippman,

> *"For the most part we do not first see and then define, we define first and then see. In the great, blooming, buzzing confusion of the outer world, we pick out what our culture has already defined for us and we tend to perceive that which we have picked out in the form stereotyped for us by our culture*(2)".

Thus in order to evaluate the extent to which designers' attitudes towards disabled people have impacted upon the building design process, it is essential to examine the definitions of disability within the socio-cultural milieu in which they were operating.

The past two decades have witnessed significant changes in the definitions of disability. These were defined by the 1971 Office of Population Censuses and Surveys report on Disability, which revised the classification of disability, and specifed a differentiation between 'Impairment', 'Disability', and 'Handicap'; this was previously a source of ambiguity, as the terms were used more or less interchangeably. This was later followed

with further refinement by the World Health Organisation (WHO)(3), who developed the International Classification of Impairments, Disabilities and Handicaps (ICIDH).

* Impairment, *"any loss or abnormality of psychological, physiological or anatomical structure of functioning."*

* Disability, *"any restriction or lack (resulting from impairment) of ability to perform an activity in the manner or within the range considered normal for a human being."*

* Handicap, *"a disadvantage for a given individual, resulting from an impairment or disability, that limits or prevents the fulfilment of a role (depending on age, sex and social and cultural factors) for that individual."*

The WHO definition had now recognised social and environmental handicap, as a significant consequence of disease, which can profoundly affect the degree of disability. Although this broader conception of disability expanded upon the largely clinical and causally based former definitions, some critics argue that this model does not go nearly far enough, in that it assumes that social handicap is a linear derivative of impairment. Indeed, it is further contended by Oliver, that handicap does not correspondingly grow from and with extent of impairment but is created by the constraints of the social system.

> *"Able-bodied professionals have tended to see these problems as stemming from the functional limitations of the impaired individual, whereas disabled people have argued that they stem from the failure of the physical and social environments to take account of the needs of particular individuals or groups*(4)."

Oliver applies this theory to access which, he stresses, begs the question as to whether disability is caused by impairment or by the restrictive effect of a flight of steps ? If the steps are removed, what was the disability factor?

2. What is Disability?

The built environment has largely evolved to fulfill social and cultural concepts of what constitutes "normality", ie, what are ascribed as normal behavioural and normal cultural requirements. However, the very notion of *"normal"*, or *"norm"*, described by Chambers dictionary as, *"a rule, a pattern, an authoritative standard or most frequent value or state"*, by definition, rests on an assumption of what it is not, of what must be the abnormal, exceptional, or aberrant. Disability, it is argued(5), has become a by-word for the state of the abnormal, that state which is perceived as deviating from able-bodied perfection.

Establishing an objective definition for "disability" has been fraught with difficulties, and confusion has reigned over precisely what is meant by this nebulous and emotive term. It is argued that the failure to clarify a functional definition has long served to undermine government efforts to improve social service provision and planning, as without an accurate assessment of the prevalence of appreciable disability, the real extent of need has continued to remain elusive. A recent Grampian Health Board Document on Services for People with Physical Disabilities and Associated Handicaps underscored this point by noting,

> *"A major reason for the lack of information about disabled people is that the various agencies concerned do not share a common unambiguous definition of what constitutes disability and handicap*(6)."

However, efforts to maintain an exact "head-count" of disabled people, laudable though they may be, aside from clarifying terminology, have served to compound a dichotomy between "able-bodied" and "disabled" people. Oliver asserts that far from helping, such research activities have deflected attention away from the real need to address concerns expressed by disabled people themselves; this conceptual model departs from the individually derived model upon which the research methodologies are largely based.

"There are a number of reasons why researchers should stop this sterile business of head-counting. Firstly, at the level of epistemology, if disability is really socially caused, then research should aim to identify these social causes with a view to eradication rather than contributing to the individualisation of disability...It is also a waste of resources; how much money has been and will be spent on attempting to estimate how many disabled people there are in the world, in London or Kent? And to what purpose? If disability is socially caused, then changes in social organisation (which occur all the time) may increase or decrease the numbers of disabled people in society at any one time(7)."

Certainly, the ICIDH definitions have served to standardise measures of disability, and their sphere of reference is flexible enough to offer significant variations in statistics. However, as disability varies by degree of severity, so definitions vary by degree of cut off point, as evidenced by the 1977 OPCS report(8); this was criticised for underestimating the prevalence of disability, because of heavy bias towards physical rather than sensory impairment.

The updated 1988 OPCS survey attempted to counter this slant by increasing its threshold to include all types of disability, thereby accounting for those previously missed out. However, the 1985 General Household Survey estimated the prevalence of limiting longstanding illness at a much higher level, 208 per thousand compared with 125 per thousand in the OPCS study. The GHS had expanded the scope of their questionnaire to include any limitation in activities, by contrast with the more specific approach adopted by the OPCS, who ascribed only those with difficulties in performing these activities included in their definition of disability.

Indeed, the variability of the scales suggest that disability is a fact of life, endemic to the human condition, which should be recognised as part of a continuum, ranging from extreme ability on the one hand through to extreme disability on the other. The position on the scale, the disability factor, is thus conditional on not only extent of impairment but the constant temporal flux of social and physical environmental influences. Given the difficulty of pinpointing a reliable definition of disability, Oliver turns to the flip side of the coin,

"One might ask questions about why so much time and space has been spent on attempts to define disability (Harris, 1971; WHO, 1980) whereas there has been no consideration of the concept 'able-bodiedness' or 'physical normality'(9)."

Separation of the able-bodied from the disabled is erroneous and misleading as it relies on a commonly perceived knowledge of just what constitutes ability. Yet what is ability? Is it 100% fitness of mind and body and if so who is fortunate enough to claim such vigour and for how long? There are few who could not cite the effects of some minor defect, indeed even those who feel they can admit to total health must, by virtue of the fact that they are alive, confront inevitable old age and thus a gradual decline of all bodily functions(10). Indeed, the most recently published 1988 OPCS(11) figures on the prevalence of disability, revealed that 6 million people in Britain today are suffering from some form of appreciable disability, with a vast proportion of disability (69% over the age of 60 years) arising from age related impairments.

3. Disability and Stigma

Most industrialised countries have inherited a utopian tradition, a vision of the ideal society which is perpetuated through philosophy, art, architecture, literature and religion(12). The classically aesthetic form, purity of the body, of the soul and of reason are held up as the ultimate exemplars of perfection against which all else must be measured. In a utopia there is no place for the flawed, for the somehow less than whole; they simply must cease to exist, as they threaten to jar with the beautiful. This set of values, which has left a powerful residual impression on cultural movements, is still in existence today. Van Gogh may now be considered alongside Michelangelo as one of the great masters but underlying beliefs have little changed.

Such a longstanding tradition of the classical\religious cult of aspiration to create the true, the beautiful and the good, has served to promulgate amongst other things, the myth that wholeness of body is evidence of purity of soul; deformity indicates a corrupt flawed nature and failure to earn eternal salvation(13).

Shakespeare's "Life and Times of King Richard III", is perhaps the most well known example of this simple equation in literature. The following passage shows how Richard III, who *"cheated of feature by dissembling nature"* bitterly justifies his dissent to crime.

> *"Deform'd, unfinish'd, sent before my time into this breathing world, scarce half made up,...therefore since I cannot prove a lover, to entertain these fair wellspoken days, I am determined to prove a villain."*

Inspite of the physical, sensory and psychological disadvantages which impairment may bring to bear, disability is exacerbated by social stigma, where people employ a number of psychological tactics in an effort to distance themselves from what is often viewed as a somewhat unwholesome, pitiable and contaminated condition(14).

The pervasiveness of prejudice in British society, as in many other countries, against disabled people is well documented(15). The 'sociology of disability and deviance' has now developed into an academic field in its own right.

Erving Goffman's seminal work 'Stigma : The Management of a Spoiled Identity', offers an analysis of deviance as a social process. Deviance can take many forms, including physical abnormality, character disreputability, ethnic category or social class. The term 'stigma' was first used by the Greeks to refer to the marks they branded onto a defiled person to signify disgrace. Goffman explains the relevance of the pattern of avoidance in today's society.

"An individual who might have been received easily in ordinary social intercourse possesses a trait that can obtrude itself upon attention and turn those of us whom he meets away from him, breaking the claim that his other attributes have upon us. He possesses a stigma, an undesired differentness from what we had anticipated. We and those who do not depart negatively from the particular expectations that I shall call the 'normals'(16).

This is evidenced in much of the literature on the subject written by people with disabilities. Robert Murphy, a distinguished anthropologist, when paralysed through a spinal tumour, noted with keen professional interest, the transformation of not only other people's attitudes towards him but also his own subsequent change in identity.

"With the onset of my own impairment I became almost morbidly sensitive to the social position and treatment of the disabled, and I began to notice nuances of behaviour that would have gone over my head in times past. One of my earliest observations was that social relations between the disabled and able-bodied were tense, awkward and problematic. This is something that every handicapped person knows but it surprised me at the time(17)."

This altered consciousness, this change in ways of thinking amounts, notes Murphy, to nothing less than a 'metamorphosis'. It is a syndrome characterised by a number of attendant psychological effects, the principal being lowered self-esteem, manifested by the twin qualities of guilt and shame.

Thus the process of acquiring and learning this new role is particularly traumatic for the recently disabled person, as it involves not just adjustment to physical debilitation or sensory deprivation but to a lowered status in the eyes of the public at large, in other words, a general emasculation. This pathway is similar to a 'rite de passage' set into reverse. The cultural initiation ceremony, marking out the turning point from child to adult, or from single state to married state, is translated from able-bodied to disabled state, here power is systematically removed rather than gained.

Our technological society is propelled by the maxim 'to acquire, possess and consume'. Material possessions, health, prestige, youth and beauty are projected by the media, a powerful and persuasive force, as the vital ingredients necessary to create happiness.

Happiness is thus perceived by many, as contingent upon not one, but all these factors. Robert Murphy suggests that within this context disability is considered profane.

> *"The kind of culture the handicapped American must face is just as much part of the environs of his disability as his wheelchair. It hardly needs saying that the disabled, individually and as a group, contravene all the values of youth, virility, activity and physical beauty that Americans cherish, however little most individuals may embody them. Most handicapped people, myself included, sense that others resent them for this reason : we are subverters of an American Ideal, just as the poor betray the American Dream. And to the extent that we depart from the ideal, we become ugly and repulsive to the able-bodied. People recoil from us, especially when there is facial damage or bodily distortion. The disabled serve as constant reminders to the able-bodied that the society they live in is shot through with inequity and suffering, that they live in a counterfeit paradise, and that they too are vulnerable. We represent a fearsome possibility*(18)."

Literature, television and the popular press have long tended to compartmentalise either disabled or old people into classic stereotypic images, which as Kreigel(19) has shown, fall mainly into two contrasting groups. The 'demonic cripple', who overcome with burning fury at the consequences of his disability, obsessively seeks to reduce all those who are unfortunate enough to cross his path to his own level of misery. Sir Clifford in Lady Chatterly's Lover is one such example. The 'charity cripple' commonly takes the form of a crippled beggar, Dicken's Tiny Tim for instance, who is reduced to humbly relying on pity to eek out a mere existence.

However, 'Coming Home' which depicts a paraplegic war veteran adapting to a new life, is one of a recent genre of Vietnam films to break away from the more conventional television and film portrayals of disabled people.

Aside from the factual documentary or magazine programme, (Ben Elton's recent fictional work "Gridlock"), serving as a promising exception, the media rarely questions public attitudes towards disabled people. Rather, it focuses on an 'attitude problem' in disabled people, who are rendered through various psycho-dramas such as soap operas and cop thrillers as self-pitying, manipulative and essentially self-destructive. The

message here is that the right mental approach can conquer any situation, and with a positive input and strength, ultimately triumph over adversity. The litany of adjusting and overcoming, Kreigel notes,

> *"points to one of the social cultural functions of that image and to one of the primary social roles expected of people with disabilities. In a culture that attributes success or failure primarily to individual character, 'successful' handicapped people serve as models of personal adjustment, striving and achieving*(20)."

The inspiring account of the severely paralysed woman who gave birth to triplets or the boy who had so little motor control, that it took him ten exhausting minutes to type one letter of the alphabet, and yet somehow managed to write and have published his autobiography, are a sample of the emotive 'human interest' articles that so often appear in the press. Recently the New York Times printed a feature on the International Games 'for the Disabled'. President Reagan at the opening 'hailed the participants as champions of the heart' and further added,

> *"There's something that has to do with courage, and with will power and with the utter refusal to give up, that has enabled you to rise above your disabilities and compete. Sports has less to do with things like times and weights and distances than with something very simple 'the human heart'. And when it comes to that, the athletes in Los Angeles (at the Olympic Games) will have to tip their hats to you, because you're the champions of the world*(21)."

The legacy of such stigma is largely responsible for perpetuating the 'personal tragedy theory', and creating the current divisive notion of disabled people as a special group, with distinctive characteristics and separate needs from the 'able-bodied' public at large.

A recent Gallup poll found that over half of the people interviewed, associated disability with paralysis and amputation. The most enduring and popular stereotype is a young paraplegic male confined to a wheelchair. Indeed "wheelchair" was often used as a synonym for disability(22). However, according to the Harris, 1971 Office of Population Censuses and Surveys report, on the prevalence of disability, less than 1 in 5

disabled people over the age of 16 had a wheelchair. The largest single cause of impairment is arthritis(23). Thus the public's tendency to assign as disabled, those with more visible, noticeable impairments, has also helped compound the misconception that disability is essentially a locomotion problem, when in reality it includes everything from shortsightedness to mental illness.

Implicit in the notion that disabled people comprise an exceptional group, is the assumption that they should be catered for not as part of normal provision, but on an ad hoc basis separatelyand additionally, if resources permit. Furthermore, it can be argued that, because of the subordinate status ascribed to disabled people, they have lowered their expectations, and accepted at a subliminal level their difference in the eyes of the public, thus accepting as a favour what many believe should be theirs by right(24).

The above point seems particularly pertinent to matters of physical access. Should disabled people really be expected, when on a night out in the pub, to go up to the bar to ask permission to use the key for the specially signed lavatory facilities, when everyone else can come and go as they please ? Would it not be more convenient for all concerned, to extend the parameters of normal provision to accommodate disabled people ?

The following eloquent and moving passage sums up the emotionally charged and multifaceted nature of the term 'disability'. It can be seen from many perspectives ranging from administrative, factual categories and labels through to the more subtle, underlying intangible feelings.

> *"The cripple is an object of Christian charity, a socio-medical problem, a stumbling nuisance, and an embarrassment to the girl he falls in love with. He is a vocation for saints, a livelihood for the manufacturers of wheelchairs, a target for busybodies, and a means by which prosperous citizens assuage their consciences. He is at the mercy of overworked doctors and nurses and*

underworked bureaucrats and social investigators. He is pitied and ignored, helped and patronised, understood and stared at. But he is hardly ever taken seriously as a man(25)."

The concept of disability, as Louis Battye so lucidly demonstrated above, has powerful negative connotations within our culture. This is reflected in the oft-used phrases, 'crippled with indecision', 'paralysed with fear', 'apoplectic with rage', all of which vividly conjure up moments of extreme frustration, or of impotence.

Just as the word 'cancer' has become a metaphor for dying, so the word 'disability' has become a metaphor for suffering and inertia(26). 'Cripples' a pejorative term used in common parlance until very recently, has now been substituted with the less derogatory 'disabled'. However, 'the disabled' is a blanket description often ascribed to people with more visible impairments, who hold certain 'badges of office' such as crutches, artificial limbs or wheelchairs. On the strength of this emotive term, the person with disabilities is at once stripped of his/her own identity and personality, and thought to be less important than the physical connotation. As Ann Shearer noted,

"We do not talk about people who are overweight as 'the fats' or people who are shortsighted as 'myopics', because their fatness or myopia is only one of their attributes, not anywhere near a complete description of the people, yet people who have cerebral palsy become 'the spastics', people who are mentally retarded become 'the subnormals', people who have arthritis become 'the arthritics'. By turning a description of a condition into a description of people, we are saying that this is all we really want to know about them. We confirm their abnormality(27)."

Language, which is often a useful barometer of public attitudes and values, by strictly differentiating between the 'able-bodied' and the 'disabled', helps to maintain the subordination of people with disabilities.

Handicap, according to the World Health Organisation, reflects the interaction of the individual with his/her surroundings. It is extremely variable, being contingent on not only personal characteristics such as mobility, finances and independence but also

environmental characteristics, including social/family support, cultural concepts of what constitutes 'normality' and the physical environment. Just where, on the continuum of ability/disability the individual is placed depends on the combined effect of all of these factors, which may serve to mitigate or enhance the degree of disablement. As Ann Shearer commented,

> *"Each and every one of us knows moments of inability, moments when the body and mind we take for granted let us down and refuse to work for us*(28)."

The individual who cannot swim, speak French when travelling in France or, through excess weight, negotiate a narrow entrance understands the frustrations caused by limited ability. By virtue of our heterogeneity, we are bound to experience difficulties in a number of areas. Yet society is organised around the general premise that most people have a range of fundamental abilities and can make the necessary adjustment to adapt to their environment. Should someone happen to cross a cut-off point, and be unable to adapt, this need is largely discounted on the grounds that it is the exception that proves the rule or it is perceived as so different that separate, special provision is required. Special institutional and residential establishments based on this principle of atypical need represent just some of the ways in which disabled people are removed from mainstream life.

4. Definitions of Disability

4.1 Medical Definitions of Disability

This century has witnessed major technological and medical innovations and an improved quality of life (largely through better nutrition, sanitation and housing) for many people. Such advances have ensured that longevity is no longer the privilege of a few hardy souls. Indeed, most people in Britain today not only expect but stand a good chance of exceeding the Bible's three score and ten allotted span. And so, the character

of disease and as such impairment has changed; many of the more life threatening acute infections of the past (polio, smallpox, tuberculosis), largely through the development of penicillin and mass immunisation, have been reduced. Infant mortality rates are also much reduced, with better antenatal and obstetric techniques responsible for the high survival rate of severely disabled babies, most of whom will live on to adulthood.

Conditions such as epilepsy, downs syndrome and spina bifida can be detected early on in pregnancy, and the more severe diseases like diabetes and pernicious anemia, although not curable can have many of their symptoms ameliorated(29).

Only 40 years ago, the medical prognosis for the traumatically injured paraplegic would have looked so bleak that the chance of surviving more than a few weeks or months was remote. However, a 1967 study by Guttman, revealed, out of 3,000 such patients, a mortality rate of only 11.4%(30).

Perhaps the most marked change to the nature of disability, has been caused by the vast (two and a half million in 1981 over 75 years) and ever growing aging population. It has been estimated that by the year 2000, some 3 million people in Britain will survive to 75 years, with three quarters of a million over the age of 85(31). Old age is accompanied by many physical and psychological changes, the most major being a marked deterioration of motor and sensory ability, and an increased susceptibility to fatigue and infection.

One of the main factors contributing to the advent of a broader definition of disability, is the realisation that the greatest amount of disability is caused not by 'stable conditions' as previously thought, but by 'progressive or fluctuating chronic conditions' such as lung disease, cardiac conditions, arthritis or the deterioration of old age. This highlights the need to further develop the recent shift towards a more community based, less medical and causal approach to care.

The overall picture of disability is much changed from that painted by the medically derived stereotypes grounded in outdated lore. Stereotypes however, if imbued with positive connotations, can be of value, as Sussman pointed out,

> *"Diagnostic stereotyping by treatment and control agencies is a consequence of the continuous search for model or normal cases which provide standardised explanations for easy and effective management, independent of what is known about the particular disease or disability*(32)."

The medical model has long identified 'loss of faculty' as the principal indicator of disability,

> *"Where there has been loss of a limb, or loss or diminution of anatomical or physiological function or the nervous system through injury, disease or surgery*(33)".

This is the model upon which the wartime benefit system was based, eligibility for compensation being weighed against level of loss of faculty. Yet, given the relativeness of disability, even comparison of ostensibly equivalent physical states is extremely problematic. Is the loss of a hand more severe than the loss of a foot, for instance? Such a mechanistic conception of disability neglects to take into account the extent to which activities may be limited by a social handicap. An artist who has depended on the use of his hand to earn his livelihood may suffer far more than the computer operator who loses his foot. Assessment may be further complicated if the disease is chronic and degenerative rather than static. The prognosis for the less acute conditions, such as arthritis is very unpredictable; the condition may fluctuate from rapid deterioration to remission to gradual decline.

Townsend described the implications of medicine's preoccupation with the individualistic causal aspects of disease rather than the social effects.

> *"Medicine has been predominantly concerned with the clinically ascertainable (and treatable) symptoms of disease. As a result, chronic conditions and disablement have tended to attract lower priority than acute conditions and have also been seen more in terms of the consequence for the functioning of the body and nervous system than for the activities engaged in by individuals, the roles they play and the relationships they have in society*(34)."

The narrow medical conception of disability is illustrated by the long used WHO International Classification of Diseases (ICD) model.

Etiology ----------Pathology----------Manifestation

The therapeutic, precautionary and technological bent of medical intervention today is consistent with the simple pathway outlined above, which has further served to inform the emergent social welfare system described more fully in the following section. As Oliver laments,

> *"That disability continues to be medicalised is testament to both the power of the medical profession and the continuing need of the state to restrict access to the disability category*(35)."

4. 2 Administrative Definitions of Disability

The quality and level of provision for disabled people in Britain today owes much to the cultural institutions which have gone before. Characterised by a system of charitable patronage reflecting earlier attitudes to disability, such favours were dispensed often only to those singled out as the most needy, in other words, to the more noticeably impaired or 'emotive' cases, who fell into the disability categories deemed most worthy by the conventional ideologies of the day. Crippled children, the blind or the deaf stood a better chance of gaining, as they were more able to play upon the sympathies of the public and their purse strings. Such charity was perceived as a measure of social progress(36).

The economic angle of welfare provision came to the fore during the two world wars, when the need for productivity and hence manpower was at its height, as was the question of remuneration for war duties rendered, by ex-servicemen. Just as women (previously largely excluded from the field of employment) were drawn into the war effort, so too were disabled people. The concept that they were a narrow, homogeneous and incapable group was revised due to political expedient, and coupled with the notion of rehabilitation, in order to elicit maximum use of work potential. War legislation was thus devised not on an equitable basis of need. Instead provision and take-up were governed by the cause type and age of disablement. The war disabled and industrially injured were given special treatment. The state endowed status through compensation (rather than charity) to those who were recognised as being economically productive, thus largely discriminating against older people, children, people with long term chronic illnesses, women and people with learing difficulties. The edict of the so-called "deserving" and "undeserving" poor was perpetuated by such bureaucratic divisions.

The Beveridge report (1942) proffered a solution to the more blatant inequities of provision. However, when the National Insurance Act of 1946 was implemented as part of the proposals, differences between those who were within and outwith the labour market resurfaced(37). The Disabled Person's Employment Act (1944) catered for those defined as having earning potential, whilst the National Assistance Act (1948) provided a welfare safety net for those classified as more substantially and permanently impaired.

So the strong link between disability and separateness became forged, and it is on this link that current cultural and welfare ideologies are based. The residual concept is indeed so pervasive that even the less segregative, broader approaches now in existence adhere, albeit with less conviction, to this basic tenet. Oliver, drawing on Deborah Stone highlights the problematic nature of this persistent, underlying and divisive rationale.

> *"The assignment of citizens into work-based or need-based distributive systems is a highly political issue which is not readily resolved by the creation of formal administrative schedules or the delegation of decisions to the medical profession (or any other technical experts)*(38).

The Chronically Sick & Disabled Person's Act (1970) reflects a consciousness of the interconnectedness of the many strands of social and environmental provision. Indeed, relying on a wider interpretation of disability, it stressed the advantages of an integrated structure(39). Designed to cover the full range of need, it was the first piece of legislation to take account of the socially handicapping effects of inadequate physical access and to advance recommendations to resolve what was perceived as a considerable problem.

The Act, drafted by Alfred Morris MP, was envisaged as a much needed social reform, indeed a charter for the disabled. It promised to lay to rest the last vestiges of the 'poor law'.

> *"No longer was it to be good enough for the local authorities to provide aid for the needy who came knocking at the town hall door*(40)."

The statutory onus was now on local authorities actively to seek out those persons eligible for assistance and compile a register of their numbers. Furthermore, the Act promised to address and broaden the scope of opportunity open to disabled people, enabling greater participation in the community by improving not just access to the community but transport and housing.

However, although the Act initiated a working framework for social change, at best acting as a source of reference for local authorities, it was essentially inadequate, with the result that the hoped for reforms did not materialise on the scale originally intended. The government, commentators contend(41), concerned that demand would outstretch available resources not only reframed the document but rendered the language more ambiguous; hence in Section 8 a clause was inserted stating that local authorities should ensure that buildings are accessible *"where practicable and reasonable"*. However, Oliver goes further and criticises the Act for its implicit assumption that disabled people need 'help', and as such should be dependent on the discretionary provision of the

'benefactor/helper', that is, the state. For Oliver (42), total independence does not exist, for we are all rely on a *"reciprocity of dependence"*, where we engage the support of others to a greater or lesser extent in almost any given situation. Shearer elucidates this point in relation to the Act.

> *"The goodwill behind the 1970's Act's provision cannot be doubted. But the philosophy can, for what it does is to reinforce the notion that people who happen to have disabilities who are 'helpless', unable to choose for themselves the aids to opportunity they need. What this effectively does is to lock them into the service providers' perception of what is good for them, and so limit rather than expand their areas of effective choice. The offer of a holiday at a time and in a place that suits the social service worker or local authority, rather than cash in hand to spend according to individual preference, sits oddly with the rhetoric which asserts that people with disabilities should have greater access to a range of social choices that many of the rest of society take for granted. The substitution of kind of cash sits no less uneasily with aspirations to enhance the self-determination and dignity of people with disabilities, in a society where status and respect has much to do with purchasing power. The potential public outcry against a paternalistic state which attempted to deliver, say, child benefit in the form of nappies, creams and baby foods, does not take much imagining*(43)."

This underlying philosophy of diminishing, rather than enhancing the independence of people with disabilities, characterises the tradition of British social welfare provision. The later implementation of the Disabled Person's Act (Services, Consultation and Representation) 1986 is a case in point. Designed to further strengthen the aims of the Chronically Sick & Disabled Person's Act, with particular regard to 'citizen advocacy', whereby a disabled person can appoint an authorised representative to speak on his/her behalf, it has also been rendered impotent by lack of government funding. To date, only Section II of the Act has been implemented. Thus the government, whilst on the one hand having requested local authorities to protect and even extend services for people with disabilities, has with the other imposed cuts to public expenditure, and so compromised social service provision.

The 'individual' model Goldsmith contends, so inherent to the CSDP Act, is clearly reflected by the development of the British ideology of design for disabled people. The

paternalistic tradition of special treatment, it is argued, has done little to empower disabled people. Indeed, Goldsmith further claims, that such intervention has impeded rather than improved self-help.

> *"England has a commendable record of concern for the welfare of the disadvantaged, and in particular for the physically handicapped. Its concern is manifested in a range of social legislation, exemplified most importantly in the Chronically Sick and Disabled Persons Act of 1970. It is a caring society. It is anxious to help disabled people, and it has an impressive quantity of national and local voluntary organisations whose business it is to assist disabled people. It likes doing things 'for the disabled'. It is in summary, benignly microistic*(44)."

By contrast, he examines the growth of the barrier-free movement in the United States, brought about, largely, by the campaigns of disabled people themselves. This movement epitomises a philosophy of 'normalisation' for disabled people. In this context of architectural enablement, and an overall presumption of the desire for 'self-management', flexible design solutions are sought on a structural rather than individual level. To Goldsmith, the British invalid tricycle, unisex public toilets, special signposts indicating facilities for disabled people and haphazard kerb cuts are all,

> *"manifestations of a society with a morality of community concern and compassion for disabled people, which it is anxious to display; the ethic is of special welfare treatment and of finding a pragmatic rather than an ideal way of doing things, and there is cursory regard for applying design rules in a functionally efficient fashion*(45)."

In contrast American design equivalents, such as automatic-opening doors, systematic kerb cutting, and public lavatories designed for use without an attendant, implicitly express the ethic of independence, of self-help.

The 'macro' as opposed to 'micro' ethic which pervades American policy has, on the face of it, many advantages. However, it also has an inherent drawback, as evidenced by the above example of public lavatories, designed for use without an attendant; by virtue of their limited space, these do not allow for help by an attendant.

The above approach is principally based upon the needs of independent wheelchair users, a group that consists largely of fit, paraplegic males, able to manage, given appropriate provision, without assistance. However, as previously stressed, many disabled people, although independent, simply do not conform to this stereotyped notion of disability, and require assistance. Thus 'normalisation' as defined by American policy, could be argued to be double-edged; whilst the notion of integration for people with disabilities into the mainstream of society, is widely supported, the efforts that have been made to respond to certain pressure groups, the most powerful and the most able, undermine this.

It may be that such policy responds less to degree of need and more to degree of ability. Rewarding the more able, is discretionary and implicitly exhorts disabled people to seek equality through striving to overcome rather than accept their disability, and so emulate their more able-bodied counterparts.

In contrast, the post-Beveridge British social welfare model, as the preceding analysis illustrates, given its many flaws, laudably accepts as a starting point the collective right of all people, disabled or otherwise to a basic level of provision; as Oliver and Barnes put it,

> *"The twin ideals of active citizenship and of rights were tentatively incorporated into the initial legislation which laid the foundations of the post-war welfare state. However, everything that has happened since has been a retreat from those ideals - including dependency creating approaches to service provision, the interventionist nature of professional practice, and the language in which it is all described.*(46)

Thus divining the actual degree of need as opposed to perceived need within this context, was initially deemed a democratic priority which should not be subject to the vagaries of charitable intervention. However, this guiding principle has become subverted by the machinations of a complex bureaucratic system.

Recent anti-discrimination legislation in the form of the American Disabilities Act (ADA) 1990, which follows similar earlier equal opportunities measures, campaigned for and instigated by women and black people, adopts a more macro approach. Although such measures go some way towards addressing the current inadequacies of the social system, their effectiveness in the past has been limited, and they have been criticised by Fine et al, for not constituting social reform which challenges the existing structure of the system, or the inherent attitudes of society.

> *"Adopting a similar approach, anti-discrimination legislation can be seen as a response to the demands of the oppressed groups for the removal of historical barriers to the achievement of full equality. These claims are compatible with bourgeois notions of justice and economic efficiency. The state therefore assumes a conformative role, using the legislation to control those employers whose practices fall short of acceptable notions of equal opportunity, and to evolve institutional structures for channeling conflicts. At the same time, it is important to disperse the cloud of mystification surrounding legislation, so that it is clearly recognised as part of the processes of containment. It is on the statute book in order to protect, not threaten, the fundamental structures of capitalist society, and therefore cannot by itself constitute the vehicle for achieving a non-racist, non-sexist society*(47)."

Thus such legislation must be extended not undermined, and further strengthened by awareness raising measures, reinforcing its effectiveness as a means of creating more enabling environments.

4.3. Social Definitions of Disability

It is argued that the micro ethic stemming from the medical approach to disability has shaped social responses to disability in terms of health and social policy. Indeed, it is further contended that this myopic approach has contributed to the constraining and often prohibitive effects of the built environment and resulted in a user-hostile environment, which is largely responsible for instituting "*disability behaviour*". Such behaviour, deemed as different and atypical by those less subject to such limitations, is vulnerable to the constraining effects of architectural environments. Physical barriers in

the form of steps, stairs and inaccessible toilets and institutional provisions such as special schools, workplaces and residential establishments militate against full or even part participation by people with disabilities, contributing towards their marginalisation in the community. Finkelstein reinforces this latter point by citing the alternative perspective offered by the Union of Physically Impaired Against Segregation,

> *"In our view, it is society which disables physically impaired people. Disability is something imposed on top of our impairment by the way we are unnecessarily isolated and excluded from full participation in society. Disabled people are therefore an oppressed group in society* (48)."

It is argued that just as gender is a biological constant within society, so is impairment, which is not the exceptional phenomenon, and misfortune of the individual, it is widely believed to be. Indeed, the latest 1988 OPCS survey(49) estimates that there appear to be not three million but twice that number, six million disabled people in Britain today. This is supported by Sheer and Groce, who point out,

> *"The World Health Organisation also suggests that approximately 10% of the world's population at any given time is physically or mentally impaired (Wood, 1980). Disabling conditions in the past and present human populations include genetic disorders, chronic or infectious diseases that cause permanent impairments, and injuries that lead to lifelong impairments. It is our position that the constant presence of the physically disabled in human societies is generally overlooked by social scientists and policy makers, as well as by the disabled themselves* (50)."

The ongoing failure to implement effective measures which support the integration of (irrespective of exact figures, which vary according to the measure used) such a substantial sector of the population suggest a high level of prejudice and discrimination, discrimination which has also been directed at women, and black people, groups, who were similarly subject to a devalued status, due largely to societal assumptions of biological inferiority, and disadvantaged through restricted access not just to the physical environment but employment, education, housing and transport. As Mayerson explained,

> *"Repeatedly it has been demonstrated - for racial, gender, religious, and ethnic groups - that the imputed, sometimes demonstrable, inferiorities were not due to an immutable minority characteristic but to environments that limited opportunities. Does that generalisation hold also for people with disabilities?* (51)"

Architectural barriers, when placed within this broader sphere of reference which includes social, financial, psychological and economic factors, can be viewed as part of an inextricably inter-linked process, achieving a cumulative detrimental effect on the living options of disabled people.

Alan Walker, Chairman of Disability Alliance, stressed the need to move away from commonly held preconceptions of physical access, which he asserts have until recently been given undue emphasis as a purely spatial problem. This emphasis has also led to the simplistic belief that if the technical problems are identified, and codified, access will follow. This a narrow assumption which underlies previous access studies (52, 53) and denies the importance of social context.

> *"The often considerable problems of physical access are to a large extent a reflection of a more pervasive set of restrictions. Thus social institutions and groups operate largely implicitly and sometimes unwittingly to create and sustain dependence and deprivation amongst people with disabilities* (54)."

Thus physical access should not be examined in isolation, but as a product of ingrained social prejudices which colour, the building designer's thinking, from the initial conceptual spark through to the completed plan. Instead there should be a reappraisal of access in the light of this more holistic approach, which acknowledges the presence of the many social effects impacting upon the design process.

Although a recent research project (55) broke new ground by assessing the relationship and importance of a varied number of needs expressed by disabled people, and placing access difficulties within a wider social context and examined alongside other factors such as transport, access to information, and social service provision, no British studies

to date have attempted to investigate architectural barriers and the attitudes of design practitioners towards people with disabilities.

However, whilst an examination of professional attitudes is important, as it implies recognition of an interplay between disability and societal values, Oliver delivers the caveat that such an examination, if it is accepted that the self-determination of disabled people is the desired shared goal, must take into account the differing interpretations of self-determination by able-bodied and disabled people.

> *"While both groups would accept independence as a goal for disabled people, for the professionals independence means the ability to care for oneself whereas for the disabled people it means having control over one's life, including the right to hire and fire the people upon whom one might be physically dependent. It is obvious that rehabilitation programmes and services would be very different, depending upon which notion of independence was adopted."*

Oliver further adds,

> *"However, the debate is not just about services but also about the politics of control; who should be in charge of the rehabilitation process, disabled people or the professionals? And should disabled people receive the services the professionals think they need or those that they themselves choose?*(56)"

Thus if this argument is extended to the building design process and related research, it is necessary to include disabled participants to clarify objectives, to appropriate a measure of control over outcome and to ensure that a range of needs are addressed. It is clear that consultation, if incorporated may also serve to reddress the imbalance of control inherent in any helper/helped relationship, or designer-disabled person dialectic, which as Finkelstein demonstrates, reinforces inequity if not challenged.

> *"The existence of helpers/helped builds into this relationship normative assumptions. 'If they had not lost something, they would not need help goes the logic, 'and since it is us, the representatives of society doing the help, it is society which sets the norms for the problem solutions*(57)."

To Oliver, the latter approach falls into the social constructionist view of disability, a view which focuses on attitudinal constructs and their potential for change, given appropriate awareness training. The constructionists, however, it is postulated, do not penetrate the heart of the problem, a problem identified by disabled people as socially created, as opposed to constructed. Whilst the constructionist line holds that fine tuning and adjustment to attitudes is an adequate solution, those who adopt the socially created stance, believe that attitudinal change is required but this must be supported by major structural reform to the *"institutions, organisations and processes that constitute society in its totality*(58)".

Thus corrective measures must be aimed at the flawed social processes which perpetuate the inequality, with the objective of mitigating the effects of a 'disabling state' which creates 'disabling environments'. This line of argument stems from the 'social' model of disability, which as Oliver(59) observes, is interchangeable with, but less emotionally charged, than the 'social oppression theory'. This revised definition, opposes the traditional 'individual' or more explicitly 'personal tragedy theory', as according to Meyerson,

> *"it denies the centrality or potency of the 'loss or impairment of a tool' aspect of disability. Impaired tools can often be improved or replaced with many other tools*(60)."

If related to architectural barriers, this school of thought carries much weight, as the provision of dropped kerbs, lighter doors with lever style handles, ramps and lifts, ensuring equal access to all, not only the fittest, bear out.

Personal tragedy theory, it is argued, is reflected by social policy to date, organised around the assumption that disability is an unfortunate quirk of fate, to be dealt with by individualised, largely medically based interventions. Oliver notes that disabled people are not the only recipients of individualised social provision, and points out that many other sections of society have also been vulnerable to an approach which arguably

serves not to foster independence but dependence, through stigmatising and divisive policy.

> *"A social theory of disability should be integrated into rather than separate from existing social theories. It has to be remembered, however, that personal tragedy theory itself has performed a particular ideological function of its own. Like deficit theory as an explanation of poor educational attainment, like sickness as an explanation of criminal behaviour, like character weakness as an explanation of poverty and unemployment, and like all other victim blaming theories (Ryan, 1971), personal tragedy theory has served to individualise the problems of disability and hence leave social and economic structures untouched* (61)."

Thus Oliver makes a plea to researchers to focus less on disabled people, which only reinforces the individual approach, and more on *"disabling environments"*; thus shifting the emphasis towards the structural, social model. Number and disability type of people, it is stressed, are of less consequence than the number and type of organisations which limit access.

> *"Functional...definitions, even if they take into account the limitations of social roles, nevertheless still focus on the problems of the disabled individual and do not attempt to develop research tools for measuring the disabling effects of the economic, social or physical environments* (62)."

However, this alternative focus should not detract from the necessity to involve disabled people in planning and consultation within the research process, an essential step if a dialogue or "partnership" is to be developed vis a vis both interest groups.

5. Conclusions

Definitions of disability, culturally and socially derived, have served to shape building designers' concepts of disabled peoples' design needs; such concepts, are reflected in the design of the built environment. In the past decade the influential WHO ICIDH categories of disability, have had the twofold effect of standardising previously ambiguous terms, and by recognising handicap as an interface between the impaired

individual and social and environmental factors, expanded upon the largely clinical and causally based former definitions. However, the ICIDH have been strongly criticised for assuming that such social handicap stems from impairment, and not from a flawed social system. This contention, if applied to access, is extremely pertinent, as it assumes if the physical environment exacerbates disability, alteration to the design of buildings will mitigate disability.

The shift in emphasis from the 'individual' to the 'social' model of disability, stresses the need to redirect attention away from the disabled person, who has for so long been the object of scrutiny. This scrutiny, is a corollary of the precept that disability is a personal tragedy, a misfortune, to be dealt with by individualised, largely medically based interventions, which arguably serve, by depriving disabled people of choice, to foster, not independence, but dependence on state provision. However, the alternative 'social oppression' theory, advanced by people with disabilities holds that a 'disabling state', creates 'disabling environments'. It is further argued that the constructionist belief in attitudinal change, is inadequate in itself and must be accompanied by structural institutional reform. Although such reform necessitates the inclusion of people with disabilities in planning and consultation within research, in order to invest a measure of control over process, realignment of the focus from disabled people to physical environments is required.

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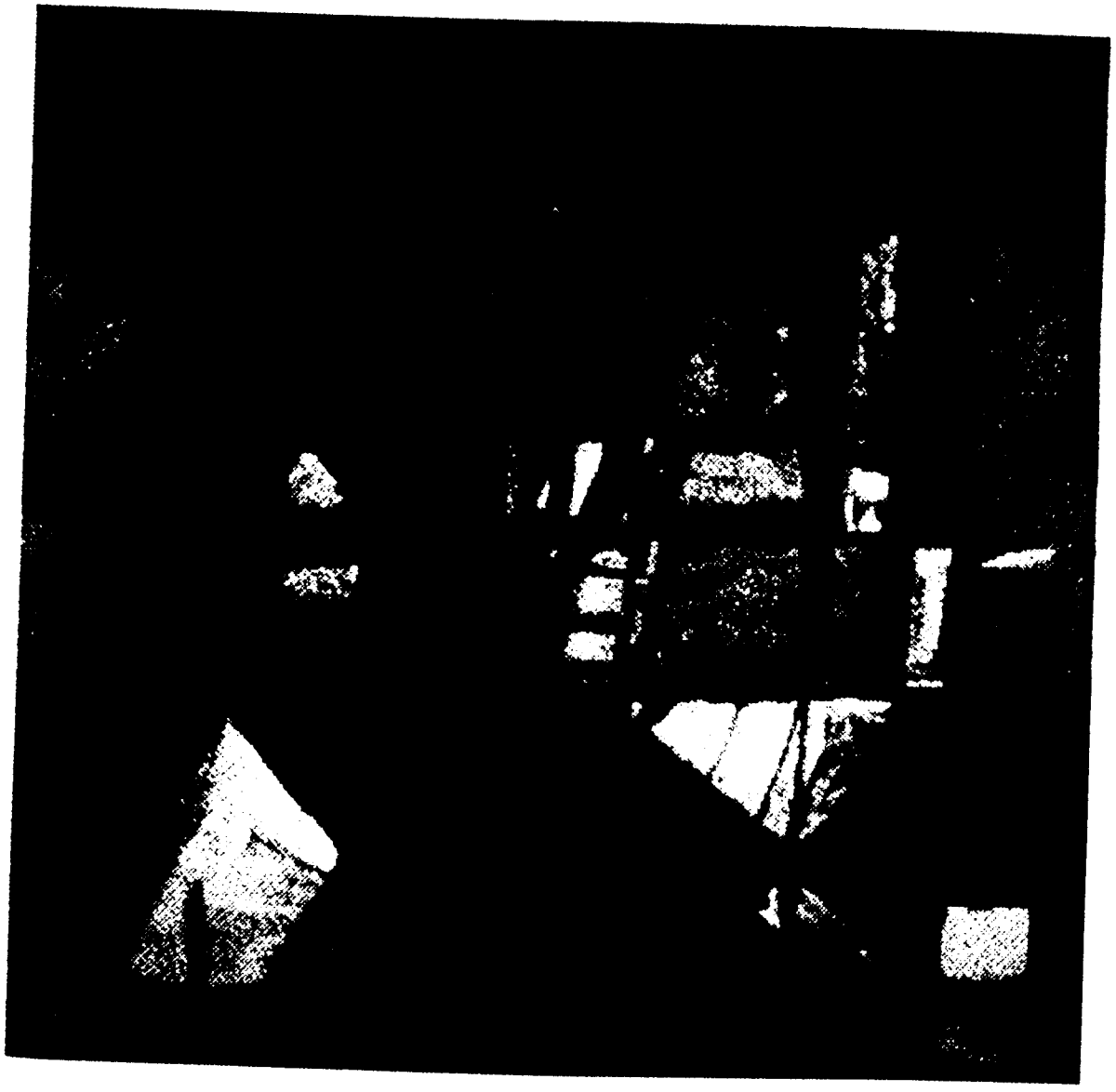
Chapter 4



Access Legislation :Towards a Universal Approach

1. Introduction

> *"All design is a compromise, and that compromise is best reached through the study of man at his weakest"* Alvar Aalto

This Chapter examines legislative protections as they relate to access, protections which largely stem from the micro needs based British social welfare system. It is argued that although such measures serve as useful design tools, they are insufficient as a means of ensuring 'Integrated' or 'Universal' Design. A chronological critique of UK design legislation as it relates to the needs of people with disabilities is undertaken comparing such traditional legislative measures and guidelines with Universal design. It is hypothesised that whereas the former approaches stem from an essentially separatist standpoint, which involves the systematic discrimination of people with disabilities, the latter approach more effectively serves their needs by embracing a philosophy of inclusion rather than exclusion. The implications of Universal design on all future developments, both legislative and techtonic, are therefore examined.

UK's Access requirements emerged in 1967, in the wake of the American Civil Rights Movement. The American Civil Rights Movement was generated in the 1950's to accord black people equal rights, and as it gathered momentum, it became principally concerned with social or consumer rights in general. Women, and later disabled people, were extended protections. In more recent years disabled people, particularly those in the US, have become increasingly vocal and organised in expressing their right to self-

determination; Oliver and Barnes draw on the observation of one protagonist, who noted,

> *"The Civil Rights Movement has had an effect not only on the securing of certain rights but also on the manner in which those rights have been secured. When traditional legal channels have been exhausted, disabled persons have learned to employ other techniques of social protest, such as demonstrations and sit-ins*(1)."

However, notwithstanding the implementation the UK Sex Discrimination Act 1975 and the Race Relations Act 1976, no anti-discrimination Act for disabled people has yet been instituted in Britain. It is ten years since the publication of the Report of the Committee on Restrictions against Disabled People (CORAD)(2), which found that *"the problem of (physical) access was mentioned by more correspondents than any other"*, thus highlighting the inadequacy of the then design prescriptions as a means of prohibiting architectural barriers. The implementation of anti-discrimination legislation was recommended as one of the most effective and holistic means of combating segregation and prejudice, and one which would integrate and support the more specifically targeted design guidelines and building regulations, and shift the emphasis away from needs-based provision.

Given the advent of the American Disabilities Act (ADA) 1990, and *"growing collective consciousness"* of people with disabilities, who have challenged the traditional medically based perceptions of disability, it is asserted that the root of the problem lies not with functional impairments but with the disabling effects of the social and physical environment. However, it is unlikely that the nine abortive attempts in the UK to pass similar far-reaching legislation as a private members bill through parliament, will be long tolerated by campaigners.

The ADA, a significant institutional reform, vaunted as the *"most comprehensive civil rights measure in the past two and a half decades...a Civil Rights Act of 1964 with respect to persons with disabilities*(3)," enshrines a philosophy of equal rights as

opposed to the discretionary targeting of resources to those believed suitably deserved, that is, those deemed as requiring 'special' provision.

Indeed, the ADA reflects a 'Universal Design' approach, an approach which has been variously labelled 'design for the broader average', 'integrated design', 'extended scope', and 'barrier-free design'. In spite of, the differing terms, all describe an attitude which marks a move away from 'separatist' provision for disabled users. The belief that 'special' groups of people have 'special' design needs, to be appended or added to the whole, if and when resources permit, is a view which contrasts with the notion of design for all people. The ramifications of this revised principle were noted in a recent editorial of 'Architecture',

> *"Accessibility features must now be considered as natural to buildings as indoor plumbing, air conditioning, and sprinkler systems, not as a resented checklist of requirements to be tacked on to a design*(4)."

This all embracing design approach was identified by Goldsmith as a 'Macro' ideology, an ideology which recommends the expansion of traditional design parameters to embrace disabled people as part of normal provision. To Goldsmith, the Macro approach,

> *"relies on structuring normal environments which are convenient for everyone, including those with disabilities. The public building whose spaces and facilities are all equally accessible to the disabled as to the able-bodied user is an expression of macroism."*

In contrast to the 'Micro' approach which,

> *"relies on special provision 'for the disabled'. The sheltered workshop, the house adaptation and the wheelchair kitchen are all micro artifacts*(5)."

Wrightson and Pope(6) further argue that such microism within design is narrowly conceived, 'restorative', and consistent with the individualistic welfare school of thought.

> *"There is no wider vision of design for community advantage, or acknowledgement of community failure to provide in the first instance, instead the focus is on the disabled minority as the original 'problem'. The emphasis is on society doing 'for the disabled' in a way that compartmentalises problems and solutions. Micro thinking identifies 'access for the disabled as the only issue rather than as one element in an integrated system of components*(7)."

Design legislation 'for disabled people', it is contended(8), is also inherently separatist, as by nature it explicitly assumes a dichotomy between the design needs of disabled people and the 'able-bodied'. However, although legislative requirements indicate a move towards a more holistic philosophy, the emphasis must be shifted away from access for disabled people to access for all, before a wholesale readjustment can be made. It is not enough to prescribe a macro environment from a micro standpoint, as this wholly undermines the philosophical basis.

Indeed, the Dutch Co-ordinating Committee for the Promotion of Accessibility (CCPT), responsible for the publication of the European Manual for an Accessible Built Environment, has adopted a pragmatic line, which accepts that,

> *"as long as 'normality' is defined by the barriers to full participation in the life of a community, the existence of the Dutch Council of Disabled People will still be necessary*(9)."

The CCPT, whilst acknowledging that what they term the 'integrated' or 'universal' approach to design is the desirable course to follow, also recognises that barriers are to be limited not only in new but existing buildings, and thus advance a three pronged route to accessibility, using a combination of the following approaches,

*"The **individual** approach is to reduce handicaps as much as possible by specific aids and individual adaptations.*

*The primary aim of the **categorical** approach is to reduce the handicaps of certain groups of people with physical impairments or disabilities by introducing special facilities into the so-called normal environment. Reconstruction of buildings, adapted toilets for wheelchair users, special entrances and induction loops for people with hearing impairments, all help people with these disabilities while at the same time making them into 'special cases'.*

*The **integrated** approach can be seen as an attempt to create a non-handicapping environment and to design for all people*(10)."

The European Manual, with the aid of significant representation from member states on the advisory committee, and the International Standards Organisation (ISO), was devised as the key reference document for a European Directive, and the basis for the development and co-ordination of local and national access legislation. Thus it is significant that the principle tenet underlying this set of guidelines is that of 'integral accessibility'; indeed this philosophy is clearly espoused in the Manual's introduction.

"The built environment should be arranged in such a way that it allows everybody to function in the most independent and natural way possible...In this definition, terms like 'everybody' and 'natural' emphasise that accessibility ought to be a common environmental quality. All features relating to accessibility are considered to be normal facilities which are used by everybody. This perception is only possible if accessibility is a starting point in the arranging or rearranging of the built environment. Everybody who makes use of the built environment is different in one way or another. 'The average person' does not exist. The manual is therefore based on a large range of human scale and physical capabilities from short to tall, from young to old, from able to disabled people(11)."

The Manual's endorsement of 'extended scope' design, affirms the changing definition of disability and philosophy as regards the way in which the built environment should perform for the broad cross section of people in society. The concept of Universal design, however, has recently been expanded from purely barrier-free concerns to encompass responsiveness to health and safety, cultural, and 'green energy conscious' considerations. Such considerations fall under the rubric of health maintenance and injury prevention, and as Wrightson and Pope point out,

"The principles of intrinsically safe environmental design are linked to the basic understandings about maintaining community health(12)."

It is further argued that the notion of rehabilitation which has traditionally dominated thinking about 'Good Health' is consonant with a micro ideology, which stems from a medical basis. Good Health, is thus perceived of in a narrow frame of reference, which assumes that it is the 'normal' and 'ideal' state to aspire towards. Rehabilitative measures are implemented to counter deviance in the form of illness and/or impairment, with the aim of segregating the individual until the desired degree of health is restored. Such attitudes have tended to divorce general ideas about health maintenance from the community, placing it firmly in a medical setting, thus designating it as a medical rather than social responsibility. As Wrightson and Pope explain,

"This approach ignores any genuine attempt to define 'Community'. Community services thus become an extension of the hospital system. They operate from the hospital environment and access to such services is by referral from the medical profession. The priority for community services is also to treat and cure illness(13)."

However, if the macro or universal ideology is applied to 'Good Health', socio-environmental factors assume the central role in health management and prevention, with medical intervention providing a supportive service. Design, thus, has significant psycho-social dimensions, which can serve to influence behaviour, either positively or negatively. Negative behavioural patterns which are unsafe may arise from, for example, open wells, in developing countries. The provision of a fence can not only ensure improved safety but hygiene(13). Unfamiliar, inappropriate and culturally unsympathetic design, which does not articulate with given cultural customs, may also be inefficient in terms of economics and energy. A western style fitted kitchen incorporated into a rural hut in India where cooking takes place on the floor, may strike one as an unlikely design solution but unfortunately ethnocentric western hegemony dominates much world wide professional thinking as regards design. In modernism this is most crudely represented by the International Style, evidenced in Brasilia.

Moreover, much universal design has arisen to date inadvertently, where the designer has responded to commercial forces to create flexible, safe and accommodating environments which benefit all users. Wrightson and Pope offer an example of the above.

> *"In New Zealand, virtually every supermarket has a continuous level sealed surface from the motor vehicle parking area into the product display section. This 'arrangement' has been provided as a matter of necessity so that shoppers, with their fully laden shopping trolleys, can negotiate the journey from inside the supermarket to their vehicle with minimal inconvenience and no threat to personal safety from architectural barriers* (14)."

It is clear from the preceding analysis that the creation of more ecological environments, that is, the application of universal design in its broadest sense, necessitates a conceptual challenge, and the break down of preconceived assumptions about client accommodation on the part of designers, if it is to be successfully implemented. However are improved design requirements sufficient in themselves to ensure that this happy state is brought about?

2. UK Access Legislation : A Historical Critique

Just as the history of legislation, as it relates to the equal rights of people with disabilities, reflects a pattern of consistent government neglect, so too does the history of access protections. Indeed, the part played by architectural barriers, in serving to prohibit the integration of disabled people, was not officially recognised in Britain until 1967, with the publication of the British Code of Practice : Access for Disabled to Buildings. This initiative following on from the 1961 American Standard and the 1965 Canadian Building Standards for the Handicapped. 1968 and 1969 saw the further appearance of the Australian Design for Access by Handicapped Persons and the Swedish Regulations for Access for Disabled to Buildings. Other countries followed suit.

Selwyn Goldsmith, leading authority on accessible design, traces his own involvement in the field back to its beginnings in 1961, when he became much influenced by the work of Professor Tim Nugent(15). The 1961 American Standard conceived of by Nugent became the exemplar upon which all the rest of the standards were based. Aside from Nugent, Goldsmith notes that the only European publication at this time to deal with the area of architectural provision was an accessibility study by Henrik Muller, of the buildings in the Stockholm suburb of Hogdalen.

During the 50's Professor Tim Nugent was appointed director of the Rehabilitation Education Centre in Illinois. It was here that Nugent developed the dual philosophy of equal opportunity and self-help that was to remain at the core of his work. His alternative 'enlightened' approach was responsible for the implementation of a 'dynamic' rehabilitation programme, which was to allow severely disabled young people, in a specially modified environment, to participate in further education. To Nugent, architectural barriers were of key importance as they played a major part in diminishing the independence of disabled people. In a paper presented in 1965, at the National Institute of Architectural Barriers, he wrote,

> *"Physical and architectural barriers or the inaccessibility of buildings, facilities and public transport, stand in the way of total rehabilitation. They stand between the disabled and their goals. They stand between the disabled and society. Although there are other problems the number one is inaccessibility. Inspite of forward moving programmes of physical restoration and rehabilitation, professionals in the field are finding it very difficult to project clients into normal situations of education, recreation, socialisation and employment because of architectural man-made barriers.*
>
> *There is overwhelming evidence that it is far more practical and economical to invest in the total rehabilitation of individuals with severe permanent disability, so that they may become self-sustaining, contributing members of our society than it is to maintain them in part, or in whole, via welfare programmes of our states and nation. Given the opportunity for normal employment, they repay in income tax alone, many times the cost of constructed rehabilitation programming. We are basically concerned with making it possible for the great talents and resources of millions of physically disabled individuals to be put to use for the betterment of mankind and elimination of architectural barriers*(16)."

Thus Nugent crystallised the aims and philosophy of what is now known as the barrier-free movement. These basic ideas were translated into practice when Nugent helped devise a programme with the American Standards Association and the President's Committee on Employment of the Handicapped, which culminated in the publication of the 1961 ANSI 117.1, Standard entitled "Making Buildings Accessible and Usable by the Handicapped".

Nugent's British counterpart, Goldsmith, convinced of the need for architects to take account of disabled people when designing public buildings, wrote the manual "Designing for Disabled". This 1963 publication, the first of its kind, has as Nee put it, *"served as a bible for a generation of architects but has been more influential in the US than the UK*(17)." Indeed, it was to become the key reference text for the 1967 British Code of Practice CP96 : Access for the Disabled to Buildings. However, the code offered little more than guidance, operating on a principle of persuasion rather than mandatory enforcement.

2.1 The Chronically Sick & Disabled Person's Act 1970

In 1969, Alf Morris, M.P. for Wythenshawe, galvanised by the civil rights movement, and a number of significant socio-economic and demographic changes, spoke out on behalf of disabled people's rights in the House of Commons.

> *"Most disabled people want more than anything to lessen their dependence on others, to get on with living their own lives as normally as they can in their own homes with their own families and wherever possible have the opportunity of contributing to industry and society as fully as their abilities will allow*(18)."

And so, framed by Morris as a private member's bill, the 1970 Chronically Sick & Disabled Persons (CSDP) Act, became statute. The Act, the first piece of legislation to focus solely on the needs and rights of disabled people, was regarded by many as a charter. Further, it augured a shift to a more humanitarian society. As one optimistic lobbyist wrote,

> *"disabled people themselves realised as it were overnight that they too had voices and perhaps even more important, they too were voters*(19)."

The Act promised to provide a framework around which local authorities could work, Sections 4-7 deal with public buildings, Section 4, specifically with access to and facilities at premises open to the public. It states,

> *"Any person undertaking the provision of any building or premises to which the public are admitted, whether on payment or otherwise, shall, in the means of access both to and within the building or premises, and in the parking facilities and sanitary conveniences to be available (if any) to make provision,* ***in so far as it is in the circumstances practicable and reasonable****, for the needs of the members of the public visiting the building or premises who are disabled*(20)."

Provision was required at places of accommodation, refreshment, entertainment, universities and school buildings. A Ministry of Housing and Local Government circular 65\70 extended the application to public halls, public libraries, theatres, cinemas and shops. Included in the brief were not only *'new constructions'* but the *'conversion of existing buildings'*.

The CSDP Act has however been widely criticised for *'lacking teeth'*(21), Section 4 of which is no exception, as it contains the qualifying clause, *"In so far as it is in circumstances both practicable and reasonable"*. This escape clause was put to the test shortly after the Act was passed by a local authority attempting to refuse planning permission on the grounds of inadequate access provision. The case was defeated in court, and confirmed the belief held by many, that the Act was unenforceable. Access was still deemed as discretionary and thus largely disregarded by developers and

building designers alike(22).

The promised reforms had failed to emerge; the main reasons singled out by Jaehnig, as contributing to this situation were twofold(23), first, the speed with which the measure was drafted and hence lack of expertise, and secondly, the later insertion of ambiguous phrases to render the bill less contentious, and so, ease its passage through Parliament.

However, Oliver and Barnes contend that the real reason, the Act's impotence, was the fact that it did not represent a significant advance in the first place.

> *"It was no more than an extension of the National Assistance Act 1948. The only extra duties imposed on local authorities under the 1970 Act were the duty to compile a register and the duty to publicise services. The former produced little information of value and the latter was widely ignored. The Act listed services to be provided, but only where it was 'practicable and reasonable' to do so. For most local authorities it wasn't, so they didn't. In short, the 1970 Act gave disabled people no new rights but instead re-emphasised needs-based provision; even so, it proved ineffective in meeting needs, however defined*(24)."

The findings of the 1975 Wycliff-Noble survey(25) strengthened claims that Section 4 be either amended or additional legislation introduced. A questionnaire was sent out to 40 Local Authorities throughout England and Scotland. Responses were sought on not only the number of private and public buildings to incorporate access provision since the implementation of the CSDP Act but also the extent of the inclusion of such facilities as parking, signs and toilets. 17 replies were received, which referred to 323 municipally owned buildings and 59 privately owned buildings. Combined, the private and public sectors show a positive upward trend in access provision. However, if parking is excluded from the figures, the level of new provision falls away after 1973-74. Indeed in the public sector, educational buildings account for much of the access input. It can be reasonably assumed that 17 Local Authorities who were motivated enough to reply were also the most conscious of access. Wycliff-Noble concludes by saying,

"From the evidence of our survey...it is clear that Section 4 of the CSDP Act 1970 has been almost ineffective on private development"

Furthermore he adds the recommendation that,

"the Town and Country Planning Act 1971 is amended and a clause the introduced making inadequate facilities for disabled people a condition of planning consent(26)."

Notwithstanding the persistent efforts of Wycliff-Noble, Morris and disabled lobbyists to instigate reforms, the then Department of Environment proved to be not only resistant, but explicitly 'hostile' to such suggestions. A DOE letter addressed to Peter Mitchell, dated February 1976, offers a telling commentary on the level of opposition to access campaigning.

"The purpose of the planning control provided by the Planning Acts is to regulate the use of land and any buildings thereon in the public interest. Thus it is the use to which the land is put that is important and not who uses it(27)."

In 1977, Alf Morris, aware of the ineffectiveness of the CSDP Act, set up the Silver Jubilee Access Committee on Improving Access for Disabled People(28). The well publicised campaign largely succeeded in its expressed aim of raising public awareness of access issues, albeit in the short term. The inquiry focused on disabled consumers' opinions of access. Although the evidence collected from a large number of people was largely anecdotal, it provided valuable information on the range and types of difficulties experienced, and revealed that it was not only architectural obstacles alone that caused the problems for disabled people but architectural obstacles combined with harmful public attitudes. A questionnaire sent out by a group of London school children, to a menswear shop, received the reply,

"As a young fashion store, we are hardly the place one would expect to find people confined to wheelchairs frequenting. Our merchandise is essentially aimed at the young slim and active(29)."

The report further commented,

> *"Attitudes rarely reflect simple bigotry, we believe instead that they reflect an easy, idle assumption that disabled people may cause trouble and extra work...*(30)"

In conclusion the report found that not only was provision in terms of access inadequate but that this situation was largely a consequence of a lack of mandatory legislation and an overall lack of awareness on the part of the general public and building designers of the needs of disabled people. Two principal recommendations emerged, first, that the Code of Practice be incorporated in the building regulations, and that the onus of proof that providing access was unreasonable and impracticable, shifted onto the developer(31). Second, that *"architectural and design schools give more emphasis to the problems of access in their professional training(*32)." Although the former proposal was not immediately adopted, the findings served to provide the impetus for the redrafting of CP96 in 1978, a precursor to the implementation of building regulations relating to access.

2.2 British Standard 5810 : 1979

BS 5810 : 1979 Code of Practice for Access for the Disabled to Buildings replaced the British Code of Practice CP:96. The key reference used was the fully revised and expanded edition of Designing for the Disabled, 1976. This work was widely accepted as the definitive design manual. However, Glynn Stanton an ergonomist, states reservations about some of its content, now incorporated into BS 5810;

> *"Selwyn Goldsmith has made a remarkably successful job of bringing together international knowledge and opinion in a single volume at a crucial time in code development... it must be said however, that it does contain some recommendations with which from my personal experience and knowledge of hospital work, I cannot agree. It follows that where these have been 'lifted' and used in codes of practice, I disagree with their recommendations too*(33)."

Stanton's concern about the feasibility of BS 5810 has in recent years been echoed in the findings of two reports (Haigh, R & Feeney,R.J. Crawford, A et al) (34,35). The studies revealed a number of shortcomings in the design prescriptions; lack of empirical anthropometric, ergonomic and social data were identified as the main factors leading to an inadequate quality and quantity of the British Standard, which is currently being completely overhauled.

2.3 The Disabled Person's Act 1981

1981, The International Year of Disabled People helped to regenerate public interest in disability related issues, particularly 'integration'. This was also the year of the Disabled Person's Act. The original bill was drafted by Dafydd Wigley, a Welsh Nationalist MP. Wigley had the bill passed at all stages with almost no opposition, by what has since been paid tribute to as 'a mastery of parliamentary tactics'. This success may also be accounted for by the strength of support offered by the many groups of disabled people, angered by rights they felt they had been denied for too long. Mitchell recorded the processes happening at the time, and noted,

> *"Members of parliament were inundated with letters and 329 - over 50% of the House of Commons - signed a motion in favour of access legislation along the lines of the Silver Jubillee report*(36)."

The bill redrafted by the Government was muted by the removal of the key enforcement clauses. However, it was later restored, as passing through the Commons at the same time was a Scottish bill. The Scottish minister demanded an accessibility clause to

strengthen the Town & Country Planning Act 1971, and argued that the CSDP Act 1970 already made access to buildings a precondition of planning permission. The bill was passed and the English Department of Environment followed suit.

The Disabled Person's Act amended the Town & Country Planning Act 1971 in two ways(37). Firstly, it placed a duty on local planning authorities when granting permission for any development covered by Section 4 of the 1970 CSDP Act to draw attention of the developers to the requirements for access in the 1970 Act and to the British Standard 5810. Secondly, Section 6 of this Act replaced the wording in the CSDP Act about making provision for access by disabled people where 'practicable and reasonable' by the wording 'appropriate provision'. However, this has yet to be brought into force.

A DOE Circular 10/12 was later issued, which suggested that a note should be attached to local authorities' notice of approval of planning permission, and which drew developers' attention to their obligations under the CSDP Act.

There followed a further DOE Circular 10/82, intended to clarify the Disabled Person's Act 1981. The recommendation was made, that as access falls under the jurisdiction of the planning authorities, an access officer be designated. However, the criticism has been made that it reveals instead an inherent weakness in the Act, as discretion is left up to individual local authorities as to whether to enforce compliance with the Act or not. It was noted,

> *"This in effect leaves the provision of access to the negotiating and bargaining skills of the local authority. It places the financial considerations and developers above the needs of disabled people*(38)."

A 1985 survey (39) carried out by the Access Committee for England to gauge local authority response to the implementation of the Disabled Person's Act 1981, found that only 3% of the 61% of questionnaires returned by councils, had refused planning

permission on the grounds of access, and only 20% had improved access provision as a condition of planning permission. Nor was provision for disabled people automatically made at policy level; only 33% of councils had incorporated relevant clauses in their local plans. Most councils tended to see their role as advisory rather than as watchdog. These results were used to press for the further tightening up of access legislation.

2.4 The Advent of the Building Regulations

In 1975 Mr. John Hannman, M.P. and then secretary of the All Party Disablement Group, introduced the subject of using the building regulations as a means of enforcing compliance with access requirements(40). This suggestion was later killed by the then Minister of Housing, who refused to give the measure his support. However, continued and applied pressure from Hannman and lobbyists eventually won through.

The first set of Building Regulations (an amendment of the 1976 Building regulations) came into force in August 1985. These roughly coincided with the Scottish version of the Building Regulations, an amendment of the Building Standards (Scotland) Regulations 1981 which took effect in March 1985.

The Building (Fourth Amendment) Regulations, 1985, Part T Access and Facilities for Disabled People, enforced access provision in certain categories of new building only. These categories extended to all floors of new office and shop buildings, and single storey buildings to which the public may be admitted, including factories, schools and educational buildings. Included in the regulations is access to and within the buildings, accessible toilets and spaces for wheelchairs in audience and spectator seating. BS 5810 and DES Note 18 for educational buildings became the 'deemed to satisfy' documents for the purpose of compliance with the regulations. The Scottish Regulations covered much the same ground, although they stipulated that direct access only be provided to a

storey at ground level. However, unlike their English counterparts, alterations and extensions fell into their remit.

In late 1987 Schedule 2 to the English Regulations was replaced by Approved Document Part M. BS 5810 currently under review was no longer deemed adequate for the purposes of enforcement. The Approved Document was designed to include practical guidance on ways in which the access requirements can be met. However, the AD has since been much criticised. McGough in an article entitled "Unhappy Birthday Part M" maintained that Part M,

> *"to the practised eye is seen to be extremely flawed, compromised in its effectiveness by anomalies, loopholes and dubious perspective*(41)."

Amongst the many problems cited, the main ones, the failure to cover alterations to existing buildings or multistorey buildings and the oversight of the needs of those with sensory impairments, served to undermine its viability. However, AD Part M, has recently been revised, and moved some way towards correcting the original limitations. Similarly, this is also true of Part T (Scotland), which has now been extended to cover all floors of all buildings to which the public are admitted. Although the updated Part M has been received with less criticism, it still contains a number of potential loopholes that "*unscrupulous developers*" could take advantage of(41). Indeed, both AD Part M and Part T (Scotland), await the finalised revision of BS 5810, currently redundant but likely to serve as a future 'deemed to satisfy' document.

3. Future Legislative Developments

The signs are that the universal design philosophy will impact upon, if not permeate all new developments in the field. The British Standards Institution (BSI) recently stated that it had embraced this approach and is operating a phased review and development of legislative initiatives which will eventually 'co-ordinate and harmonise' British design

prescriptions with European ones.

Published Document 6523 : 1989, the draft basis for the revised British Standard 5810 : 1979, best exemplifies future trends, considerable investigation having been undertaken into the worldwide situation as regards access legislation. As one observer noted,

> *"They (BSI) examined 60 source documents, including 16 national standards and 20 other key sources and have produced a document which directly compares, across the whole board, every piece of information that has been produced in relation to use of buildings by disabled people. The divergence that emerged is extraordinary. However, there is a consensus that emerges*(42)."

PD 6523 sets forth a series of recommendations based on the findings of the above study recommendations, for the content and lay-out of the revised BS 5810. Indeed, BSI state that the future BS will embrace the principle of universal design, emphasising a move away from,

> *"the popular perception of disabled people as a problem to a more balanced view of our population as a whole representing a wide range of needs*(43)"

However, notwithstanding such intentions, the recommendations overall failed to explicitly make the philosophical realignment from a micro to a macro design approach, that is, from ensuring access 'for disabled people' to ensuring the creation of environments accessible to all. The PD states,

> *"Any future British Standard should include detailed descriptions of different types of disability, the problems faced by people with such disabilities and their functional requirements. Data should be provided on the capabilities and requirements of disabled people. This together with information on the type of disabled people with whom the standard is concerned, would provide useful information to enable architects and planners to provide a user-oriented approach to their work*(44)."

In this context, the focus on 'disabled people' with distinctive needs from everyone else, clearly undermines the desired more *"user-oriented approach"*. Further, the failure to incorporate even a brief description of the 'extended scope' concept, contrasts unfavourably with the Dutch European Manual, intended to serve as the basis for a future European Directive, and as the exemplar for eventual legislative harmonisation with the 12 member states.

Although, the principle of universal design is not directly referred to in the PD, it is likely, given the Dutch and American precedents which strongly favour this approach, that open consultation will recommend its inclusion in the finalised version. Indeed, such is the primary role of 'integral accessibility' within the European Manual that the authors stress,

> *"Integral planning on the basis of the extended scope is the central principle of the European Manual, which can be seen as a first manifesto for integral accessibility*(45)"

However, doubts are expressed as to whether design legislation is adequate in itself, as a means of communicating a design philosophy which represents such a radical departure from the traditional thinking of designers. By nature, universal design relies on responsiveness to socio-environmental context, relative to circumstance and on the flexibility to reflect this sensitively and articulately. Too much standardisation may limit the ability to fluently adapt designs to create more integral solutions. Furthermore, standardisation, through design prescriptions, is widely perceived by many designers, given their rejection of positivism, as a threat to their essential creativity. One frustrated designer, whilst not unsympathetic to user-oriented design, observed,

> *"The thing is, though that the law is an extremely crude instrument, which does not express in the deepest way how to arrive at harmony...People would like the street to have a fairly rural character; they don't want buildings encroaching on it, possibly for reasons that have to do with safety of children, or with horses...I'm not at the moment questioning the judgment of the community in saying that they would like houses to be set back from the street. I'm saying that a rule that says that one wants to have houses a little bit*

away from the street should be flexible enough to permit the right thing to be done in any given case. A rule that says it has got to be a minimum of twenty-five feet back exactly, and that therefore puts somebody who locates it twenty-two feet back in a particular case in violation of the law, even though that is the right thing to do, is causing an incredible bind, even if unintended. Of course there are no evil magicians sitting chuckling in Zoning Department. The twenty-five foot rule is a sincere attempt on the part of the zoning people to create a sensible and useful standard. But the rule happens to be very inflexible. Therefore it becomes technically impossible to do the right thing(46)."

Thus universal design as a philosophy runs counter to strict prescriptions, and can only be properly expressed if given adequate scope to manipulate and engender appropriate spatial configurations. This is also recognised by Wijk, an author of the European Manual, who asks,

"Is legislation the best way of making developers and architects make their buildings accessible? Some people would argue the case for that, perhaps especially those who are continually frustrated by inaccessible environments and inadequate facilities. An inaccessible design should be thrown out of the process before being built. However, I do not think that legislation on its own is enough. Good creative plans do not come about because of enforced situations, and the integral aspect of accessibility cannot be captured by isolated pieces of legislation. Only if integral accessibility originates with the architect and is automatically taken into consideration can the problem be solved. Legislation should be a catalyst; if it is relied upon to create accessibility then their will only be more segregated access solutions(47)."

The PD does, however, stress the need for a more informative educational presentation, to support the technical details,

"It would, therefore, be better to provide guidance to enable architects and planners to think through the design of buildings to ensure that all the features and elements encountered by a disabled person in and around the building are accessible and usable. The merit of this approach is that if used properly it is likely to produce more effective results. It will however require more detailed and informed consideration than required in just following a list(48)"

Interestingly, the recognition of the need to discourage designers from using the standard merely as a 'cookbook', is followed up with the following three suggestions, which designers should adopt and exploit,

*"**a systematic approach** to the analysis of the needs of different types of disabled people when using the building, bearing in mind the use to which the building is to be put, the proportions of the different types of disabled people likely to use the building, and any special needs of a particular individual or group."*

*"**a 'design philosophy'** by identifying the tasks that have to be carried out and systematically considering the design of the environment, taking each element and feature in turn. The purpose of this approach is to ensure that the tasks can be carried out by people with different disabilities. For example, the most common task is to get from A to B. All related components of this task have to be analysed to ensure that the design and layout of the equipment and fittings used in the journey are suitably designed and that overall the task can be completed easily and conveniently bearing in mind the different requirements of people with different functional ability".*

*"**their own experience and expert judgment** in extrapolating from available research findings on the design of features and elements used in one specific setting to their design used in one particular application under consideration*(49)"

The call for the application of the above approaches, indicates that, in the light of a substantial body of evidence, much of it divergent, and supported by often negligible research, the BSI, aware of the diversity of opinion, is implicitly pointing out the limitations of such guidelines. Indeed, whilst it is affirmed that further research would serve to improve the quality of the technical guidance, it is suggested that this, if not used appropriately by the informed, interpretative abilities of the designer, will be inadequate as a means of addressing architectural barriers. The emphasis is firmly laid on the need for designers go beyond rote compliance with the minimal design guidelines. In all three recommendations, designers are exhorted to adopt an empathetic awareness of user requirements, and more rational, analytical skills, which are essential for the effective transmission of a universal design approach. Skills are further, best infused through architectural education; as Wijk put it,

"Accessibility is by far the most important functional demand which can be made of a building, but there are also other aspects. Everything I have learned about accessibility and put into the Manual has been learned in practice, and not in academic study. Far more should be done during architectural students' time at university, because the matter is not being tackled at the moment(50)."

Recent Norwegian research(51) found, in spite of the existence of statutory accessibility legislation, that *"a series of typical faults emerged which in a majority of cases negate other investments for accessibility"*. Such faults most often comprising, access ramps which were *"commonly too steep and/or lacking landings at the top"*, changes of level giving rise to *"inadequate solutions, particularly between landing at entrance door and finished floor inside"*, and doors, *"heavy (fire) doors which in effect block corridors, passages, entrances to car parks and in many cases also entry to flats"*. It was further suggested that these *"slips or goofs in detailing"* evidenced, *"a severe shortcoming : knowledge of correct building details is severely lacking - detailing for accessibility is a comparatively new skill, and it contrasts strongly with established building practice."* Such faults, it was observed, had arisen from an overall lack of familiarisation and skill of all involved in the design process and the inherent limitations of the design guidelines. The recommendation was made that,

> *"A policy for inclusion of accessibility in education for the building professions has been agreed recently. This provides a necessary framework, so that accessibility may be introduced more systematically in all fields of education related to building planning and practice."*

It may be plausibly argued that such architectural barriers are the result not only of a lack of designer awareness but of a number of other contributory factors. However, the building designer must accept a large share of the responsibility if she\he is to retain her /his important role as professional arbiter between the many interest groups involved in the design process. As Cuff observed,

> *"The architect-designer, among those individuals has the added responsibilities of co-ordinating all contributions and giving them spatial expression*(52)."

This degree of control, expertise and creative integrity could be threatened or relinquished if the designer were to suspend judgment and follow a set of strictly prescriptive rules regardless of context. In short, design guidelines can best be described as tools, and applied as tools.

There is a parallel here with Computer Aided Design (CAD), which has been received with some degree of ambivalence by designers, those tending towards the 'architecture as art' end of the spectrum perceiving it as a threat to their essential creativity, and those with a more technological bent, perceiving it as an ultimate replacement to the role of architects.

4. Universal Design : The Way Forward

If an alternative design paradigm, universal design, is to be endorsed by the design community, it must work. That is, the sum of all the parts must add up to a viable whole. Thus it may not be enough that the end product is thoroughly user-responsive if the design fails on another level, thermal insulation for instance. This design system, or *"Total Building Performance"* as Zeisel explained,

> *" is the term that the group of social and building scientists with whom I have been working use to describe the results of the way construction, mechanical system, aesthetic, ambient, managerial, and occupancy characteristics relate in a single building* (53)."

Cognisance of the 'wholeness' of a building, if assimilated at an early stage in the design process can help create not a disjointed structure, but one of coherence, and fluency, where all the components are integral yet unobtrusive. As Buchanan put it,

> *"Social dynamics are not the only discipline shaping the plan. Structure, services, construction are all crucial too, as are contextual pressures and climatic, formal and experiential considerations. But in many schools students do not learn how structure and services assert their own disciplines during design and how, if considered properly and early enough, they drop into place as organically integrated elements shaping space and form rather than intruding on them*(54)."

However, incorporating basic accessible provision into buildings has long been considered by designers an extremely costly exercise, indeed so costly as to be

prohibitive. Such is the degree of resistance to access proposals, that a pressure group emerged, calling itself the Ad Hoc Committee of Practising Architects, Engineers and Surveyors(55), with a manifesto tellingly entitled *"Handicap to the Nation - Construction Industry Alarm at Proposed Disabled Access Law"*. The group lodged objections on the grounds that whilst circulation areas would be reduced, costs would soar. Studies(56) have shown however, that this is a misconception, the cost of providing basic access facilities averages from 1% to 4%, due to the inclusion of lifts for instance. The additional access, it was concluded, increasing the general level of safety and convenience for all, thereby more than offsetting the 'extra' expense.

Moreover, accessible design is often rejected by designers, who believe it to be a synonym for ugly. They argue that it is a costly and unnecessary constraint, cluttering up clean pure spaces with hospital hardware, like grabrails, stair/chair lifts and ramps. A number of recent public buildings in America are hardly exemplars of good design, due to unattractive features which have been tacked on to the main form, often as an afterthought. They do, however, serve as useful exemplars of how not to approach access, by attempting to comply with codes at a late stage in the design process. Indeed, accessible design when applied by a practitioner cognisant of physical differences, far from presenting limitations calls, for the imaginative expansion of the traditional architectural vocabulary.

Buildings should facilitate or reflect the intentions of the user(57). It is thus important to relate the needs of the user as closely as possible to the design features of a building. The goal is a high degree of congruence between the designer's perception of need and the actual need of the user. However, should a gap or disparity exist, the user may be handicapped, unable to properly fulfil an aim. Baum et al explain,

> *"Arrangements of space inevitably restrict behavioural options (we cannot walk through a wall unless one is there), and to the extent that these restrictions inhibit preferred ways of behaving, users will be dissatisfied and negative reactions will be manifested*(58)."

Design restrictions may have far-reaching effects for people with disabilities. The more physically able when confronted by obstacles may perceive of them as awkward, but they can more readily adapt their behaviour. Indeed, if exposed to such restrictions over a certain length of time, an unconscious state of acceptance might set in, a habituation. Thus what may appear as a minor inconvenience, can be transformed into a major barrier for a person with a disability, prohibiting access.

Zeisel(59) suggests that congruence may be increased, by building-in design flexibility, thereby accommodating a greater number of behavioural options. This supports the 'universal' or 'macro' school of thought. The degree of design flexibility, as Baum et al(60) note relies on the available number of design alternatives, that is, the number of appropriate design permutations which can be arrived at for any one setting. If there are too few, it may be that costly adaptations are required. This is evidenced by new buildings which fail to conform to the building regulations demanding certain standards of access provision for disabled people. Research(61) has shown that it is far more cost-effective to cater for access requirements at an early stage in the design process rather than complying under duress when complete. Biswas further suggests that valuable lessons may be learnt from the adaptability in structure and materials of simple vernacular buildings in developing countries; in many cases more inherently universal in approach, and finely tuned to user-requirements than comparative Western models of design.

> *"Buildings of relatively 'high-tech' materials, such as concrete and steel, are usually never adapted because of the high technical skills, cost and the unresponsive administrative structure involved" whereas "the use of ecologically acceptable materials like mud and timber...sometimes waste materials, are used combined, modified and exchanged as the need may be. This gives them a degree of flexibility that most pre-planned buildings do not have. It is a practical means of improving accessibility cheaply. The use of low cost materials and methods of construction also means that easy and generous access facilities for everybody can be afforded instead of small, separate access features for persons with disabilities*(62)."

Designers, it is argued, must be educated to adopt a more positive approach towards creating designs which facilitate or reflect the intentions of the user, and to respond to this challenge as a creative opportunity to bring about satisfactory design solutions which demonstrate a high degree of congruence, or fit between design and user. Buchanan stressed the need for a greater social awareness on the part of the architectural discipline,

> *"Ultimately the lack of content and real richness in such art and architecture stems from a lack of the mastery of the medium and its intrinsic disciplines. A deep understanding of and engagement with these, and a constant honing of skills, are all necessary to the creation of works that are sufficiently densely considered yet suggestively terse to evoke real resonance in viewers/users. Now that the scenario or concept largely usurps (or at least swamps) the brief as generator of design, the reciprocative disciplines of shaping programme and plan have been lost-and with them concern not just with function and with aesthetic experience but also for social dynamics in all their many nuances."*

The application of universal design necessitates the 'dense consideration' recommended, a level of consideration, which it is argued, cannot be furnished by the design prescriptions in themselves, but only through the process of educational intervention, to provide a framework or basis of understanding from which full accessibility may be engendered.

5. Conclusions

The gradual and often controversial evolution of UK access legislation reflects not only the segregationist policies created by the British social welfare system, but the lack of statutory enforcement. Its cumbersome, often ineffectual measures have been repeatedly demonstrated as failing to satisfy the needs of people with disabilities, albeit through evidence which may be criticised for being largely anecdotal. To date, such prescriptive measures, based on little more than scant ergonomic and anthropometric research, are further undermined by the limited scope of their protections, open to expedient interpretation by opportunist designers or clients.

However, although in recent years, increased mandatory requirements have led to an increased familiarity and application of such measures; they are essentially narrow in their approach, stemming from a micro standpoint. It is argued that by virtue of their separatism, catering 'for disabled people' as distinct from the population at large, such legislative measures are fundamentally flawed as a mechanism for vouchsafing integration, and access for all. Furthermore, their status as minimal criteria, inflexible and standardised, is an inappropriate means of engendering universal design solutions. Not only do the prescriptions pose strict constraints on the designer's creativity and ability to sensitively respond to socio-environmental context, prohibiting innovation, but they also serve to reinforce within the designer, complacent, rote responses. Such responses may be little more than knee-jerk, and as the Norwegian research demonstrated, are also inadequate and often flawed due to a lack of informed interpretation and application of the prescriptions.

Just as design parameters should be extended to accommodate disabled people as part of normal provision, so design prescriptions should be. It is no longer sufficient to have 'special' guidelines relating to disabled peoples' needs; it is now incumbent that the existing prescriptions protecting the interests of all but disabled people, include disabled people.

Disabled peoples' rights should be supported by more far reaching anti-discrimination measures which are much needed to further equality through macroism, and the inclusion of disabled people in the design process, who currently have little to no redress if a building is inaccessible, particularly if it pre-dates the building regulations. Moreover, Anti-discrimination protections as the ADA has shown, necessitate an integral approach to design.

Thus appropriate user-responsive design relies not only on compliance with the minimum design guidelines but on the designer having fully absorbed the principles of Universal design into his/her design vocabulary. This process, most effectively

facilitated by educational intervention, engenders the adoption of a more positive approach towards creating designs which reflect the intentions of the user, and a response to this challenge as a creative opportunity to bring about satisfactory design solutions which demonstrate a high degree of congruence, or fit between the design and user.

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Chapter 5

Access Requirements of People with Disabilities : A Research Review

1. Introduction

"Blinded and crippled by tragic disease", *"piss on pity"*(1), number amongst the numerous sardonic T-shirt slogans sported by disabled people recently protesting against large scale charity ventures such as Telethon. Telethon, it is forcibly argued, casts people with disabilities in the much resented role of dependent, helpless victims, *"tragic-but-brave creatures to be cared for"*. To emphasise this point, a voice from the large group of assembled demonstrators called out *"What about a Telethon for black people"*; a notion so segregative as to be now too distasteful to contemplate, the ironic use of which marks the attitudinal shift won through black people's earlier campaigns for equality, mediated via anti-discrimination legislation. The attitudinal shift is now demanded by disabled people, with the impassioned plea for *"rights not charity"*.

It is observed that events such as Telethon only serve to confuse the meaning of *"'disability' (the product of social discrimination) with 'impairment' (the product of a medical condition)"*(2), by failing to differentiate between them. Just such a failure, the legacy of the traditional 'individual' medical approach to disability colours largely all the research investigating the building design requirements of people with disabilities to date. The principal projects in the UK undertaken by Goldsmith (1968), Thomson (1979), Silburn (1988), notwithstanding the architectural background of the two former and the social service derivation of the latter, all stem from a micro basis which focused on disabled people, and all fail to further place their findings within a wider social context. Indeed, although the studies laudably attempt to furnish the

architectural profession with a corpus of evidence relating to disabled peoples' access difficulties and (even in the cases of Goldsmith and Thomson), to postulate design solutions; however, such information is of little use without recognition on the part of designers of its intrinsic value and applicability. The RGU project has thereby undertaken a critique of this body of research, with a view to modifying and editing the methodologies. The basic approach stems from the pioneering work of Goldsmith, an approach adopted in order to generate an up to date broad brush picture of accessibility. The comparative evaluation adopted by the RGU survey, would then be used to inform the later stages of the research, investigating designer awareness of the principles of Universal design.

Research in the UK, dates back only three decades when it fell to Goldsmith to furnish the then proposed British Code of Practice CP : 96 Access for Disabled to Buildings, with supportive evidence(3). However, although the intervening period saw a proliferation of mainly local authority design guidelines, such guides were based on scant empirical research. Indeed, it was not only the specialism of ergonomics and anthropometrics which remained largely undeveloped but the entire socio-environmental field of disabled client accommodation; the prevailing 'individual' model of disability dictated a needs based, social service orientation which overlooked environmental design(4).

Further, the traditional tendency of the building design professions either to disregard, or to cater for the needs of people with disabilities as a homogeneous but separate group, served to restrict the focus of the few studies undertaken. The studies, deriving from a neglected architectural research base, not only failed to draw upon the social science research tradition(5) and incorporate such methodological tools as Post-Occupancy Evaluation, but place architectural barriers within the broader contextual framework of social discrimination.

The investigations undertaken thus stem from a narrowly conceived individualistic sphere of reference, which tends to fall into two categories; first, building user studies, assessing the needs and attitudes of disabled consumers and second, building studies, examining the accessibility and provision of facilities to and within building types.

2. Building User Studies

Aimed at addressing how well public buildings perform their intended function, building user studies by focusing on disabled peoples' needs and characteristics adopt the most individualistic 'medical' approach, posing three principal questions; 1)What demands are made of the built environment, that is, how often do disabled people go out and where do they go? 2)How accessible are buildings? 3) What are disabled peoples' opinions on access? These questions may be summarised under three headings:

* Destinations
* Access Difficulties
* Attitudes

2.1 Destinations

Goldsmith's 1968 Norwich based investigation, comprising only wheelchair users, reflected a narrow frame of reference, which overlooked sensory impairments. The aim of the study (which predated the 1971 OPCS Amelia Harris survey), aside from eliciting information on disabled people's needs within the built environment, was to yield as much information as possible about how severely disabled people managed inside and outside their homes and also lifestyle and the causes of their disability.

Intensity of building usage was assessed by requesting respondents to identify which, of a given list of 28 common building types, they had visited in the previous 12 months. Overall, Goldsmith found that disabled people significantly underused buildings,

> *"It would be generous to describe a person using 12 types of building out of a possible 28 as an intensive user of buildings, but if this is allowable it still means that less than one in ten of all people having wheelchairs in Norwich were intensive users of buildings*(6)."

However, this method of evaluation although repeated by Thomson(7) in 1979, does have a drawback, ambiguity. A broad brush conclusion rather than a more detailed analysis of the results is all that this particular method will permit, as the intensity of building use may be confused with the frequency of outings. Thus, although it is implicit that a high rating of building types, say 12, indicates a person who often goes out, this is potentially misleading as he/she may only go out once a month, visiting a different building type each time. Conversely a very intensive building user, who uses a building every day, may only visit two building types a year. A more accurate picture of the level of use of each building category might also have been achieved by further quarterly, monthly or even weekly breakdowns of the visits.

Thomson's later results indicate a sharp rise in the use of buildings. This can in part be explained by sample differences. Goldsmith's sample was comprised entirely of wheelchair users whereas only 21 out of 96 of Thomson's group used a wheelchair out of doors. However, the influence of the significant cultural shift towards greater independence on the part of disabled people, which occured within the intervening decade, cannot be overlooked; disabled people appear to be more assertive, and determined to manage, whenever possible, their own affairs. This overall trend, particularly with regard to the greatly increased use of post offices, marks a move away from Goldsmith's earlier, theory of delegation.

As an alternative method of gauging the relative importance of different building types to disabled users, Goldsmith advanced the notion that 'accompanied chairbound' people, given the severity of their disability, must be highly motivated to use a particular building type rather than delegate the task to someone else. According to this principal, all the buildings used by this group, were ranked by intensity of use. The results of this research led Goldsmith to conclude,

> *"Broadly buildings which afford a service which can be delegated by the handicapped person to someone else feature low on the list, whereas those where the service cannot be delegated feature high. On this basis it is explicable that railway stations, churches and dentists' surgeries come towards the top. It is also understandable that everyday shopping facilities, given that where possible people prefer to exercise their own choice rather than rely on others, are high on the list. In that public parks offer an amenity which can only be enjoyed by the individual in person, their relatively high position is also explicable.*
>
> *Buildings providing a service which, though its procurement cannot be delegated by a handicapped person to someone else, is not critical for the maintenance of basic needs feature lower on the list; in this category come cinemas, restaurants, theatres and public houses. At about the same level, though marginally lower, come buildings giving a service which, while a handicapped person might prefer to obtain it personally, can if necessary be delegated to someone else or otherwise circumvented; examples are clothes shops, hairdressers and shoe shops. At the bottom of the list come the buildings where the service can without difficulty be achieved by an agent, or which can be translated to the home of the handicapped person. On this basis the low ranking of chemists, doctors' surgeries and post offices is explicable. The building type whose usage by accompanied chairbound people appears to contradict the thesis is public lavatories, where the score was only 20%*(8)."

However, the delegation/accompanied chairbound method does not stand a great deal of scrutiny, and thus should only be used as an impressionistic rule of thumb. It is assumed that a buildings importance may be gauged by the number of severely disabled chairbound people determined to use it.

This begs a question; how many people gave up due to the enormity of the access difficulties because the architectural barriers were prohibitive, or who were so

discouraged by earlier problematic access experiences that they did not venture out again. This may possibly account, as Goldsmith admits, for the low proportion of assisted people using public toilets.

Level of mobility and thus building utilisation, and sensitivity to architectural barriers, may be affected by a conflation of variables, ranging from individual inherent characteristics, such as age, gender, type and severity of impairment to socially imposed factors including availability of assistance, mobility aids, transport, and dwelling location (whether it be rural or urban).

Age

The Norwich results (9) clearly illustrate the link between the number of buildings used and age. Indeed, the average number of building types visited in the previous year falls off considerably after 60 years, dropping from 4.8 for the 50-59 age group to 2.5 for 60-69 years, 1.6 for 70-79 and 0.9 for 80 plus. Thomson's research largely supports the above. However, 70 years marks the turning point in which building utilisation tails off. The high proportion of elderly people (over two thirds) in both sample groups should thus be borne in mind when considering the conclusions, as the younger, on the whole, more active population of disabled people has been largely under represented. Thus although the samples generally reflect the OPCS population spread (10), they neglect the broader range of consumer opinion.

Impairment Type

Goldsmith's survey(11) further highlights a close association between type of impairment and use of public buildings. Those with congenital disabilities use buildings most, scoring an average building use rating of 9.4, followed by 7.6 for polio, 4.5 for progressive disorders such as muscular dystrophy and multiple sclerosis, and 3.0 for paraplegia, down to 1.5 or less for the strongly age related yet most

common conditions which include osteo or rheumatoid arthritis. Thomson failed to correlate this particular set of characteristics, illustrating the shift away from the use of such a strongly medical focus.

Gender

The gender of the respondent appears to be a fairly negligible factor in Thomson's survey, although Goldsmith did find that males had a slightly higher building use rating at 3.7 than females at 2.8(12).

Wheelchair Use

Thomson's results(13) show that wheelchair users tend to use buildings less often than non wheelchair users, the most significant difference occured between those who use 12 or more building types per year, 24% as compared with 52% for the latter group. Goldsmith also found that the length of time spent in a wheelchair was associated with building use rating; the greater the number of years in a wheelchair, the greater was the intensity of building use.(14)

Availability of Assistance

25% of Goldsmith's wheelchair user sample would not go out at all unless accompanied by an able-bodied attendant. Thus, the availability of assistance determined the level of building use by a significant proportion of disabled people. Thomson also noted the correlation between degree of help available and intensity of building use. Recent OPCS figures(15) illustrate the importance of assistance and show that 22% of disabled people are restricted from going out unless assistance is available, leaving only 8% unable to go out irrespective of help. The report further states,

> *"those able to go out alone went out frequently; at least once a week in most cases. However, of those needing assistance to go out 29% went out less often than once a week. But among all disabled adults, including the housebound,* ***only 15% went out less often than once a week***(16). "

Transport

Goldsmith's results clearly show that disabled people's level of building use is much increased by the ability to drive their own car. Drivers ranked a high average of 8.3 building types per year as compared with those who do not drive but who had access to a car at 3.6, and those who had no car available at 2.0(17).

The recent OPCS findings(18) compared the use of different types of transport by disabled people with the general population.

Table 1 : Comparison of use of Transport by Non-Disabled and Disabled People

TABLE 1

Type of Transport	Disabled Adults	Adults in the General Population
	Proportion using each type of transport	
Private car	76	83
Bus	57	60
Train	23	40
Taxi	27	43
Voluntary Organisation's car/minibus	4	
Ambulance	3	
Areoplane	2	
No transport used in the past year	10	1

Table 1 illustrates that people with disabilities tend to use all forms of transport less than the general public. Furthermore the same study showed a direct correlation between the decline in use of transport and the severity of disability(18). Those more able to go out without assistance were also more likely to use public transport than people who relied on assistance, who tended to use cars. This is perhaps indicative of the degree of difficulty experienced by disabled people when using public transport. Indeed, 55% of a physically disabled sample group in Leeds found difficulty getting on and off buses, the principal form of public transport(19). The main problems singled out by Borsay from Feeney's study are *"platform access (steps and stairs) and carriage access (step height, lack of handholds and door widths)*"(20).

Location

Buchanan's 1982 study(21) compared the mobility problems of two sets of disabled people, urban and rural. Rural people, the report concluded,

> *"had much greater problems with mobility and accessibility. Car ownership was only a little higher, and public transport was much more limited. Facilities in rural areas were much less accessible. It was much more difficult for people to get to work, to shops and other services. people in rural areas went out less frequently than their urban counterparts and the handicapped people were much more ties to their homes*(22).

Proximity to local facilities plays a significant role in determining the level of building use within rural areas in particular. Even fairly short distances can prove an impediment as Thomson pointed out(23). Only 37 out a group of 96 disabled people could manage to walk *"a moderate*" distance or more, of the 21 who were wheelchair users only 5 could attain this. These figures are also reflected in the number of building types used. Those able to manage a moderate distance visited up to 22 building types a year, whereas the less mobile managed to visit a maximum of 10, and those unable to walk managed only 3.

2.2 Access Difficulties

Goldsmith/Thomson's building use rating offers only a loose measure of the intensity of building use by disabled people and therefore provides an ambiguous indication of the general level of accessibility of the building types. In order to elicit further evidence on the degree of difficulty associated with building types, Goldsmith (24) posed the question "Which building type would you like to see made easier for wheelchair users to use?" and asked respondents to rate answers according to their first, second, third and fourth choice. The results were ranked in order of accessibility preference and are set out in table 2 below.

Table 2 : Accessibility Preferences of Goldsmith's Sample

TABLE 2

Number of times each building type was mentioned

Public Lavatories	64	Dentist surgeries	3
Cinemas	17	Public houses	3
restaurants	16	City hall	2
Local shops	15	Employment buildings	2
Churches	12	Sports Stadia	2
Department stores	10	Art galleries	1
Hotels	9	Car park buildings	1
Hairdressers	7	Concert halls	1
Theatres	7	Doctor's surgeries	1
Public libraries	5	Museums	1
Post offices	4		

Interestingly, 180 out of a total of 279 people did not answer and were therefore recorded as uninterested in access. This proportion represented a majority of 64%. Furthermore at the other end of the scale, only 3% of people could think of 4 building types they would like to see made more accessible. Goldsmith attributes this significant lack of response to those people who did not go out at all and to "*those who did go out but were normally ambulant without a wheelchair*"; leaving 61% of the sample's opinions unaccounted for. It is more likely that the high proportion of missing answers reflect the very low expectations on the part of disabled people in the 1960's who were traditionally conditioned to blame their impairment rather than restrictive social practices.

Table 3 : Rankings of access difficulty, Goldsmith's Sample

Table 3

Services ranked in order of difficulty of physical access

Pavements	63%	Local government	20%
Road crossings	41%	Health centre	21%
Friends' houses	37%	Education centres	19%
Post offices	36%	Libraries	18%
Theatres/Cinemas	31%	Social services	16%
Banks	31%	Football ground	13%
Cafe's etc	30%	Swimming pool	12%
Shops	30%	Sports Centre	8%
Pubs/Clubs	24%	Hospitals	2%

Silburn (1988)(25) as part of a much wider survey of disabled peoples' social service requirements adopted a similar building type classification to that applied by Goldsmith and Thomson. Although the survey did not address intensity of building use, the difficulty of access to eighteen services was evaluated.

Table 3 (26) shows the proportion of respondents who from a four point scale identified physical access to the following services as 'usually difficult' and 'often difficult'. Unfortunately the semantic differentiation between Silburn's categories of 'usually' and 'often' is ambiguous and potentially confusing. Furthermore, although missing answers were recorded, no category was allowed for the experience of total inaccessibility.

Due to differences in the number and type of items, comparison with Table 2 showing Goldsmith's results is not possible. However, the results overall indicate very significant access difficulties which failed to be acknowledged or identified by Goldsmith's survey.

In Table 3, the list of building types and facilities does not include public toilets and churches, both of which, according to Table 2 are high scoring items of considerable concern to disabled people. Notwithstanding this omission, the list does comprise 'friends' houses'; 27% of respondents indicated that access to other people's homes was usually difficult. This also supports Thomson's results(27) which found that "more people considered accessibility to other people's houses to be of greater importance, than to public buildings (43% against 37%)".

In direct contrast to Table 2, 37% of respondents found access to post offices particularly problematic. This is yet further evidence which suggests that the Goldsmith delegation method is dated, and less applicable today, largely due to recent socio-cultural changes which have brought about greater independence for disabled people.

2.3 Attitudes

As illustrated by the results in Table 2, the level of awareness of physical barriers relates to an interpretation of the degree of difficulty experienced, an interpretation based on expectation. These expectations are shaped by socio-cultural influences, which given the 'disability as tragedy' model, so predominant in 1968 shifted the emphasis away from society to self, and thus to self-reproach.

Although Thomson's and Silburn's results suggest an increasing integration and self advocacy on the part of people with disabilities, a recent OPCS (28)study has shown, at least in the UK, that this upward trend is still limited. Indeed, the study found that a quarter of disabled people would like more visitors, and of these 67% of the under 50's blamed their disability as the main reason why they did not have as many visitors as they would have liked. Further questioning revealed that 47% of this younger group faulted themselves and their own personality for this situation, whilst the remaining older people were still more likely to mention health problems or their disability. The result did not appear to be related to either type or severity of disability.

This is a sad reflection of a low self-esteem amongst especially younger disabled people. Given such a tendency to blame not the complex range of external structural factors but personal characteristics, it is not surprising therefore that some disabled people remain unaware of architectural barriers and, as such, do not or cannot envisage the possibility of changing and improving what is promulgated as a very fixed and permanent environment. This further suggests that the reported access problems may be an underestimate the real level of difficulty.

Goldsmith's and Thomson's results clearly illustrate from the traditional medically oriented standpoint, "*using the disabled person as the point of focus*(29)", the significant disabling effect of a number of socio-environmental factors when combined with impairment. This approach, although illuminating about the effect of such factors

on the impaired individual, fails adequately to address or challenge the other side of the equation, the existence of social and physical barriers which are still regarded *"as being causally related to the impaired individual"*(30), rather than discriminatory attitudes and institutional policies.

However, critics stress the caveat, that it is not only the so-called 'helpers' in the relationship, whose "behaviour, roles, perceptions and attitudes"(31) must be questioned, a much wider more holistic sphere of reference must be adopted as a challenge to the medical model. Thus it is not enough that building design legislation as it relates to disabled peoples' needs (a micro solution), be fine-tuned or extended. It also imperative that this be set within the broader macro, milieu of anti-discrimination statutes.

Silburn's results show that notwithstanding the two decades which separate his survey from Goldsmith's, and the introduction of design prescriptions and building regulations, a large proportion of people with disabilities regard physical access as profoundly problematic. This evidence affirms, not only a lack of congruence between the designer's perception of need and actual need as expressed by disabled building users, but the failure of the individual, separatist approach, and the inadequacy of design prescriptions in countering architectural barriers, and thus points to the necessity of raising the awareness of building designers through pedagogical techniques, functioning as a conduit between designer and user.

Thus further research is required; to feed design education with more accurate evidence, and challenge dated detrimental stereotypes, which may be used both to inform architecture schools in the planning and development of programmes aimed at increasing cognisance of the principles of universal design and as an impetus stimulating the re-evaluation of current curricula.

Further up to date information is required, measuring the intensity of building use by disabled people, and their attitudes to the importance and difficulty of access, within the revised socio-cultural context. Likely trends of consumer demand in terms of degree of awareness, building use, and access difficulty will serve to inform building design education of the real needs and expectations of disabled building users within a rapidly changing milieu.

However, it is not enough to collect further quantitative data from people with disabilities without actively involving them within the research process. As Oliver suggests,

> *"Strategies have to be devised to ensure that research on disability provides an accurate and fruitful account and this can only be done by ensuring that the experience of disability is fed into the project by disabled people themselves, and at all stages: planning, design, fieldwork, analysis and report writing...having said this, it should be clear that no ideal blueprint for research on disability can be provided in advance, for satisfactory research can only be constructed by researchers and disabled people participating in a joint enterprise*(32)."

Thus it is essential to avoid the misleading path of the research to date. It is necessary to complement and augment quantitative data with qualitative evidence offering disabled people the scope to fully voice their opinions and exert a measure of control over the conclusions, ensuring designs compatible with their needs. This may be undertaken by means of an open loosely structured interview allowing the respondent the freedom to contribute and develop an in-depth descriptive analysis, a technique successfully applied by Shearer, 1982(33). The Research Institute for Consumer Affairs(34), when undertaking a recent survey of accessibility, employed the more novel but nonetheless valuable technique of asking people with disabilities to become diarists for the duration of a week, recording difficulties encountered when using public buildings. Alternatively, Thomson(35) carried out experimental visits with a range of disabled building users, yielding in situ critiques of the accessibility of given building types. The latter techniques offering disabled people the scope to act as design consultants,

demonstrated how a number of common architectural barriers, ranging from steps, heavy doors, out-of-reach shelves, to obstacle ridden public toilets, when combined, can serve to frustrate and diminish opportunity within largely every aspect of daily life.

3. Building Studies

The first major British investigation of the level of access provision in public buildings, both statutory and privately owned, was carried out in 1975 by the Snowdon Working Party for the Integration of the Disabled(36). The aim was to assess whether new public buildings built between 1970 and 1975 incorporated appropriate provision, in terms of access, toilets, signs and parking. The results clearly demonstrate that although there were apparent initial improvements, these fell away after 1973/4 which led the report to conclude that the Chronically Sick & Disabled Persons Act (1970) had little effect as a means of restricting architectural barriers within both the public and private sector.

The vast majority of the built environment however, comprises not new but older existing buildings, and it was with this point in mind that Thomson (1979)(37) undertook an intensive physical survey of all the public buildings within an area of one and a half square miles of the suburb Wood Green, with the exception of local and corner shops and all the buildings lining the main street. The 760 buildings investigated were classified according to function, ownership, size, catchment area, parking facilities, demolition orders, whether they were purpose built or converted, or adapted for use by disabled people.

Breakdown of the main use and ownership of the buildings showed that shopping comprised by far the largest category (69%). Of the remaining buildings, 20% were privately owned and 11% publicly owned. Table 4 adapted by Borsay from Thomson's results(38) illustrates that only 6.6% of the buildings surveyed had been specifically adapted for use by disabled people. Further analysis reveals that not a single privately

Table 4 : Comparison of Number of adapted Buildings with Total Number of Buildings in Wood Green

TABLE 4 The adaptation of public buildings in Wood Green

Facility	No.	No. Adapted
1. Shopping		
Local shopping centre	344	*
'Corner' shops	51	*
High Road shops	120	*
Chemists	8	-
Departmental stores	6	-
Supermarkets	3	-
2. Spare time activities		
Churches/chapels	29	-
Cafes/restaurants	26	-
Public houses	20	-
Parks	17	-
Libraries	4	2
Swimming pools	3	3
Cinemas	2	-
Arts centres	1	-
Sports centres	1	1
3. Information and necessity		
Government departments	12	2
Banks	9	-
Post offices	9	-
Estate agents	8	-
Public lavatories	8	8
Police stations	1	-
4. Health and welfare		
Doctor's surgeries	15	-
Dental surgeries	13	-
Clinics	2	1
Hospitals	1	-
5. Education		
Primary schools	11	-
Secondary schools	7	-
Nursery schools	2	-
Polytechnics	1	-
5. Transport		
Filling stations	10	-
Underground stations	3	-
Bus stations	2	-
Car park buildings	2	-
Railway stations	1	-

* not visited by survey team

owned building had been adapted. This also seemed to vary with function; public lavatories, leisure and local government services for instance, were generally more accessible than post offices, health or transport services.

However, Thomson did note that some commercial buildings, designed with wide thresholds on street level and pinned back doors to encourage an easy flow of speculative custom, addressed the needs of disabled users, unintentionally applying universal design principles. On the obverse side, older buildings denoting prestige, such as banks and hotels were often flanked by steps and thus completely inaccessible.

Thomson's study focused on extent of need for adaptations within existing public buildings and highlighted a dearth of accessible provision; such was the pervasiveness of physical barriers that virtually the entire built environment was shown to either impede or prevent access.

This dimension of Thomson's project, by focusing on the physical environment and its limitations, as opposed to the impaired individual, indicates the adoption of a more social model of disability within the methodology. Although encouraging, such an approach, which has been adopted by a number of recent studies, notably Norris-Baker & Stephens (1987)(39), Stanton (1988)(40), and Zisserman (1989)(41), it does not go far enough, as it focuses on the provision of 'special' adaptations for disabled people rather than evaluating general levels of accessibility for all, and the extent to which the environment is responsible for the creation of disability. Oliver further suggests that a useful research tool might be a 'disability index',

> *"-and might it not be a better aim for researchers indicators of disabling environments rather than continue to count the numbers of disabled people? Indeed, how much more interesting would it be to construct a 'disability index' for each local authority for example, so that Brent could be compared with Camden or Kent, to see which local authorities had the most and which had the least disabling policies*(42)."

Indeed, just as the international wheelchair symbol currently denotes accessibility, so it would be an ideal goal to strive towards a converse situation, where the existence of physical barriers is reduced to such an extent that they are exceptional; prohibitive environments meriting special attention through the signification of poor access.

4. Conclusions

Campaigns by people with disabilities, such as the one recently protesting against the detrimental image of disability portrayed by recent charity events such as Telethon are becoming increasingly common. Designed to bring to public attention demands for self-determination, and an end to social and environmental discrimination, such vociferousness reflects the changing attitudes of disabled people. However, surveys designed to evaluate the design requirements of disabled building users, are largely out of step, having not only failed to draw upon the social science research tradition, but failed to place architectural barriers within the broad social context. This has led to an imbalanced, myopic perspective, stemming from the traditional medical approach which has focused on the impaired individual; although it illustrates the disabling effect of the various socio-environmental factors, it neglects to further investigate the reasons underlying their existence. In short, it adopts a micro as opposed to a macro standpoint.

Comparison of Goldsmith's and Thomson's findings, separated by only a decade, demonstrates a significant increase in the intensity of public building usage by people with disabilities. However, Silburn's results indicate that this does not reflect less problematic access to public buildings. Just as more people are using buildings, so, more people are becoming aware of and reporting architectural barriers.

The survey results, including Thomson's building study, reveal that the vast proportion of the built environment serves not only to impede disabled building users but in many cases can prohibit access. This is a sad reflection of both the lack of awareness of

building designers of the real needs of disabled building users, and of the limitations of design prescriptions.

The relationship between consumer awareness, intensity of building use and difficulty of access, however, requires further investigation, evaluating future trends in consumer demand against a rapidly changing backdrop of socio-economic and demographic influences. This information, should be used as a working tool to dismantle detrimental stereotypes, and aid the development of pedagogical techniques designed to engender increased cognisance of user requirements, within schools of architecture.

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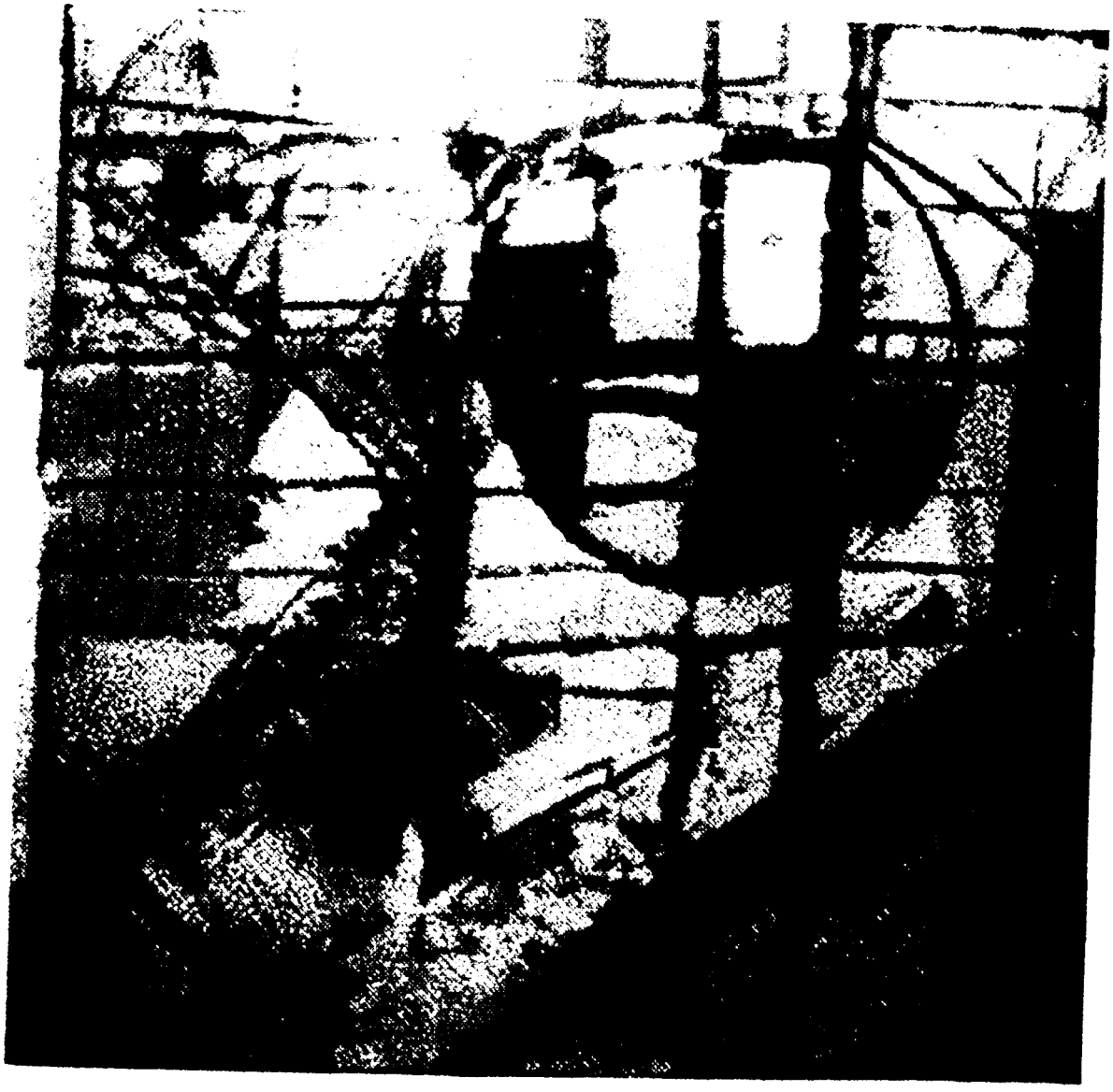
Chapter 6



A Regional Survey of the Access Needs and Priorities of Disabled People

1.Introduction

The hypothesis of the research project is to test the theory that designers do not give adequate consideration to the needs of people with disabilities and that they perceive of people with disabilities as a separate minority who require 'special' provision. Within this context it is suggested that building designers would be more able to serve the needs of people with disabilities if building design education incorporated a more holistic and user-responsive syllabus.

The research project, designed to test the above proposition, was developed as a three tiered study comprising the following avenues of inquiry.

1. A base-line survey by means of questionnaire to establish access needs and priorities, as expressed by a wide range of disabled people. This is followed by a series of case study interviews arranged around an informal checklist, to complement the quantitative evidence drawn from the base-line survey.

2. A questionnaire survey of the UK Schools of Architecture to review the curriculum content and the nature and extent of awareness of universal/integral design.

3. A longitudinal empirical evaluation of both building design students' cogniscance of universal/integral design and the effectiveness of a series of incremental educational

techniques designed to familiarise students with the design requirements of a heterogeneous public.

The first section of the project, covered in this chapter, constituted a large-scale survey, and a series of case study interviews, both of which were conceived with a view to gauging not only the degree of congruence between designers' perceptions of need and actual need as expressed by disabled building users, but current demands in terms of patterns of building use, accessibility and expectations, and likely trends in the future. For purposes of comparison, to gain a more accurate longterm predictive analysis of the course of these factors, previous models of building user surveys were adopted, and modified. Given the 'medical' bias of such studies, which narrowly focused on the physical-environmental interactions of people with disabilities without examination of the 'disabling' role of the wider social context (see Chapter 5), it was deemed necessary to avoid using the adapted models merely as a means of establishing the effect of socio-environmental factors on the disabled user, a narrow, one-sided approach which would only serve to reproduce past failings.

The base-line and case study surveys were thus designed to operate within a holistic framework, a framework which would examine the access awareness of architecture schools, and design students. Functioning as a conduit, between the user and building designer, the three sections combined, offered a broader contextual approach; the initial building user survey informs the later surveys of designer awareness, described in Chapter 7.

2. Methodology

The Sample

The base-line survey was designed to elicit as wide a range of disabled people's patterns of movement and opinions in terms of access to public buildings, as possible. Quantitative evidence was initially sought to establish a sound data base from which to extrapolate further evidence, evidence which it was hoped might both stand on its own and inform stages 2 : Survey of schools of architecture and 3 : Experimental evaluation of the user-responsiveness of architecture students and the effectiveness of awareness raising techniques.

The survey was largely formulated on the previous work undertaken by Goldsmith (1968), Thomson (1979), and Silburn (1988). Comparative analysis was necessary to strengthen the validity of the findings and to provide a longitudinal profile of the results, which might also serve as a projective tool. A full critique of the earlier research projects had been undertaken (see Chapter 5), forming the basis of a number of refinements included in the RGU survey (detailed in section 2, The Questionnaire). The survey sphere of reference was expanded to encompass not only Aberdeen City but Grampian Region, as not only would this trawl a greater number of disabled people but it would also depart from a city centric approach, tapping the views and characteristics of people from a wide geographic area, accounting for demographic variation.

The area to be surveyed covered Grampian region, with a total population of 502,910 (1)comprising the districts: Aberdeen city incorporating almost half (43%) of the total population, Banff & Buchan, 16.5%; Gordon, 14%; Kincardine & Deeside, 9.5%; and Moray, 16.8%. A recent survey of disability (2)in the area, undertaken by Grampian Regional Council Social Work (GSWD) department extrapolated from their findings a total of 16.8% people with disabilities in the population, and estimated that 66,720, one-in-seven of the population living in private households are disabled. This figure

significantly higher than the comparable OPCS(3) estimate for the area of 59,350. The wide geographical frame was selected for its lack of homogeneity, encompassing within its sphere extreme variation in terms of social and physical environment; factors which determine the distribution and needs of people with disabilities(4). The frame of reference was restricted to include physically disabled people aged 16 and over. Given limitations in terms of time and resources, those with a cognitive\ psychological\ psychiatric impairment were excluded.

A sample group of 374 users representing a wide cross section of disability types were drawn from Voluntary Organisations, Occupational Therapy Groups, Housing Associations and Press and Radio appeals.[1]

A broad range of voluntary organisations throughout Grampian were contacted. Indeed, with the sole exception of Action for Research into Multiple Sclerosis (ARMS) all the individual groups contacted represented people with a variety of disabilities. It was anticipated that this would mitigate any potential bias stemming from the over - representation of any one disability type.

Housing Associations and Occupational Therapy Centres comprising 29% of the total responses, were also targeted to further offset any bias arising from the participation of only disabled people who were members of voluntary organisations, and by implication more assertive and conscious of their rights. The views of those less visible and active were sought, to offer a more wideranging perspective.

Official records were initially considered a more statistically viable means of obtaining a randomly selected sample. However, access to statutory sources of names and addresses proved problematic and abortive. Respect for confidentiality, cited by the Local Authority was the principal ground on which permission was refused. However, the final sample composition demonstrates characteristics consistent with national average

[1] A list of participating organisations is included in Appendix A

statistics, proving initial reservations unfounded (see Table 5).

The Questionnaire

A postal survey was considered the most appropriate means of base-line quantitative data collection, as the views of a large number of disabled people were sought over the designated geographical area since there were too many people, to interview on a face to face basis given the limited time and resources of the research project.

A questionnaire was carefully prepared, overseen by the project's academic supervisors and people with disabilities, at all stages in its formulation. This ensured acceptability in terms of content, lay out, length, language, type face and size, and that it could be properly understood and managed by people with a wide range of communication skills, physical disabilities and visual impairments.[2*]

10 pilot questionnaires were initially distributed to an Aberdeen based voluntary organisation, the Disabled Christian Fellowship which comprised a wide range of disability types. All the questionnaires were completed and returned with a number of constructive suggestions, which were taken into account. For ease of comparison with related surveys (Goldsmith 1968, Thomson 1979, Silburn 1988), the questionnaire was devised as a composite of a number of sections which were refinements or modifications of earlier studies.

The sections include:

A. Social and demographic background

B. Functional mobility characteristics

C. Patterns of building use (frequency of use and destinations)

D. Attitudes (difficulty and importance of access)

E. Open question

* The base-line questionnaire is included in Appendix A

Section B incorporated the functional mobility categories recently applied by the OPCS (5), drawn from the World Health Organisation's ICIDH(6). While criticised for presenting social handicap as a derivation of impairment, this method was employed not only as an accuracy check against the local Grampian Regional Council(7) and the national OPCS(8) surveys, but as a means of demonstrating the heterogeneity of people with disabilities. The applicability of this method within the wider social context of the research project, offset any risk of an overall individual, medical bias. This section was further informed by Sheild & Silcock's 1989(9) investigation of the disability profile of users of a Belfast Leisure Centre, determining egress management within emergency evacuation procedures.

Section C refined "building use assessment" first developed by Goldsmith(10) and later adopted by Thomson(11).

Section D refined Silburn's(12) method of evaluating 'importance' and 'difficulty' of access.

Section E introduces an open ended question permitting informants, in what is otherwise a closed, economical format, the scope to express their own opinions about access difficulties.

The Response Rate

376 questionnaires were distributed via the participating organisations to their members; 184 questionnaires were returned, representing 49% of the total sent out. Of these, 20 questionnaires were returned incomplete, leaving 164 (44%) completed questionnaires; the response rate of nearly 50% exceeded conservative expectations.

Table 1: Grouping and Range of Participating Organisations, Number of Questionnaires Circulated and the Response rate.

TABLE 1 Organisations	Questionnaires mailed	returned	% response
Voluntary			
Disabled Income Group	49	33	20.1
ARMS	30	20	12.1
Social clubs	65	28	17
Support(self-help)groups	40	8	4.8
Sports clubs	8	3	1.8
Crossroads Care Scheme	12	5	3
Red Cross	12		
	=216	=97	=59.1
Occupational Therapy			
Day centres	60	27	16.4
Hospital	25	1	0.6
Community clients	5	2	1.2
Sheltered Workshops	12		
	=102	=30	=18.2
Housing Associations			
Langstane	20	5	3
Margaret Blackwoods	20	14	8.5
	=40	=19	=11.5
Press & Media*			
Northsound radio			
Press & Journal	18	18	10.9
Evening Express			
Herald & Post			
	=18	=18	=10.9
Total	376	164	99.7
	100%	43.6%	

* Press & Media results are combined

The composition of the final sample is determined by the number and type of participating groups and those yielding the highest response rate. Table 1, shows that just under two-thirds (59%) of the total number of completed questionnaires derive from Voluntary Organisations, 18% from Occupational Therapy Groups, 12% from Housing Associations and 11% from Press and Media appeals, reflecting a diverse spread of organisations.

Response rates vary within each category, notably the 100% return from Press and Media appeals; motivation to participate is an obvious factor in this context, with a high degree of interest demonstrated by respondents who have followed up pleas for participation in the survey, via telephone or letter to initially request a questionnaire.

Sheltered workshops, the Red Cross, OT clients based in hospitals, and self-help groups, all indicate very low response rates. A phone call to the organisations showing little interest, suggested that questionnaire distribution within the organisations was similarly limited, due largely to reluctance on the part of staff and/or organisers to breach what was perceived as a code of confidentiality with their clients.

3. Findings

Sample Characteristics

Table 2 :Location of Respondents by District

District	No' of respondents	respondents %	population %
Aberdeen	92	56.	43.
Kincardine/Deeside	13	7.9	9.5
Gordon	27	16.4	14.2
Banff/Buchan	14	8.5	16.5
Moray	18	10.9	16.8
	164	100	100

Table 2 reveals a skew in the proportion of respondents based in Aberdeen, reflecting the distribution of the total Grampian population who live in Aberdeen. However, although the sample population loosely corresponds to the population distribution, it does not reflect the areas with the highest levels of disability, Aberdeen North, and Banff and Buchan or the areas with the greatest number of disabled people per household(13).

Table 3 : Urban | Rural Location

Population of settlement	no' of respondents	%
over 200,000 (Aberdeen)	91	55.4
over 8,000	20	12.2
over 1,000	45	27.4
under 1,000	8	4.8
	164	100

Classification of respondents' home location as urban or rural was assessed by the population size of the settlement. Two thirds of the respondents (67.6%) live in an urban area, the remaining third in settlements populated by less than 8,000 people. Given the geographic and demographic variation of Grampian region, it was deemed important not only that the sample composition reflect this, but that rural denizens excluded in previous building user studies be included. Furthermore, Buchanan's conclusions arising from a study comparing the mobility problems of both urban and rural people with disabilities, also underlined this point.

> *"rural people has much greater problems with mobility and accessibility. Car ownership was only a little higher, and public transport was much more limited. Facilities in rural areas were much less accessible. It was much more difficult for people to get to work, to shops and other services. People went out less frequently than their urban counterparts and the handicapped people were much more tied to their homes*(14).

Thus showing that proximity to local facilities plays a significant role in determining the level of building use in rural areas in particular.

The gender and age profile shown in Table 4, reveals a largely even spread of respondents throughout all categories; whilst this does not reflect OPCS(15) statistics, which estimate that more than two-thirds of disabled people are elderly, it does offer a representative range more appropriate for the survey. The females do however, outnumber the males by 13%, the former comprising 76% of the over 65 age group, a figure which correlates with OPCS findings; not only throughout the age range was there a preponderance of women over men at all severity levels but there was a sharp increase in the proportion of women aged over 75.

Table 4 : Age Group by Gender of Respondents

Age		%	Gender	
			Males	Females
16-35	33	(20.6)	14	19
36-50	58	(36.2)	27	31
51-66	35	(21.8)	20	15
65-90	34	(21.2)	8	26
Total	160		69	91

* missing value 4

Minimum age = 17 Mean age = 49.7 Maximum age = 89

The gender and age profile shown in the above table, reveals a largely even spread of respondents throughout all categories. Whilst this does not reflect OPCS(15) statistics, which estimate that more than two-thirds of disabled people are elderly, it does offer a representative range more appropriate for the survey. The females do however, outnumber the males by 13%, the former comprising 76% of the over 65 age group, a figure which correlates with OPCS findings, that not only throughout the age range was

there a preponderance of women over men at all severity levels but that there was a sharp increase in the proportion of women aged over 75.

The lower proportion (31%) of over 60's in this study may be explained by firstly, the tendency of elderly people to define themselves as aged rather than disabled, the latter category being normally ascribed to those with visible mobility aids such as crutches or wheelchairs. Thus elderly people are less likely to respond to a questionnaire or become members of organisations perceived as catering for "severely disabled people". Secondly, the Occupational Therapy Day Centres and Housing Associations participating in the survey served younger disabled people, that is people under the age of 65.

Respondents were asked to describe in their own words, the diagnosis of their disability. The responses were grouped into the 8 categories listed below, based on the 1988 Grampian Occupational Therapy Service Review(16) and Silburn's 1988 report(17).

1. **Joints**

eg; rheumatoid arthritis, osteo arthritis, ankylosing spondylitis.

2. **Congenital disorders**

eg; cerebral palsy or spina bifida.

3. **Progressive disorders**

eg; multiple sclerosis, Huntington's chorea, motor neurone disease, parkinson's disease, muscular dystrophy.

4. **Traumatic injuries**

eg; head or spinal injury,, amputation.

5. **Organic conditions**

eg; cerebral vascular accidents (strokes), tumours.

6. **Infection**

eg; poliomyelitis, post meningitis, post encephalitis, polyneuritis.

7. **Sensory impairments**

eg; impaired sight or hearing.

8. **Other conditions**

eg; chest, heart or circulatory diseases.

The Grampian Social Work Department (GSWD) survey reports figures on the prevalence on disability in the area, figures which given regional variations closely correlate with national OPCS estimates. Although direct comparison with the OPCS statistics was not feasible, given the application of a different system of disability classification, comparison with both the GSWD and Nottingham sample populations was however permissible. The GSWD report, which included an itemised breakdown of age, number and type of impairment, permitted reclassification into the categories adopted by RGU; thus repondents with a cognitive impairment, psychiatric disorder and anyone under 16 were excluded, in order to render a more reliable match. The coding for the Nottingham survey, although similar to that adopted by the RGU survey, also required slight adjustment, again feasible as the raw data was provided. However, differences in the sample composition prevented exact comparison as only those of working age were included.

Table 5 indicates a close correlation between the disability profiles of RGU and Nottingham; both showed similar distributions of traumatic, congenital and organic impairments. RGU's sample however, had double the respondents falling into the progressive category. This may be accounted for by first, the 18% of respondents drawn from the voluntary organisation ARMS and second, the high prevalence rates of Multiple Sclerosis within Grampian region (Shephard & Downie,1978)(18).

Table 5 : Distribution of Disability within the Grampian Social Work Department, the Robert Gordon University and the Nottingham Survey

	RGU	GSWD	Nottingham *
	%	%	%
Joints	7.6	30.	16.1
Congenital	12.3	0.2	12.5
Progressive	30.5	1.5	14.3
Traumatic	16.4	0.9	17.9
Organic	8.2	3.	12.5
Infection	2.3	0.3	4.1
Sensory	2.9	12.3	5.9
Other	19.4	51.8	16.1

* Sample excluded all those over 65

The marked variation shown by the GSWD survey, which closely correlates with the latest OPCS figures on the prevalence of disability, contrasting with both the RGU and Nottingham surveys, may be explained by significant methodological differences. The GSWD project screened the general population for evidence of health problems, so yielding a very broad range of difficulties, both in severity and type, whilst both Nottingham and the RGU studies, selected their samples largely from groups already identified as having severe long term disabilities. A chi-square test found no significant degree of difference between the RGU and Nottingham samples ($P > 0.05$).

Interestingly, comparison with the Nottingham survey has shown that initial reservations about choosing a voluntary as opposed to a statutory sample are unjustified in this particular case, as the similarity of both sample distributions show, although Nottingham drew most of the respondents from Local Authority registers of disabled people.

Table 6 : Primary Diagnosis by Age Group

		%	16-35	36-50	51-65	65-90
Joints	11	(7.5)	0	1	3	7
Congenital	19	(13.)	13	3	2	1
Progressive	52	(35.6)	8	25	14	5
Traumatic	27	(18.4)	8	11	5	3
Organic	13	(8.9)	1	1	6	5
Infection	4	(2.7)	0	3	0	1
Sensory	5	(3.4)	2	1	0	2
Other	15	(10.2)	1	4	4	6
	146	100	33	49	34	30
			22.6%	33.5%	23.2%	20.5%

* Missing values = 18

As the OPCS results on the prevalence of disability underlined, most disabilities are age related, and increase in severity with the onset of years. This is especially true for diseases which affect the joints such as arthritis; this trend is shown in Table 6, where although the sample contains proportionately few elderly people, one quarter of those over 65 suffer from such conditions. Strokes and circulatory problems are also far more prevalent amongst the over 50's, accounting for around 60% of complaints in this age range. 73% of people with progressive disabilities are aged between 36-65, a high proportion of this group experiencing multiple sclerosis, which in Grampian has a mean prevalence rate of 48.2 years and mean onset age of 34.2 years(18); these statistics help to explain the large numbers within this age range. Of the congenital disorders, most (68%) of the affected tend to be young (16-35). This may be explained by not only the definition, but also recent medical advances, which now help to ensure a lower mortality rate, and increased life span for this group.

Table 7 : Degree of Assistance Required

Assistance	No' of respondents	%
24 hour help	37	22.9
help at least once a day	42	26
occassional help	56	34.7
no help	26	16.1
	161	100

* Missing values = 3

Table 7 shows that just under half (48.9%) of the sample group require assistance on a daily basis. Degree of assistance required may also serve as an approximate measure of the severity of disability, indicating a high proportion of severely disabled respondents; almost one quarter of whom require continuous care.

Table 8 : Use of Mobility Aids

Mobility Aids	respondent use %
Wheelchair & attendant	44
Wheelchair without attendant	28
Car	27
Walking stick	26.8
Electric wheelchair	10.9
Walking frame	8.5
Crutch(es)	6.7
Battery car	6.7
Calipers	5.4
Hearing aid	2.4
White stick	1.8
Attendant	1.8
* Use nothing	16.5

A very high proportion of respondents rely on the use of a wheelchair for mobility, either manual or electric; indeed, as many as 44%, unable to self-propel, require an attendant. This figure is more a reflection of the skew towards severely disabled people within the sample, than national levels of wheelchair use by people with disabilities. OPCS(20)

results showed that only 10% of people with a locomotor disability, and 7% of disabled adults overall use a wheelchair.

27% of the sample drive their own car and 6% use a battery car, permitting up to a third of the sample some measure of personal autonomy. Interestingly, the GSWD surveys show that as many as 67% of respondents, at least had access to the use of a car. This figure is matched by the increasing car ownership within the British population generally. The number of cars, within Aberdeen in the period 1971-1981, has grown by 62%, and over the same period in the UK, by 25%(21). This statistic, although dated, gives an indication of the increase in the past decade, which is concordant with an increase in the mobility of people with disabilities.

Walking sticks are by far the most commonly used mobility aid within not only the GSWD(22) but also the OPCS(23) population of people with disabilities, 29% of the latter survey using them; the RGU findings indicated a smaller proportion of the sample (26%).

Whilst the GSWD results found that 44% used some form of mobility aid, this figure doubles in the RGU survey, to 83% of respondents. If mobility aids are used as an indicator of sensitivity to the built environment, the RGU sample is appropriate, as shown by Table 8, which highlights the wide range of aids used and an intensive level of use.

Functional mobility characteristics were assessed on a 4-point scale based on the degree of difficulty experienced by respondents when attempting to undertake the physical tasks listed overleaf.

A very high proportion of the sample, 87%, experience some difficulty walking a short distance; indeed as many as 60% are unable to. However, it is not only distance which poses an obstacle; 90% of the sample reported some problems with walking up or down

stairs; these considerations which should be borne in mind when undertaking building design, hence almost half, 48% of respondents were forced to seek alternative access if confronted by steps or stairs.

Table 9 : Functional Mobility Characteristics

Functional Abilities	No difficulty %	Moderate difficulty %	Severe difficulty %	Cannot manage %
Walking a quarter of a mile on the level	12.2	14.7	12.2	60.3
Walking up or down steps or stairs	9.2	20.2	22	48.4
Bending down & straightening up	19.6	30	21.4	28.8
Keeping one's balance	17.1	33	25.7	23.9
Getting into & out of a chair	31.4	33.9	17.2	17.2
Holding, gripping or turning things	42.9	31.9	20.8	4.2
Pushing doors open	33.7	39.8	16.5	9.8
Using arms to reach & stretch for things	44.5	26.2	20.7	8.5
Hearing	83.4	14.1	1.8	0.6
Eyesight	67.4	23.9	6.1	2.4
Reading or writing	58.2	20.2	13.5	7.9

Although the statistics relating to dexterity, holding, gripping or turning things are less dramatic, with only 4% in the position of being unable to manage at all, nevertheless 52% of the sample experience some level of difficulty. This figure sees a marginal increase to 56% if related to pushing doors open, obviously a major bugbear. 46.9% similarly found

difficulty with reaching and stretching. Comparatively few people experienced difficulty with hearing, only 16%; however, this reflects the weighting of the survey towards those with locomotor disabilities; people with visual impairments are similarly under represented.

3.1 Patterns of Building Use

Frequency of building use was assessed using a 5 - point scale, measuring the intensity of respondents visits during the previous 12 months to the following building types.

Table 10 : Frequency of Building Use

TABLE 10

Building types	never %	once or twice a year %	once in 3 months %	once a month %	once a week %	*
Post offices	36.8	8.1	5	13.1	36.8	4
Shops	9.4	8.8	6.3	15.8	59.4	6
Banks	35.4	13.2	13.9	18.9	18.3	6
Libraries	66.6	9.8	6.5	11.7	5.2	11
Education centres	79.5	4.7	2	2	11.5	17
Pubs/Clubs	30.5	14.9	9.7	16.2	28.5	10
Theatre/Cinema	45.4	37.6	10.3	6.4	0	10
Health centre	47	17.8	13.9	15.2	5.9	13
Hospital	26.9	41.6	17.3	7	7	8
Sports centre	86	4	0.6	0.6	8.6	14
Local sports stadium	90.6	3.3	2.6	0.6	2.6	15
Swimming pool	71.3	6.6	1.3	3.3	17.3	14
Cafes	25.6	16.6	14.7	24.3	18.5	8
Friend's houses	10	16.8	21.8	17.5	33.7	4
Church	48.3	17.4	7.7	8.3	18	9
Museum/ Art gallery	80.1	12.5	4.6	1.9	0.6	13
Public parks	38.4	25.6	14.7	12.8	8.3	8
Public toilets	39.4	17.8	12.1	9.5	21	7
Total	47.71	15.53	9.30	10.45	17.01	

* = Missing value

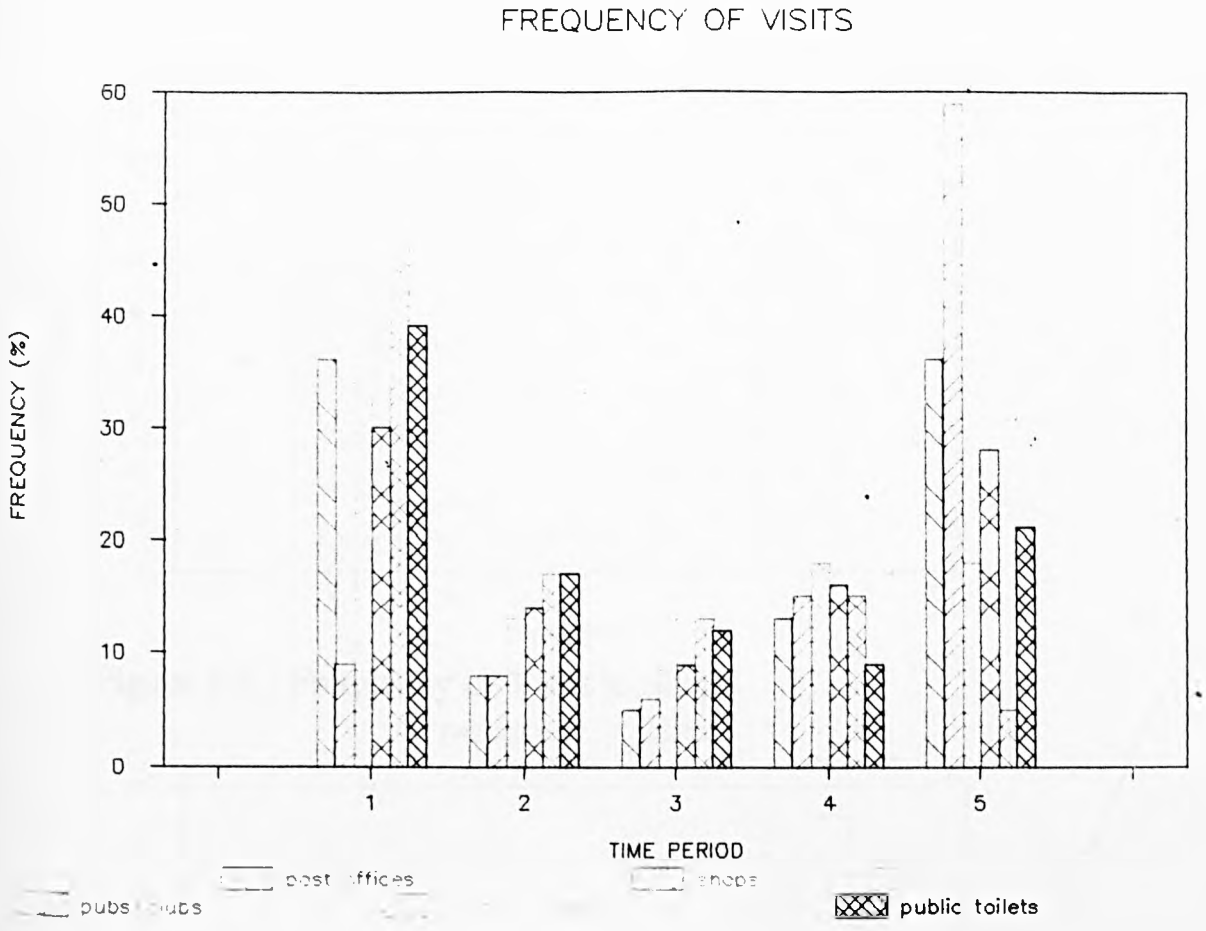
The aggregate scores show that as many as 47% of respondents, fall towards the extreme end of the scale; thus almost half of the sample more often than not reported a failure to use the above building types. The remaining scales of building usage involves a more balanced spread of ratings; however, the building types were used more than once or twice a year in only a third of cases, a limited minority of respondents (17%) using them on a frequent weekly basis.

A number of the building types offer specialist services such as Sports and Education Centres, which are little used by the majority of respondents, 86% and 79% of whom respectively never frequent them. Shops on the other hand, fail to be used by only 9% of the sample. This disparity which reflects not only the high degree of consideration accorded by respondents to the question but the more intensive use of building types essential for the fulfilment of the activities of daily living.

Thus in order to establish a more accurate picture of the underlying trends for such key public buildings, six services deemed crucial for self-determination, that is, the management and control of personal affairs, were isolated for further analysis.

* Post Offices
* Shops
* Banks
* Health Centres
* Pubs/Clubs
* Public Toilets

Figure 1 : Frequency of Visits to Key Building Types



key : 1 = never
2 = once or twice a year
3 = once in 3 months
4 = once a month
5 = once a week

Figure 1 illustrates the overall tendency towards the use of key building types if not often, occasionally or not at all, with fewer respondents falling into the intermediate categories. Further examination of these findings is required to determine the reasons underlying the marked low public building usage.

Figure 1.1 : Frequency of Visits to Post Offices

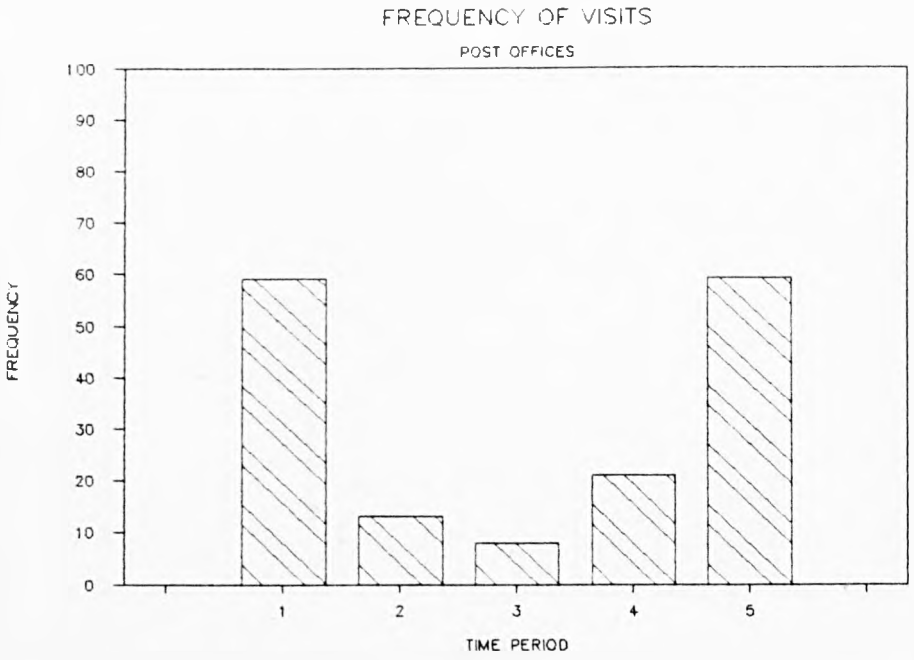
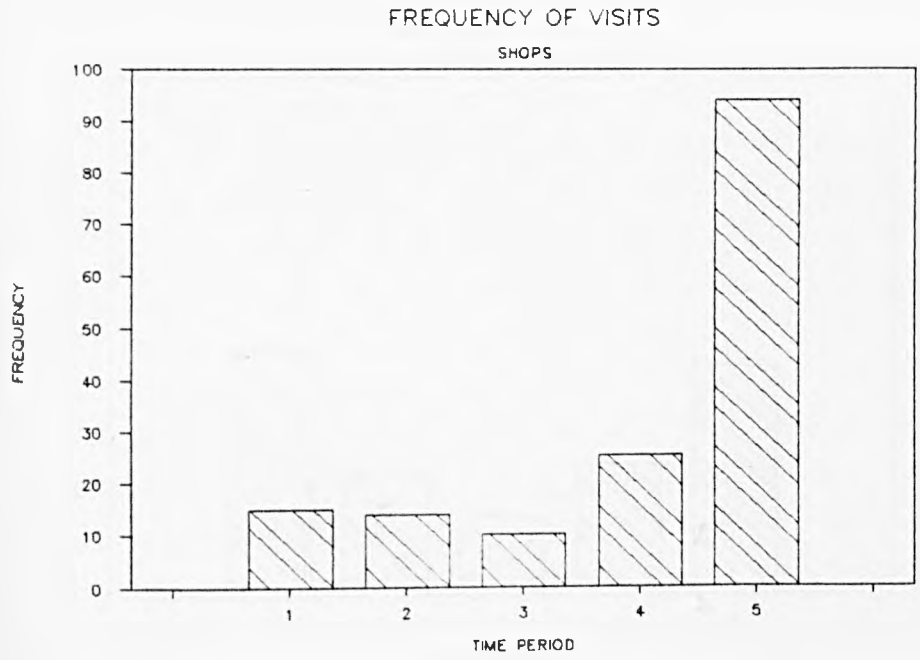


Figure 1.2 : Frequency of Visits to Shops



key :1 = never
2 = once or twice a year
3 = once in 3 months
4 = once a month
5 = once a week

Figure 1.3 : Frequency of Visits to Banks

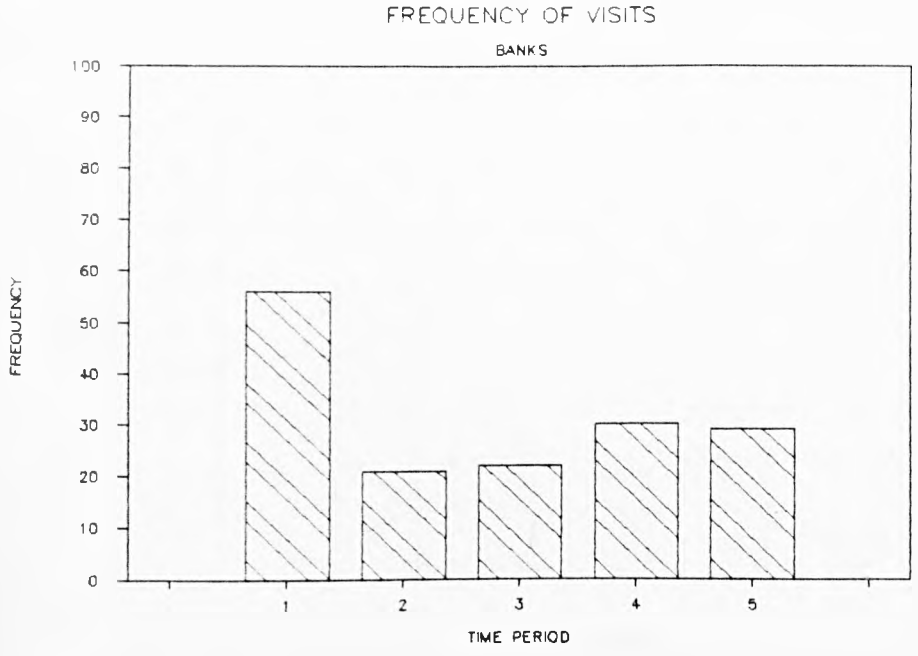
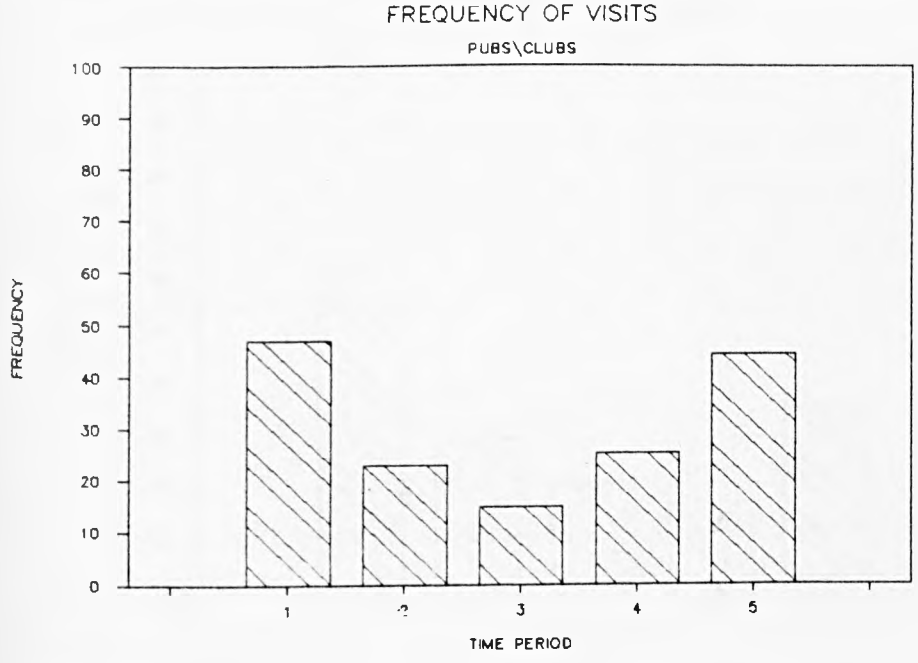


Figure 1.4 : Frequency of Visits to Pubs & Clubs



key :1 = never
2 = once or twice a year
3 = once in 3 months
4 = once a month
5 = once a week

Figure 1.5 : Frequency of Visits to Health Centres

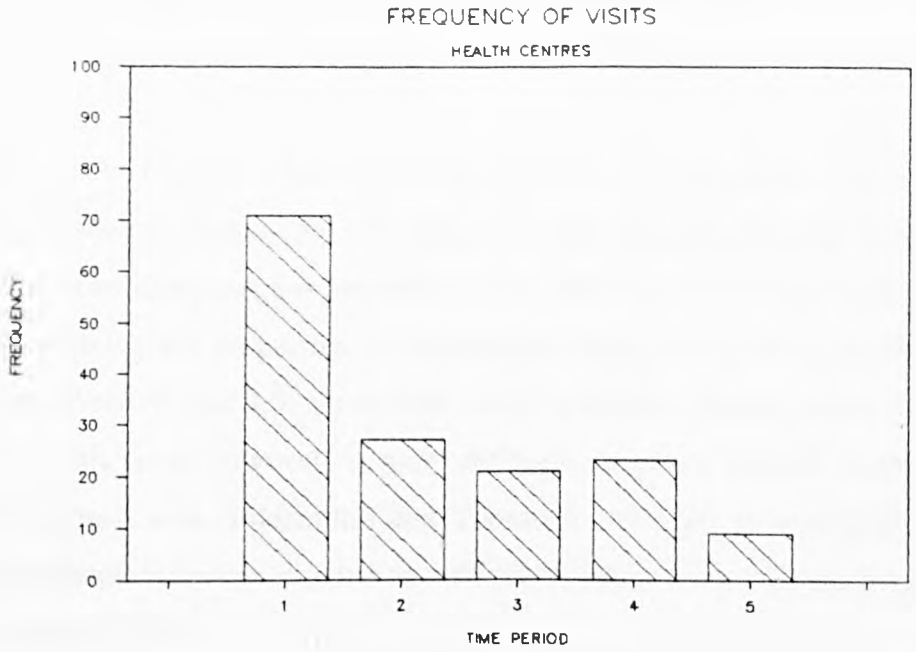
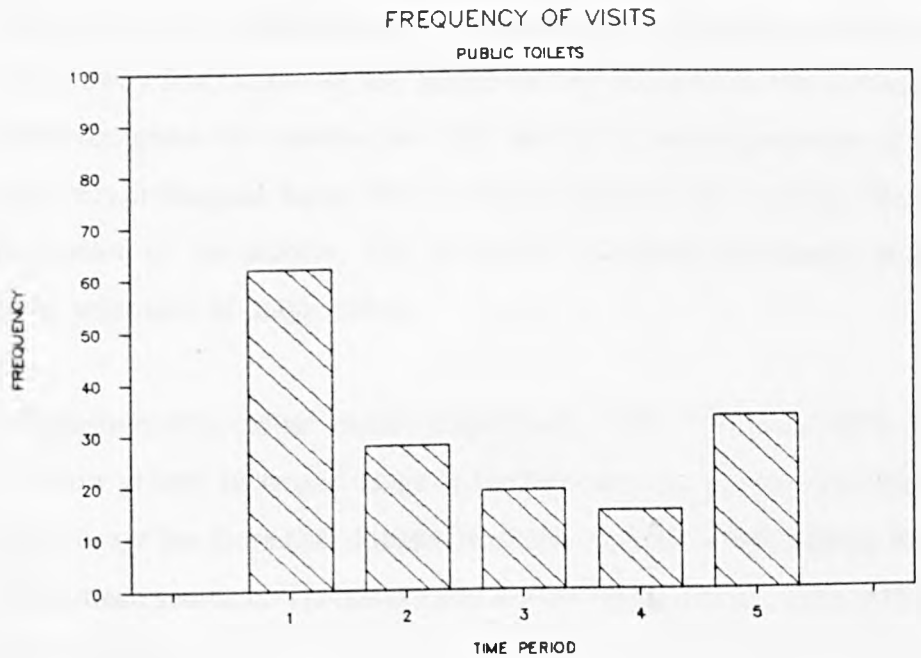


Figure 1.6 : Frequency of Visits to Public Toilets



key :1 = never
2 = once or twice a year
3 = once in 3 months
4 = once a month
5 = once a week

Figure 1.1. Post Offices are arguably one of the most essential services, and the high proportion, one third, of respondents who are unable to utilise this service indicates the proportion of severely disabled people thereby lacking personal autonomy.

Conversely, Figure 1.2 reveals that the majority of respondents, 75%, visit shops at least once a month; indeed only 9% never use them. Nevertheless, the encouraging upward trend in building usage is not repeated for Banks and Pubs and Clubs, Figures 1.3 and 1.4, with highest proportion of respondents noting a negative response, 35% and 30% respectively. Whilst 1.5, shows that visits to Health Centres reflect a similar negative skew, this trend however, is more difficult to assess without further reference and comparison with Goldsmith's and Thomson's surveys, as ostensibly it suggests that more people have less recourse to medical facilities, a statistic which may be interpreted in different ways.

Figure 1.6 Public Toilets, on the other hand is less ambiguous, as there can be little doubt that if away from home for any length of time recourse to this service will be essential. However, given the importance of this facility a surprising number of people 69%, use it on a very infrequent basis, that is once in three months or less, which given the large proportion of the sample, 75% of whom visit shops frequently, suggests significant under utilisation of public toilets.

Comparison with earlier studies (Goldsmith, 1968; Thomson 1979) as shown in Table 11, show greatly increased usage to the key services, particularly with regard to shops, where usage has more than doubled between 1979 and 1990. Indeed, further examination of the mean scores of Thomson's and RGU's frequency of visits, (39.6 and 67) reveals a 1.6 increase.

Table 11 : Frequency of Visits; Comparison of Goldsmith's, Thomson's and RGU's Surveys

TABLE 11
Disabled People who had visited key building types at least once within the twelve months prior to the survey

	Goldsmith 1968 %	Thomson 1979 %	RGU 1990 %
Post Offices	13	50	63
Shops	25 *	42 *	91
Banks	4	20	65
Health Centres	7 *	46 *	69
Pubs/Clubs	16 *	36 *	53
Public Toilets	29	44	61

* Grouped similar classification of services together for purposes of comparison, mean percentage usage given.

This significant rise in building use indicates a shift towards greater integration on the part of people with disabilities, and the concordant desire to take control of their own lives through personal management in contrast with the earlier tendency in the 1960's, as noted by Goldsmith, of the delegation of essential tasks to helpers. It should be noted however, that although the 1990 and 1979 samples comprised both ambulant and wheelchair users, all the 1968 sample used wheelchairs. Table 12 below, offers a further breakdown of the RGU respondents, permitting comparison between the proportion of wheelchair users in the RGU sample with Goldsmith's.

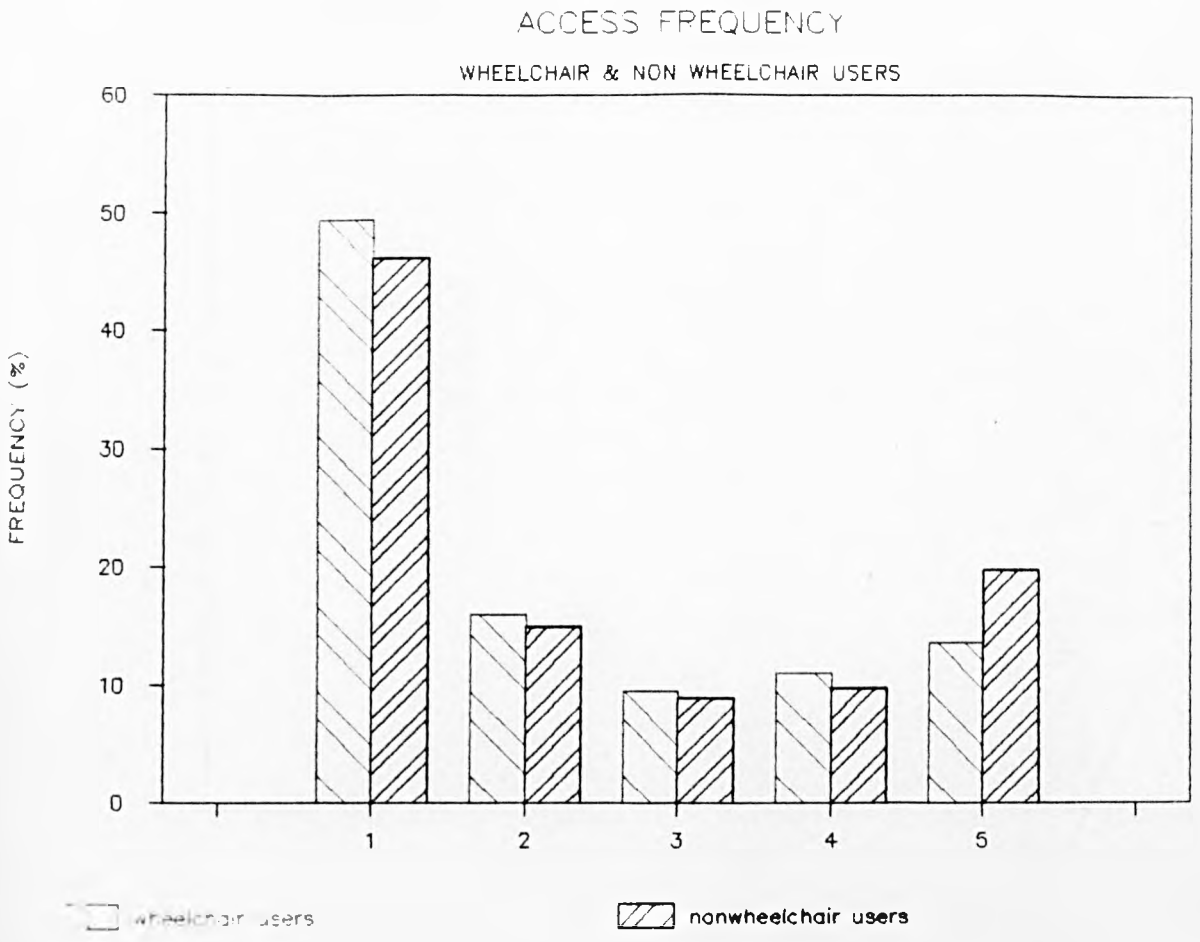
Table 12 : Frequency of visits to key building types at least once within the 12 months prior to the survey by wheelchair users.

	Goldsmith 1968		RGU 1990
	%		%
Post Offices	13		49
Shops	25	*	90
Banks	4		54
Health Centres	7	*	73
Pubs/Clubs	16	*	46
Public Toilets	29		60

* **Grouped similar classification of services together for purposes of comparison, mean percentage usage given.**

Tables 11 and 12 show that although overall building usage has risen amongst all respondents, the increase is proportionately less for wheelchair users. The precise extent of the difference in use between wheelchair users and non-wheelchair users in the RGU survey is further examined at a later point in this Chapter. However, notwithstanding the comparative differences in the rate of increase between those who use wheelchairs and those who don't, the two decades separating Goldsmith's and RGU's survey see a rise of 3.9 in usage, from respective mean scores of 15.6 and 62, of the key building types. This provides clear evidence of a highly significant growth in the numbers of severely disabled people using public buildings.

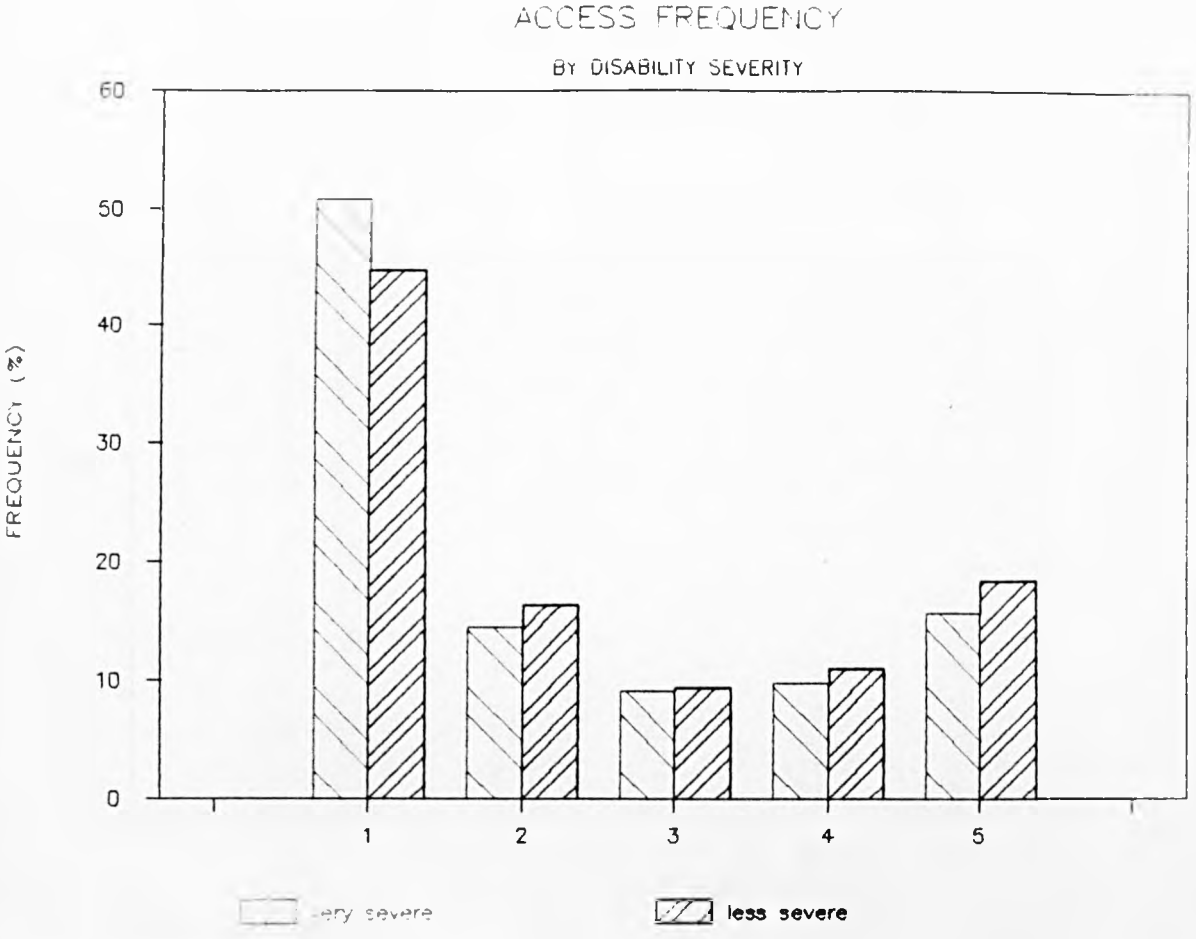
Figure 1.7 : Frequency of Visits to all Building Types by Wheelchair Use



key :1 = never
2 = once or twice a year
3 = once in 3 months
4 = once a month
5 = once a week

Figure 1.7 clearly shows the very large proportion of disabled people in the sample, notwithstanding wheelchair use, who do not go out. However, the relationship between the frequency of outings and wheelchair use was shown by the application of a chi-square test to be significant ($P < .005$) with the wheelchair users going out significantly less often than non-wheelchair users.

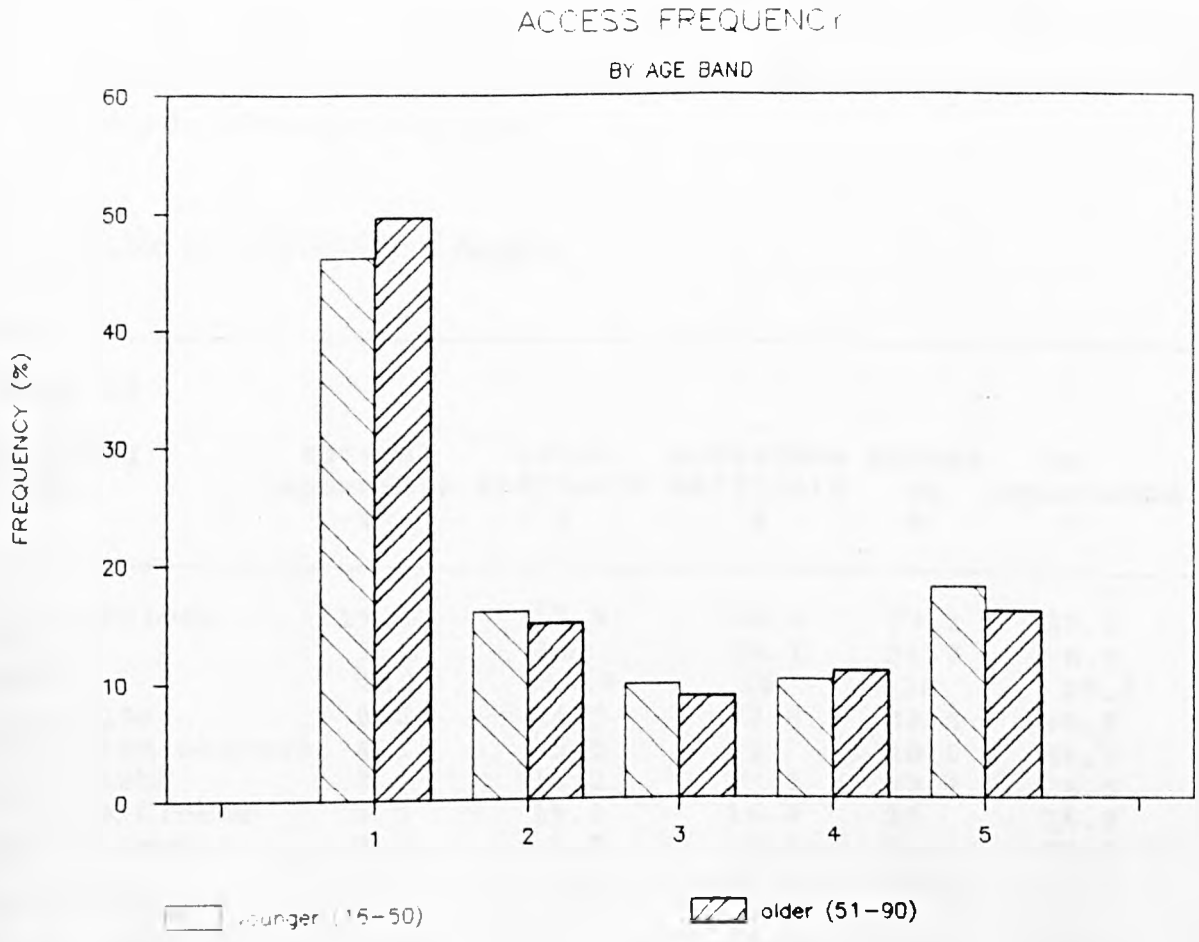
Figure 1.8 : Frequency of Visits to all Building Types by Disability Severity



key : 1 = never
2 = once or twice a year
3 = once in 3 months
4 = once a month
5 = once a week

Disability severity is denoted by the degree of assistance required on a daily basis, the terms 'very severe' and 'less severe' being ascribed to those needing help with personal care at least once every 24 hours and those needing occasional or no help, it was also shown by a chisquare test as significantly associated with frequency of visits to all building types ($P < 0.05$). However this relationship illustrated by Figure 1.8 is less marked than might be expected.

Figure 1.9 : Frequency of Visits to all Building Types by Age Band



key :1 = never
2 = once or twice a year
3 = once in 3 months
4 = once a month
5 = once a week

The age band of respondents, describing 16 to 50 year olds as 'younger' and those aged over 50 as 'older', surprisingly, when chisquare tested, showed no significant relationship between frequency of outings and age. Figure 1.1.3 offers a profile of this finding, depicting a marginal drop in building use by older respondents, the younger group seeing an increase of 2% in usage over the older group on a weekly basis.

3.2 Access Difficulty

Difficulty of access to public buildings was assessed using a 5 - point scale measuring the degree of difficulty experienced by respondents during the previous 12 months when using the following building types.

Table 13 : Difficulty of Access

TABLE 13

Building types	access impossible %	often difficult %	sometimes difficult %	access ok %	no experience %	*
Post offices	11.3	13.8	14.4	37.1	23.2	5
Shops	3.1	26	29.1	34.7	6.8	3
Banks	8.8	16.9	16.3	32	25.7	5
Libraries	6.5	4.5	7.8	32.6	48.3	11
Education centres	4.1	5.5	9	16.6	64.5	20
Pubs/clubs	3.3	15.2	23.1	33.7	24.5	13
Theatre/Cinema	6.5	15.1	16.4	25	36.8	12
Health centre	3.9	3.9	6.5	51.3	34.2	12
Hospital	1.2	6.4	12.2	65.8	14.1	9
Sports centre	3.4	2.7	2.7	21	70	17
Local sports stadium	3.4	1.3	3.4	13.1	78.6	19
Swimming pool	7.3	4	9.3	23.3	56	14
Cafes	2.6	14.9	32.7	29.2	20.7	10
Friend's houses	5.6	25.6	26.8	35.6	6.2	4
Church	5	10.1	13.9	36.7	34.1	6
Museum/ Art gallery	5.3	6.6	9.9	12.5	65.5	13
Public parks	2.6	3.2	12.4	56.8	24.8	11
public toilets	4.4	13.3	21.6	28	32.4	7
Total	4.96	10.72	15.07	32.74	36.51	

* = Missing value

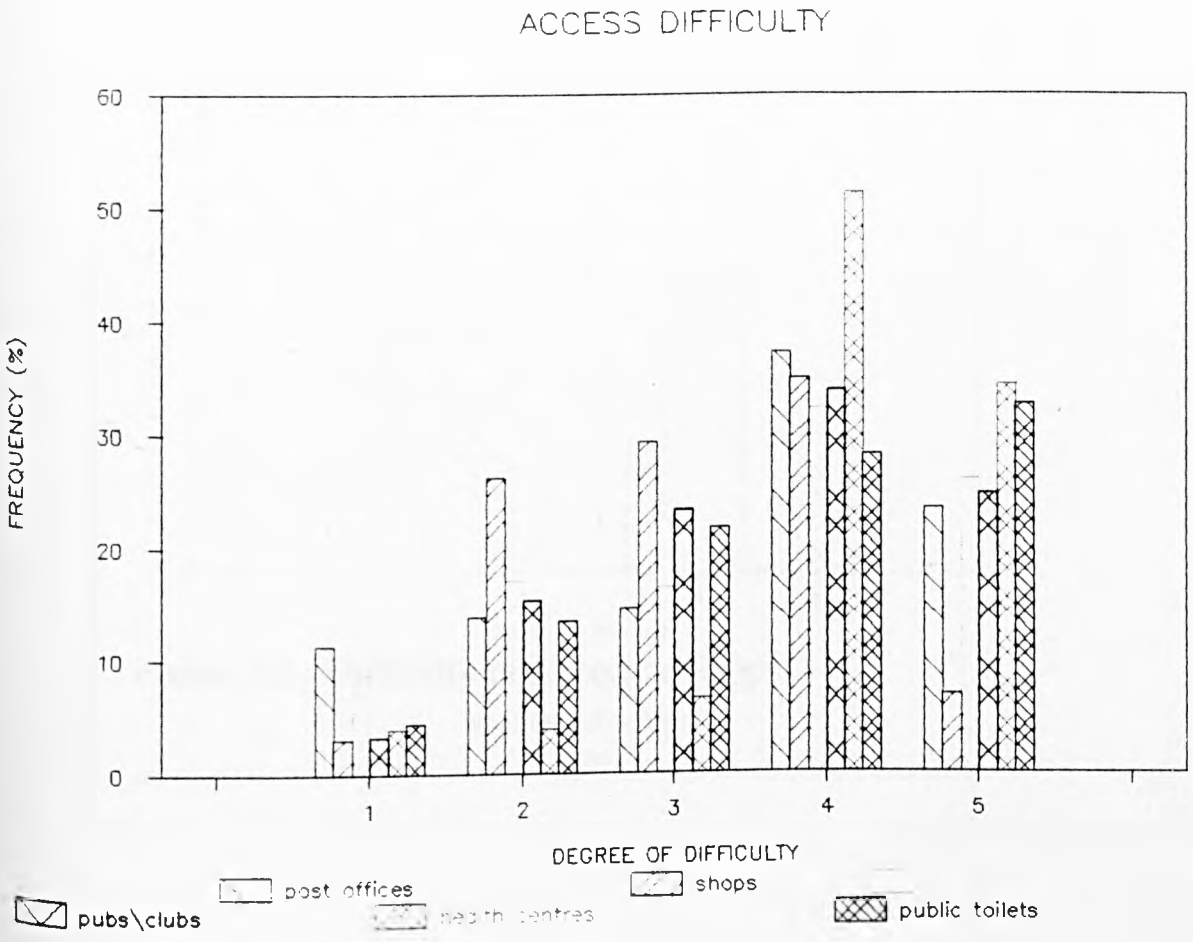
The tallied ratings for Table 13 show that over one third of the sample feel unable to comment on the accessibility of public buildings due to a lack of personal experience, a figure which corresponds with the level of missing answers for this question. The lowest number ascribed to services previously identified as most frequently visited in Table 10, Shops for instance, are shown to number only 3 missing variables, whereas Sports and Education Centres number 17 and 20, ranking amongst the least attended building types. This would suggest a correlation between the proportion of the sample (36%), who are unable to comment on the accessibility of services due to limited personal experience and the similarly large proportion (47%) reporting that they 'never' visit a broad cross-section of the public buildings.

Only 32%, just less than one third of respondents find access relatively unproblematic, whereas 30% noted some degree of difficulty, 15% of whom experience this to an extreme extent, finding access either 'often difficult' or 'impossible'. These figures are all the more significant, given that they may considerably underestimate the real level of architectural barriers, as they are based on disabled peoples' perceptions of difficulty, which have been found by the OPCS survey to be infused with lowered expectations, and a tendency to blame not the socio-physical environment but personal disability related circumstances(24); this point was further borne out in the conclusions of the GSWD report.

> *"The main reasons for interviewees being unable to participate in leisure activities was, as anticipated, physical difficulty, by 53%, although cost, the need for assistance and lack of transport were also factors. From the physical difficulties described, it would appear that for a proportion, participation could have been continued with a helper*(25)."

Patterns of accessibility to the key building types are a more accurate indication of the scale of difficulties, typifying the common problems encountered, problems less likely to be confounded by lack of experience due to the more specialist market of certain of the building types. Figure 2 shows that a significant proportion of key services are out of bounds to disabled people by virtue of their total inaccessibility, most notably post offices and shops.

Figure 2 : Difficulty of Access to Key Building Types



Key : 1 = access impossible
2 = access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.1 : Difficulty of Access to Post Offices

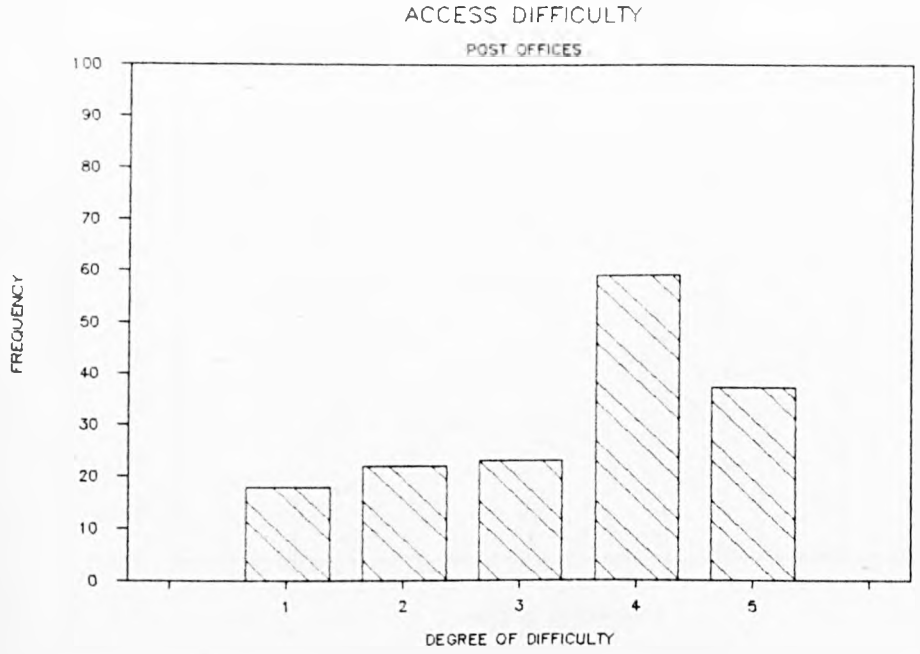
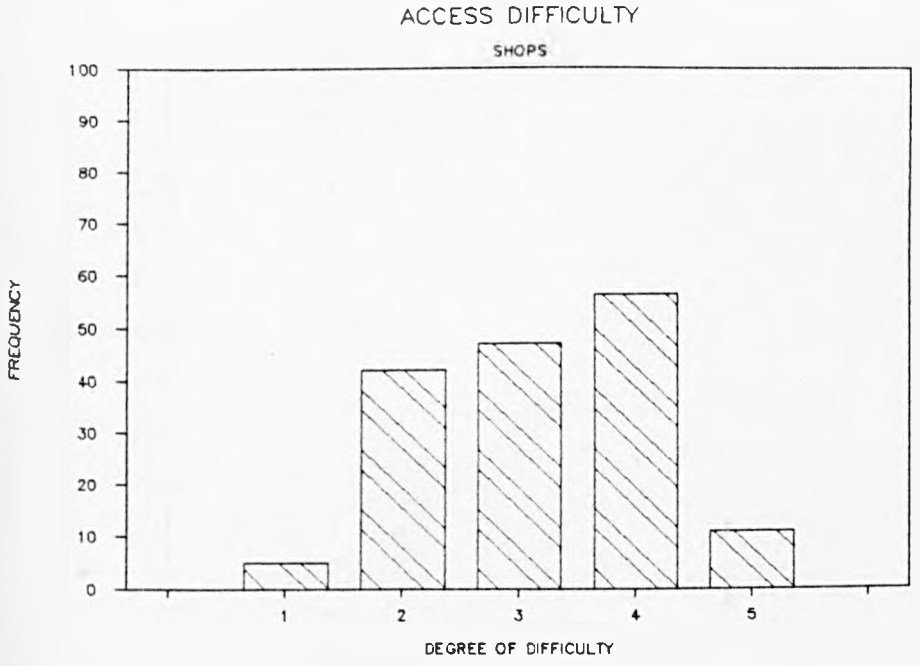


Figure 2.2 : Difficulty of Access to Shops



Key : 1 = access impossible
2 = access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.3 : Difficulty of Access to Banks

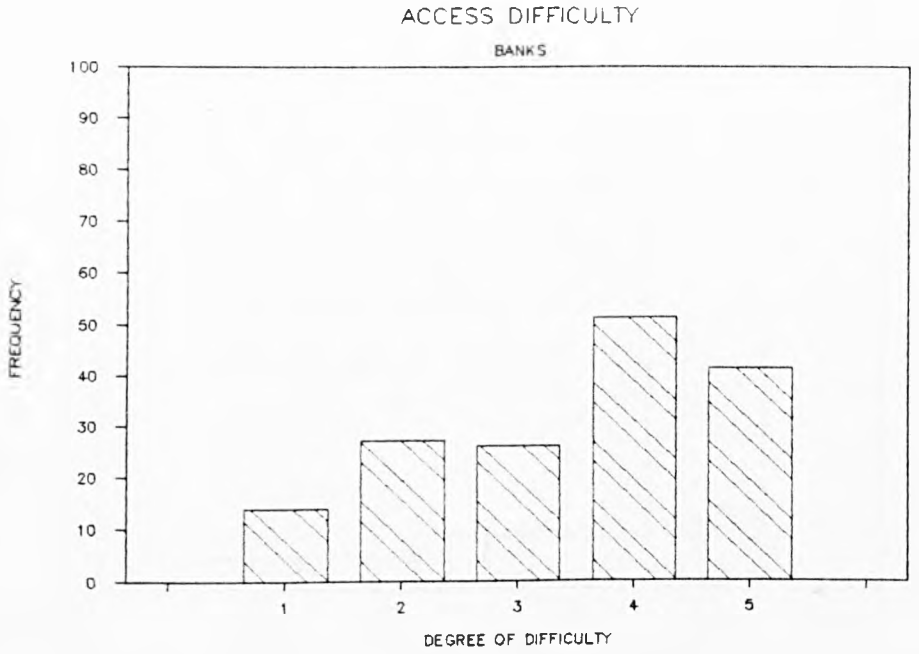
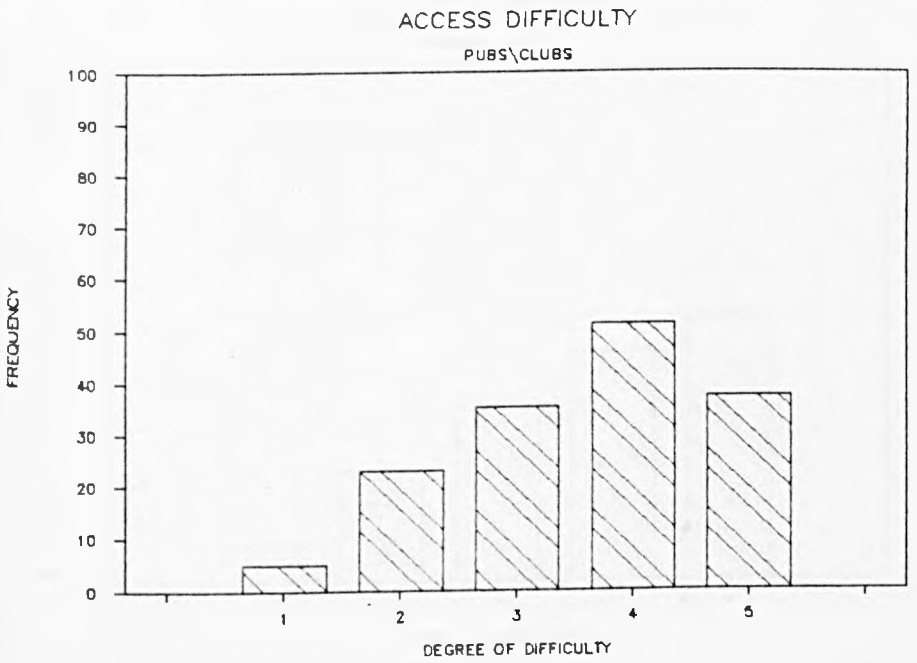


Figure 2.4 : Difficulty of Access to Pubs & Clubs



Key : 1 = access impossible
2 = access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.5 : Difficulty of Access to Health Centres

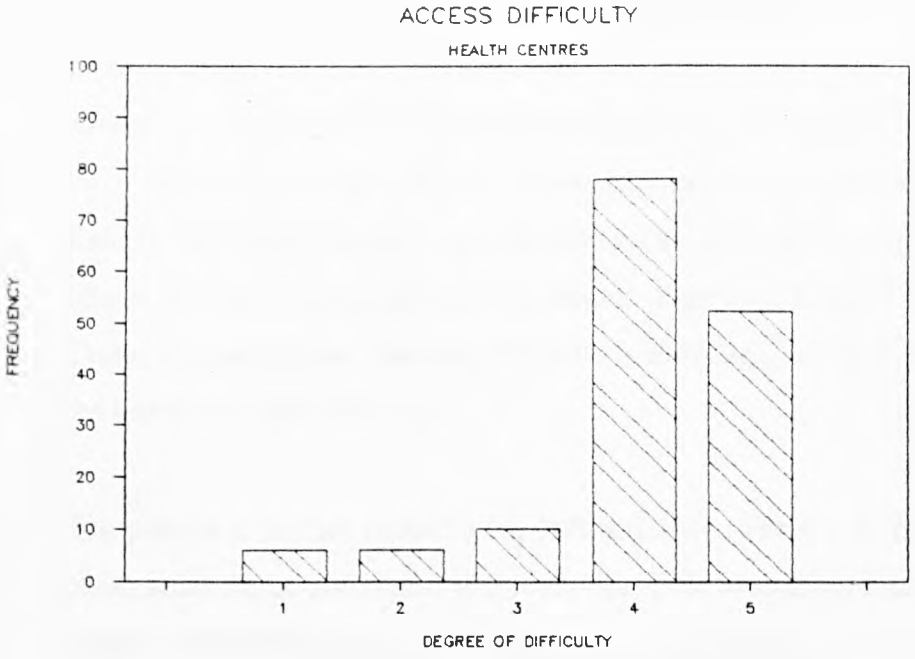
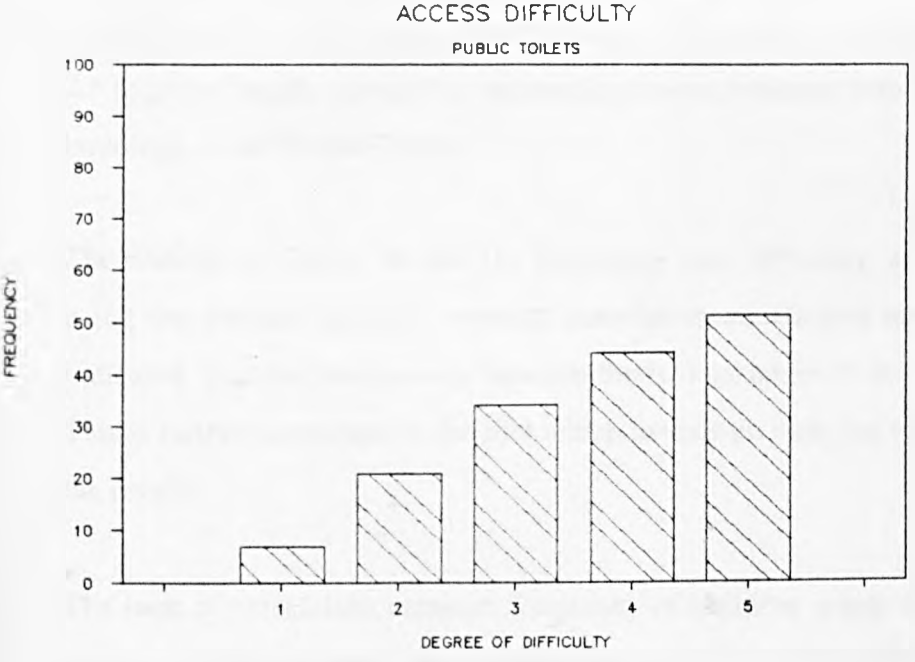


Figure 2.6 : Difficulty of Access to Public Toilets



Key : 1 = access impossible
2 = access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Of the respondents who had visited Post Offices in the previous year, a quarter reported access in Figure 2.1, as being either 'often difficult' or 'impossible', a very high proportion, given the significance of this service for the maintenance of personal autonomy. This trend is continued in Figure 2.2, for Shops, with 29%, a lamentably large number given that 90% of respondents use this service, 75% on a frequent basis. Indeed, this figure further sees an increase to 58%, well over half the sample, if the scores for 'sometimes difficult' are added. Figures 2.3 and 2.4, Banks and Pubs and Clubs, also reflect this characteristic pattern showing a rise in problems reported towards the less severe end of the scale.

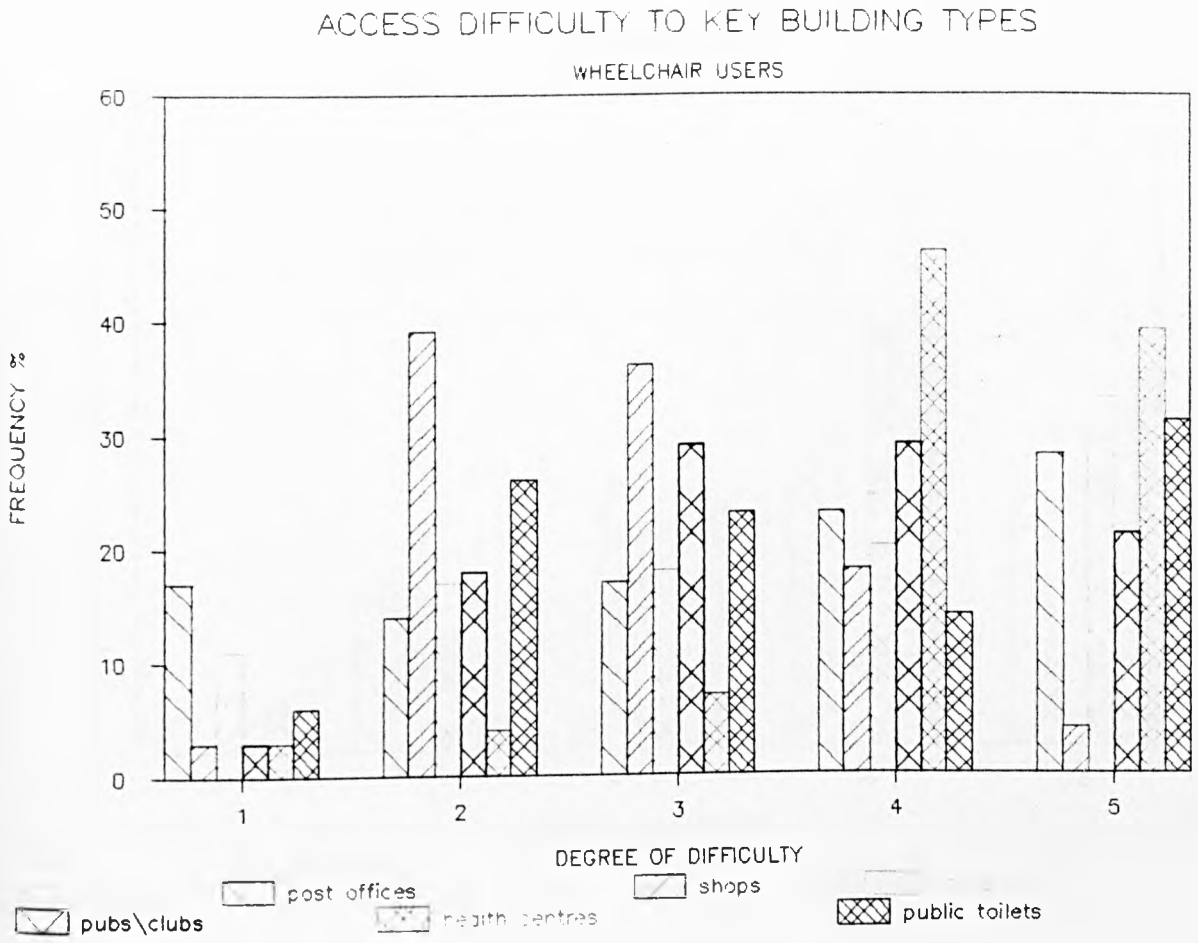
The pattern is further repeated for Public Toilets, Table 2.6, where although only 4% claim access to be impossible to this service, 39% in total experience some difficulty. The 17% of respondents who assert that access to Public Toilets is either 'impossible' or 'often difficult' does not explain their very low utilisation, with two thirds of respondents visited them once every three months or less. The only service which is shown in Table 2.5 to prove largely accessible, presenting fewer problems than any of other key public buildings, is the Health Centre.

The findings of Tables' 10 and 13, 'frequency' and 'difficulty' of access were correlated using the Pearson product moment correlation coefficient measure.[3] * The results indicated that the relationship between the two variables is not significant (r = 0.070). This is further supported by the plot which reveals no outlying scores likely to confound the results.

The lack of correlation between frequency of building usage and difficulty of access suggests a balanced split. Just as those who go out more frequently may experience more access difficulties, so those who venture out less often and may indeed be deterred by architectural barriers, avoid experiencing difficulty.

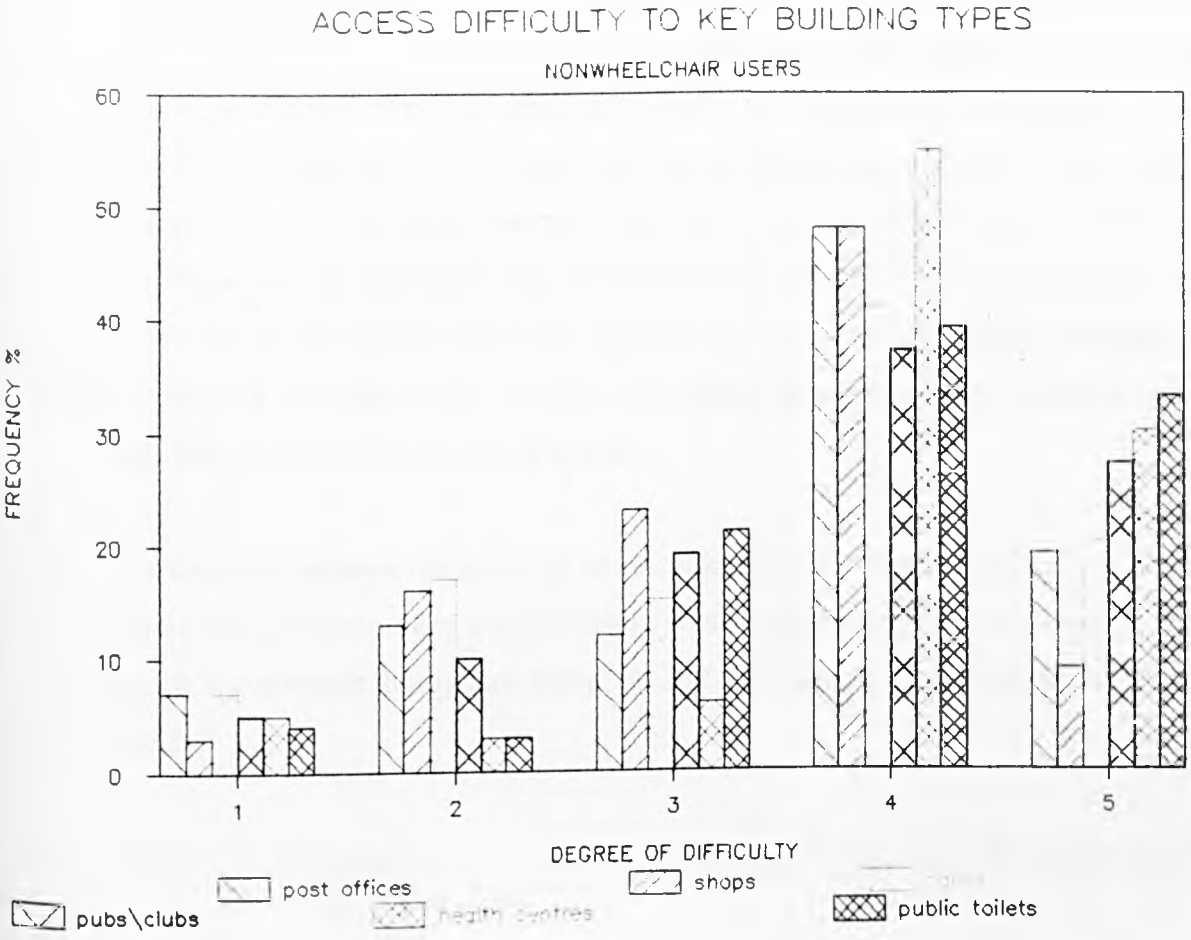
[3] Test results available in Appendix A

Figure 2.7 : Access Difficulty to Key Building Types by Wheelchair Users



Key : 1 = access impossible
2 =access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.8 : Access Difficulty to Key Building Types by Non-Wheelchair Users



Key : 1 = access impossible
2 =access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Table 14, and Figures 2.7 and 2.8, comparing wheelchair users and non-wheelchair users' rankings of access difficulty to the key building types, further supports the theory outlined above as it relates to the correlation between frequency and difficulty of access. This is highlighted by the contrasting trends with regard to certain services. Shops, for example are most frequently visited and reported as problematic in terms of access by as many as 78% of wheelchair using respondents, and 32% of non-wheelchair users, whilst Public toilets on the otherhand are under-utilised but nevertheless pose significant access difficulties for 55% of former and 28% of the latter group. Indeed, only 14% of wheelchair users, as opposed to 39% of non-wheelchair users reported access as ok to public toilets. Further investigation by means of the qualitative interviews may help to illuminate this line of inquiry.

The disparity between the scores of wheelchair and non-wheelchair users is very marked, the former group reporting a significantly greater number of access difficulties, a pattern which is consistent throughout Table 14, and thrown up into sharp relief by Figure 2.7 and 2.8.

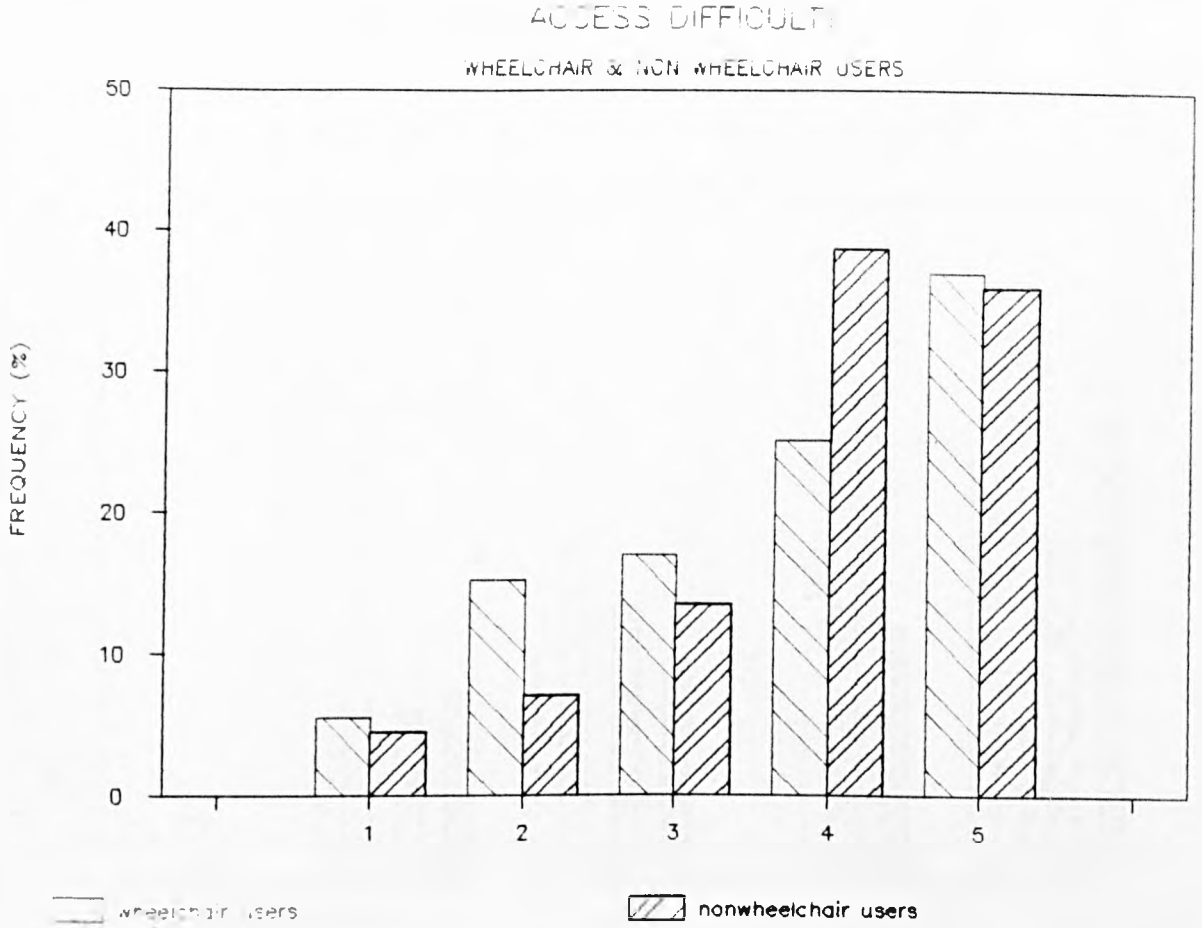
Table 14 : Comparison of Access Difficulty to the Key Building Types by Wheelchair Use

Building types	access impossible %		often difficult %		sometimes difficult %		access ok %		no experience %	
	W	N	W	N	W	N	W	N	W	N
Post Offices	17	7	14	13	17	12	23	48	28	19
Shops	3	3	39	16	36	23	18	48	4	9
Banks	11	7	17	17	18	15	20	41	33	20
Pubs/clubs	3	5	18	10	29	19	29	37	21	27
Health Centre	3	5	4	3	7	6	46	55	39	30
Public Toilets	6	4	26	3	23	21	14	39	31	33

* W = Wheelchair user
  N = Non-wheelchair user

* Percentage based on aggregate scores of each group

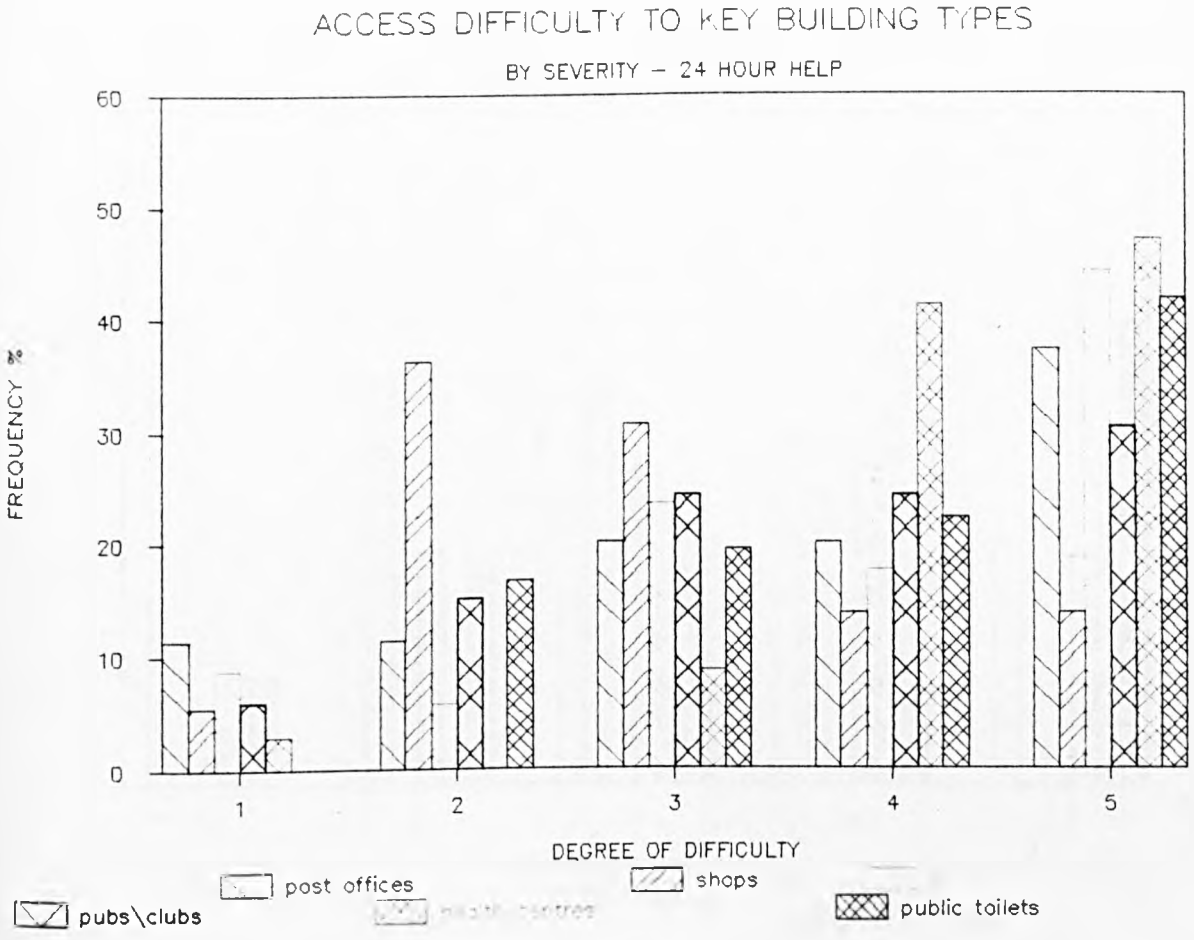
Figure 2.9 : Access Difficulty to all Building Types by Wheelchair Use



Key : 1 = access impossible
2 = access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

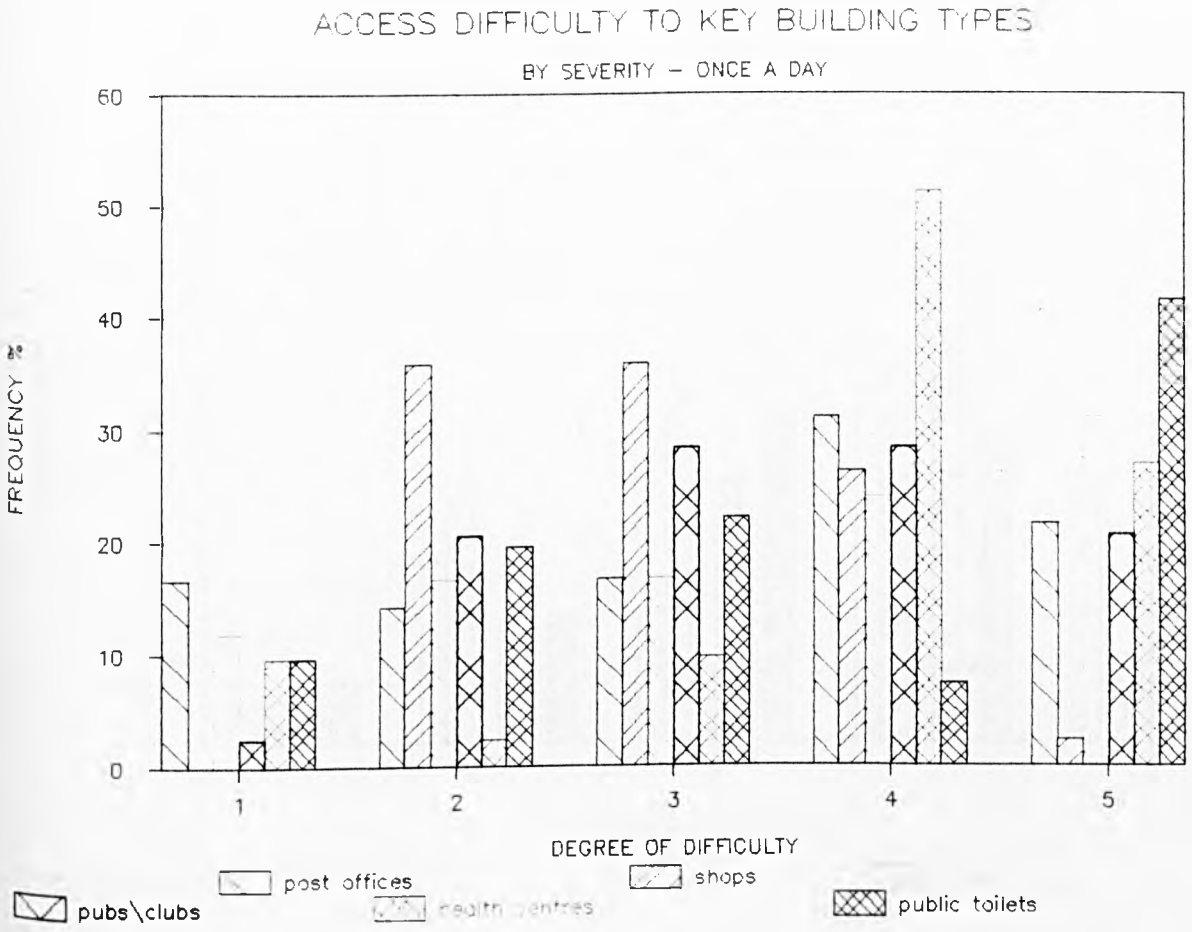
Figure 2.9 permitted a comparison of aggregate scores indicating difficulty of access to all the building types, between wheelchair users and non-wheelchair users. A chisquare test was significant ($P < .005$); the bar chart illustrates that the largest differences occur in the 'often' and 'sometimes difficult' categories, with the wheelchair users experiencing 11% more difficulty. Again a further difference between the two groups record of finding access unproblematic becomes apparent with only 25% of wheelchair users reporting 'access ok' as compared to 38% of the non-wheelchair users.

Figure 2.10 : Access Difficulty to Key Building Types by Disability Severity - 24 Hour Help



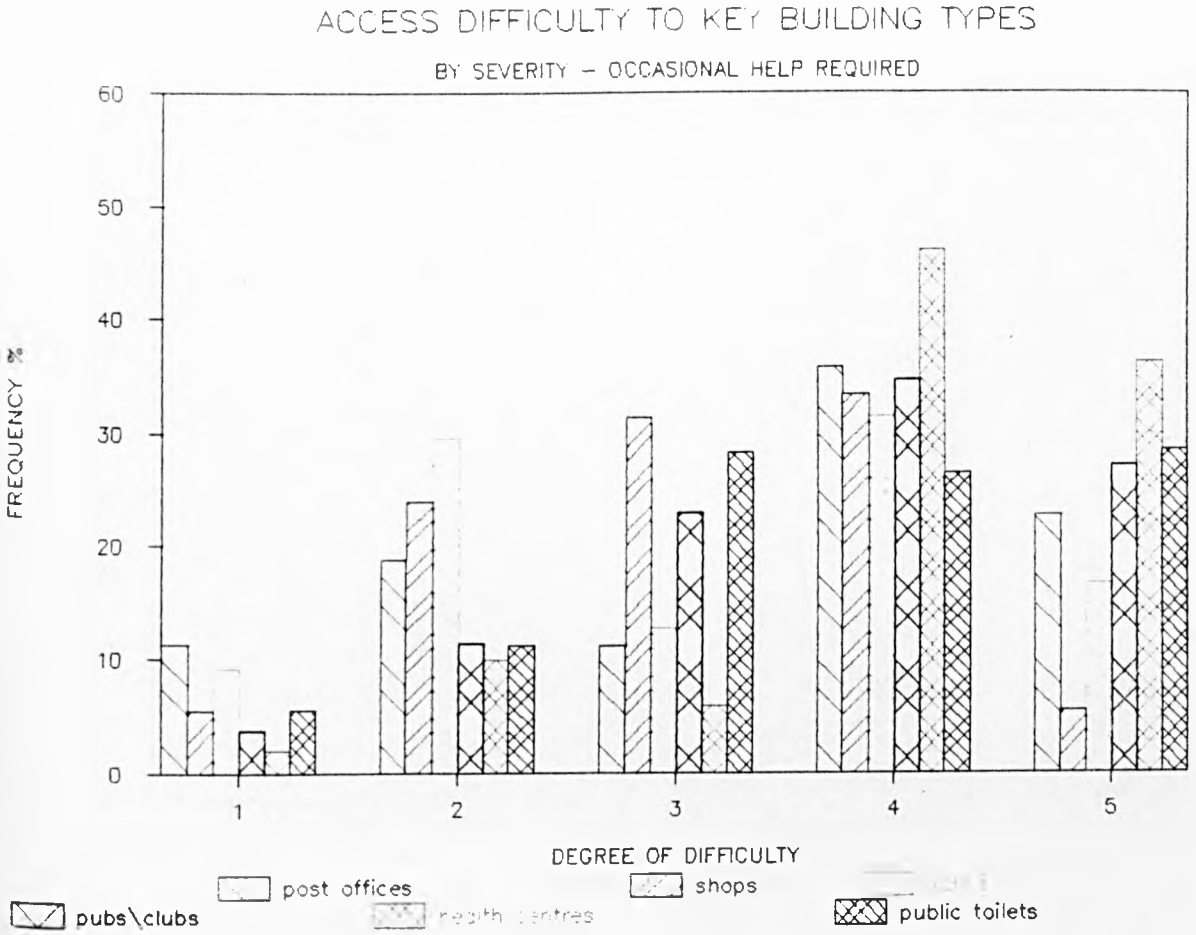
Key : 1 = access impossible
2 = access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.11 : Access Difficulty to Key Building Types by Disability Severity - Once a day



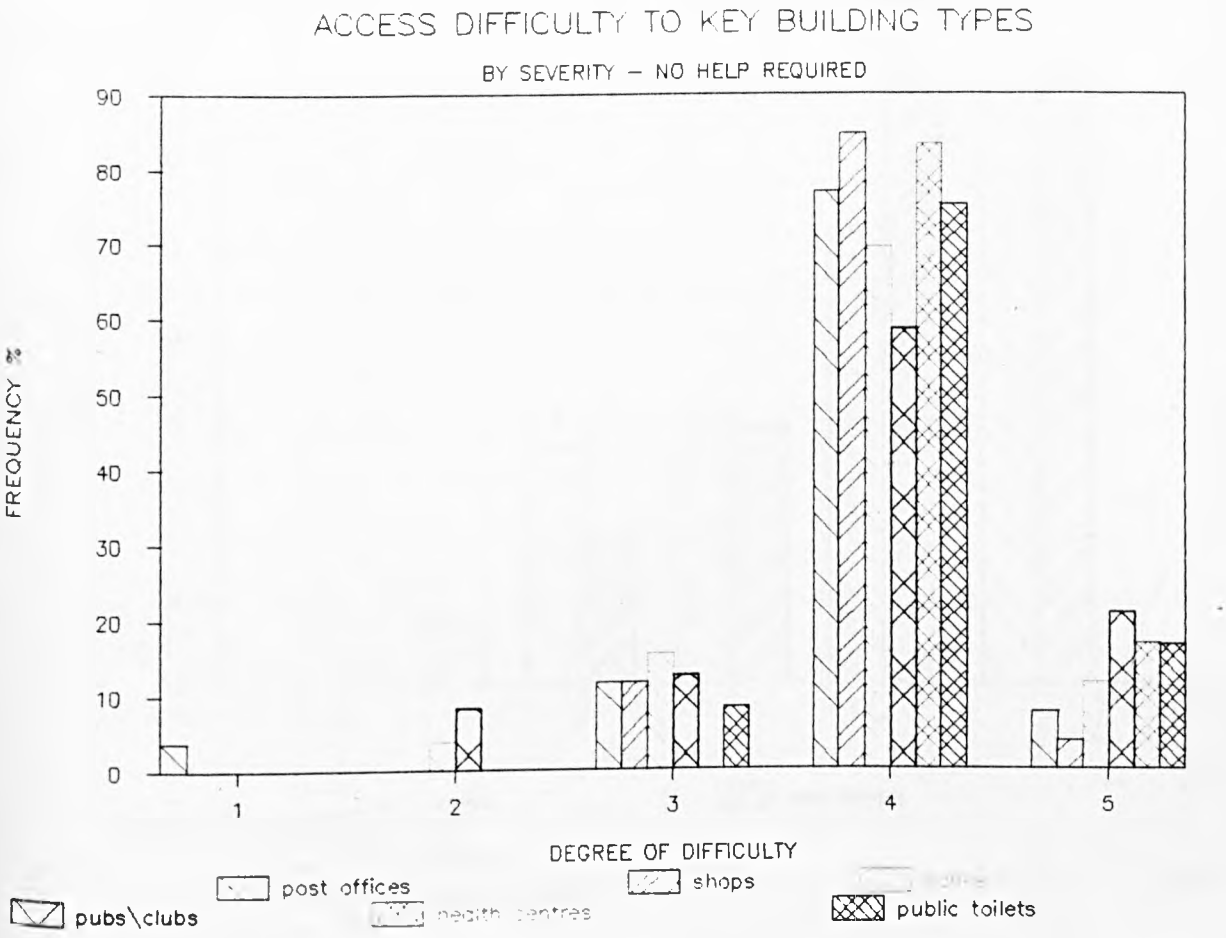
Key : 1 = access impossible
2 = access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.12 : Access Difficulty to Key Building Types by Disability Severity - Occasional Help



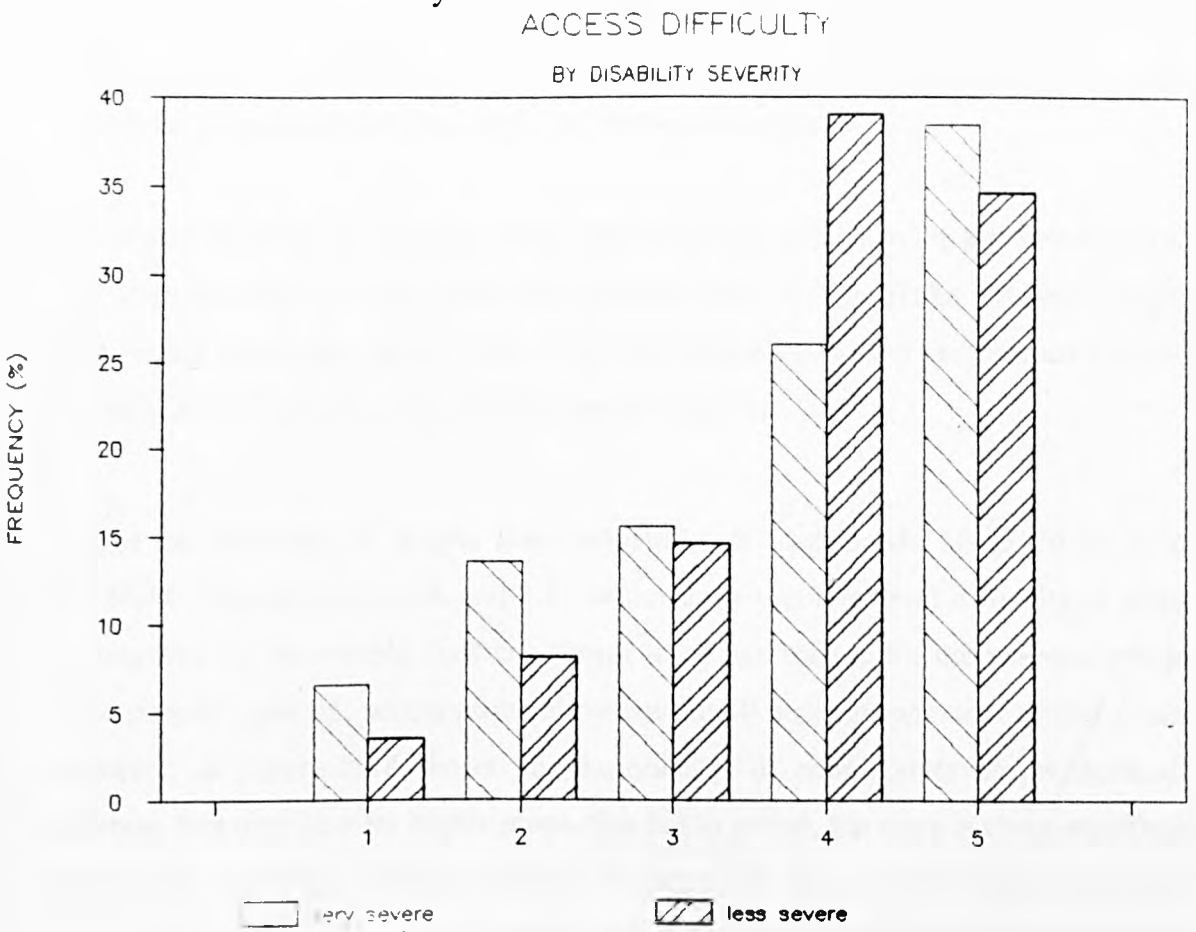
Key : 1 = access impossible
2 = access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.13 : Access Difficulty to Key Building Types by Disability Severity - No Help



Key : 1 = access impossible
2 = access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.14 : Access Difficulty to all Building Types by Disability Severity



Key : 1 = access impossible
2 = access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Incremental scales of severity of disability were assigned on the basis of degree of assistance required by the sample, whether 24 hour, daily, occasional, or not all. Degree of severity is shown by figures 2.10, 2.11, 2.12 and 2.13 to closely accord with the degree of access difficulty experienced; reported difficulties gradually fall away as the need for assistance lessens. This is particularly true for building types such as Shops and Public Toilets, a sharp decline in access problems becoming most apparent in Figure 2.13 where no assistance is required. This indicates that even those who require 'occasional' assistance are subject to architectural barriers and more environmentally

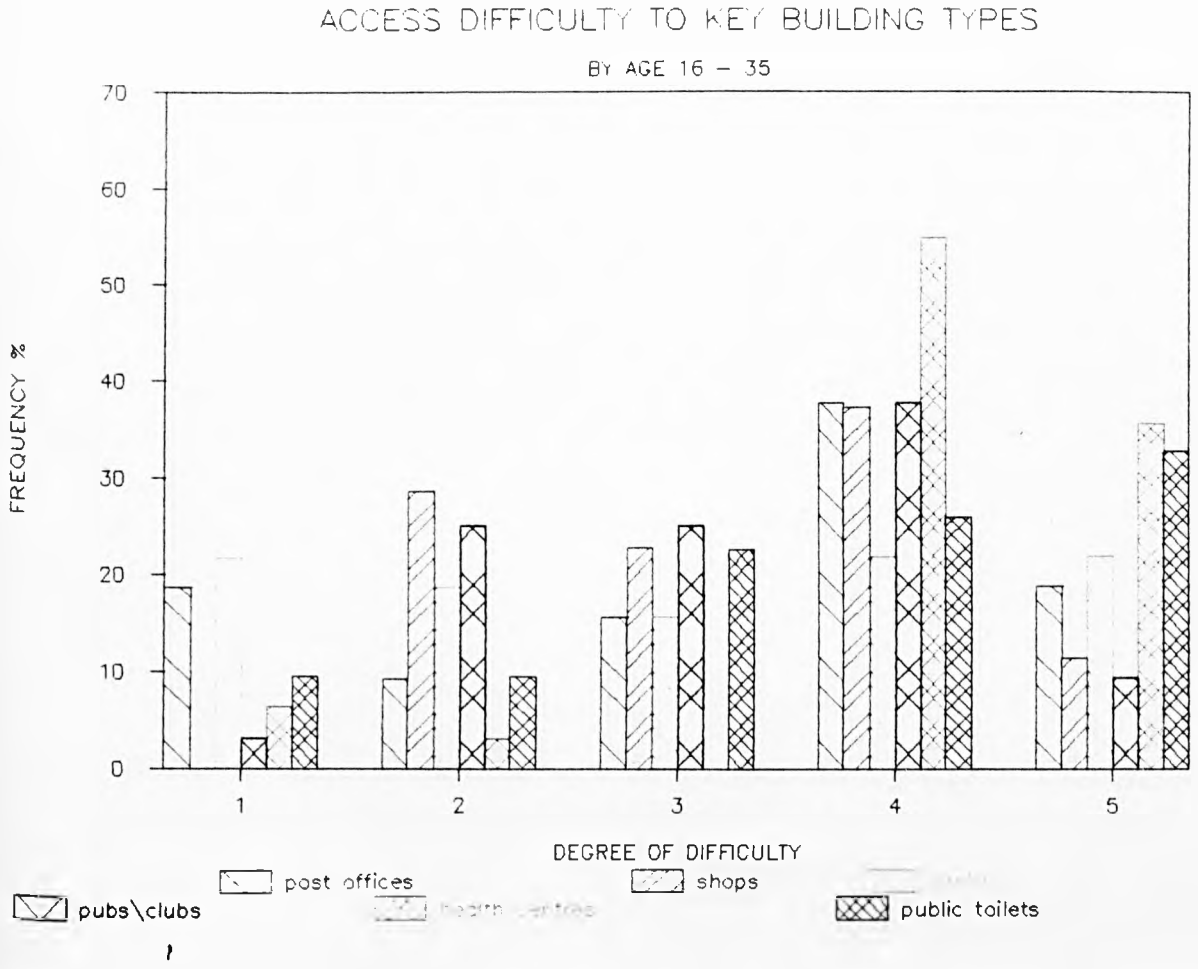
sensitive than those people requiring no assistance. The disparity in perceived barriers between Figures 2.10, 2.11, and 2.12 as compared with Figure 2.13, furthermore serves to illustrate the environmental delineation, the point at which the design parameters begin to exercise a significant limiting effect on behavioural options.

The overall relationship between access difficulty and severity to the key building types was demonstrated by a bar chart, and chisquare test as significant (P<.005). Figure 2.14 clearly shows that where 39% of the less severely disabled people record 'access ok', only 25% of very severely disabled people note this.

Degree of difficulty of access was compared with 4 age bands, 16-35, 36-50, 51-65 and 66-90. Figures 2.15, 2.16, and 2.17 demonstrate that degree of difficulty of access experienced by the sample does not appear to be age-related for the younger groups, those people under 65; access problems prevail in all these groups to a similar extent. However, as Figure 2.18 shows, the experiences of people over 66 are markedly different. Not only do a far higher proportion fail to go out, but there is also a significant drop in the number of people reporting access as ok. This would suggest, given the sample composition of people identified as severely disabled, that access problems already glaringly apparent to the younger group become compounded by the deleterious effects of age.

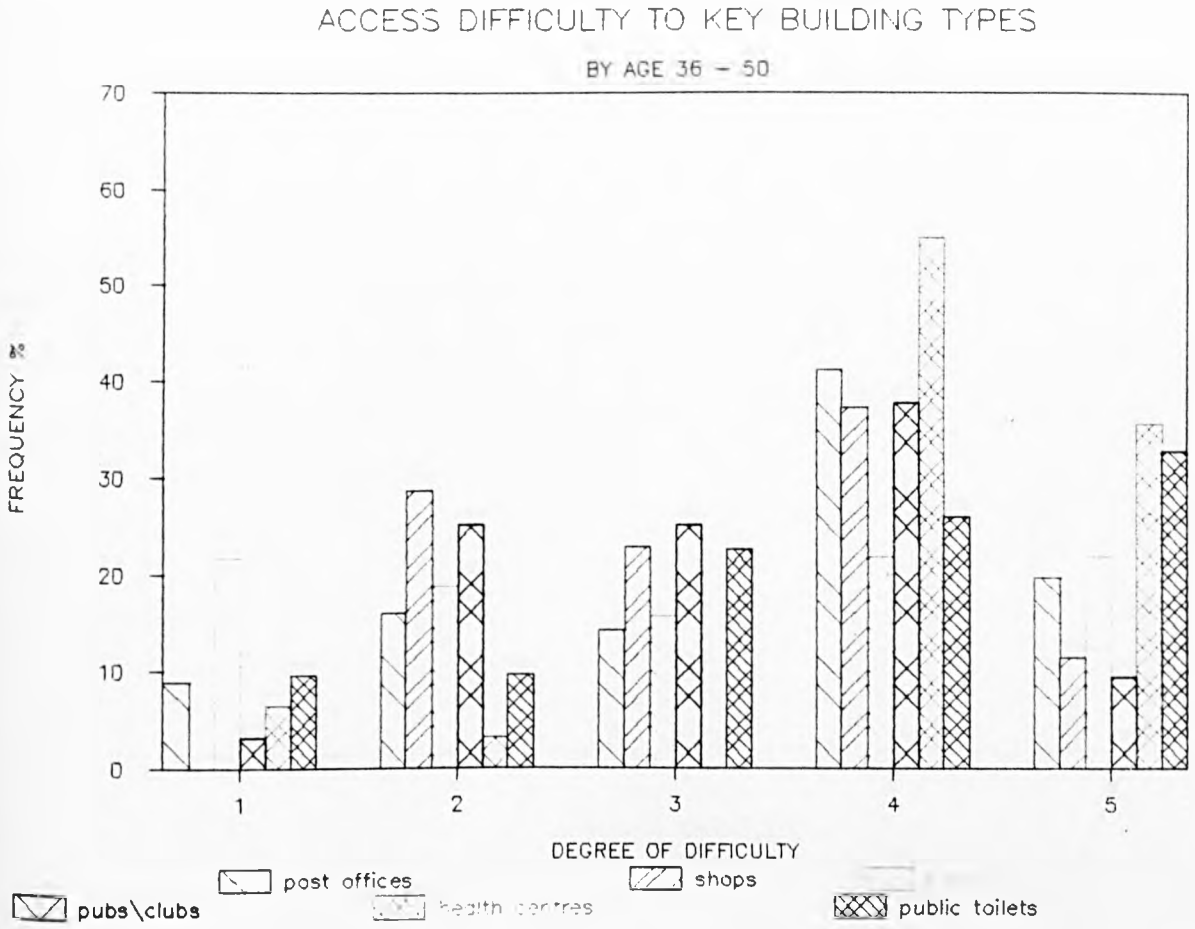
This exacerbating effect on mobility, thus further serves to sensitise people to the strict design parameters, parameters which militate against those less able to adapt. This finding is further illustrated by Figure 2.19, and consolidated by the chisquare test result revealing significance (P<.005).

Figure 2.15 : Access Difficulty to Key Building Types by Age 16- 35



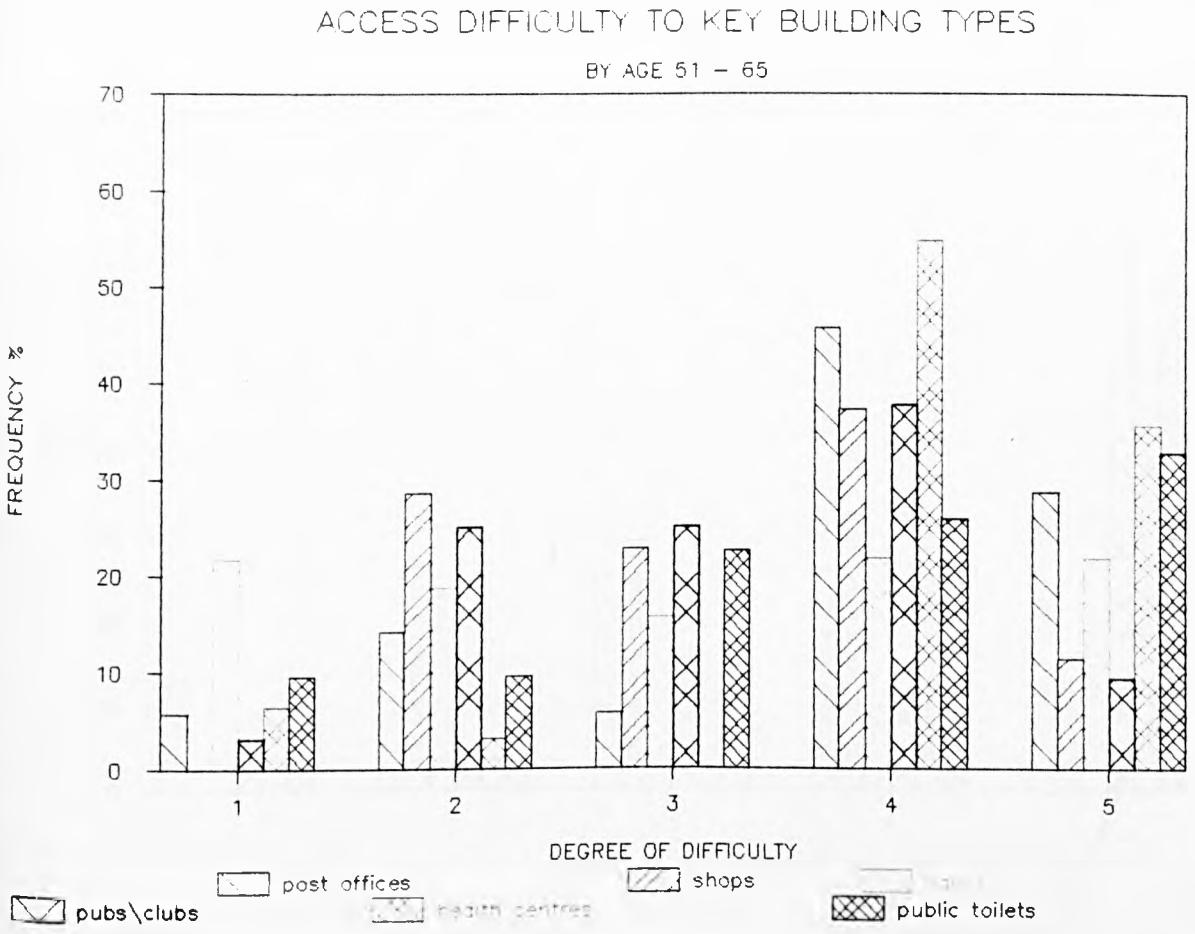
Key : 1 = access impossible
2 =access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.16 : Access Difficulty to Key Building Types by Age 36 -50



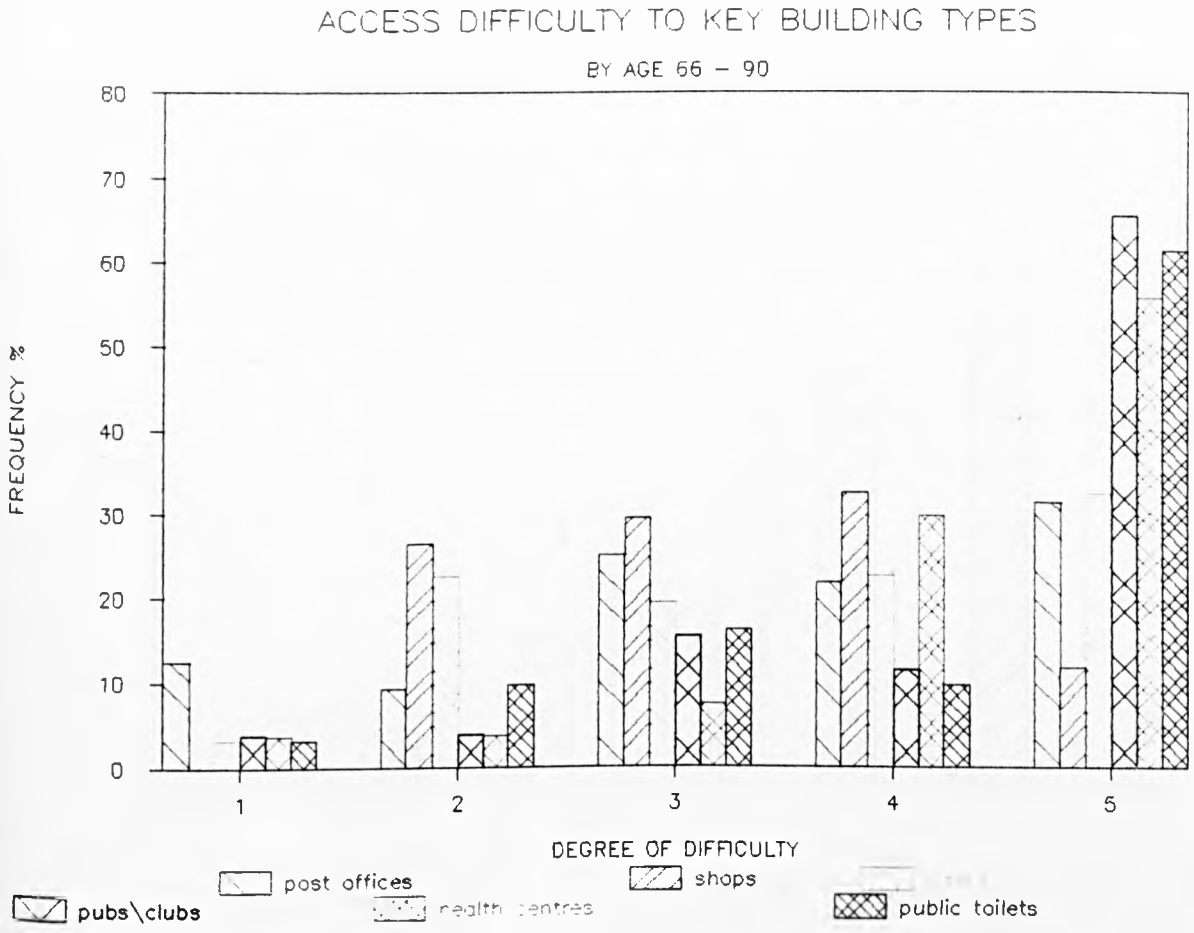
Key : 1 = access impossible
2 =access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.17 : Access Difficulty to Key Building Types by Age 51-65



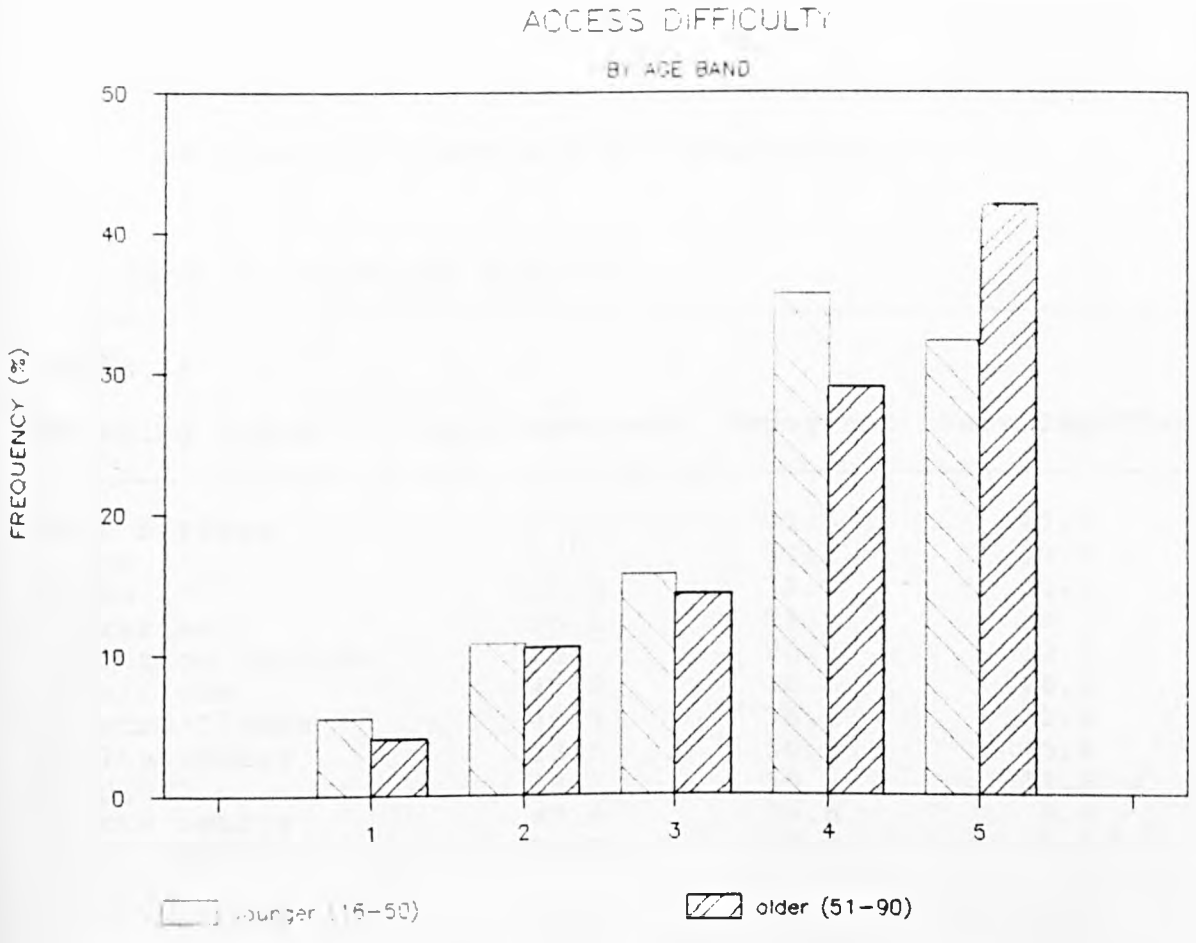
Key : 1 = access impossible
2 =access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.18 : Access Difficulty to Key Building Types by Age 66 - 90



Key : 1 = access impossible
2 =access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

Figure 2.19 : Access Difficulty to all Building Types by Age



Key : 1 = access impossible
2 =access often difficult
3 = access sometimes difficult
4 = access ok
5 = no experience

3.3 Access Importance

Importance of access to public buildings was assessed by asking respondents to indicate on a 3 - point scale, how important it would be for them personally to be able to use each of the following list of public buildings, if access was good.

Table 15 : Importance of Access

TABLE 15

Building Types	Not Important	Important	Very Important	*
Post offices	24.3	31.8	43.7	4
Shops	10	37.7	52.2	5
Banks	25.1	32.7	42.1	5
Libraries	56.1	25.8	18	9
Education centres	66	20.2	13.7	11
Pubs/Clubs	45.2	28.6	26.1	7
Theatre/Cinema	40.8	36.4	22.6	5
Health centre	23.5	30.5	45.8	7
Hospital	13.3	35	51.5	7
Sports centre	69.6	20.6	9.6	9
Local sports stadium	75.5	17.2	7.2	13
Swimming pool	61.6	17.5	20.7	10
Cafes	28.4	43.4	28.4	6
Friend's houses	12	38.6	49.3	6
Church	40.7	34.8	24.3	12
Museum/ Art gallery	66	22.2	11.7	11
Public parks	33.7	41.5	24.6	10
Public toilets	22.7	20.8	56.3	6
Total	39.48	29.83	30.69	

* = Missing value

Table 15, gauging general user expectations as regards access was also intended to serve as a check, determining the level of correlation between frequency and importance of access, a negative discrepancy being used as a yardstick indicating the number of people who would like to use a service but are prohibited from doing so given access difficulties. For instance, Table 15 shows that 75% of the sample noted against Post

Offices either 'important' or 'very important'; however, only 63% actually visit Post offices which suggests that 12% would like to but can't. The high degree of access difficulty posed by this building type would seem to indicate that the problems in certain cases are so severe as to cause some people to give up trying.

Individual scores for public buildings were deemed of more significance in Table 15 than the aggregate scores, as a number of the given building types offer specialist services, such as Sports Stadia, which although they may rank as highly important to the more dedicated 2% of supporters in the sample who attend on a weekly basis, are of less importance to those who do not share their enthusiasm. Thus analysis of the key building type rankings should prove a more realistic measure.

Figure 3 : Access Importance to Key Building Types

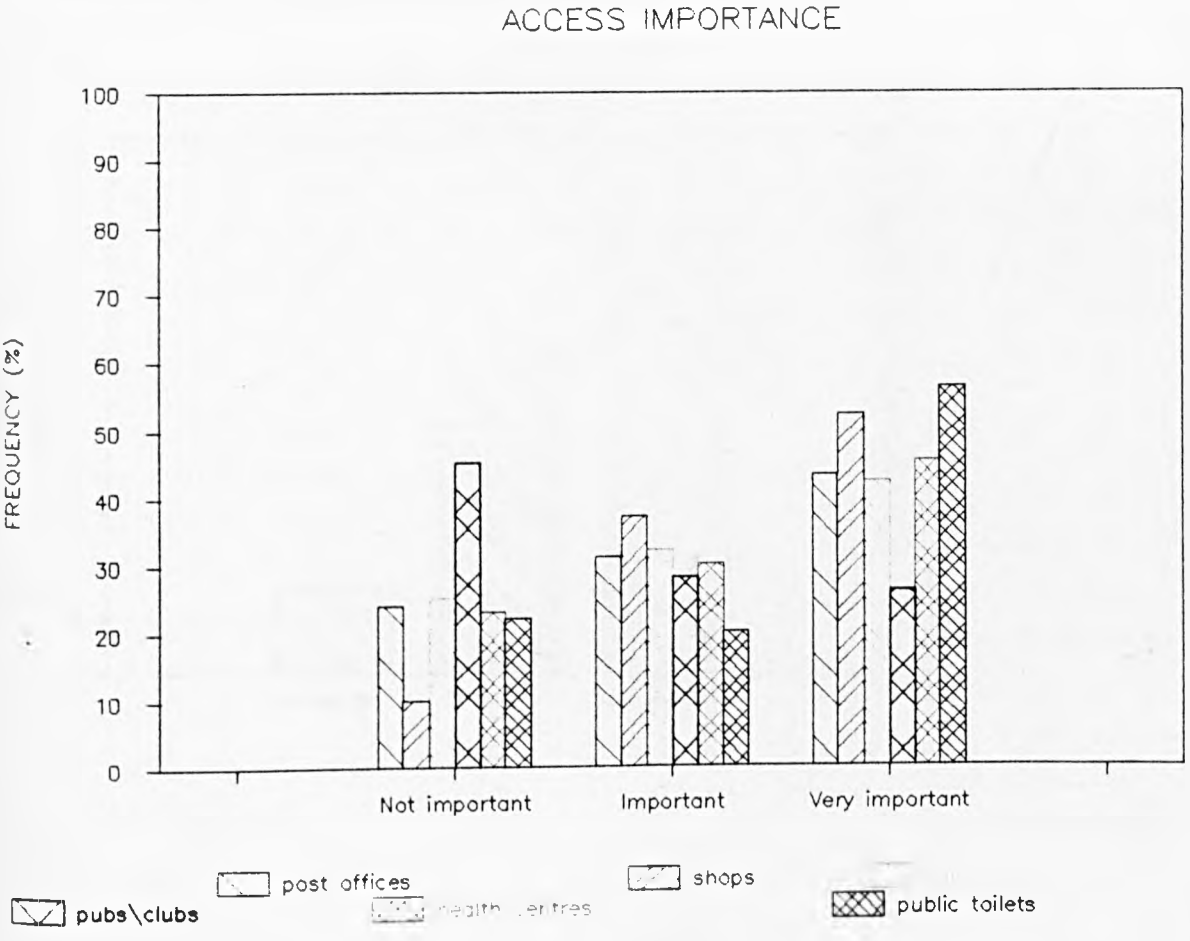


Figure 3.1 : Access Importance to Post Offices

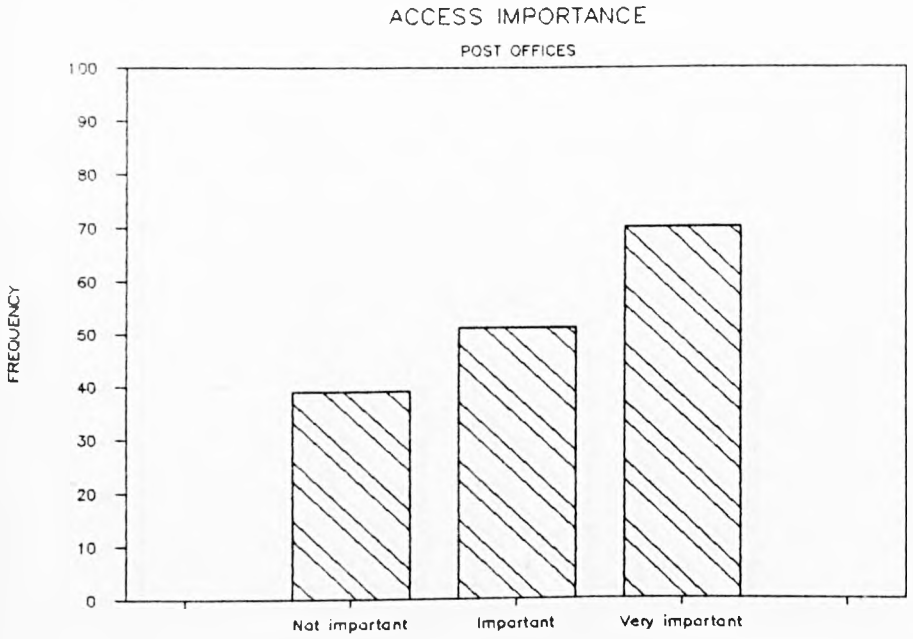


Figure 3.2 : Access Importance to Shops

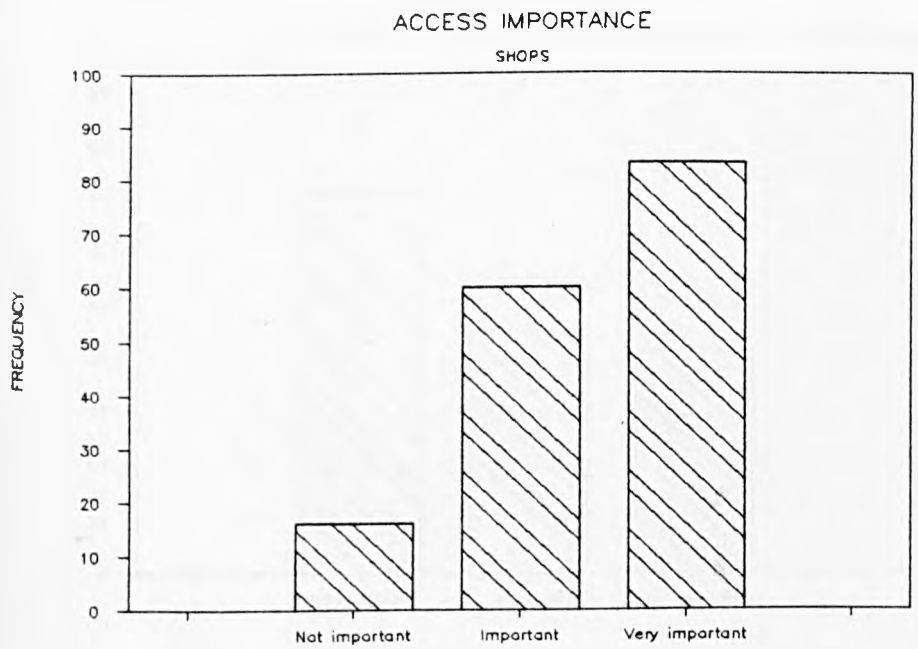


Figure 3.3 : Access Importance to Banks

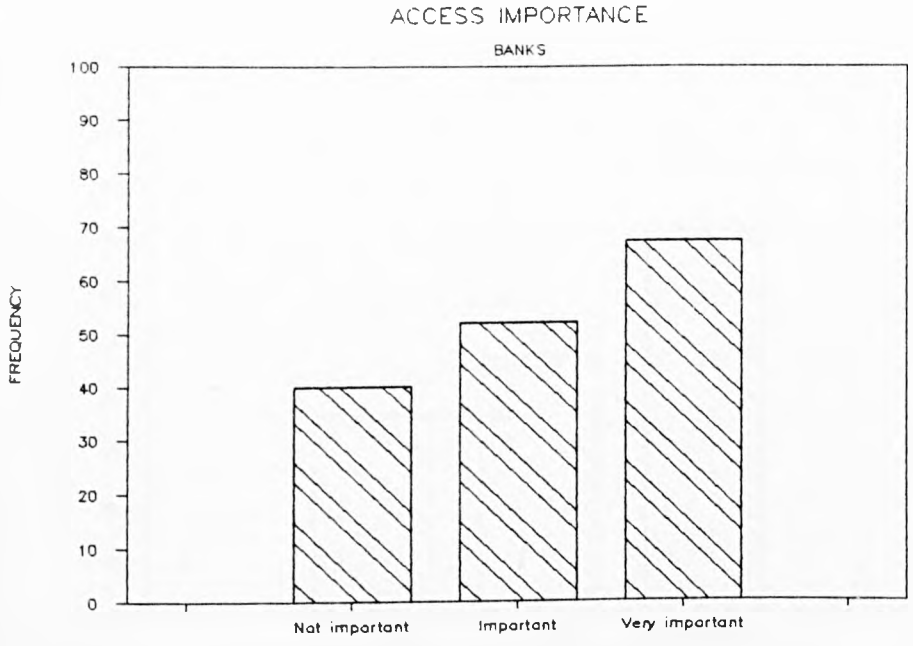


Figure 3.4 : Access Importance to Pubs & Clubs

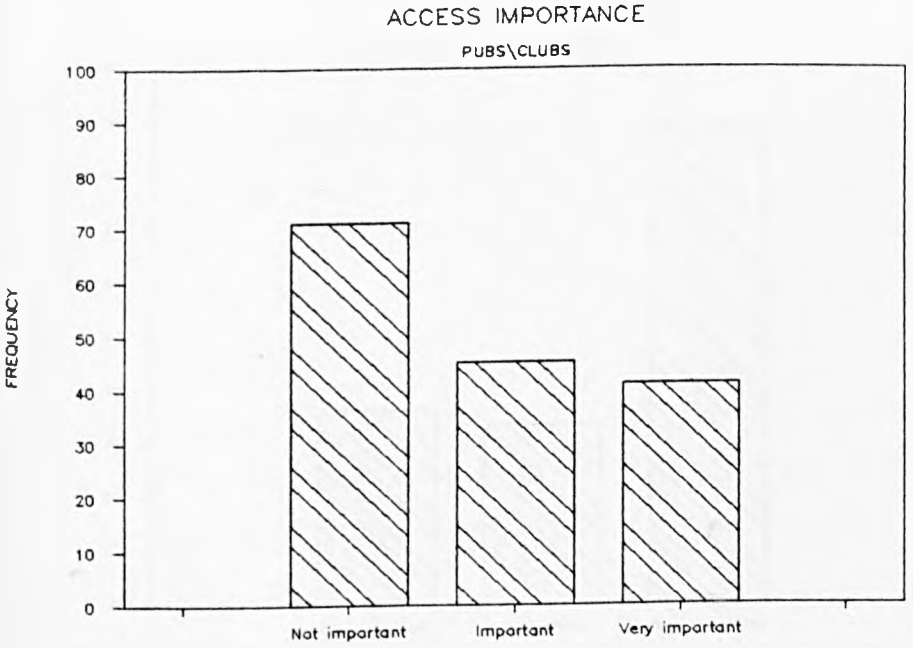


Figure 3.5 : Access Importance to Health Centres

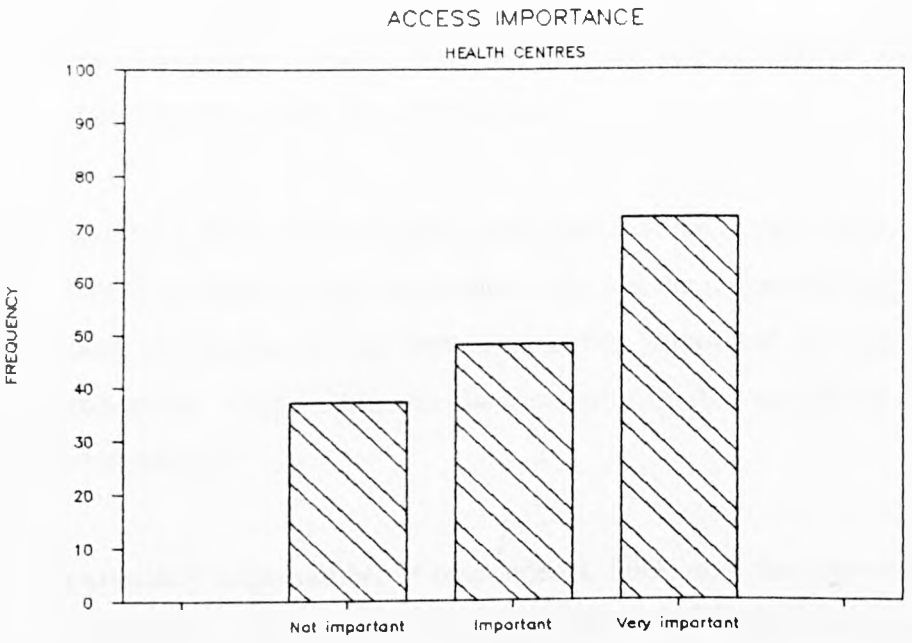


Figure 3.6 : Access Importance to Public Toilets

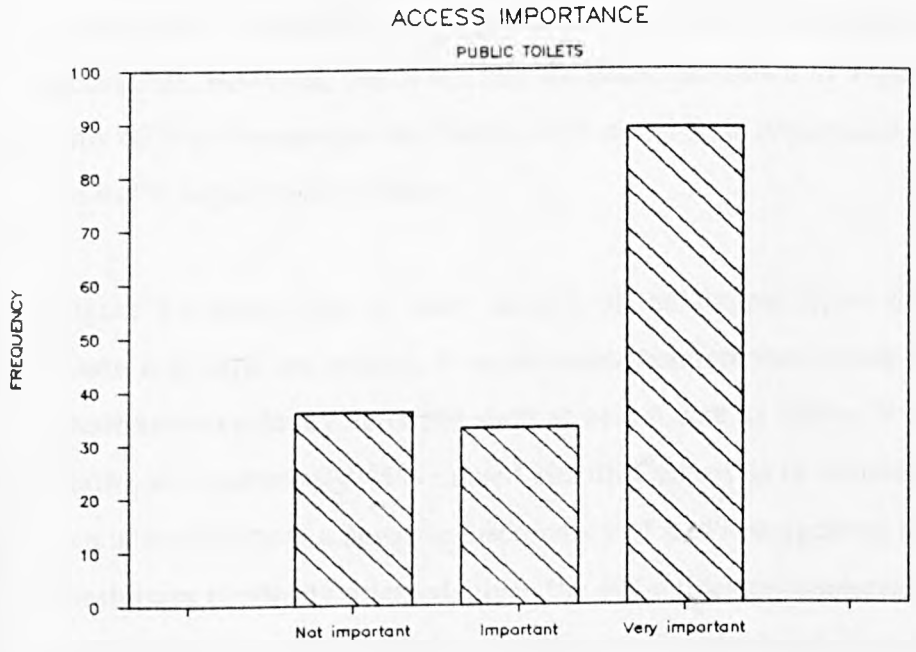


Figure 3 indicates a skew towards the 'very important' end of the scale; Public Toilets, Health Centres and shops are thrown up into sharp relief as the most notable building types for which access is desired. However as noted earlier, degree of importance is relative to the individual service offered.

Figure 3.1 shows that just under one quarter of the sample, 24%, consider access to Post Offices as meriting little importance, whereas the remaining three quarters of the sample noted that access to this service is either 'important' or 'very important'. This high proportion, which indicates the centrality of this service to disabled peoples' self determination.

A similarly large number of respondents, 90%, note the importance of Shops in Figure 3.2; however no discrepancy is apparent between usage and importance. This figure is perhaps more indicative of the number of shops available, at least in Aberdeen or the larger towns, thus permitting a greater range of options enabling selection of the more accessible. However, this is not true for Banks as shown by Figure 3.3, where although only 62% of the sample visit Banks, 73% noted their importance as a service, indicating an <11% negative discrepancy.

Figure 3.4 shows that as many as 45% of the sample report that access to Pubs and Clubs is of little importance. It would seem therefore that leisure pursuits are considered secondary to primary activities such as health care as shown in Figure 3.5. Figure 3.5, shows that conversely 45% ranked Health Centres as of considerable importance, but actual use indicates a negative discrepancy of <24% suggesting that life for people with disabilities is priority oriented, given the difficulties encountered. Further, although this building type has been included as a key service, the level of requirement on a frequent basis is very different to that of either Post Offices, Public Toilets or Shops, all of which necessitate frequent use on a daily or weekly basis, as shown by Table 10. Thus the level of discrepancy between actual use and noted importance closely relates to the type of service, and can only be used a yardstick determining inaccessibility in those building

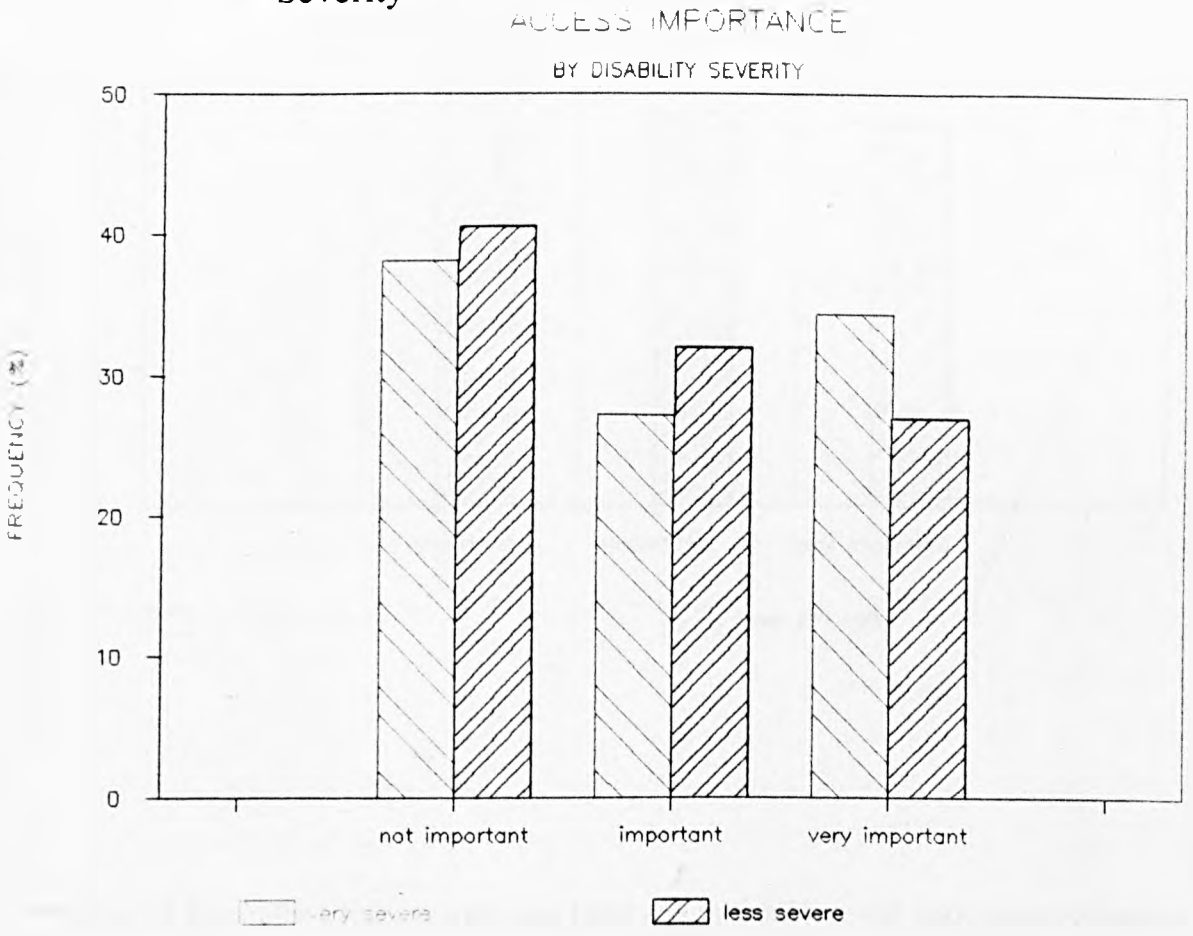
types which by virtue of their service necessitate frequent access.

This is certainly true of Pubic Toilets, where well over half of the respondents, 56%, ranked the accessibility to this service as 'very important', which as Table 15 shows is the highest score falling into this scale. The bar chart in Figure 3.6 clearly indicates the very strong feelings surrounding this service, feelings further supported by the high negative discrepancy, <17%, between actual use and noted importance, which reinforces the earlier thesis that a high proportion of respondents experience such difficulty with this service, that they have given up trying, and are making alternative arrangements.

Figure 3.7 : Access Importance to all Building Types by Wheelchair Use

Interestingly although a chisquare test demonstrates significance ($P < .025$) between the rate of importance ascribed by both wheelchair and non-wheelchair using respondents, Figure 3.7 clearly shows that this is not consistent, between the categories 'important' and 'not important'; a variation apparent between the 28% wheelchair users as against the 31% non-wheelchair users who rank 'important' and the contrasting 28% non-wheelchair users and 33% wheelchair users noting 'very important'.

Figure 3.8 : Access Importance to all Building Types by Disability Severity



Severity of disability is also a factor demonstrated by the chisquare test to be significant with the importance of access rankings ($P<.005$). Figure 3.8 repeats the trend for Figure 3.7, where a higher number, 34%, of very severely disabled people than less severely disabled at 27%, respond 'very important', the less severely disabled scoring higher in the 'important ' category, at 32% as against 27%.

Figure 3.9 : Access Importance to all Building Types by Age

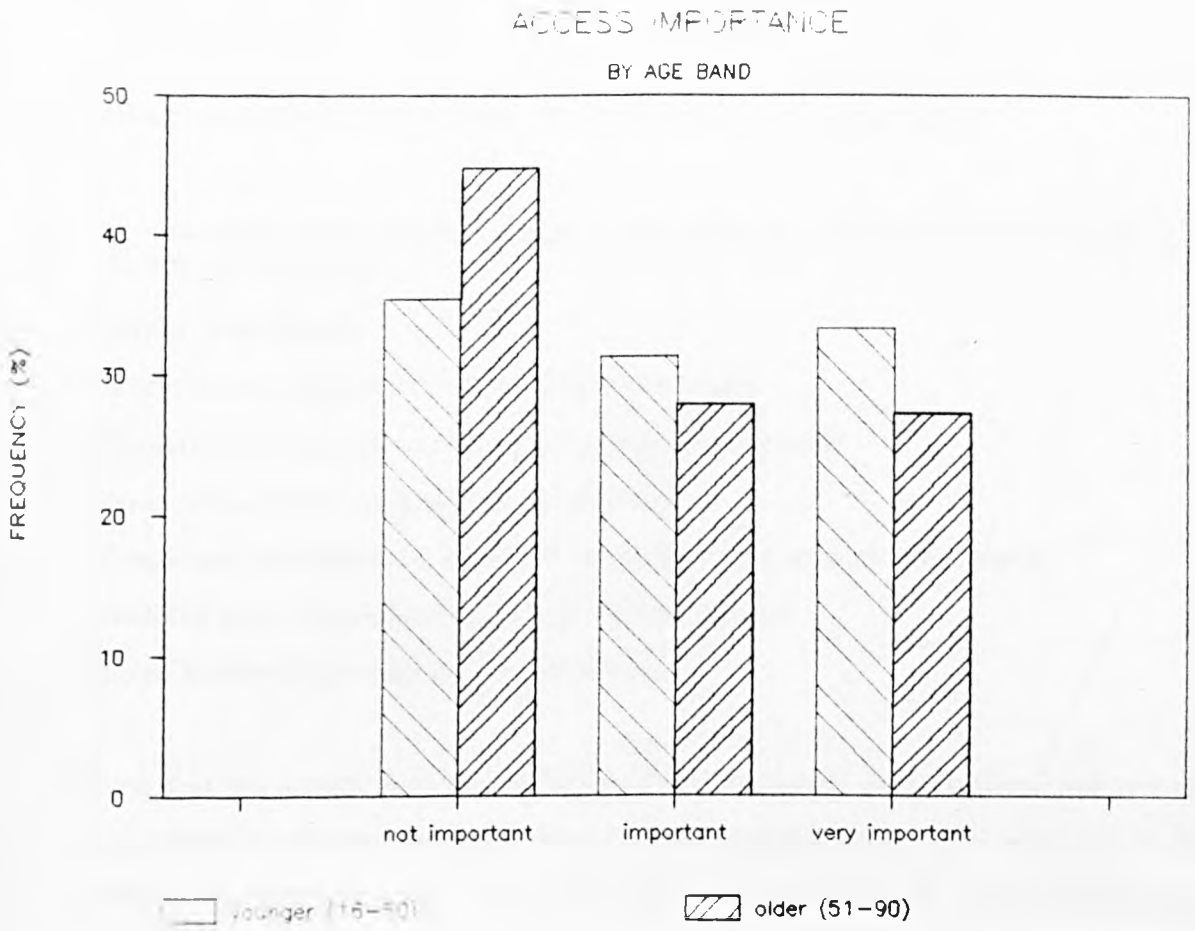


Figure 3.9 illustrates a link between age band and the rankings for importance of access, the chisquare test showing a high significance (P<.005). The 'older' group at a rate of 44% against the 'younger' group's 35% responded 'not important', a trend further repeated in both the 'important' and 'very important' categories, the younger groups consistently ranking access of higher priority.

4. Case Study Interviews

Six case study interviewees were selected on the basis of a number of guiding considerations, considerations reflecting the heterogeneity of people with disabilities highlighted in the base-line survey. Moreover, it was hoped that this approach would yield a greater diversity of opinion. The considerations are listed below:

* an indication in the previous postal questionnaire of willingness to participate in the follow-up interviews.
* gender; male/female
* employment status; full time/part time/ not working
* disability type; progressive/fluctuating/degenerative/stable
* onset of disability; congenital/non congenital
* functional characteristics; ambulant/ wheelchair user/ sensory impairment
* mobility aids; wheelchair/guide dog/ walking stick(s)
* home location; Aberdeen city/ regional town

Given that the sample was drawn largely from voluntary organisations, and housing associations, it was not possible to reach those disabled people who were less visible and by implication less active. Thus the decision was made to target only disabled people who had demonstrated in the postal questionnaire open question, an interest in issues of accessibility. This was a deliberate bias which was intended to draw on experienced respondents who were already aware of architectural barriers and therefore more likely to offer well considered opinions, which were less likely to be picked up by architects' unfamiliar with their needs.

The six respondents selected on the basis of the above criteria were conducted around an open questionnaire with a loose checklist format. [4] *

[4] Checklist available in Appendix A

The interviewees representing a broad range of disability types were encouraged to describe either a typical outing or a building which posed access difficulties. This method was effective as a means of eliciting not just isolated problems but of demonstrating how these culminated, impinging and eroding on a daily basis the life options of people with disabilities.

The taped sessions are revealing; however, given the limited time available to transcribe each interview which ran for approximately one hour, it was deemed necessary that they be edited and considerably shortened.

The interview content, designed to complement and further illuminate the more quantitative data from the postal questionnaires, was finally abbreviated to retain only the evidence focusing on Public Toilets. Public Toilets were selected as they most notably were ranked as one of the most under frequented, but most important building type by the RGU respondents.

The following six edited transcripts offer brief but telling commentaries as to why Public Toilets are perennially cited by disabled people as being a major bugbear. Furthermore the testimonies perhaps serve to encapsulate the experience of all types of restrictions in the physical environment and its consequent effect on building users.

Ms S is a 45 year old woman who lives and works in Aberdeen as a recruitment consultant. Since developing Polio as a child she now uses a wheelchair.

"Toilets can be difficult - particularly the ones that are advertised in the streets - and they are always relatively dirty, cold and cluttered with things that ought not be in there - like pails, basins and brushes and all that sort of stuff.

So when I go to the loo I will head towards specific loos I know to be OK and I will travel a fair distance if I have to go - I tend not to go if I am in town rather than go.

I am very careful about using loos - as I used one in a multistorey car park and I actually landed up with a black and blue jaw because the flooring was all that sparkly, smooth stone and it was absolutely littered with mops and pails and I really had to go, or once I saw it I would have come out again. And I actually slipped as I was moving between the toilet and the chair and I caught my chin - I won't go back there again and I just won't go where I don't feel comfortable.

I guess if you go to a public loo and it is not particularly clean or fresh you don't really have to touch anything - but if I open the door of a toilet and it smells or there are pools of water and I have no way of avoiding either touching that or coming close to it - so I just won't go - I have to touch virtually everything - your wheels are going through whatever - so if it doesn't feel clean I don't use it"

Mr W. is a 47 year man who lives and works in Aberdeen as an engineer. He has Multiple Sclerosis, and during the past two years has used a wheelchair.

"I travel a lot and have to plan days or hours in advance to make sure that wherever I am going will not leave me stuck.

A lot of people have bladder problems and try to plan their visits to make sure that there are adequately adapted toilet facilities - most shops these days provide them. Although most are reasonable there are some strange and glaring anomalies - a new modern shopping centre for example has two disabled toilets.

And in one of them the problem is not once you are in it - the problem is getting in it

because there are two doors to enter and a narrow corridor which creates an air lock. You get in past door one, and close it behind you - it doesn't have any grab handles on it - and you get to door two - and you cannot open it as it opens into your wheelchair. So the only way you can get into that disabled toilet is to get out of your wheelchair - either that or you need assistance but to be independent you cannot do it - however, once you are in it is OK.

Really, I wonder sometimes whether those who design such facilities have got the right spirit - because I would love to see them do it in a wheelchair. They seem to forget the most simple, practical details - it would be very easy to make that toilet entrance accessible - but I could not get in there and it is unfortunate. That is what interests me, exercises could be carried out by students - put them in a wheelchair - so they can't get out - can't even get home except by using the wheelchair. That would be very instructive - even then they underestimate just how much energy it takes to propel yourself in a wheelchair. Even a little slope might seem trivial until you push yourself up it - what might seem to someone able-bodied as marvelously accessible - would realise it is not if you are pushing a wheelchair. Illustrating the problems you can quite unwittingly land yourself in - because you don't expect it to happen - and when it does happen you make sure it doesn't happen again."

Ms B. is 32 years old and lives and works in Aberdeen as a personnel officer. She has Cerebral Palsy and uses a wheelchair.

"I tend to try to find out before I go somewhere new what access is like and if I know it is going to be very difficult I will find some excuse not to go.

As long as I can get my chair into the toilets - I can normally manage. If the toilet happens to be in the centre of the floor without grab rails I might have difficulty - if it is against the wall without a grab rail I can manage that. I use incontinence pads when I am out - not

that I have a problem but it gives you an extra safeguard - if you know you are not easily going to make it into the loos. It is far more of a problem on longer journeys, say up North - because they often shut toilets down after a certain time of night. RADAR keys don't always work.

My mother is getting older and less able to assist me and of course toilets are often a difficult thing for my father to be able to assist with - he is embarrassed - and unless it is a Unisex loo he couldn't help anyway. Normally if they had been appropriately designed I wouldn't need assistance."

Mr W. is a 41 year old man, who lives in Stonehaven, Kincardine and Deeside. He is a joiner but has been off work for the past two years following a spinal injury. Until recently he used a wheelchair but now uses a walking stick.

"On the big jobs we were on - changes always had to be made to disabled toilets - sometimes the doors had to be altered - hand rails too - they were often at the wrong height. The architects sometimes did use guidelines but they often didn't seem to understand what was required - things often had to be changed - sometimes mirrors were at the wrong height, handrails weren't in the correct place.

In some toilets now there is only one big hand rail instead of two - there is often nothing at the wall side for someone to hang onto and if you are in wheelchair and your side is down and you are lifting yourself onto the toilet - you have really got to hold onto something - often only the toilet roll holder is there which is not enough to hang on to - you know just little things like that.

Not everybody can transfer themselves from just one side -it depends on which side your strong arm is - when I was in my wheelchair I liked to transfer to my left - I never really lifted myself off to my right - sometimes getting back on was tricky."

Ms F. is 63 years old, and lives in Ellon, Gordon district. Since Coronary Bypass surgery and an above knee amputation three years ago she has used a wheelchair and walking sticks.

"I don't go to a strange toilet unless I know where it is - or unless I am desperate - toilets are really...wild - it's scary to go to a toilet. I went a bus run, a British Legion ladies outing and I got into this place and I had to shout for someone. I didn't realise I couldn't get back up - I need leverage to get up there was no hand rail - but then everybody has got different needs for toilets. The main Aberdeen hospital has only got two disabled toilets in the whole of the hospital - and I couldn't even shut the toilet door.

I only go now if it's an absolute necessity - if you have just got to go - now I don't bother shutting the door - in case I have to shout for help. It's quite harassing in a strange toilet - Oooch! you make the best of it!"

Ms A. is 40 years old. She lives in Aberdeen and trained as a Personnel Assistant but is currently unemployed. She is registered blind and uses a guide dog.

"Public toilets aren't very easy to use, there are often lots of steps. I mean for a blind person unless you are very familiar with the area you don't know where the ladies is from the gents, so I tend not to use public toilets.

I would use disabled toilets if I knew where they were - but you don't know where they are. I use my toilet here at home before I go out and if possible I wouldn't use one until I come home. Well you don't know where they are and sometimes there is not enough room to take my dog in - and if you left her in an outside corridor you couldn't be sure that she wouldn't wander off.

I will ask a shop assistant if I am really desperate, to take me to the toilet but I would rather not because you are asking a stranger who may or may not feel comfortable about it."

The testimonies provide strong evidence that the behavioural options of a range of six people with both physical and sensory disabilities, are severely reduced, circumscribed by the physical environment. The accounts demonstrate that a number of the problematic features of design, glaringly evident as obstacles to disabled people, may go unrecognised as obstacles, remaining invisible to designers, less physically sensitive to the built environment. The expressed need of a blind person to have enough space in a toilet cubicle for a guide dog, for instance, is a use of space unlikely to be envisaged without active consultation with people who are visually impaired. A badly placed grab rail, a slippery stone floor, an air lock created by a short, narrow corridor, are all examples of design shortcomings which might have been overcome if the designer were more informed and empathetic of the design requirements of building users who are disabled by architectural constraints.

This finding supports the quantitative evidence, by illustrating that buildings are failing to meet the needs of the full range of users, even when they have been, as in the case of the unisex public toilets cited in the interviews, designed to cater for people with disabilities. The results point to the need for designers to conceptualise and resolve through appropriate spatial configurations, a greater range of behavioural requirements necessitating an infusion of knowledge at a formative point by pedagogical means, so that it may inform the generative process of design thereafter.

5. Conclusions

The RGU survey of disabled people showed sample characteristics consistent with national average statistics, however, the distribution of disability within the group was weighted towards more severely disabled people, with largely locomotor difficulties, a significant proportion of whom relied on mobility aids; aids as an indicator of sensitivity to the built environment highlight the appropriateness of the sample as access informants. Given that the sample composition included for pragmatic reasons only severely disabled people, further research investigating access to the built environment is required. This additional research must adopt a much wider sampling frame which is reflective of the heterogeneous range of building users; including people with a range of functional characteristics such as pregnant women, tall, short, frail and elderly people, and those who are physically, and sensorily impaired.

This suggestion is further reinforced by the findings demonstrating that the past two decades have seen a significant cultural shift towards the greater integration of people with disabilities into the community, as evidenced by their increased frequency of visits to public buildings. Notwithstanding such an advance, almost half the respondents reported that over the period of the previous twelve months they did not use the majority of the given building types. Indeed key services such as shops, post offices, banks and public toilets, services essential for ensuring self-determination, fail to be used by 9%, 36%, 35% and 39% of the sample respectively. These figures which although indicative of the desire on the part of disabled people to manage wherever possible their own affairs, rather than delegating to helpers, also show that they are frustrated in this aim. Furthermore, the findings suggest that disabled people are seriously frustrated by their inability to gain ready access to almost all public buildings. Indeed, only 32% of the total sample find access relatively unproblematic, whereas 30% noted some degree of difficulty, 15% of whom experience this to an extreme extent finding access either 'often difficult' or 'impossible'.

Many disabled people therefore remain isolated; this finding becomes all the more disturbing given first, that the RGU sample population was drawn from voluntary organisations and hence more 'active' and second, the in-built bias of any questionnaire survey which relies on a postal return, requiring motivation to respond. What of those people with disabilities who are not so aware of access difficulties? who are not so active? What of those people who fell outwith the survey sphere of reference? As the survey included only disabled people who are members of voluntary organisations and so by implication people who are more visible, it is clear that the results indicate access difficulties which are a gross under-representation of the real figures, the very existence and form of which may be ignored or denied by designers.

The fact that age, disability severity and wheelchair use are all factors rendering users more susceptible to 'disabling' environmental constraints was demonstrated. The pattern indicative of the current inflexible and uncompromising nature of the built environment, of the narrowness of design parameters which restrict behavioural options. The more physical and sensory demands are placed on the physical environment, the less likely it is to accommodate them. The trend is indicative of the inadequacy and failure of buildings to cater for people with disabilities, and by implication a heterogeneous public who accordingly have a wide variety of design needs. Clearly, the evidence shows that the environment is designed to respond to, and meet the needs of only a limited section of the population, the section of the population who are most physically and sensorily able at any one time. It may be further postulated that the physical environment caters for an idealised vision of the average user, the user who is not so functionally impaired as to become sensitive to restrictive spatial arrangements, which represent narrowly delimited parameters, reflective of the narrow stereotyped attitudes of designers, which to date have largely overlooked or ignored those users, such as people with disabilities whose needs lie outwith building designers' frame of reference. People with disabilities, arguably, have experienced not just segregation facilitated through the marginalising mechanism of architectural barriers but apartheid. Clearly, the designer's frame of reference as it relates to the design requirements of building users, and particularly people with disabilities,

must be expanded to accommodate those who are more environmentally sensitive.

Correlation between frequency and difficulty of access found that the relationship between the variables was not significant. Indeed, the lack of association indicated a balanced split. Just as those who go out more frequently may experience more access difficulties, so those who venture out less often and may be deterred by architecture barriers avoid experiencing difficulty. The pattern was shown to be dependent largely on the service offered by the building type; both shops and public toilets present considerable access difficulties, however, shops are very frequently visited, whilst the converse is true for public toilets. Indeed, of all the key building types, public toilets were ascribed by wheelchair users, the lowest ranking at 10%, of 'access ok'. Interestingly, well over half of the respondents, 56%, ranked the accessibility of public toilets as very important, a figure disproportionately high in relation to actual use, suggesting that this service is so problematic as to prompt many people to make alternative arrangements.

Leisure pursuits were largely identified as of secondary importance to primary activities such as health care, suggesting that life for many disabled people is priority oriented, given the extent of architectural barriers. Indeed, this assumption was further borne out by the case-study interviews, which serve to illustrate through the extreme example of public toilets, how 'disabling' environmental barriers have served to impact upon the lives of disabled people, diminishing personal autonomy. Moreover the testimonies although brief, highlight the often invisible nature of architectural barriers to those such as building designers who are unlikely to have witnessed their circumscribing effect. This observation provides a powerful argument for improved collaboration between designers and building users, for listening to the voice of the disabled consumer which for too long has been subjugated. Further research is required to investigate the means by which the communication flow between architect and building user may be rendered more effective. This calls for an inter-disciplinary methodology which steps outside the parameters of any one discipline which may be too narrow and constrained to properly

address a topic of such a macro scale. However, it is important to depart from a taxonomy of disabled people's needs, a micro individualistic approach which repeats the mistakes of the past by merely classifying needs without relating them to the social milieu, and addressing the etiology of architectural barriers. Certainly a more holistic methodology is required, drawing on such tried and tested social science survey techniques as Post Occupancy Evaluation (POE), and numbering people with disabilities amongst its lay participants.

Public toilets, shops, hospitals, health centres, post offices and banks are the building types for which access is deemed of greatest importance and the services identified, as meriting urgent consideration by designers, in terms of both existing and new buildings. Indeed, those building types ranking of immediate concern to people with disabilities, also comprise the means by which personal autonomy may be increased, if rendered more accessible.

The findings clearly indicate that the vast proportion of public buildings in the UK, fail to meet the access needs of a significant proportion of the population. The interviews provided strong supportive evidence of a lack of congruence between the designer's perception of need and actual need as expressed by disabled people. It is therefore obvious that there exists a failure to communicate the fundamental needs into functional designs, due essentially to a lack of awareness and responsiveness by designers. Clearly this is a fertile field for research; a comparative analysis is required, evaluating designer/user responses to Universal Design and more orthodox micro approaches as represented by legislative measures for disabled people. Further questions which may be drawn from the survey results are: Do designers respond positively, negatively or with a degree of ambivalence to Universal design? Do they feel it provides more flexibility and thereby worth trading off against the less challenging, safe approach of following strict prescriptions? It is also recommended that further related work be undertaken investigating how effectively Universal design prescriptions translate into the finished buildings.

Overall the results indicate that although an increased proportion of people with disabilities are frequenting public buildings, access continues to remain significantly problematic. Indeed, belying the marked intensity of building use, is the disturbing fact that a substantial number of disabled people remain isolated, with a tendency to blame their physical impairment rather than the external structural factor of access for their estrangement. It is further shown that degree of physical impairment correlates with degree of environmentally sensitivity and so susceptibility of behavioural control by architectural barriers. Barriers which contribute towards the marginalised and invisible status of many disabled people.

Given the proven lack of congruence between the designer's perception of need and actual need, it is thus imperative that designers be educated to reappraise their concept of the building user, particularly disabled people and concomitantly expand their design parameters to incorporate those who are environmentally sensitive.

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Chapter 7

Universal Design: Awareness with Architectural Education

1. Introduction

> *"Knowledge is the raw material for design, it is not a substitute for architectural imagination: but it is necessary for the effective exercise of imagination and skill in design. Inadequate knowledge handicaps and trammels the architect, limits the achievements of even the most creative and depresses the general level of design (Oxford Education Conference, 1958)*(1)."

Espoused as one of the guiding tenets of the 1958 Oxford Education Conference, this statement may have appeared a truism, thus explaining its failure to merit serious attention as the years have progressed. This failure has recently been well documented in the report by the Steering Group on Architectural Education chaired by Richard Burton(2), which strongly recommends the development of a more responsive and effective pedagogical system, informed by research generated knowledge. Such an infusion of research, it is argued, is required not only to supplement the discipline's knowledge base but to also instill "research consciousness - and associated *"research literacy"*.

Burton further stresses that it is not revolution within education which is called for, but evolution based on academic rationalism which it is hoped will help to redress public disquiet and quell the post modernist clamour for artistic autonomy in architecture. This

evolution, while long overdue, if not fully assimilated and granted more than cursory, expedient regard will lead to the ultimate stagnation if not extinction of architecture. As Hawkes observed,

> *"When much of the discourse in architecture is anti-science, or possibly supra-science, the research community is in danger of becoming irrelevant to the interests of much of education and practice. The dire prospect opens up of research being useful to education primarily for its influence on the statistical balance sheet, but becoming ever more isolated from other currents which now flow through the architectural landscape.*(3)"

The Burton report acknowledges the need to link the two cultures of *"science and art, between the client/consumer and built form, between resources/technology and ability to pay, between uncertainty and certainty"* and the need for their *"harmonious resolution*(4)". However, although it touches on the need for *"advanced design theory and history*(5)" as related branches of research, the report evades specific focus on the need to develop an architectural theory. This is the theory to bind the knowledge, the theory so elegantly mooted by Martin in 1958, when commenting on the Oxford Education Conference, as an essential ingredient of architectural education.

> *"The characteristic feature of architectural education is that it involves widely different types of knowledge. From the point of view of the university this raises two considerations. If architecture is to take its proper place in the university and if the knowledge which it entails is to be taught at the highest standard, it will be necessary to establish a bridge between faculties: between the arts and science; the engineering science, sociology and economics. Furthermore, the universities will require something more than a study of techniques and parcels of this or that form of knowledge. They will expect and have a right to expect that knowledge will be guided and developed by principles: that is by theory. 'Theory' as one speaker said, 'is the body of knowledge that explains and interrelates all the facts of a subject'. Research is the tool by which theory is advanced. Without it, teaching can have no cutting edge*(5)."

The Burton report laudably recognises as a starting point not only the existence of the building user but the right of the building user as a consumer, and as design participant. Also included amongst the 45 recommendations is the proposition that,

> *"the core of architectural education should remain focused on design and design management placed in a social context. It should be studied through project-based, student-centred methods, normally with individual or small-group tutoring, which also facilitate inter-disciplinary studies.*(6)."

Moreover, most significant is the stipulation that,

> *"Article 3 of the EC Architects Directive should remain the broad curriculum for recognised courses in architecture. The syllabus for the RIBA Examination in Architecture should be the key guide for core studies in architecture. However, decisions as to the specific curricula or syllabi of courses or pathways should be a matter primarily for schools and their respective institutions*(7)."

Article 3 of the EC Architects Directive 1985 became enshrined in British legislation in 1989, via the Architects' Registration Act. This was the first statute to specifically refer to the curriculum content of architectural education, and informs the tri-partite system; Parts' 1 and 2 marked by the RIBA Examination in Architecture, Part 3 by the RIBA Examination in Professional Practice. The Professional Practice Examination, validated by the Architects Registration Council of the United Kingdom (ARCUK), is the only way of gaining the protected title of Architect.

Given the centrality of the EC Architects Directive(8), which sets out 11 key curricular objectives within Article 3, ARCUK as part of its education policy have produced a consultative document(9) clarifying the EC guidelines. The guidelines have a very strong social emphasis, so much so, as to prompt ARCUK to note, *"Apart from number 1 which is quite sweeping, 5 of the remaining 10 make references to "human sciences...people...social factors...the brief...(and) users' requirements*(10)." Indeed just as 5 of the objectives explicitly take account of social factors, so, those omitting direct reference are nonetheless influenced by them, as evidenced by objective 3 for instance, requiring, *"A knowledge of the fine arts as an influence on the quality of architectural design*(11)."

A skill which according to ARCUK begs such questions as, *"What is the social process behind the art/architecture link? Do developments in the arts explain anything about the man-environment relationship, building use and built forms?*(12)."

The five most socially oriented skills, the core skills most pertinent to this thesis comprise objectives 2, 5, 6, 9 and 10. These are listed below;

Objective 2 :

> *"An adequate knowledge of the history and theories of architecture and the related arts, technologies and human sciences."*

Objective 5 :

> *"An understanding of the relationship between people and buildings, and between buildings and their environment, and of the need to relate buildings and the spaces between them to human scale."*

Objective 6 :

> *" An understanding of the profession of architecture and the role of the architect in society, in particular in preparing briefs that take into account social factors."*

Objective 9 :

> *"An adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against the climate."*

Objective 10 :

> *"The necessary skills to meet users' requirements within the constraints imposed by cost factors and building regulations."*

The social dimension of architecture is clearly spelled out; if Article 3 is to be effectively implemented, the social sciences, currently little favoured within architectural education must be reinstated, and reinvented with a "design-relevant" thrust. However, such a fusion of the two cultures, requires the development of Martin's 'theory', as it is only through the application of theory with a social emphasis that the more user-responsive curriculum demanded by Article 3, can be realised.

Drawing on the social sciences, the emergent theory would contextualise the philosophy of Universal or Integral design, facilitating its more effective implementation within design schools. Disabled people, referred to, even by such enlightened educationalists as ARCUK, as a *"special needs group "* requiring *"special focus*(12)", through the application of a socially-based theory would thus be accommodated and perceived of as part of a heterogeneous population at large.

This proposal is similarly applicable to the RIBA syllabus, where design for people with disabilities is included as a topic meriting special consideration under the heading *"The Morality of Building*(13)." Furthermore, the section entitled *"The Grammar of Architecture*" indicates a measure of ambiguity as it relates to theory. It is stated that *"the Sub-Committee consider that the history and social content of the RIBA syllabus is broadly sound, but recognises that the content of architectural theory still needs further attention*(14)." However, this is a non-sequitur as the "*history and social content*" cannot, given their theoretical base, be *"sound"*, if the theoretical base remains largely undeveloped. This is a case in point, exemplifing the urgent need to inject a social theory of architecture, which will support and inform further social agendas such as 'Universal' and 'Green' design. Such agendas in order to be properly assimilated necessitate a conceptual challenge, a complete reappraisal of traditional attitudes within a developing theoretical framework.

The above approach is also recommended by Markus, who notes that if design pedagogy were to follow the EC Directive literally, a radical rethink of the system would be necessitated. Would this entail revolution rather than evolution? Certainly Markus appears to think so, as he asks if such an approach would *"compel architects to see buildings as primarily social objects*" forcing them to "*redefine their concept of the user?*" He further adds,

> *"The concept of both the client and the social dimension in architecture would have to be transformed. At present designing for the disabled brings tears to the eyes of kindly tutors, as do occasional 'community architecture' projects or rhetoric about energy, green design and third world housing; but even with*

such unarguably 'social' issues students are given little knowledge or skill. The occasional 'real' client introduced into a school is often as not an authority or a developer. But the new focus changes all this - the client becomes the 99% of the population who use buildings but have no legal or financial interest in them(15)."

Such a change in focus, a change at philosophical level must permeate and colour the entire curriculum; specialisation may be desirable but it will only serve to undermine the rights of the user if the conceptual reorientation has not been assimilated, and a basic awareness of integral or universal design established.

Recent access regulations (see Chapter 4), the influential EC Architects Directive 1985, and the resolutions passed at the CIB W84 conference on Prague 1987 (16), have reinforced the importance of the need to instill an awareness of the integral or universal design approach as a fundamental philosophy. To this end, the Council of Europe(17) undertook a questionnaire survey, to gauge levels of awareness of Universal or Integral design within the curricula of Architecture Schools within 9 member States (the UK included).

The findings show that notwithstanding the design guidelines relating to design for people with disabilities existent in all countries, aside from Belgium, the countries followed a categorical, or separatist approach to design for people with disabilities. The Council further comments that without exception no country has devoted a chair to the subject and conclude,

"In the past it was post-education courses and seminars that represented the usual approach to accessibility. Today it has become necessary to evolve towards a total integration of concepts at undergraduate level. The ultimate objective of barrier-free design may take some time to implement since it involves preconceived ideas and traditional design features, eg; stepped entrances. In the light of the need for not only accessibility but also a completely new approach to concepts of space, it is clear that nothing short of a policy of complete integration will ensure an adequate level of education. Such education should integrate the needs of people with any type of disability

- physical, sensory, intellectual. Information concerning these needs should be obtained from people with disabilities themselves : that would have a considerable impact on students and help to reinforce the concept of consulting the consumer. Moreover, this represents an important condition for making progress in research for models, and, together with the development of methods of analysis and evaluation of solutions it should become an established part of the curriculum of architectural education and other space-related educational institutions(18)."

The results of stage 1 of RGU Grampian survey demonstrated that disabled people experienced significant access difficulties, which impinged upon their self-determination, highlighting the imperative need to dismantle detrimental stereotyped attitudes held by designers, through a major realignment and expansion of spatial concepts. Given the RGU findings and the related results of the Council of Europe's survey which examined curricular policy at national level, revealing that awareness levels of integral/universal design is almost non-existent, an investigation of the general staff awareness and curriculum content within the 36 British Schools of Architecture was deemed a timely and essential move. Designed to evaluate educationalists' attitudes on the effectiveness of current design prescriptions as a means of catering for the design needs of disabled people, such an investigation was also viewed as a basis on which to build an educational model aimed at testing the effectiveness of awareness raising techniques.

2. Survey of Schools of Architecture

RGU carried out a survey of the 36 UK Schools of Architecture by means of questionnaire, to review the curriculum content and nature and extent of access awareness in each. Each questionnaire[1] * was accompanied by a covering letter[2] * addressed to the school head of department, explaining the purpose of the survey.

[1] Questionnaire and

[2] covering letter included in Appendix B

30 completed questionnaires were returned, representing an 83% response rate. Given that all schools who failed to reply within three months were issued with a reminder questionnaire and later a phone call, it may be reasonably assumed that the remaining six schools give little positive consideration to access issues. In a number of schools the form was forwarded to staff members within whose remit the study was deemed to fall. This was true of one architecture school where the Head of Technical Studies has a particular interest in access given his own experience as a wheelchair user.

2.1 Findings

2.1.1.Course Documentation

The results show that only 8 schools have course documentation which specifically refers to the access requirements of disabled people. Within this context, design project briefs were most likely to address access considerations. However, although one school did cover the area in a Design, Technology and Management course, and another in a series of human studies lectures, they were the exception. It was far more likely to be the case that departments approached access through project work, along with egress and other functional criteria, as and when it was considered appropriate; ie, when the design failed to meet legislative requirements, rather than as a focus. 50% of the sample schools tended towards this line of thinking.

2.1.2 Introduction to Access Considerations

Of the 14 schools who provide a preliminary briefing on access, all do so as part of an introduction to a related project; however, in only 3 schools, is this pursued at any length in the form of a lecture. Nonetheless, access promotion, although addressed in depth by few schools, takes many varied and interesting forms which range from liaising with local welfare and access organisations (16%), running access competitions

(6%), running an awareness raising series of events (6%), simulation exercises (10%), inviting disabled speakers and experts (20%), to giving handouts on literature references and information sources (10%).

One positive example of liaison between community groups, professional organisations and educationalists, not only saw the growth of awareness of students, but all concerned.

> *"The school has close links with the local access group, who have met groups of students and have had some of their meetings in the school premises with students in attendance. Further, in conjunction with the local branch of the RIBA (who put up £40 per year) an access prize is awarded annually for the design thought to be the best at having catered for the needs of the disabled - this is open to students in any year. The jury is comprised of representatives from the Access Committee, RIBA branch and school staff."*

2.1.3 Definitions of Disability

The working definition of disability normally adopted by each school served as an approximate measure of the degree of access awareness. A broad interpretation of disability which departed from the common misconception of disabled people as comprising only wheelchair users, suggested a high level of knowledge, whereas a missing answer to this question, the contrary.

As many as 11 schools, representing 36% of respondents failed to answer. Of those who did, only 2 replies referred to wheelchair users alone, whilst a further 6 added visual impairments to the latter category. The remaining 11 schools applied a more wide ranging definition, 10 of which included aural impairments, 10 elderly people, 4 cognitive impairments and 4 psychological/psychiatric disorders.

Table 1 : Working Definitions of Disability Employed by Schools of Architecture

Definitions	No' of schools	%
Wheelchair users	19	63
Visually impaired/ Blind	14	46
Aurally impaired/ Deaf	10	33
Elderly	10	33
Cognitive impairment	4	13
Psychological disorder	4	13
Mothers with prams / economically disadvantaged/ heterogeneous population/ Universal definition	5	16
* No answer	11	36

However, only 16%, that is 5 schools, extended their categories sufficiently, by including children, women with prams, the economically disadvantaged, to embrace the principle of access for all. The 5 schools who did employ a more comprehensive definition demonstrated a comparatively advanced understanding of the issues of universal design, as evidenced by the following informed reply,

> *"Visual, aural, ambulatory and on the degree of accompanying infirmity, whether severe or partial. The satisfaction of human needs is of course central to our design philosophy, for it is viewed as the purpose of the process of Architecture. The criterion by which we should judge a buildings fitness for purpose, as well as a means of assessing the quality of fit between people and buildings and as a performance standard for design precedent."*

Unfortunately, such enlightened approaches were in the minority, leaving 25 schools and possibly the additional 8 non-respondents, holding the now dated separatist, categorical approach to access.

2.1.4 Access Related Projects

A third of schools responded negatively to the question, "Within the past 5 years, have any students undertaken a project which specifically focused on the design needs of disabled people?" The remaining two-thirds carried out studies which tended to fall into four groups; project work - 14 schools, live projects - 8, dissertations - 5, and research, just 2 schools.

A selection of some of the most interesting project descriptions, using real briefs, serve not only as stimulating examples of the consideration and the solution of the problem of physical differences, but also underline the importance of this goal.

> *"A climbing frame and other structures designed and built by second year students for a local school for the mentally/physically handicapped"*
>
> *"Housing for the disabled by a student diagnosed as having multiple sclerosis, who between ending Part 1 and Part 2 became wheelchair confined"*
>
> *"A polytechnic-wide consciousness raising week of events followed by a design project based on the school of architecture building and its access."*
>
> *"A third year option focusing on the refurbishing of the students' union for improved use by disabled students."*
>
> *"Non-visual aesthetics for blind and partially sighted people."*
>
> *"Light for partially sighted people, the design of a wheelchair for the third world, and a hospice."*

However, in considering the above examples, one respondent stressed the advantage of the iterative process of familiarisation, whereby firstly an integral approach is established, whereupon more specialist knowledge may be grafted,

> *"Whilst designing for physically disabled people in a potential user-population is clearly important, undergraduate students must become familiar with the general rules before exceptional cases. However, this does not preclude graduate students from choosing to do a specialist study of the needs of the disabled."*

2.1.5 Staff Awareness

A large proportion (56%) of architecture departments felt unable to address access issues adequately. Of these departments, 7 remarked that this was because greater staff awareness was required. As several respondents not untypical of this group noted,

> *"If someone would tell us what to include in the course to extend consideration of the disabled, I'd be grateful."*
>
> *"We are probably not as aware of the range of problems as we should be"*
>
> *"We are at the mercy of the vague climate of design, change that and we'll change"*

Whilst 4 and 5 schools respectively, stated that more specialist projects and more specialist lectures and exercises were needed. One school commented,

> *"It (access) needs to be made more of a live issue for those who set projects - this is difficult for various reasons"*

A further 4 schools noted that consideration of 'users' should be extended to all courses as a primary concern. Remarked two such schools,

> *"We introduce design for disability through Regulation Part M. We have options and electives for students, some of whom choose to design for the disabled in a certain amount of depth eg; dissertations. However, this information is not available to everyone."*
>
> *"Two eight week terms and one six week term per year leave little time for greater detail. The course development could be greater -inclusive of reference to the needs of the disabled in all existing courses rather than special new lectures"*

However, it was not necessarily the schools with the least knowledge of access, who identified a need for further course development. A number of the more active, recognising the complexity of the subject, noted areas requiring further attention. Some

schools, with little or no consideration of access, had no concept of the need to become more user-responsive and thus of the need to develop appropriate courses.

2.1.6 Attitudes Towards Access Guidelines and Regulations

Almost half of the schools responding to the survey felt that current access guidelines and regulations are an inadequate means of serving the design needs of disabled people, indeed only 9 schools believed them to be satisfactory as they stand. Of the former group, 7 schools made comments to the effect that access legislation is too prescriptive. The following comments are clearly indicative of the degree of resistance, confusion and frustration invoked by what is perceived as the inflexibility of the guidelines and/or regulations.

> *"Minimum publications are too limited in scope. Goldsmith in particular has been responsible for a 'look it up and do as he says' mentality rather than thinking it out for oneself."*
>
> *"Advice is confusing. As an architect I find that satisfying a brief for one client can produce shock, horror from disabled users, eg; sliding/hinged doors"*
>
> *"Some progress has been made but actual outcomes are clearly ad hoc and therefore only partially successful."*
>
> *"They (guidelines/regulations) could be stronger but education and attitudes are important."*
>
> *"Guidelines are guidelines and specific research underlying published guidelines is often not transferable to selected situations."*

It was further noted that statutes specifically relating to the access needs of people with disabilities were a means of segregation in themselves, creating an artificial differentiation between disabled and so called able-bodied people which led to a divisive rather than an inclusive approach engendering contradictory guidance, and the misconception of a dichotomous society.

"It is an area which tends to be too patronising - I think all our work should have simple considerations for the handicapped rather than a self-congratulatory sign"

"The concentration on male wheelchair users is limiting. The guides do not consider the disabled as part of family groups or society in general."

Interestingly, the latter opinions were further reinforced in the section inviting open comments at the end of the questionnaire. In this context design prescriptions were regarded as constraints running counter to the educational objectives designed to encourage creativeness of thought.

"Architectural education is about problem solving and spatial manipulation. They (students) should certainly be made aware of the problems of the handicapped, but designing for their needs should be no more specialised or difficult than other problems. Architectural students cannot (and should not think they can) carry finished solutions in their heads for any of these, but be able to design an appropriate solution."

"Our course intends to firstly, introduce the discipline of architecture to students to secondly, enable students to acquire intellectual understanding and the skills relevant to designing, thus thirdly, exact and precise building law is not taught on the course."

"'Access for all' is a physical requirement. But true access is one of attitude that encourages breadth rather than seeks minimums."

Overall the results of the study indicate a piecemeal, inconsistent approach countrywide. The degree of consideration ascribed to barrier-free design was largely discretionary and dependent either on the specialist interests of the department, one particular lecturer or even the existence of disabled students. One school observed, *"We have two deaf students going through our course (2nd year and final year) this makes us more aware than we might be of special needs across the curriculum."* Schools also tended to be complacent about access, believing it sufficient that the minimal criteria were being met by students, thereby neglecting to increase knowledge and so, quality of provision.

The marked vilification of access prescriptions by the educationalists is a measure of general antipathy towards rote 'cookbook' design solutions, which are felt to militate against pedagogical methods aimed at stimulating intellectual breadth and creativity. Also stressed were the guidelines inbuilt inadequacy as means of transmitting the broader more inclusive philosophy of design for all. These comments clearly reinforced the need for guidelines which stem from the macro base of anti-discrimination statutes; universal guidelines, the application of which cannot be effective and contextual without the informed, creative problem solving abilities of the designer.

However, just as it is evident that the majority of schools of architecture believe in approaching user accommodation from a broader more educative standpoint, so it is also evident from the findings that there exists a significant lack of awareness of the concepts of universal design. Indeed there is too little awareness to transmit the philosophy of universal design effectively, without further staff training and information on the issue. Clearly, this survey has demonstrated the urgent need for an educational awareness raising model, which familiarises students through pedagogical exercises applying design guidelines as tools, as adjuncts, rather than as a means sufficient in themselves of ensuring accessibility.

3. Universal Design : Assessment of Awareness Raising Techniques Within Architectural Education

3.1. Methodology

This survey was formulated on the pioneering work of Raymond Lifchez(19), University of California, who found that in order for design students to fully assimilate and express the needs of disabled people in spatial terms, they had to be directed towards a full understanding through a programme of educational techniques. A

programme, which although successful, was not transferable to other schools, being uniquely tailored to the specialised environment of the University of California (see Chapter 2). Taking into account the shortcomings of Lifchez' model, the RGU study aimed to evaluate architecture students' awareness of the needs of disabled people in a largely typical UK educational context, with little experience of design provision for disabled people. Furthermore, both the programme and the evaluation tests were simplified as much as possible, to avoid their being misconceived by staff and students with variable knowledge of the subject.

The sample group initially comprised all Final Year Postgraduate Diploma students. Fifth Year was chosen as not only, would their work and attitudes at this late stage reflect the almost completed effects of the architectural training course, but their work would more closely approximate that of architects in practice, thereby permitting a more reliable comparison. The RGU syllabus for Part 1, Part 2 and the Diploma Year, comprised no components which specifically related to Universal design. This was further substantiated by discussion with the Final Year Tutor.

A programme of three educational interventions influenced by Lifchez, was devised (for a full critique of Lifchez model see Chaper 2). Each technique was designed to increasingly familiarise students with the needs of building users; interventions, developed with the aim of stimulating empathy, an awareness of others and their design needs by means of projective tools drawn from social science.

The first section led from the more theoretical, indirect understanding engendered by the conventional lecture/seminar-based method of a workshop, to the second section necessitating the physical participation of the students, via the 'learning-by-doing' method. Although the latter section failed to be included within Lifchez' precedent experiment, it has found favour within a number of other design schools cognisant of the issue of accessibility(20). The third section culminated in a meeting with a disabled person and the opportunity to gain a more rounded appreciation of user requirements.

Plenary discussions were undertaken in all three sections to ensure that all students undertaking the educational inputs, would be exposed to an equivalent amount of information.

The sections utilised either experienced teaching staff, or as in the case of Section C, a disabled, wheelchair using person well versed in the art of lecturing on access considerations, to undertake the exercises, with the intention of offsetting any bias stemming from a lack of not only knowledge of the subject but also its communication.

A. Workshop : video and lecture on the principles of universal design. Feedback plenary.

B. Simulation Exercises : on site use of wheelchairs, crutches, bandages. Feedback plenary.

C. Site Visit : guided tour by disabled person of local shopping centre. Feedback plenary.

The longitudinal experiment ran for six months throughout the academic year 1990/91. Thirty-five students were pre-tested at the end of October 1990, prior to the implementation of the educational programme. At the beginning of May 1991, all the students sat the post-test. Both the pre-test and the post-test were administered blind, and in controlled conditions. The test was incorporated without prior warning towards the end of normal teaching periods, by a lecturer with whom the students were largely unfamiliar, but who was not in any way connected with the subject of access. In order to ensure that the real purpose of the test was concealed, students were not informed of the programme until the pre-test was over.

It was hoped that the five month time lapse between the end of the programme and the post-test would also discourage any associations, whilst at the same time testing memory retention of the programme. Lifchez' research project, found that the students registered test fatigue, a consequence of being overloaded with questionnaires, which was counter productive in the final results. It was also possible that if the students were administered with questionnaires after each test they would 'twig' that they were experimental subjects, and as such the real purpose of the test. The decision was thus taken to avoid jeopardising the experiment through the application of further questionnaires.

The pre- and post tests comprised an A2 plan of a 1967 Sports/Community centre[3] and a 1973 Leisure/Community centre[4] respectively. Initially the same plan was to have been applied in both test situations; however, given the success of the first test evidenced by the degree of thoughtful considered responses by the students, it was decided that it would be a counter productive exercise to force them to repeat the experience.

Efforts were made to match the plans for equivalent function, size, date and access provision. Both plans were selected for their pre-access building regulation status, the Building Standards (Scotland) Regulations, Part T coming into force in 1985.

It was assumed that given the low levels of access awareness apparent from the RGU schools of architecture survey findings, this would likewise be reflected in the student results.

Thus the pre-regulation, plans whilst not demanding high levels of expertise would serve as measure of students basic working knowledge of access considerations. Both plans were also selected for a balance between simplicity and complexity, as there was

[3] Both plans are
[4] included in Appendix B

concern that if they tended towards either extreme, this might prejudice the potential criticisms evoked by the students.

The first plan was however, of poor print quality, thus it was hoped that any confounding variables thrown up by discrepancies in the two plans would be picked up by the control test administered in the next academic session 1991/92 to the new group of Diploma students. The control test would thus not only permit comparison between the untreated groups' responses in both years but also between the same groups' responses to the alternate plans.

Each student was asked to examine the plan of the buildings carefully and to identify what she/he considered to be the 10 main functional problems of the building; 'functional' was described as the ability of the building to perform its intended purpose as a Public Leisure or Sports/Community Centre in the 1990's. The brief[5] was kept deliberately vague as it was hoped that the students would ascribe the ambiguous word 'functional' their own semantic priority. It was further suggested that the student write her/his answers down first, comment on them, and rank them in order of importance.

At the outset of the experiment, students were randomly divided into four groups, originally chosen alphabetically from class lists. However, this selection procedure was later amended to reflect changing circumstances. Groups 1, 2 and 3 were exposed to Section A only, Groups 2 and 3 to Sections A and B and Group 3 to Section A, B and C. Thus only Group 3 experienced all Sections and Group 4 none by acting as a control. Group 5 comprising 27 of the following Diploma Year students, was applied as further control to test for corruption of results.

Indeed, there was such a positive response on the part of the students to the simulation exercise, that all those who had been at the first technique, with the exception of three students, attended this section. Group 3 was therefore reduced to only 3 students, and

[5] the brief is included in Appendix B

as such was unworkable as a discrete group, with too low a constituent number of students to remain statistically viable. This effectively reduced the experiment to only two Groups exposed to the 3 incremental educational techniques rather than three. Seven students, for various reasons could not be included in the results, students who for example, were present at the pre-test but not the post-test or vice versa.

Group 1 : 10 students = Section A, B and C

Group 2 : 8 students = Section A and B

Group 3 : 3 students = Section A *

Group 4 : 11 students = Control (1), 1990/91

Group 5 : 27 students = Control (2), 1991/92

3.1.1 Section A : Workshop

In order to achieve not only as high an attendance rate of students as possible, but also to keep the experimental objectives of the exercises covert, students were given little advance warning of the programme. Thus it was only possible to undertake this exercise with the full collaboration of the architectural teaching staff, who briefly introduced the programme prior to the hijack of a 2 hour lecture period normally reserved for the standard syllabus.

It was crucial having pulled off the coup to arrest the students' attention and maintain interest without revealing the underlying aims. Since this objective might have been jeopardised by sending out the control group at this point, it thus decided that the 15 non-attending students would constitute the control group, a number which was later reduced to 11, given 4 students failure to attend the pre- and/or post-test. It could be

* Group 3 was later combined with Group 2

argued that the decision to designate the non-attending students control group status might bias the results; however, it was hoped that the use of the 1991/1992 Diploma students as a control would act as a further check against this possibility.

The students were given a short lecture on Universal design, followed by a video on the same subject. Both the lecture and the video were then opened up to a half hour plenary discussion which proved lively. At the end of the session, students were informed of the forthcoming simulation exercise, and it was requested that as many as possible attend; selection for Section B at this point was voluntary. Thus the criticism could be levelled that the process of self- as opposed to random-selection was inevitably prejudicing the results with only the most interested pursuing the subject further. This a valid objection, which may be met by the equally valid counter argument that self-selection is evidence of the effectiveness of the awareness raising exercises. Furthermore, if the exercises were to be incorporated into the standard syllabus, students would be obliged by mandatory requirement to attend.

3.1.2 Simulation Exercises

This Section, attended by 18 students voluntarily, indeed only 3 students who had undertaken the previous workshop exercise, failed to turn up, was a measure of the students enthusiasm for the subject.

Students were divided into 9 pairs, each of which was issued with one of the following;

* 4 self propelled wheelchairs
* 1 attendant propelled wheelchair
* 2 pairs of crutches
* 2 blindfolds

Given the drawback of simulation exercises as a very temporary means of learning-by-doing, the introduction alerted students of this fact. The pairs were instructed with the aid of the props, to adopt the roles of 'helper' and 'disabled person', and to switch roles half way through the exercise. The simulation exercise took place insitu at the college. The college, set on a steep slope in wooded parkland, built before the advent of the building regulations, was well endowed with numerous physical obstacles both man-made and natural, such as steep slopes, stepped entrances, two floors and the absence of lifts. A setting which was to prove physically challenging for even the fittest of students. The students were instructed to spend one hour traversing the college environs both external and internal in their respective roles.

On return, one wheelchair, crutch and blindfold using pair were selected as representatives and requested to communicate to the assembled group their experiences in both roles, through the process of talking through and writing them in note form on a blackboard. The following student accounts, testify the advantages of this method as an insightful projective tool, albeit it brief.

Wheelchair user:

"Toilet - non-accessible for wheelchair helper and chair couldn't get both in cubicle.
Kerbs - projecting - possibility of toppling over chair.
Steep slopes - male helper ok, but female helper needed use of the breaks.
Steps - didn't attempt them.
Double swing doors - were easier if approached backwards."

Helper :

"Doorways - difficulty negotiating them; balance between door width and weight.
Stairs - (down) tiring, difficult and dangerous.
Textured surfaces - more friction therefore more tiring.
Kerbs - immediately at doorways difficult in themselves but adjacent to doorway added to problems.
Stairs - (up) tiring, especially external which would be treacherous when wet."

Blindfold :

"Comfortable to feel along corridor wall but problems arose where pictures were hung.
Stairs were a big problem especially where unfamiliar.
Fell down one flight and was laughed at by a QS (Quantity Surveying student).
Slight changes in level were a problem as well.
Sometimes inspite of knowing the building well I got disoriented - this was quite frightening - when not being guided."

Helper:

"Doors were difficult to negotiate.
Handrails missing on access to car park.
Difficult to estimate how many steps lay ahead which proved an obstacle when giving guidance."

Crutches:

"Difficulties with stairs - both going up and coming down and also with ramps - there was a feeling of falling down.
The crutches were hard on the hands, underarms and knees.
Doors were impossible to open on your own."

Helper:

"The main difficulties were opening doors and helping down stairs - supporting the person and aiding them slide down. Of not knowing when difficulties will arise - a slip or a fall."

The testimonies drawn from three pairs approached, to communicate their experiences, reveal an emerging sense of renewed awareness of the environment and empathy with the access problems of people with disabilities; the descriptions indicating a level of understanding which only comes of personal experience. This understanding is not only of the physical difficulties encountered but of their attendant emotions; students reported 'feelings' of fright, disorientation, embarrassment, instability, pain and exhaustion, all feelings with which they were unlikely to be familiar in terms of their attitude to the physical environment.

Overall the students responded well to the exercise describing it as 'fun', however, as one student tellingly remarked on returning to the lecture room, *"the moment you get back you can take your 'disability' off"* , referring to a blindfold. A further advantage worth noting was the spin off awareness; the sight of students struggling in wheelchairs, crutches and blindfolds did not go unnoticed by passing staff and students, who were anxious to know the purpose of the exercise. Towards the end of the exercise 10 students were invited to volunteer for the final exercise, it was explained that the disabled design consultant undertaking this task preferred smaller groups, as communication was more effective.

3.1.3 Site Visit

The site visit, intended to furnish students with first hand experience of meeting a person with disabilities, communicating their experience of the built environment, was carried out at a recently built shopping centre in Aberdeen city centre, by a local wheelchair using person, well experienced in access matters. All 10 student volunteers turned up for the exercise, notwithstanding the difficulty of travelling across town and a number of competing study commitments. The students were given a guided tour for the duration of an hour, and informed of the many access difficulties which can arise even in a new building. The tour culminated in the cafe where a question and answer session was undertaken.

Although all the students had voluntarily attended the session, suggesting a high level of interest on their part, this did not appear true for all. Indeed, the degree of manifest interest was variable, ranging from one student who joked about excessive access requirements on the part of disabled people, to 4 students who demonstrated such enthusiasm that they proffered a design solution to the upper level unisex toilet, which by virtue of two heavy entrance doors hinged on the same side and a narrow corridor which failed to meet mandatory design criteria, was inaccessible to all but the most

athletic wheelchair users. The students recommended, on watching the disabled design consultant's attempts to negotiate it, that the internal door be rehung, and hinged from the alternate side. This solution was relayed to the local authority planning department, who welcomed this suggestion and carried it out.

The 10 students noted during the plenary discussion that this method of instruction was particularly useful at this stage in their studies, as they could become aware of the design contradictions and apply such knowledge. They also noted the 'special' lift in the Louvre Pyramid by I. M. Pei; when it was countered that this was separatist as only disabled people were allowed to travel in it, they responded that it was positive discrimination, whereby the disabled person could gain the upper hand and the experience of movement. Such comments were indicative of a growing thoughtfulness about the often thorny subject of accessibility.

4. Findings

The pre- and post - test forms were coded for the number and type of user considerations recorded, including physically and sensorily disabled people, the elderly, children, families and the situationally disabled.

Rating :

1 : General comments about access and circulation

2 : Comments about disabled toilets, lifts, ramps etc;

3 : More subtle and/or detailed observations about provision in terms of access for disabled people to swimming pool, changing facilities, spectator balcony etc;

1 : wider consideration of user groups, mention of elderly/ family/children/situationally disabled etc;

2 : comments about baby changing facilities, creche etc;

3 : more subtle and/or detailed observations about provision in terms of universal/integral design solutions, accommodating all peoples' needs.

The scores were based on the rank (1-10) of importance assigned by the student to the consideration, these were then subtracted from 11, and multiplied by the sum of the rating. A high score equating with a high degree of awareness.

Number of user oriented considerations : worth 0, 1, 2, 3 rating
Score : Sum of (rating x (11 - Rank)
weighting
(scale 1:10) = high score for awareness

Comparison of the post scores of the treated and control groups using the Mann Whitney significance test indicate a significant increase in awareness (P<.02) on the part of the treated group, as shown by Figure 1.[6]

The pre-scores of the treated groups and Control Group1 were checked for any disparity, however there was no significant difference (U = .7509)[7] . Furthermore the increase in the scores between the educated students and Control Group1 are marked by a significant increase (U = .04) on the part of the former[8] . These results clearly demonstrate the effectiveness of the programme in sensitising students to a wider appreciation of user requirements.

[7] test results are included in Appendix B

Figure 1 : Comparison of Pre- and Post Scores of Treated and Control Group 1

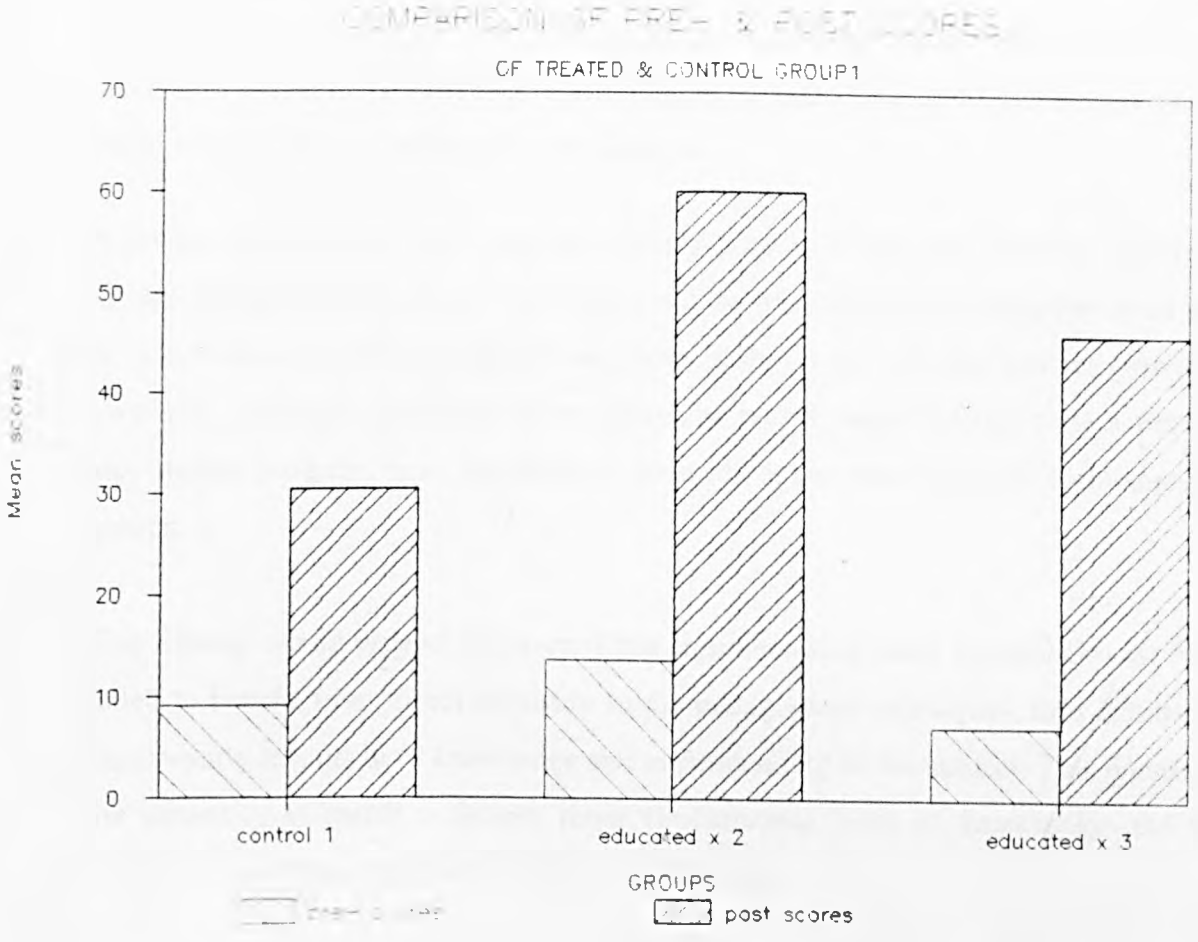

Figure 1 shows an awareness increase within the two treated groups. However, it also reveals correspondent growth within Control Group1. By way of a check, Control Group1 was taken from the same year (1990/91) as the treated students and was compared for degree of variance with Control Group2 comprising Diploma students from the following year 1991/92. Control group2 were tested at the beginning of the academic session using the 1973 plan originally applied in the 1990/91 post-test. The Mann Whitney test indicated no significant difference between Control Groups' 1 and 2 (U = 0.6407).[9] This degree of similarity further served to verify no significant degree in response to the use of the two different plans, excluding the plans as a confounding variable.

[9] included in Appendix B

However, Control Group2 when tested against the post scores of Control Group1 indicates a significant increase on the part of the latter (U = 0.0015)[10] . A thorough examination of the course syllabus and discussion with the tutor for the Diploma Year revealed no educational interventions relating to the subject of universal/integral design likely to have been responsible for this increase.

A further explanation which may be feasibly posited, is that the post-test results of Control Group1 are indicative of an insight into the true objectives of the experiment and as such a desire to offer appropriate responses. If this is the case, the level of growth in awareness although significant when compared with Control Group1's pre-scores, is also shown however, to be significantly lower than the post scores of both educated groups.

This finding would suggest that even if this argument were valid, Control Group1 have failed to benefit from direct exposure to the pedagogical techniques, thus exhibiting significantly less depth of knowledge and understanding of the subject. This illustrates the necessity to instill a deeper more fundamental level of knowledge and the effectiveness of the programme in achieving this aim.

The possibility of Control Group1 becoming informed via an informal network was anticipated at the outset of the experiment, given the close community of the Year group. However, the decision was made to proceed, as sampling all the students from one year was a way of ensuring that all had the same educational experiences. The information 'leak' was also viewed as an encouraging and positive by-product of the programme. Indeed, one of the corollary advantages of the studio and project centred focus of architectural education is the collaborative and supportive interchange of creative concepts and information; a process clearly evidenced as it related to user-accommodation.

[10] included in Appendix B

Such a process of the transfer of knowledge by word of mouth, may also if applied to the wider sphere of architectural practice have far reaching spin off effects, whereby newly qualified designers who have undertaken the programme may prove effective conduits transmitting the principles of universal design to the existing practitioners. A method which may be enhanced by related Continuing Professional Development (CPD) courses.

Figure 1 shows that those students who had undertaken only two and not three of the exercises demonstrate the highest degree of awareness. Awareness levels tend to fall away after the third technique, results which bear further in depth analysis investigating why this unexpected disparity may have arisen. Tables 2 and 3 show the break down of the aggregate scores of both groups.

Table 2 : Pre- and Post Scores of Group Educated x 2

	Pre-score	Post score
	0	30
	6	95
	0	103
	63	62
	9	42
	0	0
	0	82
	18	120
	9	35
	24	46
	22	47
Mean	= 13.73	= 60.2
Standard Deviation	= 18.65	= 36.0

Table 3 : Pre- and Post Scores of Group Educated x 3

	Pre-score	Post score
	19	55
	0	32
	9	59
	18	24
	16	91
	0	20
	10	63
	0	30
	0	45
	0	39
Mean	= 7.20	= 45.80
Standard Deviation	= 8.19	= 21.67

The mean difference or increase in awareness between the pre- and post tests of the educated x 2 and educated x 3 groups, at 46.5 and 38.60 for each, only serves to reinforce the original finding. Comparison of the standard deviations of the pre- and post scores of both groups may explain the surprising results, the educated x 2 group revealing much higher margins of variation from the mean, standing at 18.65 for the pre-score and 36.0 for the post score as compared with 8.19 and 21.67 for the educated x 3 group. This suggests that the educated x 2 group has a number of maverick scorers deviating from the mean trend. Table 2 shows that this is the case with one individual scoring nought for both tests, having proved entirely resistant to both educational inputs. Another student from the same group has similarly failed to pick up points, scoring 63 in the pre- test and 62 in the post test. This drop suggests that she/he may be producing conditioned responses, responses which conform with expectations in terms of building regulations but do not exhibit a deeper level of awareness of the subject. Four individuals in this group however, demonstrate a very large increase in cognisance moving from 0 to 103, 0 to 82, 6 to 95 and 18 to 120.

However, comparison of the mean pre- test scores of both groups show that the mean awareness is lower in the educated x 3 group. Indeed, if the latter group's mean is compared with the pre- test scores of Control Groups' 1 and 2, standing at 9.27 and 8.22 respectively, it remains the lowest overall at 7.20. Moreover, if the mean post scores of both the educated groups are divided by their mean pre-scores, the results indicate that whilst the educated x 2 scores have risen by four times the pre-score mean, at 4.3, the educated x 3 scores have risen by six times the pre- score mean. It may be that the educated x 2 group's greater standard deviation combined with a higher mean pre-score have contributed to their greater level of awareness overall.

A further explanation of the score anomaly begs two questions: Was the simulation exercise so effective as to have a more memorable and potent effect on attitudes, which may have been blocked or neutralised by the further exercise, inspite of the students notable and enthusiastic participation in the latter technique? If this were true, was the longlasting effect due to the 'learning by doing' educational method, or was it due to the effectiveness of presentation by an architecture lecturer well experienced in communicating user accommodation and applying this information in design terms, or was it a combination of both?

The weight of evidence drawn from the RGU survey of disabled peoples' design requirements, clearly calls for the need not just to consult disabled building users but also to involve them actively in the formative stages of design education. This will help to build empathy and mitigate the more detrimental, separatist stereotypes, thereby bridging the cognitive and physical gap between people with disabilities and designers. It may be that the simulation exercise combined with an experienced lecturer, as a technique proved highly effective overshadowing the educational effects of the site visit with a disabled design consultant. However, it should be borne in mind that the necessity of participation of disabled people within the pedagogical process is not only demonstrable and but imperative.

This experiment has shown the simulation technique combined with an introductory workshop, to be a highly effective means disseminating the principles of user-accommodation. This finding contradicts Lifchez reservations about the use of such techniques, where it was feared that such,

> *"tactics backfire...generating so much anxiety that the student over-reacts, unable to to understand or even believe that any but 'supercrips' venture out alone or at all."*

Indeed the results indicate that on the contrary, students had assimilated the experience, translating it six months hence, in the form of increased responsiveness to user requirements into their design approach.

Furthermore, the advantage of presentation by experienced lecturers has been underlined. However, further research is required to investigate the main questions arising from the findings. This research should investigate how building users including disabled people might best be incorporated within the educational syllabus, working in collaboration with teaching staff, is a fertile topic for analysis. Participatory design with lay users may be one avenue; live projects necessitating the collaboration and consultation of users, including disabled people another.

5. Conclusions

The RGU survey of disabled peoples' design requirements and attitudes found that they experienced significant access difficulties, indicative of the shortcomings of design prescriptions catering for the needs of disabled people. These prescriptions by virtue of their status as minimal, inflexible criteria, specifically vouchsafeing the needs of 'the disabled' as separate from 'the able-bodied', are inherently flawed. As fundamentally segregative mechanisms, such prescriptions constitute an inappropriate, insufficient means of promoting integration, and implementing integral or universal design

solutions, which rely upon the creative reappraisal and expansion of traditionally narrow design parameters, serving the interests of a minority of the population.

This consitutes a conceptual reorientation, necessitating the break down of preconceived, detrimental stereotyped thinking on the part of building designers, and the development of an awareness of the need to become more responsive to building users, including people with disabilities. Thus an educational approach is required which, if channeled through the vocational establishments which shape and inform thinking at a formative stage, will be most most effective, for it is in this milieu that fundamental concepts are laid.

This latter point was underscored by the Burton report, reviewing architectural education, where the need for an educational curriculum more responsive to the demands of building users who have rights not only as consumers but as active participants in the design process, was strongly emphasised. However, notwithstanding such a declaration, the report only tangentially touched upon the necessity to evolve a social theory of architecture, which would serve to contextualise the philosophy of universal design, instilling its aims at a fundamental level. Without such a theory, the inherent contradictions between the two cultures of 'science and art', which makeup the discipline, will fail to be resolved. And it is upon this resolution, that the successful dissemination of the principles of universal design depends.

User oriented principles form the key tenets of Article 3 of the EC Architects Directive, setting out the curricula which UK Schools of Architecture, by law must comply. However, the EC constitution as it relates to architectural education cannot be fully realised without a 'revolution' as opposed to the 'evolution' recently called for by the architectural establishment; this necessitates a radical shake up of traditional architectural values, and a revised definition of the user and her/his role within the design process.

In order for the objective of instilling a knowledge of universal design, of reconciling the fit between the built environment and building user to be effectively implemented, it was deemed important to evaluate the current nature and level of awareness within the 36 UK schools of architecture. The degree of receptiveness to the subject, could thus inform the further development of an educational awareness raising model.

The results reinforce documentary evidence cited throughout the thesis, suggesting that design prescriptions are an inadequate means of developing full cognisance of architectonic principles as they relate to user accommodation. Indeed, the majority of educationalists responding to the survey, revealed a marked antipathy towards the legislative measures, which were largely felt to proffer little more than 'rote' solutions, militating against pedagogical methods aimed at stimulating intellectual breadth and creativity.

However, although there was majority consensus as to the inadequacy of the current design prescriptions, there was little evidence of the degree of awareness required to promulgate more socially conscious design solutions. The definitions of disability held by 25 schools and possibly the 8 non-respondents comprised the categorical, now dated separatist approach to access. Indeed, only 5 schools were sufficiently well informed to employ the inclusive definition of design for all. This is a lamentable statistic, which must only be further consolidated, and the philosophy of universal design obfuscated, by the continued application of statutes stemming from a narrow, micro basis.

Overall the approach adopted is piecemeal, inconsistent and largely discretionary. Until such time that the syllabus content within architectural education incorporates universal design as a requirement, there will remain a lack of real understanding of the concept, with a continuing functional failure of public buildings in particular. Clearly, this survey demonstrated the urgent need for an educational awareness raising model, familiarising students to the 'otherness' of users and developing empathy, through applied social science.

The study of the user-responsiveness of Final Year (Diploma) students suggests a very low appreciation of the needs of disabled people, by these senior students; all of whom have experience in practice. Whilst the experiment found the simulation exercise combined with an introductory workshop, to be a highly effective means of disseminating the principles of user accommodation, this eclipsed the effectiveness of the final technique, comprising direct collaboration with a disabled design consultant.

This finding generates a number of questions and theories which can only be investigated by further research, continuing the investigation into the most feasible and effective pedagogical means of incorporating building users including disabled people within the curriculum. Moreover, although a relatively simple and very short exposure of students to a controlled learning situation did significantly increase their level of awareness, the theme of user accommodation should be supported not only by specialist subjects, but by a philosophy permeated throughout every course in the curriculum.

The results highlight the urgent need for building design education to address and satisfy in design terms the changing expectations of a more vociferous public and stringent body of legislation.

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Chapter 8

Conclusions and Recommendations

1. Conclusions

Chapter 1 traced the history of pedagogical theory and practice as it relates to architecture, from Vitruvius to Post Modernism. The documentary evidence shows that throughout time, notwithstanding the flux of architectural movements, the concept of architecture as art has remained constant. This abiding ideology, of the primacy of the 'ideal' aesthetic form, has served to significantly colour building designers' thinking, promulgating an overriding concern with appearance, with form, to the detriment of content.

If the building user was considered, it was only in the abstract, as either admiring spectator, or perfect homunculus, as befitted the creation of 'beautiful' buildings. Thus the concept of the 'perfect' user became wedded to the concept of the 'perfect' built form; a synergy which subjugated, in particular those people, who by virtue of physical disability, were perceived as violating this classical and potent belief system. The built environment served as a filter, segregating those people who were more sensitive to its constraints and thus deemed as 'undesirable', as 'unsightly', consigning them to a marginal, invisible status.

It was not until the 1960's that building users were recognised as consumers by building designers, who have been slow to respond to an increasingly vociferous and disaffected population.

Chapter 2 through a critique of related literature and research, explored the issues lying behind the crisis in the architectural profession. The discipline's failure to respond to public demand was traced to the educational core of the discipline, which was found

wanting. The documentary evidence showed that academic positivism, believed to be incompatible with artistic, intuitive autonomy is embraced only nominally, thus reinforcing the two culture, art-science, divide. It was further demonstrated that academic theory and research, particularly social science, must become more fully developed and applied, if this divide is to be reconciled and an effective user-designer dialogue implemented.

Applied social science was identified as the most appropriate pedagogical means by which designer empathy and awareness of the full range of peoples' needs might be enhanced. A process, which necessitated the application a series of techniques designed to systematically dismantle an entrenched ideology, most detrimental to people with disabilities.

Chapter 3, identified the move away from the 'individual' to the 'social' model of disability; from the precept that disability is a tragedy to be dealt with on a personalised basis by mainly medical intervention to the precept that physical disability stems not from impairment but from socio-environmental barriers created by a discriminatory state. Architectural barriers comprise one of the principle dimensions of a 'disabling' social structure which serves to erode disabled peoples' autonomy. It was demonstrated that a realignment of focus is required, away from people with disabilities to a structural and attitudinal analysis of the built environment.

The past three decades in the UK have witnessed the introduction of access legislation aimed at ensuring design provision for people with disabilities. Such measures, however, have been undermined by a number of factors ranging from scant anthropometric and ergonomic research to a lack of statutory enforcement. However, Chapter 4 through an examination of recent evidence, shows that attitudes as regards how the built environment should perform for people with disabilities have undergone a significant realignment. This realignment is demonstrably the principal reason why access legislation is no longer sufficient as a means of ensuring the integration of people with disabilities.

Marked by a shift in focus from the notion that people with disabilities comprise a separate group, with special needs to be catered for if and when resources permit, the universal, integral view holds that on the contrary, design parameters should be expanded to accommodate all people. Chapter 4 goes on to show that access guidelines by virtue of their separatist premise are inherently flawed, and unsuitable as a mechanism for vouchsafing integration and access for all. Further, their status as minimal criteria, inflexible and standardised are an inappropriate means of engendering universal design solutions, permitting a greater number of behavioural options. Just as design parameters should be extended so mainstream design prescriptions should also expand to accommodate access considerations. This expanded scope however, poses a conceptual challenge and the redefinition of the building user, which can most effectively be facilitated by educational intervention.

Chapter 5 examined the research evidence surrounding the issue of access for people with disabilities to the built environment. This revealed that surveys formulated to evaluate the design requirements of disabled people to date, have not only failed to draw upon the social science research tradition but to place architectural barriers within a broad social context. Such surveys it was found derived from the traditional, medical approach which focused on the impaired individual. Although illustrating the disabling effect of various socio-environmental factors, this perspective neglected to undertake a structural analysis of architectural barriers, thus reproducing a micro as opposed macro standpoint.

Chapter 6 comprised the methodology and results of the first stage of the RGU tripartite project; specifically formulated around a more holistic principle which not only examined disabled peoples' design requirements but set the findings in a structural and attitudinal context, it also investigated disability awareness within architectural education.

The first stage of the research project undertook an examination, by means of a base-line questionnaire survey and qualitative case study interviews, of the design needs and attitudes of disabled people within Grampian Region.

The survey results clearly demonstrate that although disabled people have increasingly become integrated into the community over the past two decades, as evidenced by a growth in frequency of visits to public buildings, almost half of the sample remain disenfranchised, failing to use the majority of public buildings.

The findings provide strong evidence showing that as degree of physical impairment increases, so the physical environment becomes more restrictive, demonstrating the delimits of architectural spatial arrangements. This trend is indicative of the narrow parameters of design, and their concomitant failure to facilitate behavioural demands beyond a given cut off point.

Moreover, this pattern reflects the blinkered conception of designers as to the number and type of behavioural options they deem necessary to support. The constraints of the built environment is therefore a measure of the constraints of designers' attitudes, habituated by a deeply entrenched belief system, which is clearly responsible for, as demonstrated by the preceding chapters, the promulgation of detrimental stereotyped thinking as to the nature of building users and in particular, people with disabilities. It is proven that the physical environment caters for an idealised vision of building users, who by virtue of their average physical status, conforming to normative assumptions as to functional mobility, are perceived of as deserved of access. However, this conception does not accord with reality where people are heterogeneous, largely contravening designer expectations of user requirements and thus circumvented by design for a homogeneous public.

The evidence highlighted an imperative need for designers to expand their frame of reference as it relates to the design requirements of disabled people, thereby accommodating those people who are more environmentally sensitive, so increasing the degree of fit between the built environment and user.

Chapter 7 outlines the methodology and findings of stages' 2 and 3 of the project. The former stage examined the nature and level of awareness of universal design within the 36 UK Schools of Architecture. The results show that access guidelines and regulations are ostensibly little favoured as a means of promoting more accessible design solutions within a pedagogical context. However, although this places an onus on the Schools to increase cognisance, there was scant evidence of the degree of knowledge required to instill this approach. Indeed, the majority of establishments still hold the now dated, categorical or separatist school of thought on the issue. Access awareness overall, was piecemeal, inconsistent and largely discretionary, and it was concluded that until such time as the syllabus incorporated universal design as a requirement, a lack of real understanding of the concept would remain.

The final stage of the project comprised an evaluation of the effectiveness of two educational techniques designed to raise the user-responsiveness of Final Year (Diploma) architecture students. The results demonstrated, prior to the introduction of the educational interventions, a very low appreciation of user accommodation by these senior students, all of whom had experience in practice.

The experiment found both pedagogical methods to be highly effective as a means of disseminating the principles of universal design, engendering a significant increase in cognisance. However, the simulation 'learning by doing' exercise proved more successful than the final technique, comprising direct collaboration with a disabled person. From this surprising outcome, arose a number of questions concerning the statistical limitations of the use of such small samples. Thus although the experiment provided conclusive proof of the overall effectiveness of the techniques, the results were inconclusive as an assessment of the merits of one technique over another. The experimental results should thus be considered as useful indicator, namely a methodological pilot project, for a much larger scale research project which would investigate the most feasible and effective pedagogical means of not only disseminating the principles of universal design but of incorporating building users, including disabled

people into the syllabus.

Overall the results, drawn from both sociological epistemological and empirical evidence, served to highlight the relationship between the key factors influencing designer perceptions of building users, identifying their commonalities. It was demonstrated that just as the wider group of building users had been neglected by building designers, so had people with disabilities. However, analysis of both groups revealed that the treatment of disabled people compared unfavourably with those who are less environmentally sensitive. It was shown that provision for the latter group was marked by not just a policy of neglect but of systematic exclusion mediated by architectural environments. This process, stratified over time through socio-cultural stigmatisation, the needs-based social welfare system and associated legislative protections for disabled people, has served to promulgate separatist definitions and hence solutions to need.

Universal design offers an alternative, more inclusive approach to design, relying on a reconceptualisation and redefinition of people with disabilities, not as a 'separate' and 'special' group but as part of the general population, to be similarly catered for in design terms. However, Universal Design cannot effectively be applied without the informed, interpretive abilities of designers, whom it is demonstrated require an increased cognisance of people with disabilities. Design education is shown to be the most appropriate means by which this re-definition of the user, constituting a major conceptual challenge away from a 'special needs' towards an 'inclusive' approach, may be disseminated.

In conclusion, it is shown that the concept of 'Universal' design should be treated not just as a specialist subject, but as an underlying philosophy permeated throughout the entire curriculum. If architecture is to survive as a discrete discipline, it must be flexible and responsive, stepping out side of its current solipsism to accommodate the forces of an increasingly consumer-led culture, and so quell the publics', and in particular disabled peoples' criticism.

2. Recommendations

It is recognised that whilst the goal of a totally integrated, universal design approach is desirable, it is longterm and as such can only be achieved by a series of pragmatic and feasible short term objectives. Whilst these may not be as ideologically sound as the future ideal, such objectives must articulate with the current unsatisfactory state of affairs.

1. Wheelchair symbols are currently used to denote accessibility; this policy, on the strength of a civil rights bill, should be reversed so that only those environments which fail to measure up to required standards of accessibility are indicated. The Council of Europe recommended the creation of a regularly monitored 'accessibility chart', a measure, which this thesis in principle supports, as the onus should be placed on those buildings which fail to meet accessibility standards, the title should alternatively be called an 'inaccessibility chart', a black list.

2. Part 1 of the RGU survey found that leisure pursuits were largely identified as of secondary importance to primary considerations such as financial and health management, suggesting that life for many people with disabilities is priority oriented given the extent of physical barriers. Public Toilets, Shops, Hospitals, Health Centres, Post Offices and Banks are the building types for which access was deemed of greatest importance. These services merit urgent consideration by designers, in terms of both new and existing buildings. They should thus rank as of top priority in the 'inaccessibility black list'.

3. Universal design solutions rely upon the creative reappraisal of traditionally narrow design parameters serving the interests of a minority of the population. Such a conceptual reorientation, necessitates the breakdown of preconceived, detrimental stereotyped thinking on the part of building designers, and the

development of an awareness of the need to become more responsive to building users, including people with disabilities.

Professional and educational organisations such as the RIBA and ARCUK must become familiar with the definition, aims, and objectives of the integral or universal approach to design.

4. This should be dissemination to Schools of Architecture, of an awareness raising package setting out not only the principles of integral or universal design solutions but also educational exercises.

5. The educational package on universal design should be framed in 'sexy', aesthetic terms, palatable to designers, to dispel negative preconceptions about the design needs of people with disabilities.

6. Such a package should comprise examples of school syllabi demonstrating innovative methods of incorporating user oriented design. Such methods might include 'live' projects, liaison with local access groups, community groups which include people with disabilities, and the use of simulation exercises, shown by the RGU research project to be a highly successful method of engendering user responsiveness in terms of design, by learning-by-doing.

7. User oriented principles form the key tenet of Article 3 of the EC Architects Directive, which sets out the curricula which UK Schools of Architecture by law must comply. The EC constitution as it relates to architectural education cannot fully be realised without a 'revolution' as opposed to an 'evolution' in thinking, necessitating a radical shake-up of traditional architectural values, and a revised definition of the user and his/her role in the design process.

8. The syllabus must specify the inclusion of not a 'special needs' dimension which accords with the dated categorical approaches to designing for disabled people, but an integral or universal approach.

9. Anti-discrimination protections as the American Disabilities Act (ADA) has shown, necessitate an integral/universal approach to design, which cannot sufficiently be met by the current design prescriptions and regulations stemming from a narrow, micro basis, catering for 'the disabled' through separatist provision. Thus it is imperative that mainstream design legislation becomes more holistic, and expands to include the needs of disabled people. This move should be further supported by a civil rights bill ensuring a measure of protection.

10. Further pedagogical research is required to investigate the many methods by which building users, including people with disabilities may be most effectively integrated within the syllabus.

11. Whilst it is essential that the principle of universal design be promoted by specialist projects, it must be permeated as philosophy throughout the entire curriculum.

12. Future research and social policy which addresses the design needs of people with disabilities should adopt the 'social' rather than 'individual' model of disability.

The 'social' perspective holds that corrective measures must be aimed at the flawed social processes which perpetuate inequality, with the objective of mitigating the effects of a 'disabling state' which creates 'disabling environments'. This view opposes the traditional 'individual' or 'personal tragedy theory' reflected by social policy to date, which is organised around the assumption that disability is an unfortunate quirk of fate, to be dealt with by individualised, largely medical based interventions. If related to architectural barriers, the 'social' school of thought

addresses the structural processes responsible for their creation, such as design legislation and the attitudes of design practitioners and schools towards consumer demand, including people with disabilities.

13. The development of educational theory stems from the social theory of architecture; pedagogical methods within the studio, in particular, call for further evaluation as to how they might better incorporate the tenets of academic rationalism, which embraces the principles of social science, as a means of developing a more analytical, research oriented approach.

14. A social theory should be developed through academic research, as a foundation for the discipline of architecture. This theory should embrace a socio-historical critique which if melded to design considerations would serve to alert architects to reappraise their current solipsism, and step outside of the closed professional network of entrenched thinking, becoming sensitive and responsive to not only the value of collaboration with the conflation of related disciplines and in particular social science, but the building users. The development and inclusion of a social theory of architecture, would serve to contextualise social agendas such as 'universal' and 'green' design, instilling their aims at a fundamental level.

15. There should be an expansion of interdisciplinary studies, including social science, within the architectural education curriculum, which far from having a constraining effect on the designer, can engender innovation through increased flexibility, challenging the barriers created by role stereotyping.

16. Social science within the pluralist framework of interdisciplinarity, should be tailored to the precise needs of design and embrace the differing teaching styles, characterised by lectures and studio work. Further, its application should be consistent and compatible with the methods favoured at foundation, intermediate and advanced levels of learning.

17. Social Science must become applied and adopt a design-relevant thrust, thus moving away from the reductionist, colourless methods of analysis and presentation currently employed; this entails a more creative 'arts' based as well as scientific approach.

18. Social science should apply knowledge to the largely studio-based and experiential learning programmes so characteristic of architectural education, thus appealing to designers preference for practical, experience oriented knowledge.

19. Participatory design should be used to tap into and respond to the ground-swell of users' opinions, enabling users to take a more proactive role in the design process. Development of 'consensus-building' along the lines of the dialectic posited by Albrecht is required, necessitating an authentic dialogue to be extended to the community with the aim of engendering advocacy. Such a dialogue must include people with disabilities.

20. Drawing on an increased emphasis on academic rationalism, within the educational curricula, and the application of research methods, feedback in the form of Post Occupancy Evaluation should constitute a standard component, to be used in conjunction with participative design which includes people with disabilities.

21. Social science must address the communication gap between architecture and related disciplines, and evaluate its ability to function effectively as conduit and investigative tool, as differences lie not only in the problematic domain of conflicting value systems but in language. A more visual presentation style is much needed.

22. Interdisciplinary pedagogical techniques must be employed, focusing on the development of social skills promoting design students' empathic awareness of

other people, on the value of building users' contributions, and on clarification of the design process by improved methods of communication, encouraging a more reciprocal, egalitarian approach to design.

23. Social science research, should incorporate a number of techniques designed to act as 'projective tools' in order to create for designers a more authentic social vocabulary of images of people ascribed not with stereotyped, mono-dimensional characteristics but with heterogeneous characteristics more closely in accord with reality.

The investigative tools which might be employed range from indirect sources of documentary evidence as such as literature references and visual media, through to the more direct experience of participative inquiry, such as interviewing people with disabilities. A more detailed list is available in Chapter 2.

24. Self-concept and personal biography are also significant variables affecting the course of spatial manipulation; thus it is important to examine the recruitment system within Schools of Architecture and the means by which selection may be accessed by less advantaged sectors of society, such as people with disabilities.

Participating Organisations

Action For Research into Multiple Sclerosis (ARMS) - Grampian

Banchory Social Club (for People with Disabilities)

Banff Social Club (for People with Disabilities)

Crossroads Care Attendant Scheme - Aberdeen

Disabled Income Group (Taxi Service for People with Disabilities)- Gampian

Evening Express - Grampian

Herald & Post - Aberdeen

Inverurie Support Group (for People with Disabilities)

Langstane Housing Association - Grampian

Margaret Blackwood Housing Association - Grampian

North Sound Radio - Grampian

Press & Journal - Grampian

Red Cross (Wheelchair Loan Service) - Aberdeen

Tullos Products (Sheltered Workshop) - Aberdeen

Turiff Social Club (for People with Disabilities)

Voluntary Services Association Aberdeen - Aberdeen

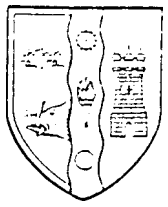
Westburn Occupational Therapy Centre - Aberdeen

Woodend Hospital - Aberdeen

Woodside Sports Club (for Disabled People)- Aberdeen

Queenscross Discussion Group (for People with Disabilities) - Aberdeen

Quarrywood Occupational Therapy Centre - Elgin



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SURVEY OF ACCESS TO PUBLIC BUILDINGS AND PHYSICAL DISABLITY

Dear Sir / Madam,

I would be very grateful if you could help with my survey. I am a research student based in the Schools of Architecture and Surveying, Robert Gordon's Institute of Technology.

The aim of the 3 year project is to find out whether, and in what ways, Building Designers can improve the general accessibility of buildings for disabled people. To this end , it is important that the designer learns of the access problems or the kind of difficulties which you, the user may have experienced.

I am interested in everyone's opinion, even if you don't go out or feel you have no difficulties.

Can you help by filling in the enclosed form and returning it to me in the pre-stamped and addressed envelope provided. Please can you reply as soon as possible.

Your reply will be treated in the strictest of confidence and the information used only for statistical purposes. Your identity will not be revealed.

I look forward to hearing from you,

Yours Sincerely

JOANNE MILNER.

1.
Please write your age and sex below

age (in years) sex (please tick)

male ☐ female ☐

☐

2.
Please name or describe the main type of disability or health problem you have.

3.
Please answer each of the following questions by ticking the box which best describes the amount of difficulty you have.

	No difficulty	Moderate difficulty	Severe difficulty	Cannot manage	
Walking quarter of a mile on the level	☐	☐	☐	☐	☐
Walking up or down steps or stairs	☐	☐	☐	☐	☐
Bending down and straightening up	☐	☐	☐	☐	☐
Keeping your balance	☐	☐	☐	☐	☐
Getting into and out of a chair	☐	☐	☐	☐	☐
Holding, gripping or turning things	☐	☐	☐	☐	☐
Pushing doors open	☐	☐	☐	☐	☐
Using arms to reach and stretch ..... for things	☐	☐	☐	☐	☐
Hearing	☐	☐	☐	☐	☐
Eyesight	☐	☐	☐	☐	☐
Reading or writing	☐	☐	☐	☐	☐

Please answer each of the following questions by ticking the boxes that best apply.

Office use

4. Do you need

1. 24 hour help ☐
2. help at least once a day ☐
3. occasional help ☐
4. no help required ☐ ☐

5. Do you live

1. alone ☐
2. with partner ☐
3. with an adult relative ☐
4. other (please describe) ☐

---

6. Is your home

1. a bungalow ☐
2. a house of more than one storey ☐
3. a flat on the ground floor ☐
4. a flat on an upper floor ☐
5. other (please describe) ☐

---

7. Does your home belong to

1. you ☐
2. the council ☐
3. a private landlord ☐
4. a housing association ☐
5. other (please describe) ☐

8.
Do you have

1. no employment ..... ☐
2. part-time employment ..... ☐
3. full-time employment ..... ☐

9.
If you are employed, please describe in a few words what you do.

10.
Which village/ town or city do you live in or near ?

11.
Do you have the use of a car which you can drive ?

yes ☐ no ☐

12.
Below is a list of mobility aids. Please tick the box next to the aid or aids (you may pick more than one)you use when **not** at home.

Battery car/scooter ..... ☐
Electric wheelchair ..... ☐
Wheelchair and helper ..... ☐
Wheelchair without helper ..... ☐
Walking frame ..... ☐
Crutches ..... ☐
Walking stick ..... ☐
White stick ..... ☐
Guide dog ..... ☐
Hearing aid ..... ☐
Use nothing ..... ☐
Other (Please describe) ----------

Please answer questions 13 to 15 by ticking the box which best applies to your situation in the past 12 months.

office use

13.
Roughly how often do you visit each of the building types listed below ?

	never	once or twice a year	once in 3 months	once a month	once a week	
* Post Offices	☐	☐	☐	☐	☐	☐
* Shops	☐	☐	☐	☐	☐	☐
* Banks	☐	☐	☐	☐	☐	☐
* Libraries	☐	☐	☐	☐	☐	☐
* Education Centres	☐	☐	☐	☐	☐	☐
* Pubs/ Clubs	☐	☐	☐	☐	☐	☐
* Theatre/Cinema	☐	☐	☐	☐	☐	☐
* Health Centre	☐	☐	☐	☐	☐	☐
* Hospitals	☐	☐	☐	☐	☐	☐
* Sports Centre	☐	☐	☐	☐	☐	☐
* Local Sports Stadium	☐	☐	☐	☐	☐	☐
* Swimming Pool	☐	☐	☐	☐	☐	☐
* Cafes	☐	☐	☐	☐	☐	☐
* Friends' Houses	☐	☐	☐	☐	☐	☐
* Churches	☐	☐	☐	☐	☐	☐
* Museum/ Art Gallery	☐	☐	☐	☐	☐	☐
* Public Parks	☐	☐	☐	☐	☐	☐
* Public Toilets	☐	☐	☐	☐	☐	☐

14.
In your experience in the past 12 months; how difficult has physical access been for each of the following building types.

off... use ...

	access impossible	often difficult	sometimes difficult	access ok	no experience	
* Post Offices	☐	☐	☐	☐	☐	☐
* Shops	☐	☐	☐	☐	☐	☐
* Banks	☐	☐	☐	☐	☐	☐
* Libraries	☐	☐	☐	☐	☐	☐
* Education Centres	☐	☐	☐	☐	☐	☐
* Pubs/Clubs	☐	☐	☐	☐	☐	☐
* Theatre/Cinema	☐	☐	☐	☐	☐	☐
* Health Centre	☐	☐	☐	☐	☐	☐
* Hospitals	☐	☐	☐	☐	☐	☐
* Sports Centre	☐	☐	☐	☐	☐	☐
* Local Sports Stadium	☐	☐	☐	☐	☐	☐
* Swimming Pool	☐	☐	☐	☐	☐	☐
* Cafes	☐	☐	☐	☐	☐	☐
* Friends Houses	☐	☐	☐	☐	☐	☐
* Churches	☐	☐	☐	☐	☐	☐
* Museum/Art Gallery	☐	☐	☐	☐	☐	☐
* Public Parks	☐	☐	☐	☐	☐	☐
* Public Toilets	☐	☐	☐	☐	☐	☐

15.
If physical access to each of the following building types was good; how important would it be for **you** to be able to use each?

office use

	not important			important			very important	
* Post Offices	☐	...		☐	...		☐	☐
* Shops	☐	...		☐	...		☐	☐
* Banks	☐	...		☐	...		☐	☐
* Libraries	☐	...		☐	...		☐	☐
* Education Centres	☐	...		☐	...		☐	☐
* Pubs/Clubs	☐	...		☐	...		☐	☐
* Theatre/Cinema	☐	...		☐	...		☐	☐
* Health Centre	☐	...		☐	...		☐	☐
* Hospitals	☐	...		☐	...		☐	☐
* Sports Centre	☐	...		☐	...		☐	☐
* Local Sports Stadium	☐	...		☐	...		☐	☐
* Swimming Pool	☐	...		☐	...		☐	☐
* Cafes	☐	...		☐	...		☐	☐
* Friends' Houses	☐	...		☐	...		☐	☐
* Churches	☐	...		☐	...		☐	☐
* Museum/Art Gallery	☐	...		☐	...		☐	☐
* Public Parks	☐	...		☐	...		☐	☐
* Public Toilets	☐	...		☐	...		☐	☐

16.
If you have experienced physical access difficulties. Please answer by identifying a particular building which poses problems and explain briefly what these are.

Name of building----------

Address----------

Access problems----------

17.
Please add any further comments on the subject of physical access which you feel are important.

18.
If you were unable write the answers in this form yourself, please ask your helper to tick the box. ☐

19.
I will at a later date, carry out interviews on the subject of access problems with a few of the people who filled out this form. If you would be prepared to participate, please tick the box below and fill in your name and address.

I would like to help ☐ .

Name----------

Address----------

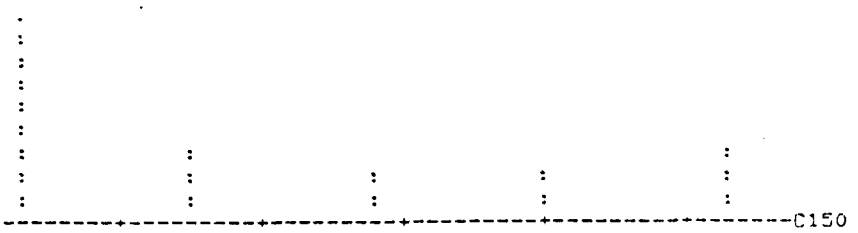
Town----------

Thanks very much for filling in this form.

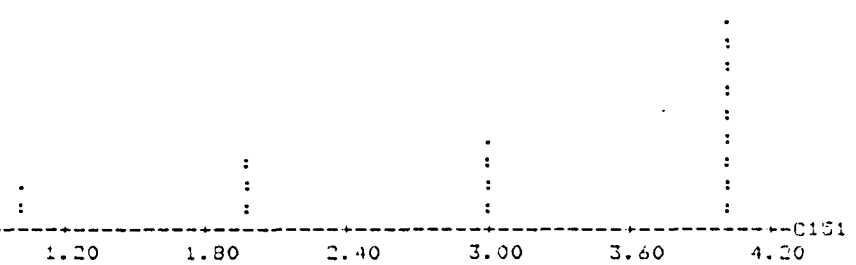
Results of correlation between 'frequency' and ' difficulty' of access

Appendix A - 3

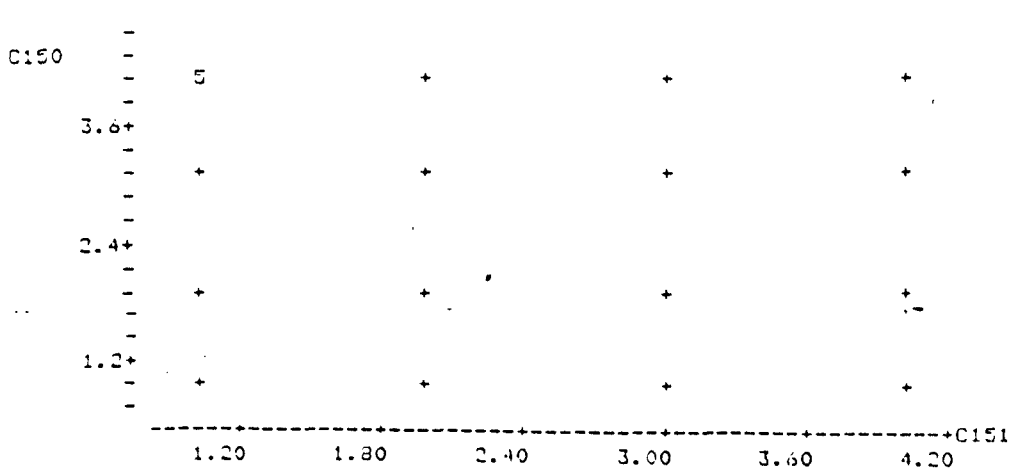
```
MTB > CODE (5) '*' C57-C74
MTB > CODE (5) '*' C57-C74 PUT IN C57-C74
MTB > STACK C39-C56 INTO C150
MTB > STACK C57-C74 INTO C151
MTB > STACK C57-C74 INTO C151;
SUBC> SUBS IN C152.
MTB > DOTPLOT C150 C151

177 POINTS MISSING OR OUT OF RANGE
Each dot represents 82 points
```




```
1026 POINTS MISSING OR OUT OF RANGE
Each dot represents 63 points
```




```
1
MTB > NOTE RANK CORRELATION
MTB > RANK C150 PUT INTO C154
MTB > RANK C151 PUT INTO C155
MTB > NAME C154 'FREQ-R' C155 'DIFF-R'
MTB > CORRELATION C154 C155

Correlation of FREQ-R and DIFF-R = 0.070

MTB > PLOT C150 C151
```




```
        N* = 1103
MTB > NOOUTFILE
```

FOLLOW - UP INTERVIEW CHECKLIST

NAME.....

ADDRESS.....

DISABILITY CHARACTERISTICS

AGE .....

DISABILITY TYPE.....

SEVERITY.....

LENGTH.....

MOBILITY.....

AIDS FOR INDOOR/OUTDOOR USE.....

.....

TRANSPORT.....

ACCOMMODATION CHARACTERISTICS

ACCOMMODATION TYPE.....

LOCATION : RURAL/URBAN.....

DISTANCE FROM SHOPS/TOWN CENTRE.....

HOUSEHOLD COMPOSITION.....

.....

ASSISTANCE.....

.....

LIFESTYLE

OCCUPATION.....

INTERESTS.....

.....

HOLIDAYS.....

.....

A. **DESCRIBE BRIEFLY WHAT YOU DO/WHERE YOU GO IN A TYPICAL WEEK?**

.....

.....

.....

B. **DESCRIBE IN DEPTH EITHER 1) A TYPICAL OUTING, OR**
2) A BUILDING WHICH POSES ACCESS DIFFICULTIES

WHERE?.....

PREPARATION - Nature/length of forward planning required

eg; - transport
- physical access
- weather
- assistance
- toilet
- day & time

.....

.....

.....

.....

JOURNEY

- Mode of transport
- route
- travel time
- parking
- street obstacles

.....

.....

.....

.....

.....

DESTINATION

- choice
- access to building

eg;
- entrance
- doorway
  (width/position)
- door type
  (opening mechanism /angle/weight)
- handle
- flooring
- circulation space

- provision of facilities

eg;
- lifts
- seating
- ramps
- toilets

- internal fixtures

eg;
- phones
- counters
- switches
- signs
- door handle

- staff/public attitudes
- staff assistance

.....

.....

.....

.....

.....

.....

RETURN JOURNEY - length of outing

.....

.....

.....

.....

C. DESCRIBE ANY ACCESS RELATED PROBLEMS YOU MAY HAVE EXPERIENCED WHEN GOING OUT TO A LESS FAMILIAR PLACE? eg; HOTEL/THEATRE

.....

.....

.....

.....

The data was down loaded to the minitab statistical package. To preserve the confidentiality of the respondents, the complete data set and the key for the code have been ommited.

```
**********************************************************
1
 MTB > PRINT C1-C7
  ROW  CODE NO  SOURCE  DISTRICT   AGE   SEX  DIS TYPE  SEC DIS

    1        1       3         1    31     2         1         3
    2        2       1         1    64     2         2         1
    3        3       1         1    67     2         3         1
    4        4       1         1    75     1         4         1
    5        5       2         5    21     2         5         2
    6        6       2         5    20     1         6         2
    7        7       2         5    26     2         7         2
    8        8       2         5    50     1         8         2
    9        *       2         5    32     2         *         2
   10       10       2         5    56     1        10         2
   11       11       1         1    38     1        11         1
   12       12       3         1    41     1        12         3
   13       13       3         1    31     2        13         3
   14       14       2         3     *     2        14         2
   15       15       3         1    25     1        15         3
   16       16       1         4    74     2        16         1
   17       17       1         2    40     2        17         1
   18       18       4         2    39     1        18         4
   19       19       1         4    48     1        19         1
   20       20       3         1    46     2        20         3
   21       21       3         1    28     1        21         3
   22       22       3         1    49     1        22         3
   23       23       4         2    47     2        23         4
   24       24       2         5    39     2        24         2
   25       25       2         5    57     1        25         2
   26       26       2         5    54     1        26         2
   27       27       2         5    33     1        27         2
   28       28       3         1    30     2        28         3
   29       29       3         1    51     1        29         3
   30       30       1         3    47     2        30         1
   31       31       1         1    51     2        31         1
   32       32       1         1    64     1        32         1
   33       33       2         5    50     2        33         2
   34       34       2         5    47     1        34         2
   35       35       2         5    53     1        35         2
   36       36       2         5    24     2        36         2
   37       37       2         5    21     2        37         2
   38       38       1         1    73     1        38         1
   39       39       1         3    45     2        39         1
   40       40       2         5     *     1        40         2
   41       41       4         3    26     1        41         4
   42       42       1         3    29     1        42         1
   43       43       1         3    40     1        43         1

   44       44       1         1    47     2        44         1
   45       45       2         1    43     2        45         2
   46       46       1         3     *     1        46         1
   47       47       1         3    53     2        47         1
   48       48       1         4    76     2        48         1
   49       49       4         1    45     2        49         4
   50       50       1         3    73     2        50         1
   51       51       1         3    40     2        51         1
   52       52       1         1    66     2        52         1
   53       53       2         1    53     1        53         2
   54       54       1         2    73     2        54         1
   55       55       4         1    45     2        55         4
   56       56       1         1    67     1        56         1
```

QUESTIONNAIRE : ACCESS FOR DISABLED PEOPLE

1. Does your course documentation specifically mention designing for disabled people?

   Yes / No

1.1 If Yes, please list the elements of your course which detail disability.

.....

.....

.....

.....

2. Within project work are students generally required to consider the design needs of disabled people ?

   Yes / No

3. Is there any preamble / preliminary briefing or lecture on disability ?

   Yes / No

3.1 If Yes, Please give details.

.....

.....

.....

.....

3.2 If Yes, what definition of disability is normally used ?

.....

.....P.T.O

4. Within the past 5 years, have any students undertaken a project which specifically focused on the design needs of disabled people ?

Yes / No

4.1 Briefly outline the nature of this project.

.....

.....

.....

.....

5. Do you think your course is able to address adequately relevant disability related issues ?

Yes / No

5.1 If No, how would you anticipate the course developing in this respect?

.....

.....

.....

.....

6. Do you think that current design guidelines / regulations adequately cater for the needs of disabled people ?

Yes / No

6.1 If No, please comment.

.....

.....

.....

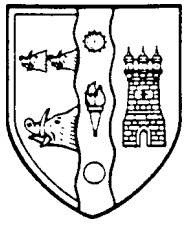
.....P.T.O

Completed by..... (name)

..... (designation)

Please add any further comments below.

Covering letter



Appendix B - 2

ROBERT GORDON'S INSTITUTE OF TECHNOLOGY

FACULTY OF DESIGN
GARTHDEE
ABERDEEN AB9 2QB
Tel. 0224 313247
Ext 3723

RESEARCH PROJECT: ACCESS FOR DISABLED PEOPLE

I would be very grateful if you could help with my survey. I am a post-graduate research student based in the Faculty of Design, Robert Gordon's Institute of Technology.

The main aim of the 3 year project is to assess how, and to what extent building design education addresses the design needs of physically disabled building users.

Please can you help by completing the form below and returning it to me as soon as possible in the enclosed stamped and addressed envelope.

I would also be grateful if you could send me a copy of your course curriculum/syllabus.

Please contact me by telephone if you would like anything clarified.

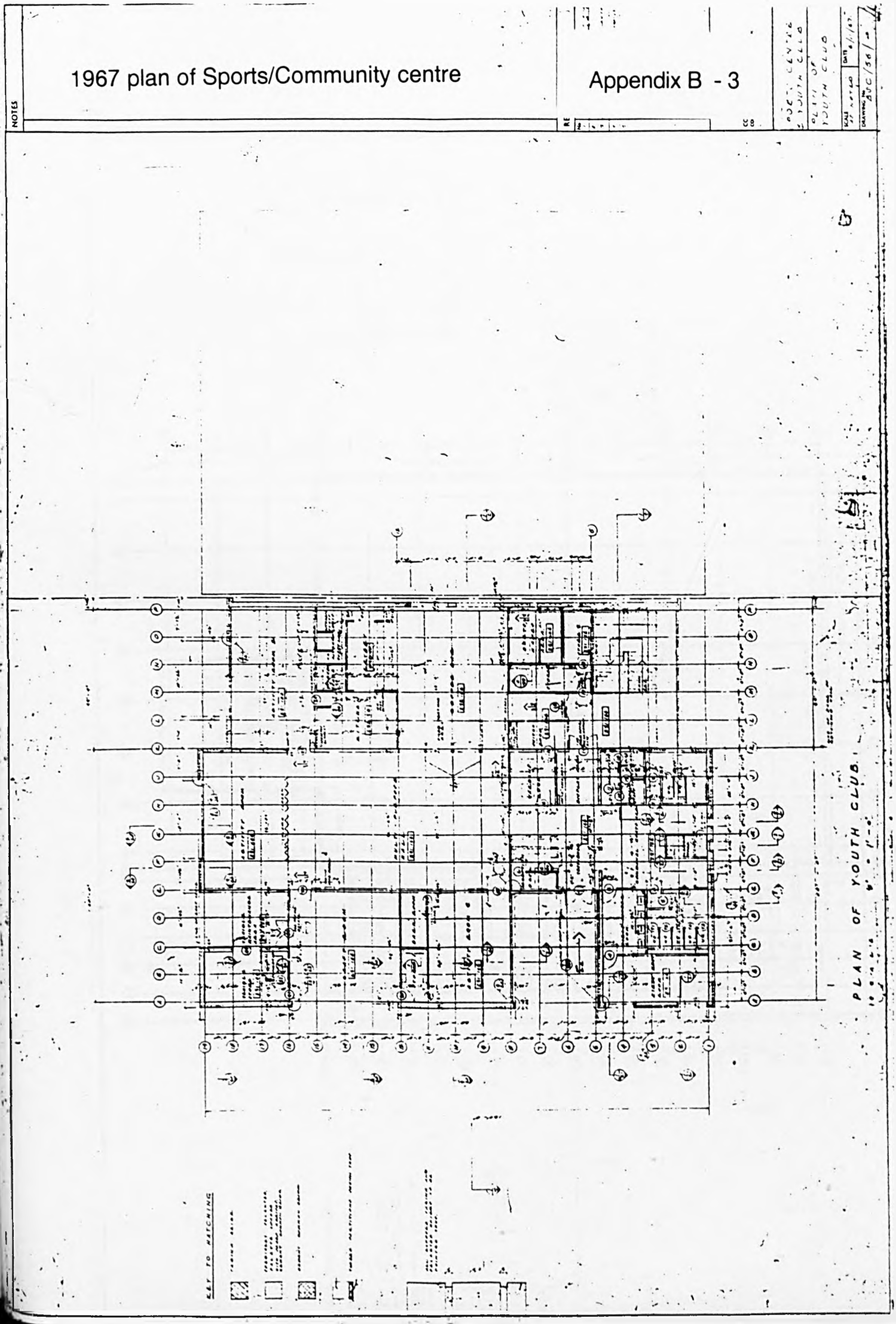
I look forward to hearing from you,

Yours Sincerely

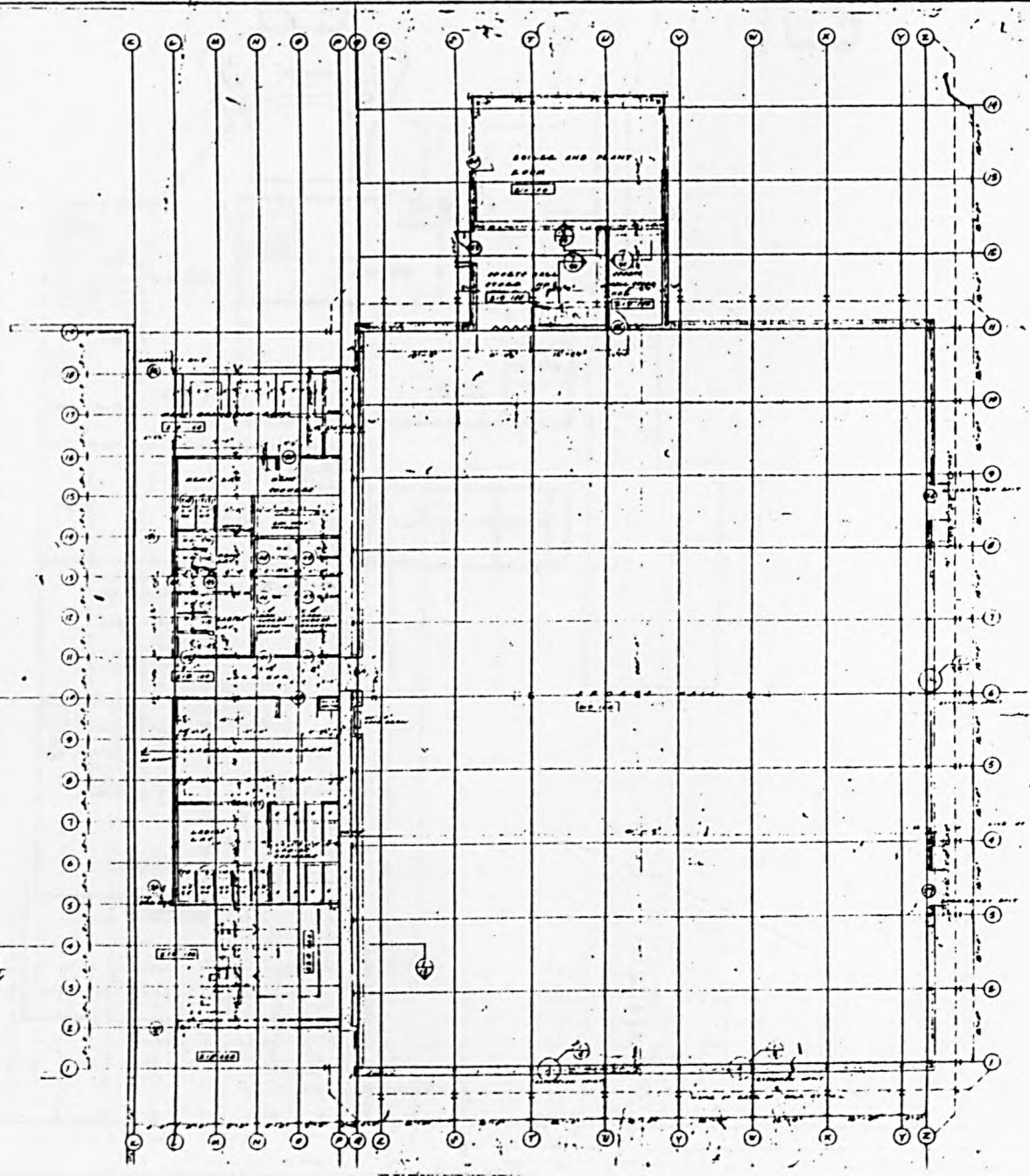
Joanne Milner

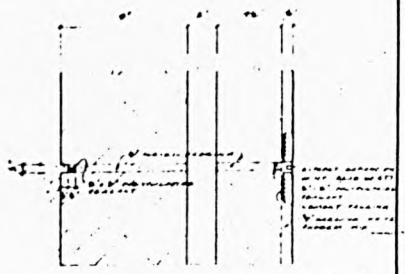
1967 plan of Sports/Community centre

Appendix B - 3



KEY TO HATCHING





⊕ DETAIL OF EXPANSION JOINT

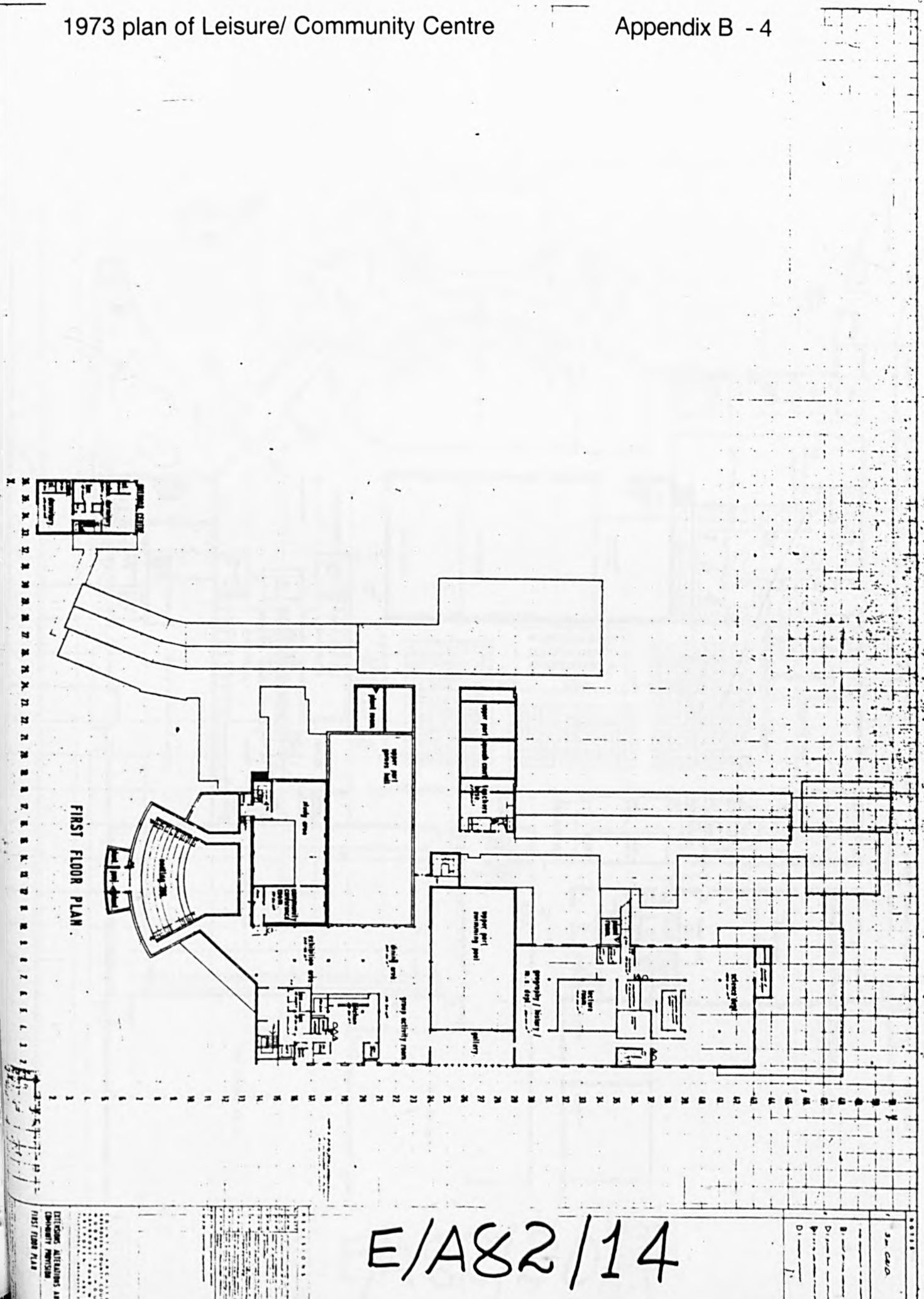
NOTES

REVISIONS

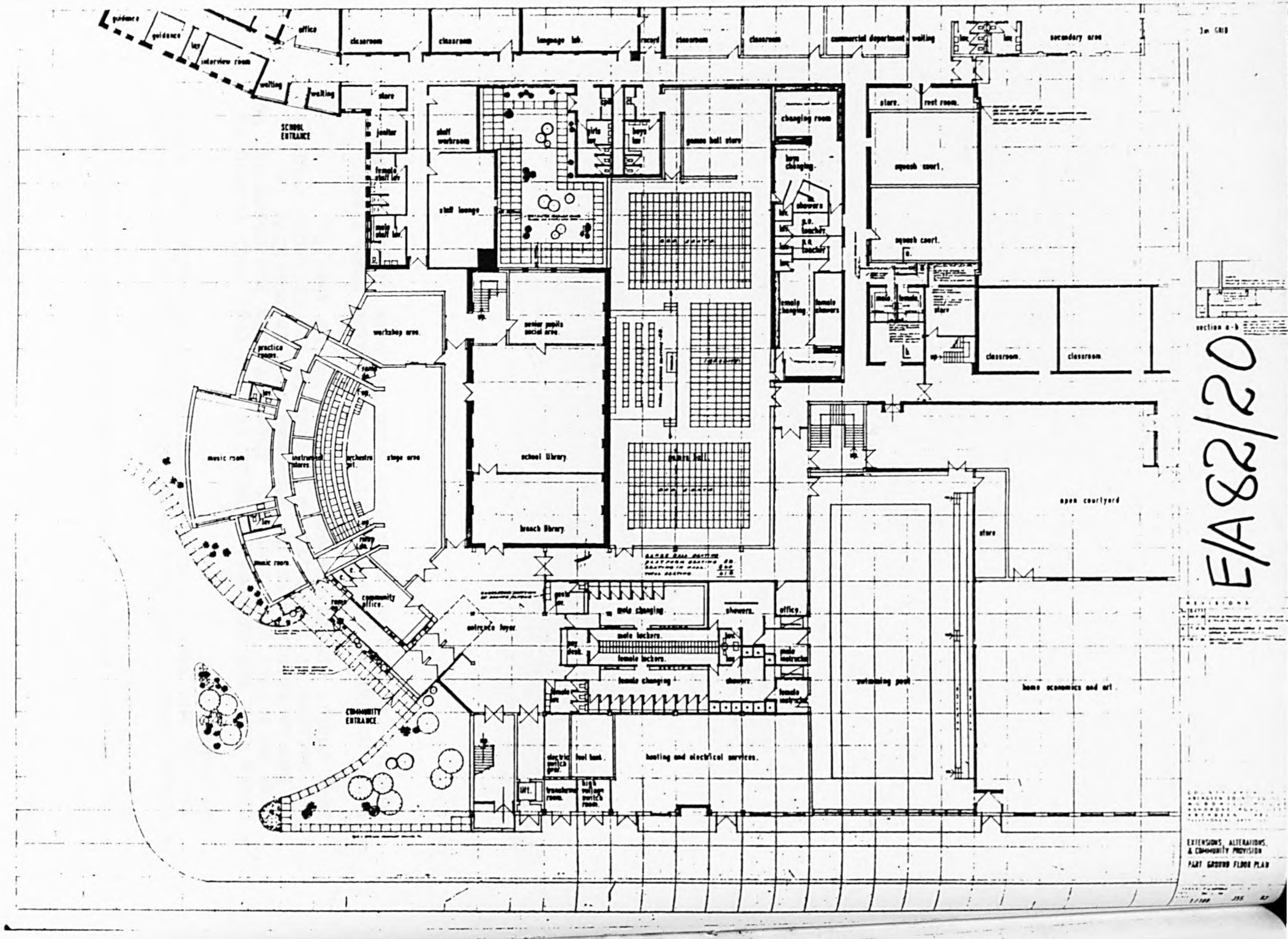
SPORTS CENTRE & YOUTH CLUB

1973 plan of Leisure/ Community Centre

Appendix B - 4



E/A82/14



E/A 82/20

EXTENSIONS, ALTERATIONS & COMMUNITY PROVISION

PART GROUND FLOOR PLAN

Brief for pre- and post - tests

Appendix B - 5

NAME:

* THE ATTACHED PLAN IS A SPORTS/COMMUNITY CENTRE DESIGNED AND BUILT IN 1967.

* PLEASE EXAMINE THE PLAN CAREFULLY. WE APOLOGISE FOR THE POOR QUALITY AND HAVE SUPPLIED THE ORIGINAL PLAN SHOULD YOU WISH TO CONSULT IT.

* GIVEN THAT THE REGIONAL COUNCIL IN THIS CASE WERE FORCED TO KEEP TO A VERY STRICT BUDGET, **IDENTIFY WHAT YOU CONSIDER TO BE THE 10 MAIN FUNCTIONAL PROBLEMS OF THIS BUILDING** ie: THE ABILITY OF THE BUILDING TO PERFORM ITS INTENDED PURPOSE AS A PUBLIC SPORTS/COMMUNITY CENTRE IN THE 1990'S.

* IT IS SUGGESTED THAT YOU WRITE YOUR ANSWERS DOWN FIRST, COMMENT ON THEM AND THEN RANK THEM IN ORDER OF IMPORTANCE.

NAME :

* THE ATTACHED PLAN IS A LEISURE/COMMUNITY CENTRE DESIGNED AND BUILT IN 1973.

* PLEASE EXAMINE THE PLAN CAREFULLY, AND CONSIDER BOTH THE 1973 EXTENSION AND THE EXISTING SCHOOL PREMISES.

* GIVEN THAT THE REGIONAL COUNCIL IN THIS CASE WERE FORCED TO KEEP TO A VERY STRICT BUDGET, **IDENTIFY WHAT YOU CONSIDER TO BE THE 10 MAIN FUNCTIONAL PROBLEMS OF THIS BUILDING** ie: THE ABILITY OF THE BUILDING TO PERFORM ITS INTENDED PURPOSE AS A PUBLIC LEISURE / COMMUNITY CENTRE IN THE 1990'S.

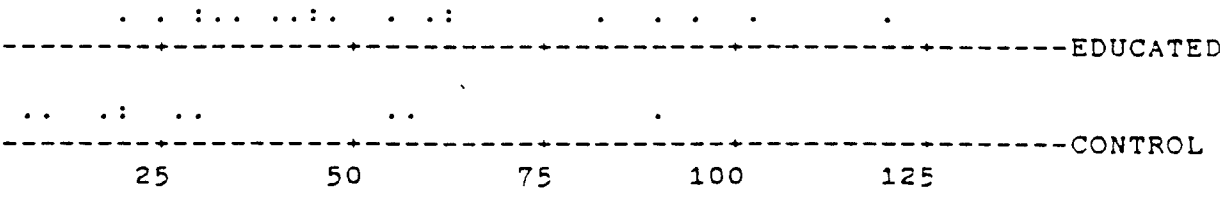
* IT IS SUGGESTED THAT YOU WRITE YOUR ANSWERS DOWN FIRST, COMMENT ON THEM, AND THEN RANK THEM IN ORDER OF IMPORTANCE.

PROBLEMS	COMMENTS	RANK (1-10)
1.		____
2.		____
3.		____
4.		____
5.		____
6.		____
7.		____
8.		____
9.		____
10.		____

Comparison of post-scores of Treated and Control Group1

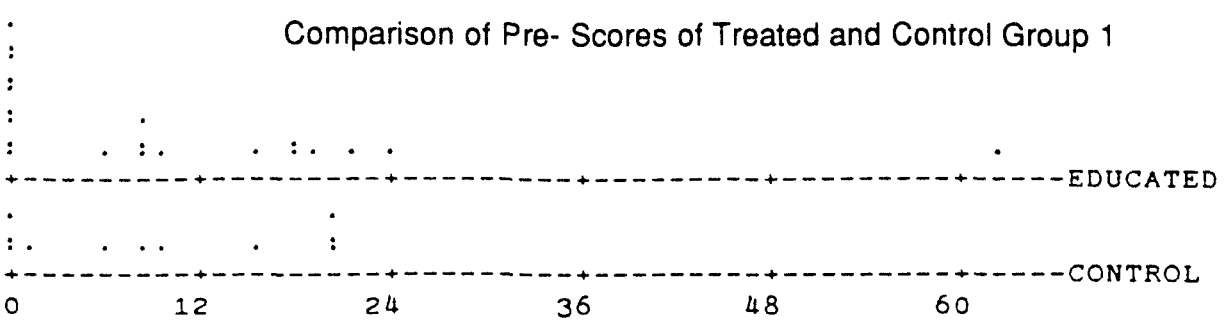

```
SUBC> SUBS IN C10.
MTB > NOTE : Mann-Whitney on Post-scores
MTB > MANN C11 C12

Mann-Whitney Confidence Interval and Test

EDUCATED    N =  21     Median =       46.00
CONTROL     N =  11     Median =       20.00
Point estimate for ETA1-ETA2 is        23.00
95.3 pct c.i. for ETA1-ETA2 is (4.01,41.00)
W = 405.5
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0203
The test is significant at 0.0202 (adjusted for ties)

MTB > TWOS C11 C12;
SUBC> ALTE 1.

TWOSAMPLE T FOR EDUCATED VS CONTROL
            N      MEAN     STDEV   SE MEAN
EDUCATED   21      53.3      30.2       6.6
CONTROL    11      30.5      26.6       8.0

95 PCT CI FOR MU EDUCATED - MU CONTROL: (1.2, 44.3)

TTEST MU EDUCATED = MU CONTROL (VS GT): T= 2.19  P=0.020  DF=  22

MTB > DOTPLOT C11 C12;
SUBC> SAME.
```

Comparison of the Post Scores of the Treated and Control Group



Comparison of pre-scores of Treated and Control Group1


```
MTB > UNSTACK 'PRESCORE' INTO C11 C12;
SUBC> SUBS IN C10.
MTB > NOTE: Pre-scores compared
MTB > DOTPLOT C11 C12;
SUBC> SAME.
```




```
MTB > MANN C11 C12

Mann-Whitney Confidence Interval and Test

EDUCATED    N =  21     Median =        9.00
CONTROL     N =  11     Median =        8.00
Point estimate for ETA1-ETA2 is        -0.00
95.3 pct c.i. for ETA1-ETA2 is (-8.00,8.00)
W = 338.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.7509
The test is significant at 0.7442 (adjusted for ties)

Cannot reject at alpha = 0.05

MTB > NOOUTFILE
```

Comparison of increase in scores of Treated and Control Group1

Comparison of the increase in scores between Control Group 1 and the Treated Groups

```
MTB > TWOT C9 BY C10;
SUBC> ALTE -1.

TWOSAMPLE T FOR INCRSCRE
GROUP(2)    N      MEAN     STDEV   SE MEAN
4          11      21.3      31.6       9.5
1          21      42.7      31.0       6.8

95 PCT CI FOR MU 4 - MU 1: (-45.8, 2.9)

TTEST MU 4 = MU 1 (VS LT): T= -1.83  P=0.041  DF=  20

MTB > UNSTACK C9 C11 C12;
SUBC> SUBS C10.
MTB > COUNT C11
   COUNT    =     21
MTB > NAME C11 'EDUCATED' C12 'CONTROL'
MTB > MANN C11 C12

Mann-Whitney Confidence Interval and Test

EDUCATED    N =  21     Median =       33.00
CONTROL     N =  11     Median =       10.00
Point estimate for ETA1-ETA2 is        23.00
95.3 pct c.i. for ETA1-ETA2 is (1.01,41.02)
W = 398.5
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0410
The test is significant at 0.0410 (adjusted for ties)

MTB > MANN C11 C12;
SUBC> ALTE +1.

Mann-Whitney Confidence Interval and Test

EDUCATED    N =  21     Median =       33.00
CONTROL     N =  11     Median =       10.00
Point estimate for ETA1-ETA2 is        23.00
95.3 pct c.i. for ETA1-ETA2 is (1.01,41.02)
W = 398.5
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0410
The test is significant at 0.0410 (adjusted for ties)
```

Comparison of pre-test scores of Control Group1 and 2 Appendix B - 9

Comparison of pre-test scores of Control Group2 with post-test scores of Control Group1 - 10

```
COLUMN     NAME       COUNT
C1         CONTROL2      27
C2         CONT1PRE      11
C3         CONT1POS      11
C4         EXT1+2PR      11
C5         EXT2+3PO      11

CONSTANTS USED: NONE
```

Control Group 2 compared with Control Group 1 - Pre- Scores

```
MTB > NAME C4 'EXT2+3PR'
MTB > MANN C1 C2

Mann-Whitney Confidence Interval and Test

CONTROL2   N =  27   MEDIAN =    8.0000
CONT1PRE   N =  11   MEDIAN =    8.0000
POINT ESTIMATE FOR ETA1-ETA2 IS   -0.0017
95.0 PCT C.I. FOR ETA1-ETA2 IS (   -8.0,    6.0)
W =  511.5
TEST OF ETA1 = ETA2 VS. ETA1 N.E. ETA2 IS SIGNIFICANT AT   0.6407

CANNOT REJECT AT ALPHA = 0.05

MTB >
MTB > MANN C1 C3
```

Control Group 2 compared with Control Group 1 - Post- Scores

```
Mann-Whitney Confidence Interval and Test

CONTROL2   N =  27   MEDIAN =    8.000
CONT1POS   N =  11   MEDIAN =   20.000
POINT ESTIMATE FOR ETA1-ETA2 IS  -15.9985
95.0 PCT C.I. FOR ETA1-ETA2 IS (  -29.9,   -5.9)
W =  427.5
TEST OF ETA1 = ETA2 VS. ETA1 N.E. ETA2 IS SIGNIFICANT AT   0.0015

1
MTB > INFO

COLUMN     NAME       COUNT
C1         CONTROL2      27
C2         CONT1PRE      11
C3         CONT1POS      11
C4         EXT2+3PR      11
```